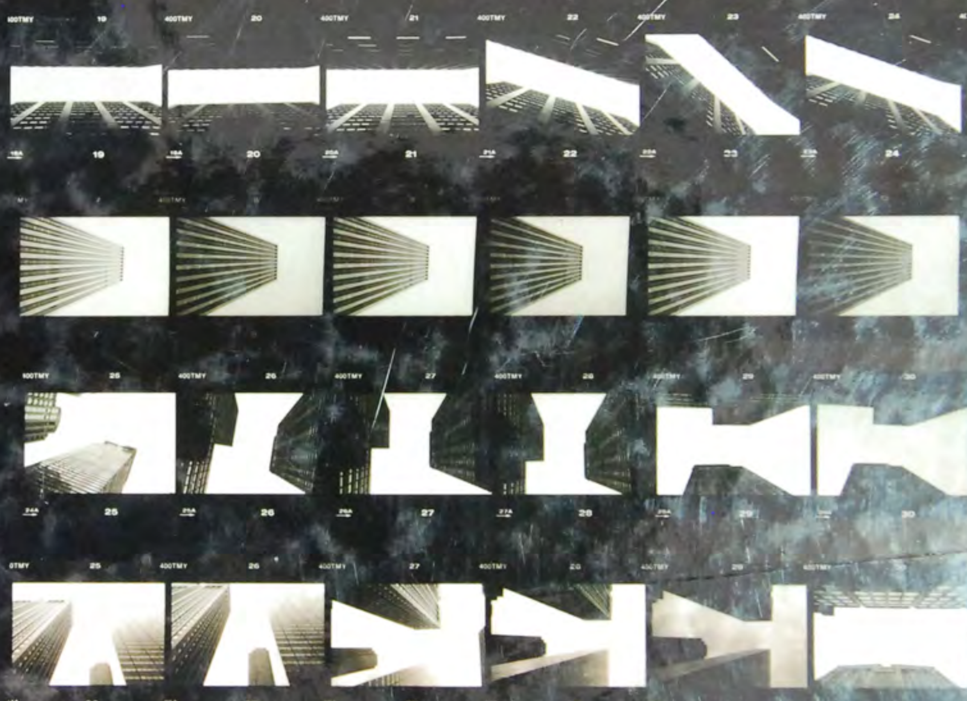
REAL ESTATE FINANCE AND INVESTMENTS

WILLIAM B. BRUEGGEMAN • JEFFREY D. FISHER



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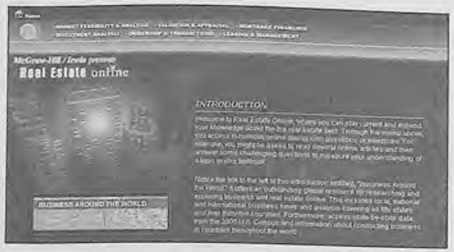

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www.alta.org The American Land Title Association

www.ired.com International Real Estate Digest

www.reals.com This is a real estate directory for such subjects as commercial real estate, international real estate, and professional services.

www.homeglossary.com This is an online real estate dictionary.

www.FindLaw.com A good source of legal information including real estate.

www.mortgagemag.com Includes real estate related articles and links to sites covering Mortgage Banking, Legal Services, and Technology.

dictionary.law.com Legal dictionary.

real-estate-law.freeadvice.com Real estate law FAQs.

www.bai.org Current market rates on various financial investments.

www.interest.com Current average mortgage rates, a mortgage calculator, and basic information on home buying.

www.interestratecalculator.com Various tools including a mortgage calculator.

www.bankrate.com Source of interest rates for CDs and other investments, also provides tools and information on mortgages.

www.mortgage-loan-search.com Information on types of mortgages, recommended refinancing options, pre-qualifications vs. pre-approval, and tips on saving money on your mortgage.

www.nahb.com National Association of Home Builders

www.Countrywide.com National lender that provides mortgage rate information on their website.

www.pueblo.gsa.gov FAQs on various real estate tools.

www.fanniemae.com Federal National Mortgage Association

www.hud.gov Department of Housing and Urban Development

www.freddiemac.com Federal Home Loan Mortgage Corporation

www.mbaa.org Mortgage Bankers Association of America

www.aba.com America Banker Association

www.businessfinance.com/Wraparound-Mortgage.htm Examples of wraparound loans.

www.fha-home-loans.com/buydown_fha_loan.htm Discussion of how FHA Buydown Loans are structured.

www.mgic.com Mortgage Guarantee Insurance Corporation

realtor.com National Association of Realtors

www.ofheo.gov Office of Federal Housing Enterprise Oversight House Price Index

www.freddiemac.com/finance/cmhpi Freddie Mac's Conventional Mortgage Home Price Index (CMHPI)

www.bestplaces.net Statistics on places to live.

www.ers.usda.gov/Data/Unemployment/ U.S. Department of Agriculture. This link includes median household income and unemployment data on every county in the U.S.

www.statetaxcentral.com/ Provides tax information for every state.

realestate.yahoo.com/realestate/homevalues Tools and information on home buying.

www.owners.com *(then Click on Mortgage)* This site provides information and articles on buying a home and financing.

www.hud.gov/offices/hsg/hsgabout.cfm Discussion of FHA.

www.va.gov Veterans Affairs

www.bls.gov/cpi Consumer Price Index site sponsored by the U.S. Department of Labor Bureau of Labor Statistics.

www.reis.com Provides commercial real estate trends, analytics, market research, and news that support transactions by real estate professionals.

www.leasingprofessional.com/ Source of information about leases including terminology, sample leases, and links to other sites.

www.GlobeSt.com Provides current real estate news that is updated daily.

www.appraisalinstitute.org The Appraisal Institute

www.naifa.com/information/process/ National Association of Independent Fee Appraisers

www.nreionline.com/ National Real Estate Investor

www.irei.com Institutional Real Estate, Inc. provides current news and on the "research" page includes links to research reports provided by several institutional investment firms.

www.buildings.com *Buildings* magazine

www.ncreif.com The National Council of Real Estate Investment Fiduciaries

www.reiac.org Real Estate Investment Advisory Council

www.gecapitalrealestate.com/ GE Capital Real Estate

www.gmaccm.com GMAC Commercial Mortgage

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Real Estate Finance and Investments

Thirteenth Edition

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Preface

Interest in real estate has increased dramatically in recent years. In addition, approaches to real estate investment and financing continue to expand and evolve. There are now a myriad of ways of investing in real estate. These include purchasing properties directly as an individual or with other investors in a partnership, or investing in the stock of publicly traded real estate companies. The latter companies, called real estate investment trusts (REITs), develop and own properties throughout the nation. Investments can also be made in mortgage loans that are used to finance real estate. These investments could include making a mortgage loan (as a lender) or purchasing publicly traded mortgage-backed securities (residential or commercial). This book prepares readers to understand the risks and rewards associated with many approaches that may be used when investing in and financing both residential and commercial real estate. Concepts and techniques included in the chapters and problem sets are used in many careers related to real estate. These could include investing, financing, appraising, consulting, managing real estate portfolios, leasing, managing property, analyzing site locations, and managing corporate real estate. This material is also relevant to individuals who want to better understand real estate for their own personal investment and financing decisions.

Excel Spreadsheets and ARGUS Software

The book is rigorous yet practical and blends theory with applications to real-world problems. These problems are illustrated and solved by using a blend of financial calculators, EXCEL spreadsheets, and specialized software designed to analyze real estate income property. EXCEL spreadsheets, provided on the book's Web site at **www.mhhe.com/bf13e**, are an aid for students to understand many of the exhibits displayed in chapters throughout the text. By modifying these exhibits, students also may solve many end-of-chapter problems without having to design new spreadsheets.

A trial version of the ARGUS software is also included on the Web site. ARGUS is a Windows-based program that is widely used throughout the real estate investment industry to solve complex lease-by-lease investment and valuation problems. Problems including leases appear in various chapters throughout the book. Data files have been replicated so that students can modify examples when solving homework problems at the end of chapters.

Internet Tools and Assets

Making informed real estate investment and financing decisions depends on being able to obtain useful information. Such information may include national and local market trends, interest rates, properties available for acquisition, financing alternatives, and the opinions of experts concerning the outlook for various real estate sectors.

The Internet now provides a rich source of information to real estate investors and lenders. Knowing how to find information on the Web is an important part of the "due diligence" that should be done before making any real estate investments. This edition includes an expanded number of **Web App** boxes that provide exercises that require finding relevant information on the Internet. These Web App boxes provide practical examples of the types of data and other resources that are available on the Internet. The thirteenth edition also contains more URLs that students can use to research various real estate topics. In addition to research, these resources provide readers with an opportunity to remain current on many of the topics discussed in the book.

McGraw-Hill/Irwin has also created an Internet resource called **Real Estate Online**. Real Estate Online allows the reader to stay current and obtain knowledge of real estate through online discussion questions, articles, and exercises. Access to this and other student/instructor's resources, including a **new online quiz feature**, is available at **www.mhhe.com/bf13e**.

Plan of the Thirteenth Edition

This edition is organized in five major sections:

Part I introduces real estate investment and financing by examining important legal concepts related to ownership rights and real estate notes and mortgages. The importance of the time value of money (TVM) in financing is also reviewed. Many students will have been exposed to the TVM in other courses; however, this material provides a framework for many applications that are specifically related to real estate.

Part II of this edition focuses on financing residential properties. Chapters 4, 5, and 6 describe various types of mortgages, including fixed rate, adjustable rate, hybrid, subprime, and home equity–based loans. Chapter 7 has been substantially revised. In addition to evaluating single family housing as an investment, it contains a discussion of the demand for housing, how to analyze whether a residence should be rented or owned, tax considerations, expected price appreciation, and other factors. A discussion of hedging, "housing bubbles," and investing in "distressed properties" is also included.

Part III turns to investment analysis and financing of income properties. It includes an expanded discussion of leases and addresses rent determination, expense recoveries, and other options and features that are peculiar to the four major property types. It also includes in-depth coverage of methods used to estimate the value of income properties, an analysis of various financing alternatives, risk analysis, and disposition decisions. The role of real estate in corporations not in the real estate business, but that must decide whether to lease or own facilities and that make many other real estate decisions in their operations, is also discussed. EXCEL spreadsheets as well as the ARGUS software also are utilized throughout this section of the text.

Part IV discusses the analysis of construction and land development projects. Analysis of these projects differs considerably from that of existing properties because of the additional risk introduced by the development process. These risks and expected returns are discussed from the perspective of both lenders and investors. Topics include how construction and land development loans are structured, how a developer receives advances, or "draws," during development and the lease-up phase, and how such loans are repaid. Concept boxes containing terms frequently used in development are also included in these chapters.

Part V has been expanded to include more material related to joint venture investment structures used by developers and investors. Mortgage-backed securities have been expanded to include collateralized debt obligations (CDOs) in addition to residential and mortgage-backed securities. Real estate investment trusts (REITs) have been expanded to include international securities. International real estate investment diversification is also discussed. Readers will also see how "derivatives" can be created using real estate (or mortgages on real estate) as collateral. The final chapter considers the importance of real estate in a diversified investment portfolio that also includes stocks and bonds. This provides readers with an introduction to institutional investors and how portfolio managers view real estate relative to other asset classes both domestically and globally.

Supplements

Several ancillary materials are available for instructor use. These include:

- Instructor's Manual—developed by Jeffrey Fisher and William Brueggeman.

- Test Bank—developed by Jeffrey Fisher and William Brueggeman.
- PowerPoint slides—developed by Edward Baryla and Pamela Plücker, East Tennessee State University.

Acknowledgments

We would like to thank several people who contributed to the thirteenth edition revision by either being a reviewer or providing feedback to us in other ways that helped improve the current edition. These include Michael Fratantoni at Georgetown University, Roy T. Black at Georgia State University, Michael Schonberger at Rutgers University–New Brunswick, Edward Baryla at East Tennessee State University, Thomas P. Boehm at the University of Tennessee–Knoxville, Ping Cheng at Florida Atlantic University, Carlos Slawson at Louisiana State University, and W. Keith Munsell at Boston University.

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We will miss the late Theron Nelson who contributed to prior editions of the book, including creating the original version of several of the spreadsheet templates. We appreciate his contributions to this book and to the real estate profession.

Our thanks to the book team at McGraw-Hill/Irwin for their help in developing the new edition: Paul Ducham, executive editor; Michelle Driscoll, editorial coordinator; Dan Wiencek, marketing manager; Brian Nacik, media project manager; Kristin Bradley, project manager; Debra Sylvester, production supervisor; Cara David, designer; and Becky Szura, supplement producer.

We also continue to be indebted to people who have contributed to previous editions, especially the late Henry E. Hoagland, who wrote the first edition of this book, and Leo D. Stone, who participated in several editions. Finally, we thank all of the adopters of previous editions of the book, who, because of their feedback, have made us feel that we have helped them prepare students for a career in real estate.

William B. Brueggeman

Jeffrey D. Fisher

Brief Contents

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Chapter 1

An Introduction to Real Estate Investment: Legal Concepts

This is not a book about real estate law; however, a considerable amount of legal terminology is used in the real estate business. It is very important to understand both the physical nature and property rights being acquired when making real estate investments. In this chapter, we survey many important terms pertaining to real estate. Additional legal terms and concepts will appear in later chapters of this book on a "need to know" basis.

Many of the legal terms currently used in the real estate business have evolved from English common law, which serves as the basis for much of the property law currently used in the United States. For example, the term *real* in real estate comes from the term *realty*, which has, for centuries, meant land and all things permanently attached (the latter would include immovable things such as buildings and other structures). All other items not considered realty have been designated as *personalty*, which includes all movable things (e.g., automobiles, shares of stock, bank accounts, patents). The term *estate* has evolved to mean "all that a person owns," including both realty and personalty. Hence, the portion of a person's estate that consists of realty has come to be known as *real estate*. However, in current business practice, although the term realty is sometimes used, we generally use the term *real estate* to mean land and all things permanently attached.

Understanding the distinction between realty and personalty is important because our legal system has evolved in a way that treats the two concepts very differently. For example, long ago in England, disputes over real estate usually involved issues such as rightful ownership, possession, land boundaries, and so forth. When such disputes were brought before the court, much of the testimony was based on oral agreements, promises, and the like, allegedly made between the opposing parties, and these disputes were difficult to resolve. Decisions that had to be rendered were extremely important (recall that England's economy was very heavily dependent on agriculture at that time) and affected people's livelihood. Court decisions may have required one of the parties to vacate the land plus turn over any permanent improvements that had been made (houses, barns, etc.) to other parties. As the number of disputes increased, a pragmatic solution evolved requiring that all transactions involving real estate be evidenced by a *written, signed contract* in order to be enforceable.[1]

[1] This requirement was included as part of the *Statute of Frauds and Perjuries*, which was passed in England in 1677 with the intent of reducing the number of disputes and questionable transactions brought before the court.

Parallel developments included (1) a system whereby land locations and boundaries could be more accurately surveyed and described in contracts and (2) an elaborate system of public record keeping whereby ownership of all realty within a political jurisdiction could be catalogued. Any transactions involving realty could then be added to this record, thereby creating a historical record of all changes in ownership and providing notice of such changes to the general public and especially to any parties contemplating purchasing or lending money on real estate. Similar practices continue today in the United States as we require written contracts, requirements, survey methods, and public record systems detailing the ownership of real estate within all counties in every state. We should note that many transactions involving personalty are not subject to the same contractual requirements as real estate and that oral contracts may be enforceable.

When investing in real estate, in addition to acquiring the physical assets of land and all things permanently attached, investors also acquire certain *rights*. Examples of these rights include the right to control, occupy, develop, improve, exploit, pledge, lease, and sell real estate. These have come to be known as *property rights*. Hence, the terms *real property* and *real property rights* have evolved.[2] As a practical matter, in business discussions, the terms *real estate* and *real property* are sometimes used interchangeably. However, as we will see, many of the property rights acquired when investing in real estate are independent and can be separated. For example, real estate may be leased or pledged to others in exchange for rent or other consideration. This may be done without giving up ownership. Indeed, understanding the nature of property rights and how they can be bundled and creatively used to enhance value is one goal of this textbook. The reader should refer to Exhibit 1–1 for an outline of these concepts.

Property Rights and Estates

As pointed out above, the term **real estate** is used to refer to things that are not movable such as *land* and *improvements* permanently attached to the land, and **ownership rights** associated with the real estate are referred to as **real property.** Real property has also been contrasted with **personal property.**[3]

It is important to distinguish between physical real estate assets and ownership rights in real property because many parties can have different ownership rights in a given parcel of real estate. Our legal system offers ways for the person financing or investing in real estate to be creative and to apportion these various interests among parties.

We generally refer to **property rights** as the right of a person to the possession, use, enjoyment, and disposal of his or her property. With respect to its application to real estate, *interest* is a broad legal term used to denote a property right. The holder of an interest in real estate enjoys some right, or degree of control or use, and, in turn, may receive payment for the sale of such an interest. This interest, to the extent that its value can be determined, may also be bought, sold, or used as collateral for a loan.

The value of a particular parcel of real estate can be viewed as the total price individuals are willing to pay for the flow of benefits associated with all of these rights. An individual does not have to be an owner per se to have rights to some of the benefits of real

[2] For nonrealty, the term *personal property* has evolved, and personal property rights would include the bundle of rights which are similar to those listed above but pertaining to personalty.

[3] We should also point out that there are some items known as *fixtures*. These are items that were once personal property but have become real property because they have either been attached to the land or building in a somewhat permanent manner or are intended to be used with the land and building on a permanent basis. Examples include built-in dishwashers, furnaces, and garage door openers.

EXHIBIT 1–1 Basic Property Concepts Important in Real Estate Finance and Investment

(1) The General Nature of Property	(2) Classification of "Things"	(3) Examples	(4) Property Ownership: Evolution of Legal Requirements/Evidence
Any "thing" that can be possessed, used, enjoyed, controlled, or conveyed is generally considered to be property.	A. Real Property (Realty)	A. Land and all things permanently affixed (buildings, sidewalks, etc.). Immovables. Fixtures.	A. Written contracts, legal descriptions, surveys, deeds, wills, possession. Public notice.
	B. Personal Property (Personalty)	B. Intangibles and all movable things (e.g., autos, stocks, patents, furniture).	B. Contracts oral or written, purchase orders/invoices, etc.
Property Rights Rights that can be exercised by the property owner. These include possession, use, enjoyment, control, and the creation of interests in property.			
Interests in Property Created by owners of real estate who pledge and encumber property in order to achieve an objective without giving up ownership.		C. Property owner pledges real estate as security for a loan.	C. Mortgage liens, easements, etc.
		D. Property owner grants an easement to another party to cross land in order to gain access to another site.	

estate. For example, a person who leases land, a **lessee,** may have the right to possession and exclusive use of a property for a period of time. This right of use has value to the lessee, even though the term of the lease is fixed. In exchange for the right to use the property, the lessee is willing to pay a rent for the term of the lease. A holder of a mortgage also has some rights as a nonowner in real estate pledged as security for a loan. These rights vary with state law and the terms of the mortgage, but, in general, the lender (or mortgagee) has a right to repossess or bring about the sale of a property if the borrower defaults on the mortgage loan. Although a lender may not possess or use the real estate, the mortgage document provides the lender with evidence of a **secured interest.** Obviously this right has value to the lender and reduces the quantity of rights possessed by the owner.

It should be clear that some understanding of the legal characteristics of real estate is essential to analyzing the relative benefits that accrue to the various parties who have some rights in a particular property. In most real estate financing and investment transactions, we generally think in terms of investing, selling, or borrowing based on one owner possessing all property rights in the real estate. However, as we have discussed, all or a portion of these rights may be restricted or transferred to others. For example, a property owner may lease a property and pledge it as security for a mortgage loan. Remarkably, these parties generally enjoy their respective rights in relative harmony. However, conflicts arise occasionally concerning the relative rights and priorities among holders of these interests. The potential for such conflicts may also affect rents that individuals may be willing to pay or the ability to obtain financing from lenders and, ultimately, the value of property.

Definition of Estate

The term **estate** means "all that a person owns." The term *real estate* means all realty owned as a part of an individual's estate. The term *estates in real property* is used to describe the extent to which rights and interests in real estate are owned. A system of *modifiers* has evolved, based on English property law, that describes the nature or collection of rights and interests being described as a part of a transaction. For example, a *fee simple estate* represents the most complete form of ownership of real estate, whereas a *leasehold estate* usually describes rights and interests obtained by tenants when leasing or renting a property. The latter is also a possessory interest and involves the general right to occupy and use the property during the period of possession.

Two General Classifications of Estates

(1) Based on Rights: Estates in Possession versus Estates Not in Possession (Future Possession)

Two broad categories of estates can be distinguished on the basis of the *nature of rights accompanying the ownership of such estates*. An estate in possession (a present estate in land) entitles its owner to immediate enjoyment of the rights to that estate. An estate not in possession (a future estate in land), on the other hand, does not convey the rights of the estate until some time in the future, if at all. An estate not in possession, in other words, represents a *future* possessory interest in property. Generally, it does not convert to an estate in possession until the occurrence of a particular event. Estates in possession are by far the more common. When most people think of estates, they ordinarily have in mind estates in possession. Obviously, lenders and investors are very interested in the nature of the estate possessed by the owner when considering the purchase or financing of a particular estate in property.

(2) Based on Possession and Use: Freehold versus Leasehold Estates

Estates in possession are of two general types: freehold estates and leasehold estates. These types of estates are technically distinguished on the basis of the definiteness or certainty of their duration. A **freehold estate** lasts for an indefinite period of time; that is, there is no definitely ascertainable date on which the estate ends. A **leasehold estate,** on the other hand, expires on a definite date. Aside from this technical distinction, a freehold estate connotes ownership of the property by the estate holder, whereas a leasehold estate implies only the right to *possess* and *use* the property owned by another for a period of time.

Examples of Freehold Estates

It is beyond the scope of this chapter to review all the possible types of freehold estates. We will discuss two of the most common examples, however, to convey the importance of knowing the type of estate that is associated with a particular transaction.

Fee Simple Estate

A **fee simple estate,** also known as a fee simple absolute estate, is the freehold estate that represents the most complete form of ownership of real estate. A holder of a fee simple estate is free to divide up the fee into lesser estates and sell, lease, or borrow against them as he or she wishes, subject to the laws of the state in which the property is located. Apart from government restrictions, no special conditions, limitations, or restrictions are placed

on the right of a holder of a fee simple estate to enjoy the property, lease it to others, sell it, or even give it away. It is this estate in property which investors and lenders encounter in most investment and lending transactions.

Life Estates

It is possible to have a freehold estate that has fewer ownership rights than a fee simple estate. One example is a **life estate,** which is a freehold estate that lasts only as long as the life of the owner of the estate or the life of some other person. Upon the death of that person, the property reverts back to the original grantor (transferor of property), his or her heirs, or any other designated person. Most life estates result from the terms of the conveyance of the property. For example, a grantor may wish to make a gift of his or her property prior to death, yet wish to retain the use and enjoyment of the property until that time. This can be accomplished by making a conveyance of the property subject to a reserved life estate. A life estate can be leased, mortgaged, or sold. However, parties concerned with this estate should be aware that the estate will end with the death of the holder of the life estate (or that of the person whose life determines the duration of the estate). Because of the uncertainty surrounding the duration of the life estate, its marketability and value as collateral are severely limited.

Estates Not Yet in Possession (Future Estates)

The preceding discussion concerned estates in possession, which entitled the owner to immediate enjoyment of the estate. Here we discuss estates not in possession, or **future estates,** which do not convey the right to enjoy the property until some time in the future. The two most important types of future estates are the reversion and the remainder.

Reversion

A **reversion** exists when the holder of an estate in land (the grantor) conveys to another person (a grantee) a present estate in the property that has fewer ownership rights than the grantor's own estate and retains for the grantor or the grantor's heirs the right to take back, at some time in the future, the full estate that the grantor enjoyed before the conveyance. In this case, the grantor is said to have a reversionary fee interest in the property held by the grantee. A reversionary interest can be sold or mortgaged because it is an actual interest in the property.

Remainder

A **remainder** exists when the grantor of a present estate with fewer ownership [illegible] the grantor's own estate conveys to a third person the reversionary interest [illegible] grantor's heirs would otherwise have in the property upon termination [illegible] estate. A remainder is the future estate for the third person. [illegible] mortgageable interest in property.

Examples of Leasehold Estates

There are two major types of leasehold estates: estates for years and estates from year to year. There are two other types, but they are not common.[a] Leasehold estates are classified on the basis of the manner in which they are created and terminated.

[a] *Estate at Will:* An estate at will is created when a landlord consents to the possession of the property by another person but without any agreement as to the payment of rent or the term of the tenancy. Such estates are of indefinite duration. *Estate at Sufferance:* An estate at sufferance occurs when the tenant holds possession of the property without consent or knowledge of the landlord after the termination of one of the other three estates.

Estate for Years

An **estate for years** is the type of leasehold estate investors and lenders are most likely to encounter. It is created by a lease that specifies an exact duration for the tenancy. The period of tenancy may be less than one year and still be an estate for years as long as the lease agreement specifies the termination date. The lease, as well as all contracts involving transactions in real estate, is usually written. Indeed, a lease is generally required by the statute of frauds to be in writing when it covers a term longer than one year. The rights and duties of the landlord and tenant and other provisions related to the tenancy are normally stated in the lease agreement.

An estate for years can be as long as 99 years (by custom, leases seldom exceed 99 years in duration), giving the lessee the right to use and control the property for that time in exchange for rental payments. To the extent that the specified rental payments fall below the market rental rate of the property during the life of the lease, the lease has value (leasehold value) to the lessee. The value of this interest in the property can be borrowed against or even sold. For example, if the lessee has the right to occupy the property for $1,000 per year when its fair market value is $2,000 per year, the $1,000 excess represents value to the lessee, which may be borrowed against or sold (assuming no lease covenants prevent it).

While a property is leased, the original fee owner is considered to have a *leased fee* estate. This means that he or she has given up some property rights to the lessee (the leasehold estate). The value of the leased fee estate will now depend on the amount of the lease payments expected during the term of the lease plus the value of the property when the lease terminates and the original owner receives the reversionary interest. Hence, a leased fee estate may be used as security for a loan or may be sold.

Estate from Year to Year

An **estate from year to year** (also known as an estate from period to period, or simply as a periodic tenancy) continues for successive periods until either party gives proper notice of its intent to terminate at the end of one or more subsequent periods. A "period" usually corresponds to the rent-paying period. Thus, such a tenancy commonly runs from month to month, although it can run for any period up to one year. Such estates can be created by explicit agreement between the parties, although a definite termination date is not specified. Since these estates are generally short-term (a year or less), the agreement can be, and frequently is, oral. This type of estate can also be created without the express consent of the landlord. A common example is seen when the tenant "holds over" or continues to occupy an estate for years beyond the expiration date, and the landlord accepts payment of rent or gives some other evidence of tacit consent.

If present tenants are to remain in possession after the transfer or sale of property, the grantee should agree to take title subject to existing leases. The agreement should provide for prorating of rents and the transfer of deposits to the grantee. Buyers of property encumbered by leases should always reserve the right to examine and approve leases to ensure that they are in force, are not in default, and are free from undesirable provisions.

Interests, Encumbrances, and Easements

An *interest* in real estate can be thought of as a right or claim on real property, its revenues, or production. Interests are created by the owner and conveyed to another party, usually in exchange for other consideration. In real estate, an interest is usually thought to be less important than an estate. For example, an owner of real estate in fee simple may choose to *pledge* or *encumber* his property as a condition for obtaining a loan (mortgage loan). In this case, the lender receives only a *secured interest,* but not *possession, use, and so on,* of the

property. The nature of the secured interest is usually documented in a mortgage which explains the actions that a lender may take in the event that the loan terms are not met by the property owner. In the interim, the property owner *retains possession and use* of the property. Another example of the creation of an interest in real property occurs when an owner encumbers a property by granting an easement, or the right to ingress or egress his property to another party.

An **easement** is a **nonpossessory interest** in land. It is the right to use land that is owned or leased by someone else for some special purpose (e.g., as a right of way to and from one's property). An easement entails only a limited user privilege and not privileges associated with ownership.[5] Examples of easements would be the following: property owner A allows property owner B to use a driveway on A's land to provide owner B with better access to his property. In some retail developments, owners A and B may execute reciprocal easements to allow access across both properties, thereby enhancing customer traffic flow and shopping opportunities.

Assurance of Title

When making real estate investments, buyers of property typically want assurance that they will become the legal owner of the property and that the seller is lawfully possessed and has the right to convey title. Exhibit 1–2 contains a basic flow diagram that should help the reader understand concepts relating to real estate ownership.

When considering the purchase of real estate, buyers must be in a position to assess the quantity and quality of ownership rights that they are acquiring. **Title assurance** refers to the means by which buyers of real estate "(1) learn in advance whether their sellers have and can convey the quality of title they claim to possess, and (2) receive compensation if the title, after transfer, turns out not to be as represented."[6] Lenders are also concerned about title assurance because the quality of title affects the collateral value of the property in which they may have a secured interest. Before we examine the mechanisms used for title assurance, we must briefly review the concepts of title and deed.

The Meaning of Title

Title is an abstract term frequently used to link an individual or entity who owns property to the property itself. When a person has "title," he is said to have all of the elements, including the documents, records, and acts, that prove ownership. Title establishes the quantity of rights in real estate being conveyed from seller to buyer. The previous section briefly examined some of the various types of ownership rights and possessory interests that can be involved in a parcel of real estate. We saw, for example, that one person can hold a fee simple ownership, convey title to a life estate to another, and convey the right to reversion upon termination of the life estate to yet another person. Hence, there are many possible combinations of rights and interests.

An **abstract of title** is a historical summary of the publicly recorded documents that affect a title. The quality of the title conveyed from seller to buyer depends upon the effect these documents have upon the seller's rightful possession of his or her property.

[5] When a property owner provides another with an interest such as an easement, the property owner is said to have encumbered the property. This may be transferred as a part of subsequent sales to successive owners unless it is defeated, or the owner of the interest releases or reconveys the interest to the property owner.

[6] Grant S. Nelson and Dale A. Whitman, *Real Estate Transfer, Finance and Development*, 2nd ed. (St. Paul, MN: West Publishing, 1981), p. 167.

EXHIBIT 1-2
Flowchart: Ownership of Real Property

Concept	Discussion
Ownership	When a person or other legal entity has lawful possession of realty and real property rights they are said to have "ownership."
Proof of ownership	Proof is usually accomplished with documents such as deeds, contracts, wills, grants, property records, and/or evidence of continuous possession and use, etc.
Title	When a person or entity has legal evidence, or "proof," of ownership, they are said to have "title" to a property. This evidence links ownership by a person to a specific property.
Assurance of title:	When investing in real estate, the investor must be able to evaluate the quality and/or completeness of title that they will receive. As part of the contract negotiations, the seller usually agrees to convey title *and* to provide a warranty or guarantee.
(a) General warranty deed	When the seller conveys a *general warranty deed*, she warrants (1) that she is in lawful possession of the property and all property rights, (2) that no other individuals or entities have an ownership interest in the property, and (3) that the title is unencumbered or free of imperfections (with any specific exceptions noted: e.g., easements, leases, or liens). In the event that a buyer who relies on the seller's warranty incurs a loss because of title imperfections, the seller may be liable.
(b) Qualified warranty deeds	In cases when the seller is unsure of the quality of title or is unwilling to provide a general warranty deed, the seller may qualify assurance of title by conveying a "special warranty deed," a "bargain and sale deed," or a "quit claim deed."
Evidence as to the nature and quality of title being conveyed:	How can the investor in a property be assured that the seller legally possesses the property and that the record of ownership is clear, or that the title is unencumbered?
(a) Attorney's opinion	An attorney reviews the property records and other evidence to ascertain whether or not the "chain of title" is "clear." When a title is clear, this usually means that all individuals who may have had an ownership interest in the property have conveyed or relinquished such interests in previous conveyances of title.
(b) Title insurance	More commonly, an insurance policy indemnifying against a loss due to title imperfections is purchased (usually by the buyer). This may be done because the seller's warranty may be effectively limited. This could happen if the seller files for bankruptcy or does not have the financial capacity to reimburse the buyer for losses due to title imperfections. Title insurance also may be used in lieu of an attorney's opinion because the latter protects the buyer only to the extent that the title search was done negligently by the attorney or her abstractor.

Essentially, title exists only for freehold estates. A leasehold estate, on the other hand, is typically created by a contract (called a lease) between a person who holds title (the **lessor**) and another person (the lessee), whereby possession of the property is granted by the owner to the other person for a period of time. The existence of leases on a property will, however, affect the nature of the rights that can be conveyed to a new buyer because lease terms are

binding on the new owner unless waived by the lessee. Because investors and lenders are concerned about the nature and extent of the rights they are acquiring or financing, leases encumbering the property can have a profound impact on a property's value.

Deeds

Usually title is conveyed from one person (the grantor) to another (the grantee) by means of a written instrument called a **deed.**[7] (We use the term *grantor* instead of *seller* because title may also be transferred by the owner [grantor] to an heir [grantee] by means of a will; hence the terms *grantor* and *grantee.*) To be a valid conveyance of ownership interests in real property, all deeds must be in writing and meet certain other legal requirements of the state in which the property is located.

Generally, a purchaser wants the deed to convey a good *and* marketable title to the property. A good title is one that is valid in fact; that is, the grantor does lawfully have the title he or she claims to have to the property. However, a good title, because of the lack of sufficient documentation or encumbrances on the property, may be unmarketable. A marketable title is one that is not merely valid in fact but is also "free from reasonable doubt," one that is "reasonably free from litigation," and "one which readily can be sold or mortgaged to a reasonably prudent purchaser or mortgagee (mortgage lender)."[8]

Encumbrances on a title, such as easements, leases, and mortgages (secured interests), do not automatically make it unmarketable. A purchaser may be willing to take title to the property subject to encumbrances. But the deed should note all encumbrances on the title so that a potential purchaser can rationally decide whether to purchase the property and to arrive at the appropriate price given any risks, costs, or restrictions posed by the encumbrances.

Methods of Title Assurance

There are three general ways in which a buyer has assurance that a title is good and marketable. First, the seller may provide a warranty as part of the deed. Second, there may be a search of relevant recorded documents to determine whether there is reason to question the quality of the title. This is usually done by an attorney and is accompanied by a legal opinion. Third, title insurance may be purchased to cover unexpected problems with the title.

General Warranty Deed

It is important to understand that any deed, no matter how complete the warranties contained therein, can only convey the quality of title that the grantor actually has to the property. This is why most buyers of real estate usually obtain independent assurance of the validity and marketability of the title from a third party. A **general warranty deed** is the most commonly used deed in real estate transactions and the most desirable type of deed from the buyer's perspective. It offers the most comprehensive warranties about the quality of the title. Essentially, the grantor warrants that the title he or she conveys to the property is free and clear of all encumbrances other than those specifically listed in the deed. As pointed out above, encumbrances listed in a deed could include easements and leases. Generally, the most significant covenants contained in such a deed are the following: (1) a covenant that the grantor has good (legally valid) title to the property, (2) a covenant

[7] A deed is not the only way by which ownership rights in real property are conveyed. Titles are also transferred by wills, court decrees, and grants of land from the government to private persons. In addition, lawful title to property can be acquired by means of adverse possession.

[8] *Black's Law Dictionary,* 7th ed. (St. Paul, MN: West Publishing, 1999).

that the grantor has the right to convey the property, (3) a covenant to compensate the grantee for loss of property or eviction suffered by the grantee as a result of someone else having a superior claim to the property, and (4) a covenant against encumbrances on the property other than those specifically stated in the deed. In a general warranty deed, these covenants cover all conveyances of the property from the time of the original source of title to the present.

Special Warranty Deed

A **special warranty deed** makes the same warranties as a general warranty deed except that it limits their application to defects and encumbrances that occurred only while the grantor held title to the property. Unlike the warranties in a general warranty deed, those in a special warranty deed do not apply to title problems caused or created by previous owners.

Quitclaim Deed

A **quitclaim deed** offers the grantee the least protection. Such a deed simply conveys to the grantee whatever rights, interests, and title that the grantor may have in the property. No warranties are made about the nature of these rights and interests or of the quality of the grantor's title to the property. The quitclaim deed simply says that the grantor "quits" whatever "claim" he or she has in the property (which may well be none) in favor of the grantee.[9]

Very few buyers of real estate rely solely on the guarantees of title provided in deeds of conveyance by the seller. The two methods that buyers employ most often to obtain assurance of title independently of the guarantees provided by the seller are an attorney's opinion of title and title insurance.[10]

Abstract and Opinion Method

Obtaining a lawyer's opinion of title used to be the most common method of title assurance before the widespread availability of title insurance. Essentially, the abstract and opinion method is a two-step process. First, there is a search of the title record, which involves locating and examining all of the instruments in the public records that have affected the title of the property in question.[11] Second, when the title search is completed, a lawyer studies the relevant public records and other facts and proceedings affecting title for the purpose of arriving at an expert opinion of the character of the title. Based upon this study of the abstract or the record, the lawyer will give his or her judgment whether the title is good and marketable. If the title is found to be "clouded," the opinion should state what defects or encumbrances were uncovered by an examination of the records, and it should also state what the lawyer thinks can and should be done to "cure" the defects uncovered.

Because a lawyer's responsibility is limited to what appears in the records, the lawyer cannot be held liable for any defect in the title not disclosed therein. Any liability borne by the lawyer is based upon proof of his or her negligence or lack of professional skill in the examination of the records. Rather than rely on the lawyer's opinion, the title insurance industry has evolved. Many lenders and investors now prefer title insurance, which reduces this risk.

[9] Quitclaim deeds are appropriately and frequently used to clear up technical defects or "clouds" on the title to a property. Where the record indicates a person may have any potential claim to the property, obtaining a quitclaim deed from him will eliminate the risk that such a claim will be made in the future.

[10] There are other types of deeds, such as the bargain and sale deed, and deeds that are given by third-party fiduciaries, such as a sheriff's deed or a trustee's deed.

[11] Most of the instruments that affect title to real estate are recorded, in accordance with the recording acts of the various states, at what is typically called the county recorder's office. But some instruments that affect title may be recorded in other places. The nature of these other places where records are filed varies from state to state.

Web App

The American Land Title Association (**www.alta.org**), founded in 1907, is the national trade association for the title insurance industry. ALTA members search, review, and insure land titles to protect home buyers and mortgage lenders who invest in real estate. ALTA is headquartered in Washington, DC. There is a "Consumer Information" link on this site that includes a discussion of common title problems. Outline the types of problems that can be encountered due to a problem with the title for a property.

The Title Insurance Method

Title insurance was developed to cure the inadequacies of title validation accomplished through an abstract and legal opinion. Title insurance does all that a carefully drawn abstract and a well-considered opinion by a competent lawyer are expected to do. In addition, it adds the principle of insurance to spread the risk of *unseen hazards* among many property owners.

Elimination of risk arising from unseen hazards in the public record has caused many investors and lenders to prefer this method of title assurance. In fact, title insurance is required for any mortgage that is traded in the secondary mortgage market. The title insurance process starts with a careful analysis of the records. The information available to the commercial title insurance company may be even more complete than that found in the public records. Skilled technicians at title insurance companies examine all available evidence of the title to determine its character. If their conclusions warrant, the title company will insure the title to a property and assume risks that are not even disclosed in the public records or in its own files. In short, title insurance ensures that the title is good and marketable.

What title insurance is supposed to add to the abstract system and the opinion of skilled lawyers may be summarized as follows: (1) definite contract liability to the premium payer, (2) reserves sufficient to meet insured losses, (3) supervision by an agency of the state in which the title insurance company operates, and (4) protection to the policyholder against financial losses that may show up at any future time because of any kind of title defect, disclosed or hidden. Despite these advantages, the abstract and opinion method may still be used because of its lower cost. In general, one method, but not both, is used when purchasing property, to avoid the duplication of effort and cost.

Kinds of Title Insurance Policies

There are two kinds of title insurance policies. The owner's policy insures the interests of a new property owner. The lender's (or mortgagee) policy insures the interests of the mortgagee. The owner's policy is payable to the owner (or to the heirs of the owner); the lender's policy is payable to the mortgagee.

Both policies are paid for with a one-time premium. In many states, premiums are regulated by a state insurance commission, as are financial requirements to incorporate and continue to do business. The one-time premium for the owner's policy insures the owner for the entire period of time that she owns the property. The insurance premium may be paid by either the seller or the buyer, depending on the terms of the purchase contract, which are influenced by local custom and market conditions. It is almost universal practice for the borrower to pay the cost of the mortgagee's policy which will insure the lender for the term of the loan. In cases where properties are refinanced by the same owner, a title search may be required by new lender. In these cases it may be possible to obtain a new title insurance policy from the same company at a reduced cost.

Recording Acts

All states have enacted statutes known as **recording acts**. Although the recording acts are not uniform among the states, these acts in general provide a publicly accessible system for assessing and establishing claims or interests in real estate as against all other parties. These statutes also provide a set of authoritative rules for resolving priority disputes among competing claimants to interests in real estate. As part of this system, procedures have been established for placing documents affecting claims to real estate interests on the public record and for maintaining these records to make information available concerning almost all interests in real estate. Once an instrument creating a claim on an interest in real estate has been duly recorded, the recording is deemed to give constructive notice of this interest "to the world." Constructive notice means that the recording acts deem a person to have whatever information is contained in the public records—information that could be obtained by a reasonably diligent investigation of the records whether or not the investigator actually has knowledge of the information recorded. Instruments affecting virtually all interests in real estate, including deeds, mortgages, assignments of mortgages, liens on real estate, land contracts, long-term leases, easements, restrictive covenants, and options to buy, are covered by recording acts.

Most recording acts say that in order to establish and preserve a claim to an interest in real estate that will take precedence in law against future claimants, the instrument creating that claim must be recorded in accordance with state law. These acts were designed in part to protect an innocent person who purchased an interest in real estate in good faith unaware that the interest had already been acquired by another. For example, if A conveyed to B, who did not record the instrument establishing his claim, and later A conveyed the same interest to C, who did record, C's claim would be superior to B's if C was unaware of the prior conveyance and paid valuable consideration to A. B's only claim would be to file a suit against A for fraud.

Mechanics' Liens

One cloud on the title which may not be disclosed by the public records is a **mechanics' lien.** In general, mechanics' liens give unpaid contractors, workers, and material suppliers the right to attach a lien on the real estate to which they added their labor or materials. To obtain the payment owed them, they may foreclose such liens by forcing a judicial sale of the encumbered property. They are then paid from the proceeds of the sale. Use of mechanics' liens exists in every state, although the nature of the statutes varies.

Mechanics' liens are permitted to be recorded "after the fact." In other words, state laws generally give contractors, laborers, or suppliers of materials a certain period of time following the completion of work or delivery of materials during which to file their lien. When the lien is filed it "relates back" and takes priority over all liens filed after the time when materials were first delivered or work first performed on the real estate. As a result, until the end of the time allowed for filing (generally 60 days), a purchaser of an interest in newly constructed or improved real estate cannot be sure that the interest will be unencumbered or that the interest will have the priority bargained for. As a precaution, lenders and purchasers of such real estate should require the seller to provide an *affidavit* stating that at closing, all moneys due to contractors and subcontractors have been fully paid. In the event that liens are filed after the closing, a breach of the seller's covenants in the affidavit can easily be proven, and the seller can be held liable for the discharge of those liens.

Limitations on Property Rights

Government Restrictions

Throughout this chapter, we have stressed the importance of property rights in real estate. We should also point out that although our form of government protects the rights of individuals to own real estate and to enjoy real property rights, these rights are not unrestricted. Government restrictions on private property rights do exist. Land use regulations are most prominent at the state and local level. The right to regulate emanates from the "police powers of the state," which are based on the protection of health, safety, and general welfare of its citizens (societal considerations). The state usually delegates to counties and municipalities some areas of land use regulation, which are usually enumerated in zoning ordinances and building codes. Common restrictions used to implement provisions in zoning ordinances include allowable uses, height restrictions, parking requirements, and building codes-permits-inspections. The state usually retains control over water or riparian rights, mineral rights, eminent domain, and the like, while the federal government regulates housing and loan descrimination, interstate land sales and securities, environmental restrictions, pollution of water and air, and endangered species, as well as effects of property use and development on wet lands.

Private Deed Restrictions

In some cases property owners may choose to incorporate certain **deed restrictions** that limit the use of property by all owners of that property, including future owners. Property owners may use such restrictions to achieve personal or business objectives. One example of a personal objective would be to add a deed restriction explicitly prohibiting the sale or consumption of alcoholic beverages on the property forever. In the event that this restriction is violated, the restriction may stipulate that title will revert to the owner who incorporated the restriction or to his heirs. An example of a business objective that is commonly achieved through deed restrictions may involve subdivision of a large tract of land into smaller individual tracts to be sold to builders and developers. In order to assure the initial buyers of the subdivided tracts that subsequent buyers will build improvements that conform in quality and use, the owner of the initial larger tract may deed restrict each of the subdivided tracts. Such restrictions may require a minimum and/or maximum building size, minimum quality building materials, landscaping, and the like, thereby providing all owners with some assurance of conformity and general standards in design and building quality. However, resolution of any future violations of deed restrictions may prove to be problematic, particularly after a long period of time. In the first example, the original property owner or all of his heirs would have to bring an action against the current owner to regain title to the property if the deed restriction prohibiting the sale of alcohol were to occur. In the case of the subdivision, usually a property owners association representing owners of the subdivided properties would have to bring legal action against the property owner who is in violation. In this instance, the court may require the owner in violation to cure the problem or pay the owners association for any loss in property value as opposed to forcing the sale of the property.

Conclusion

This chapter discussed legal considerations important in creating and defining various rights to real property. This is important in the study of real estate finance since it is these rights that are purchased, sold, and mortgaged. Thus, an understanding of the various rights associated with real estate is necessary to properly evaluate a real estate financial decision. Legal considerations affect the risk of receiving the economic benefit associated with one's property rights. For example, we have discussed the importance of having a marketable title. Any defects in the title may result in a loss of benefits to the owner and jeopardize the collateral value of the real estate for the mortgage lender. To some extent, this risk is controlled and minimized by the use of title assurance methods, including title insurance and the use of general warranty deeds.

Knowing the various ways of petitioning property rights may also result in maximizing the value of a particular property, since it allows parties with different needs (e.g., users, equity investors, lenders) to have a claim on the property rights that best meet those needs. Thus, the total value of all the rights associated with a property may exceed that of a property where there could be no leases or other ways to separate rights.

Key Terms

abstract of title, *7*
deed, *9*
deed restrictions, *13*
easement, *7*
estate, *4*
estate for years, *6*
estate from year to year, *6*
fee simple estate, *4*
freehold estate, *4*
future estates, *5*
general warranty deed, *9*
leasehold estate, *4*
lessee, *3*
lessor, *8*
life estate, *5*
mechanics' lien, *12*
nonpossessory interest, *7*
ownership rights, *2*
personal property, *2*
property rights, *2*
quitclaim deed, *10*
real estate, *2*
real property, *2*
recording acts, *12*
remainder, *5*
reversion, *5*
secured interest, *3*
special warranty deed, *10*
title, *7*
title assurance, *7*

Useful Web Sites

www.alta.org—The American Land Title Association—Provides information related to title insurance.

www.ired.com—International Real Estate Digest provides information for most Real Estate Professionals and real estate software and tools.

www.reals.com—This is a real estate directory for such subjects as commercial real estate, international real estate, and professional services.

www.homeglossary.com—This is an online real estate dictionary.

www.FindLaw.com—A good source of legal information, including real estate.

www.investorwords.com—It has lot of great investing and personal finance sites on the web, but most of them assume you already have a certain level of experience, or even a certain vocabulary. InvestorWords.com provides all of the necessary keys for decoding what can often seem like an encrypted language, regardless of your investing experience. InvestorWords.com provides definitions for over 6,000 financial terms and includes 20,000 links between related terms. The glossary is completely free to use.

www.fiabci.com—This site is good source for a comparison between legislation, professional standards, taxation, and licensing among different countries run. It also gives a comparative snapshot of various requirements for commercial leases in several countries.

www.china-window.com/china_market/china_real_estate/index.shtml—This website gives information about real estate market in China. It also gives useful information about the laws and regulations concerning real estate, different websites related to real estate in China and contact information of different government agencies.

www.epra.com—This site is hosted by The European Public Real Estate Association (EPRA), which is not-for-profit body established under Dutch law. This website gives quarterly review reports of developments in European Real Estate Sector. It also provides different research reports published related to Real Estate.

Questions

1. What is the difference between real estate, real property, and personal property?
2. What is meant by an estate?
3. How can a leased fee estate have a value that could be transferred to another party?
4. What is an abstract of title?
5. Name the three general methods of title assurance and briefly describe each. Which would you recommend to a friend purchasing a home? Why?
6. Would it be legal for you to give a quitclaim deed for the Statue of Liberty to your friend?

Chapter 2

Financing: Notes and Mortgages

Financing can be a very important component of investing in real estate. In general, when investors desire to obtain financing, they usually pledge, or hypothecate, their ownership of real estate as a condition for obtaining loans. In many cases, investors also pledge personal property to obtain loans. What follows is an introduction to notes and mortgages, two legal instruments that are used frequently in real estate financing.

Notes

A *note* is a document which serves as evidence that debt exists between a borrower and a lender and usually contains the terms under which the loan must be repaid and the rights and responsibilities of both parties. Unless stated otherwise, the borrower is personally liable for payment of all amounts due under the terms of the note. While many loan provisions may be included, notes usually contain at least the following.

A. The *amount borrowed*—this is generally the face amount of the note, which is usually advanced in total when the loan agreement is executed. However, in cases involving construction loans, amounts could be advanced as a construction progresses not to exceed a maximum amount.

B. The *rate of interest*—this could be a fixed rate of interest or an adjustable rate. If it is the latter, exactly how the rate may be adjusted (changed) will be specified.

C. The dollar amount, due dates, and number of payments to be made by the borrower—(e.g., $500 per monthly due on the 1st of each month following the closing date for 300 consecutive months).

D. The maturity date, at which time all remaining amounts due under the terms of the loan are to be repaid.

E. Reference to the real estate serving as security for the loan as evidenced by a mortgage document (to be discussed).

F. Application of payments, which are usually made first to cover any late charges fees/penalties, then to interest and then to principal reduction.

G. Default—occurs when a borrower fails to perform one or more duties under the terms of the note. Default usually occurs because of nonpayment of amounts due.

H. Penalties for late payment and forbearance provisions—the latter specifies any grace periods during which late payments can be made up (usually with penalties) without the lender declaring that the borrower is in default. The lender does not give up the right to declare that the borrower is in default at some future date by allowing a grace, or forbearance, period. Forbearance is used by lenders when they believe that borrowers will make up late payments. They allow time for borrowers to make up such payments when they believe that benefits from this course of action will exceed the time and the expense of declaring the loan in default and embarking on foreclosure proceedings and, perhaps, forcing the sale of the property.

I. Provisions, if any, for early payments or prepayment of outstanding balances—when included, this is usually referred to as a "prepayment privilege." It allows borrowers to make early payments, or to repay the loan, in part or fully before maturity. If allowable, the note will indicate whether future payments will be reduced or whether the loan maturity date will be shortened. This provision is a *privilege* and *not* a right because the dollar amount and number of payments to be made by the borrower are specified in (C). A prepayment provision is generally included in residential mortgage loans. However, when financing income-producing properties, it may be highly restricted and require payment of a fee or penalty.

J. Notification of default and the acceleration clause—in the event of past due payments, the lender must notify the borrower that he or she is in default. The lender *may* then accelerate on the note by demanding that all remaining amounts owed under the loan agreement be paid immediately by the borrower.

K. Nonrecourse clause—provision under which the lender agrees not to, or specifies conditions under which it will *not*, hold the borrower personally liable in the event of a default on the note.

L. Loan assumability—this clause indicates under what conditions, if any, a borrower will be allowed to substitute another party in his place, who will then assume responsibility for remaining loan payments. This could occur if the borrower wishes to sell a property to another while allowing the new buyer to retain favorable financing terms that may have been previously negotiated. Lenders who deny borrowers this right can do so by expressly prohibiting it and/or by including a "due on sale" clause which requires all remaining amounts due be paid upon sale of, or transfer of title to, the property. However, if the note provides that a new owner may assume the loan, the lender usually requires that the credit of the new owner be equivalent to that of the previous owner, or be acceptable to the lender. The note will also specify whether or not the original borrower remains personally liable or is released from liability when the loan is assumed by the new borrower.

M. The assignment clause—clause giving the *lender* the right to sell the note to another party without approval of the borrower.

N. Future advances—provision under which the borrower may request additional funds up to some maximum amount or maximum percentage of the current property value under the same terms contained in the original loan agreement. These advances may be subject to an adjustment in the rate of interest.

O. Release of lien by lender—lender agrees to release or extinguish its lien on the property when the loan is fully repaid.

The Mortgage Instrument

The following is a general discussion of mortgages. Although much of the discussion applies to all mortgages, we will concentrate on owner-occupied residential properties. Provisions that are more applicable to commercial properties and construction loans will be

discussed as these topics are introduced. Utilization of mortgage financing has been the most common method of financing the purchase of real estate. This process usually entails the buyer borrowing funds from a lender, and then using these and other funds to purchase a property. Funds are usually borrowed with the express intent of using the proceeds to acquire real estate that will serve as a security for a loan. However, loans also may be refinanced from time to time and a new mortgage is made serving as loan security. Real estate is generally regarded by lenders as excellent security for a loan, and lenders acquire a *secured interest* in the real estate with a mortgage.

Definition of a Mortgage

In its most general sense, a **mortgage** is created in a transaction whereby one party pledges real property to another party as security for an obligation owed to that party. A **promissory note** (discussed above) is normally executed contemporaneously with the mortgage. This note creates the obligation to repay the loan in accordance with its terms and is secured by the mortgage. The elements essential to the existence of a mortgage are an *obligation* to pay or perform and a *pledge* of property as security for that obligation.[1]

Relationship of Note to Mortgage

Normally, the underlying obligation secured by a mortgage is evidenced by a separate promissory note. The note provides evidence of the debt and generally makes the borrower (mortgagor) personally liable for the obligation. The mortgage is usually a separate document that pledges the designated property as security for the debt. Therefore, the lender (mortgagee) has two sources from which amounts borrowed can be repaid: (1) the borrower, who is personally liable, and (2) the property that serves as security for the note. In case of default, the mortgagee may elect to disregard the mortgage and sue on the note. The judgment awarded the mortgagee as a result of a suit on the note may be attached to other property of the mortgagor which, when sold to satisfy the judgment lien, may enable the mortgagee to recover the amount of the claim more readily than if he or she foreclosed on the mortgage. In practice, the mortgagee will normally elect to sue on the note and foreclose on the mortgage simultaneously. Mortgages typically include clauses containing important covenants for both the mortgagor and mortgagee. These clauses are frequently repeated in the promissory note, or the note may incorporate these covenants by reference to the mortgage.

Interests That Can Be Mortgaged

Most people are accustomed to thinking of a mortgage in relation to full, or fee simple, ownership. But any interest in real estate that is subject to sale, grant, or assignment—that is, any interest that can be transferred—can be mortgaged. Thus, such diverse interests as fee simple estates, life estates, estates for years, remainders, reversions, leasehold interests, and options to purchase real estate, among others, are all mortgageable interests as far as legal theory is concerned. Whether, as a matter of sound business judgment, mortgagees would be willing to lend money against some of the lesser interests in land is quite another question.

Minimum Mortgage Requirements

A mortgage involves a transfer of an interest in real estate from the property owner to the lender. Accordingly, the statute of frauds requires that it must be in writing. The vast volume of mortgage lending today is institutional lending, and institutional mortgages are

[1] The obligation secured by a mortgage need not be monetary. It may be, for example, an agreement to perform some service or to perform some other specified actions. An obligation which is not itself an explicitly monetary one must be reducible to monetary terms. In other words, a dollar value must be placed on it.

Web App

The Equal Credit Opportunity Act (ECOA) and the Fair Housing Act (FHA) protect you against discrimination when you apply for a mortgage to purchase, refinance, or make home improvements. Find out what your rights are under these acts. Go to a Web site like **www.FindLaw.com** and use the search feature on the site to find information on mortgage discrimination. Alternatively, search for information on "mortgage discrimination" using one of the general search engines like **www.Yahoo.com** or **www.Google.com**. Give examples of what would be considered illegal discrimination by mortgage lenders.

standardized, formal documents. There is, however, no specific form required for a valid mortgage. Indeed, although most mortgages are formal documents, a valid mortgage could be handwritten. The requirements of a valid mortgage document are (1) wording that appropriately expresses the intent of the parties to create a security interest in real property for the benefit of the mortgage and (2) other items required by state law.

In the United States, mortgage law has traditionally been within the jurisdiction of state law; by and large, mortgages continue to be governed primarily by state law. Thus, to be enforceable, a mortgage must meet requirements imposed by the law of the state in which the property offered as security is located.

Whether a printed form of mortgage instrument is used or an attorney draws up a special form, the following subjects should always be included:

1. Appropriate identification of mortgagor and mortgagee.
2. Proper description of the property serving as security for the loan.
3. Covenants of seisin and warranty.[2]
4. Provision for release of dower rights.[3]
5. Any other desired covenants and contractual agreements.

All of the terms and contractual agreements included in the note can be included in the mortgage as well by making reference to the note in the mortgage document.

Although the bulk of mortgage law remains within the jurisdiction of state law, a wide range of federal regulations also are operative in the area of mortgage law. Moreover, in recent years the federal government has acted to directly preempt state law in a number of areas (e.g., overturning state usury laws,[4] overturning state restrictions on the operation of due-on-sale clauses, and establishing conditions for allowing prepayment of the mortgage debt and for setting prepayment penalties).

In addition, the federal government has exerted a strong but indirect influence on mortgage transactions by means of its sponsorship of the agencies and quasi-private institutions that support and, for all practical purposes, constitute the secondary market for residential mortgages. The Federal National Mortgage Association (FNMA) and the Federal Home Loan Mortgage Corporation (FHLMC) have adopted joint standardized mortgage forms for the purpose of facilitating secondary-market transactions on a nationwide basis. The

[2] A *covenant* is a promise or binding assurance. *Seisin* is the state of owning the quantum of title being conveyed.

[3] *Dower* is the interest in a husband's real estate transferred by law to the widow after his death. The common law counterpart running in favor of the husband as a widower is called *curtesy*. Many states now have a statutory allowance from the decedent's estate in lieu of dower and curtesy.

[4] Usury laws prohibit charging unconscionable and exorbitant rates or amounts of interest for the use of money. A usurious loan is one whose interest rate exceeds that permitted by usury laws.

joint FNMA-FHLMC uniform mortgage form has been so widely adopted by residential mortgage lenders that it has largely replaced the use of mortgage forms used by individual institutions. One reason for the popularity of this form with residential lenders is that it is readily acceptable by the major secondary market institutions, should the lender desire to sell the mortgage after it has been originated.

Important Mortgage Clauses

It is beyond the scope of this chapter to discuss all the clauses that might be found in a mortgage document. We will mention some of the more important clauses, however, so that the reader gains an appreciation of the effect these clauses may have on the position of the borrower and lender.

Funds for Taxes and Insurance

This clause requires the mortgagor to pay amounts needed to cover property taxes and property fire and casualty insurance, plus mortgage insurance premiums, if required by the lender, in monthly installments in advance of when they are due unless such payments are prohibited by state law. The purpose of this clause is to enable the mortgagee to pay these charges out of money provided by the mortgagor when they become due instead of relying on the mortgagor to make timely payments on his own. The mortgagee is thereby better able to protect his or her security interest against liens for taxes, which normally have priority over the first mortgage, and against lapses in insurance coverage. Such funds may be held in an escrow or trust account for the mortgagor.

Charges and Liens

This clause requires the mortgagor to pay all taxes, assessments, charges, and claims assessed against the property that have priority over the mortgage and to pay all leasehold payments, if applicable. The reason for this clause is that the mortgagee's security interest can be wiped out if these claims, or liens, are not paid or discharged, since they generally can attain priority over the interests of the mortgagee. For example, if taxes and assessments are not paid, a first mortgage on the property can be wiped out at a sale to satisfy the tax lien, unless the mortgagee is either the successful bidder at the tax sale or pays the tax due to keep the property from being sold at the tax sale.

Hazard Insurance

This clause requires the mortgagor to obtain and maintain insurance against loss or damage to the property caused by fire and other hazards, such as windstorms, hail, explosion, and smoke. In effect, this clause acknowledges that the mortgagee as well as the mortgagor has an insurable interest in the mortgaged property. The mortgagee's insurable interest is the amount of the mortgage debt.

Preservation and Maintenance of the Property

This clause obligates the mortgagor to maintain the property in good condition and to not engage in or permit acts of waste.[5] This clause recognizes that the mortgagee has a valid interest in preventing the mortgaged property from deteriorating to the extent that the collateral value of the property is impaired.

Transfer of Property or a Beneficial Interest in Borrower

This clause, known as the **due-on-sale clause**, allows the mortgagee to accelerate the debt (i.e., to take action to make the outstanding loan balance plus accrued interest immediately

[5] *Waste* is the abuse or destructive use of property which reduces the value and, therefore, the security for the loan.

due and payable) when the property, or some interest in the property, is transferred without the written consent of the mortgagee. The purpose of the due-on-sale clause is to enable the mortgagee to protect his or her security interest by approving any new owner. The clause may also permit the mortgagee to increase the interest rate on the loan to current market rates. This, of course, reduces the possibility of the new owner assuming a loan with an attractive interest rate.

Borrower's Rights to Reinstate

This clause deals with the mortgagor's right to reinstate the original repayment terms in the note after the mortgagee has caused an acceleration of the debt. It gives the mortgagor the right to have foreclosure proceedings discontinued at any time before a judgment is entered enforcing the mortgage (i.e., before a decree for the sale of the property is given) if the mortgagor does the following:

1. Pays to the mortgagee all sums which would then be due had no acceleration occurred.
2. Cures any default of any other covenants or agreements.
3. Pays all expenses incurred by the lender in enforcing its mortgage.
4. Takes such action as the mortgagee may reasonably require to ensure that the mortgagee's rights in the property and the mortgagor's obligations to pay are unchanged.

Lender in Possession

This clause provides that upon acceleration or abandonment of the property, the mortgagee (or a judicially appointed receiver) may enter the property to protect the security. The lender may collect rents until the mortgage is foreclosed. Rents collected must be applied first to the costs of managing and operating the property, and then to the mortgage debt, real estate taxes, insurances, and other obligations of the mortgagor as specified in the mortgage.

Future Advances

While it is expected that a mortgage will always state the total amount of the debt it is expected to secure, this amount may be in the nature of a forecast of the total debt to be incurred in installments. In other words, a mortgage may cover **future advances** as well as current advances. For example, a mortgage may be so written that it will protect several successive loans under a general line of credit extended by the mortgagee to the mortgagor. In case the total amount cannot be forecasted with accuracy, at least the general nature of the advances or loans must be apparent from the wording of the mortgage.

An illustration of a mortgage for future advances, sometimes called an **open-end mortgage,** takes the form of construction loans. Here the borrower arranges in advance with a mortgagee for a total amount, usually definitely stated in the mortgage, that will be advanced, in stages, under the mortgage to meet the part of the costs of construction as it progresses. As the structure progresses, the mortgagor has the right to call upon the mortgagee for successive advances on the loan. All improvements become security under the terms of the mortgage as they are constructed.

Subordination Clause

By means of this clause, a first mortgage holder agrees to make its mortgage junior in priority to the mortgage of another lender. A **subordination clause** might be used in situations where the seller provides financing by taking back a mortgage from the buyer, and the buyer also intends to obtain a mortgage from a bank or other financial institution, usually to develop or construct an improvement. Financial institutions will generally require that their loans have first mortgage priority. Consequently, the seller must agree to include a

subordination clause in the mortgage whereby the seller agrees to subordinate the priority of the mortgage to the bank loan. This ensures that even if the seller's mortgage is recorded before the bank loan, it will be subordinate to the bank loan.

Assumption of Mortgage

When the mortgagor transfers his or her rights to another, the question arises, "Does the grantee (buyer) agree to become liable for payment of the mortgage debt and relieve the mortgagor (seller) of his or her personal obligation?" If this is the intention of both parties, the **assumption of the mortgage** by the grantee may accomplish the purpose. The deed, after specifying the nature of the mortgage which encumbers the property, will contain a clause to the effect that the grantee assumes and agrees to pay the amount of the obligations owed to the mortgagee as part consideration for the conveyance of title. Where an assumption is undertaken by the grantee, it should be couched in language that leaves no doubt about the intent.

An assumption agreement takes the form of a contract of indemnity. It shifts the responsibility for the payment of the debt from the grantor to the grantee. Thereafter, the grantor stands in the position of a surety (guarantee) for the payment of the debt. However, such an arrangement binds only the parties to it: the grantor and the grantee. Since the mortgagee is not ordinarily a party to such an agreement, he or she is not bound by it. As a consequence, the mortgagee may still hold the original mortgagor liable. Thus, if a property is sold with a loan assumption and the new owner defaults on the loan, the lender can hold the previous owner liable unless the previous owner was released from the debt.

Release of Grantor from Assumed Debt

When a mortgagor owning property grants that property to another and the grantee assumes the grantor's mortgage, the lender may or may not release the grantor from personal liability for the mortgage debt. The decision of release will depend on the value of the property as security, the grantee's financial capabilities, and other factors affecting the lender's attitudes toward the transaction. A mortgagee cannot be expected to release an antecedent mortgagor if the result will be to increase the credit risk unless the mortgagee is compensated in some way (e.g., a higher interest rate).

Acquiring Title "Subject to" a Mortgage

In contrast to the assumption of the personal obligation to pay the debt, grantees may not be willing to accept this responsibility. In this case, they may ask grantors to allow them to take title **"subject to" the mortgage.** So long as the grantees are financially able and think it will be to their advantage, they will keep up payments on the mortgage and observe its other covenants. Under normal conditions, if they purchased the property at a fair price, it will be to their advantage to avoid default on the mortgage to protect their own equity.

But should the grantees reach the conclusion that there is no longer any advantage in making further payments, or should they become financially unable to do so, they may default on their payments. By so doing, they run the risk of losing whatever equity they have in the property. However, grantees cannot be held personally liable for the amount of the debt that they assumed. Grantors are still personally liable and may be held liable for any deficiency judgment resulting from the foreclosure sale.

It is obviously riskier for grantors to sell property subject to the mortgage. Given a choice, they would generally prefer that responsible grantees assume the mortgage unless they are compensated for the additional risk they undertake as a surety (e.g., by receiving a higher price for the property).

Property Covered by a Mortgage

The property that is covered by the mortgage as security for the loan includes not only the land and any existing buildings on the land but also easements and fixtures. In addition, the mortgage agreement may provide that property covered by the mortgage also includes rights to natural resources (e.g., mineral, timber, oil and gas, and water rights) and even rights to rents and profits from the real estate. An easement that runs with the property is generally regarded by the law as being covered by the mortgage, regardless of whether the easement is created before or after the mortgage is executed. Such an easement, if in existence at the time the property is mortgaged, is covered by the mortgage even if it is not mentioned in the mortgage. Foreclosure of the mortgage will not extinguish this easement. An easement created subsequent to the recording of a mortgage, however, will be extinguished by the foreclosure.

Issues involving fixtures have generated a considerable amount of legal controversy. In general, a **fixture** is an item of tangible personal property (also referred to as chattel) that has become affixed to or is intended to be used with the real estate so as to be considered part of the property. The law is in general agreement that fixtures are covered by the mortgage, with the exception of "trade fixtures"[6] installed by a tenant.

A mortgage will usually contain what is called an **after-acquired property clause** as part of its description of the type of property to be covered by the mortgage. This provision states in effect that property acquired subsequent to the execution of the mortgage that becomes part of the real estate *is included in the security* covered by the mortgage. After-acquired property includes additional improvements erected on the property or fixtures that become part of the property at any time in the future for as long as the debt remains outstanding. The courts have generally affirmed the validity of after-acquired property clauses, and the Uniform Land Transactions Act (ULTA) expressly accepts their validity.[7]

Junior Mortgages

In simple real estate financing transactions, such as those involving single residences, the character of the mortgage structure is easily defined. The senior or prior mortgage is usually called a first mortgage. All others are given the class name of **junior mortgages.** In any particular situation, there may be one or more junior mortgages or none at all. One junior lien, usually called a second mortgage, is sometimes used to bridge the gap between the price of the property and the sum of the first mortgage and the amount of money available to the purchaser to use as a down payment. Traditionally second mortgages are short-term and carry a higher rate of interest than first mortgages because of the additional risk associated with their junior status.

Recording of Mortgages

Unless the statutes of the state require it, recording is not essential to the validity of a mortgage because it is an agreement between the mortgagor and the mortgagee. The act of recording creates no rights that did not exist before, but it does give others notice of the existence and effect of the mortgage. A recorded mortgage protects its holder by giving him or her priority over the subsequent acts of the mortgagor. For example, if a mortgagee failed to record the mortgage, the mortgagor could mortgage the property to a second

[6] Trade fixtures are personal property used by tenants in businesses. Such fixtures retain the character of personal property (e.g., shelves used to display merchandise).

[7] For a discussion and case law materials related to after-acquired property clauses, see Grant S. Nelson and Dale A. Whitman, *Real Estate Transfer, Finance, and Development*, 2nd ed. (St. Paul, MN: West Publishing, 1981), pp. 633–39; see also Robert Kratovil and Raymond J. Werner, *Modern Mortgage Law and Practice*, 2nd ed. (Englewood Cliffs, NJ: Prentice Hall), pp. 114–17.

lender. If this second lender had no notice of the prior unrecorded mortgage, the second lender would have a lien prior to that of the original mortgagee. In general, the priority of successive liens is determined by the time they are accepted for record.

As we have discussed, the recording acts provide opportunities for the protection of holders of interests in property, but at the same time they place responsibilities upon them to make use of these opportunities. Failure to inspect the records for prior liens or to record the mortgage may result in loss to the mortgagee. In most states, *junior lienors* of record without notice of the existence of a senior mortgage will have priority over an unrecorded senior mortgage. Even subsequent recording of a senior mortgage lien will generally not elevate it to a higher priority.

Other Financing Sources

Seller Financing

A source of credit for a real property buyer is often the seller. If the seller is willing to take back a mortgage as part or full payment of the purchase price, it is referred to as **seller financing.** This type of financing is used when:

1. Third-party mortgage financing is too expensive or unavailable.
2. The buyer does not qualify for long-term mortgage credit because of a low down payment or difficulty meeting monthly payments.
3. The seller desires to take advantage of the installment method of reporting the gain from the sale.
4. The seller desires to artificially raise the price of the property by offering a lower-than-market interest rate on the mortgage, thereby creating more capital gains and less interest or ordinary income.[5]

Any mortgage given by a buyer to the seller to secure payment of all or part of the purchase price of a property is usually called a **purchase-money mortgage.** It can be a first mortgage, which might be the case if the seller is providing all of the financing necessary to consummate the transaction. It also could take the form of a second mortgage that is provided by the seller and is used to bridge the gap between an available first mortgage and the buyer's down payment. As such, it must be differentiated from mortgages given to secure a loan from a third party for the purchase of the property. The third-party lender (e.g., a financial institution) will normally want its mortgage to be a first mortgage. Thus, the purchase-money mortgage must either be recorded after the third-party loan or contain a subordination clause, as defined earlier.

Land Contracts

One form of financing real estate that has been widely used over the years is commonly referred to as a land contract. The term **land contract** has a variety of aliases, including real estate contract, installment sales contract, agreement to convey, and contract for deed. As the last term implies, the land contract seller promises to convey title at such time as the purchaser completes the performance of the obligation called for in the contract. Such performance usually means payment of the purchase price in stipulated installments, much the same way as under a note and mortgage.

[5] The use of this technique has been limited by the "imputed interest rule."

It should be emphasized that a land contract is not a mortgage. Under the land contract, the sellers retain the title in their name. The deed record shows that the sellers are still the owners of the property, but the land contract is supposed to tie their hands to make sure that the sellers or their assigns ultimately transfer title to the vendees or their heirs or assigns.

The land contract may be used as a substitute for a purchase-money mortgage and would normally not be preferred if the latter were available. However, in cases where there is no down payment or a small down payment, and a very long period of time during which a buyer must make periodic payments to the seller, sellers of land may refuse to give a deed and take back a mortgage until a very substantial part of the purchase price has been paid.

Several points of comparison exist between purchase-money mortgages and land contracts. A land contract buyer does not have title to the property and therefore cannot control whether the property will be mortgaged subsequent to the execution of the land contract or be made subject to covenants, easements, or mechanics' liens in the future by the contract seller. Most land contracts contain a clause allowing the seller to mortgage property up to an amount equal to the buyer's indebtedness to the seller. The buyer would have this protection if mortgage financing were used because limits would be made explicit and the buyer would have title. Furthermore, the possibility of forfeiture of the land contract interest may exist without any of the procedural protections afforded mortgages. It is suggested that all such points of comparison should be considered in making the decision whether to buy or sell on land contract or to obtain mortgage financing. In general, land contracts are used in many of the same situations as purchase-money mortgages (e.g., where the buyer has difficulty obtaining third-party financing).

Recording of Land Contracts

State laws provide for the recording of conveyances of land and instruments affecting title. Land contracts generally are considered instruments affecting title and are consequently admissible to record. Recording land contracts is not essential to their validity; it merely gives notice of their existence to third parties.

Default

We have discussed the various property rights associated with real estate. Next consider some of the problems that result when one of the parties does not fulfill a contractual obligation associated with its property right. The legal ramifications of these problems affect the financial security of other parties' rights and are thus an important aspect of real estate finance.

One of the most important risks in making a mortgage loan is that the borrower will default on the note in some way, so that the lender may not receive the expected mortgage payments. The risk associated with mortgage loans depends in part on the rights of the lender if and when such default occurs. Thus, it is important to understand the legal ramifications of mortgage default.

What Constitutes Default?

Default is a failure to fulfill a contract, agreement, or duty, especially a financial obligation such as a note. It follows that a **mortgage default** can also result from any breach of the mortgage contract. The most common default is the failure to meet an installment payment of the interest and principal on the note. However, failure to pay taxes or insurance premiums when due may also result in a default, which may precipitate an acceleration of the debt and a foreclosure action. Indeed, some mortgages have clauses that make specific stipulations to this effect. Even a failure to keep the security in repair may constitute what is commonly referred to as a *technical default*. However, because a breach of contract resulting in a technical default can usually be cured by a borrower, it seldom results in an actual

foreclosure sale. Furthermore, it may be difficult for the mortgagee to prove that the repair clause in the mortgage has been broken unless the property shows definite evidence of the effects of waste. This means that even though there is a breach of contract, the mortgagee may postpone doing something about it. However, in the case of technical default accompanied by abandonment, the probabilities are that the mortgagee will act quickly to protect his or her interests against vandalism, neglect, and waste. This may occur even though the borrower may be current on the loan payments.

Alternatives to Foreclosure: Workouts

Foreclosure involves the sale of property by the courts to satisfy the unpaid debt. The details of this process are discussed later. Because of the time involved and the various costs associated with foreclosure (and possibly repair of any damage to the property), lenders often prefer to seek an alternative to actual foreclosure.

Although mortgage contracts normally indicate definite penalties to follow any breach therein, experience has shown that in spite of provisions for prompt action in case of a default in mortgage payments, many commitments are not met in strict accordance with the letter of the contract. Instead, whenever mortgagors get into financial trouble and are unable to meet their obligations, adjustments of the payments or other terms are likely to follow if both the borrower and lender believe that the conditions are temporary and will be remedied.

The term **workout** is often used to describe the various activities undertaken to deal with a mortgagor who is in financial trouble. Many times the parties make a workout agreement that sets forth the rules by which, during a specified period of time, they will conduct themselves and their discussions. The lender agrees to refrain from exercising legal remedies. In exchange the borrower acknowledges his or her financial difficulty and agrees to certain conditions such as supplying current detailed financial and other information to the lender and establishing a cash account in which any rental receipts from the property are deposited and any withdrawls are subject to lender approval.

Five alternatives can be considered in a workout:

1. Restructuring the mortgage loan.
2. Transfer of the mortgage to a new owner.
3. Voluntary conveyancy of the title to the mortgagee (lender).
4. A "friendly foreclosure."
5. A prepackaged bankruptcy.

Restructuring the Mortgage Loan

Loans can be restructured in many ways. Such restructuring could involve lower interest rates, accruals of interest, or extended maturity dates. If the original loan is nonrecourse to the borrower, the lender may want to obtain personal recourse against the borrower as part of the loan restructuring agreement. This makes the borrower subject to significantly more downside risk if the restructuring fails. The lender also may want a participation in the performance of the property to enhance the lender's upside potential as compensation for being willing to restructure the loan. For example, the lender could ask for a percentage of any increase in the income of the property over its current level.

Recasting of Mortgages

Once a mortgage is executed and placed on record, its form may change substantially before it is redeemed. It may be recast for any one of several reasons. A mortgage can be renegotiated at any time, but most frequently it is recast by changing the terms of the mortgage (either temporarily or permanently) to avoid or cure a default.

Where mortgage terms such as the interest rate, amortization period, or payment amounts are changed, mortgagees must exercise care to avoid losing their priority over intervening lienors. The mere extension of time of payment will not generally impair the priority of the extended mortgage. Courts, however, are watchful to protect intervening lienors against prejudice, and mortgages may lose priority to the extent that changes in the interest rate, payment amounts, or the amount of indebtedness place additional burdens on the mortgagor.[9]

Extension Agreements Occasionally, a mortgagor in financial difficulty may seek permission from the mortgagee to extend the mortgage terms for a period of time. This is known as a mortgage **extension agreement.** A mortgagor may request a longer amortization period for the remaining principal balance or temporary grace period for the payment of principal or interest payments or both. In responding to such a request, the mortgagee needs to consider the following issues:

1. What is the condition of the security? Has it been reasonably well maintained or does it show the effects of waste and neglect?
2. Have there been any intervening liens? These are liens recorded or attached after the recordation of the mortgage but before any modifications to it. If so, what is their effect upon an extension agreement? If such liens exist, it is possible that the extension of an existing mortgage may amount to a cancellation of the mortgage and the making of a new one. If so, this could advance the priority of intervening liens.
3. What is the surety status of any grantees who have assumed the mortgage? Will an extension of time for the payment of the debt secured by the mortgage terminate the liability of such sureties? The best way for mortgagees to protect themselves against the possibilities implied in these questions is to secure the consent of the extension agreement from all sureties to the extension. As parties to it, they can have no grounds for opposing it. But if they are not made parties to the extension—particularly if changes in the terms of the mortgage through the extension agreement tend to increase the obligations for which the sureties are liable—then care should be exercised to ensure that those sureties who refuse to sign the agreement are not released by the extension agreement. The possibility of foreclosure and a deficiency judgment against them may be a sufficient inducement to obtain their agreement to be parties to the extension.

The exact nature of an extension agreement depends upon the bargaining position of mortgagor and mortgagee. If mortgagors can refinance the loan on more favorable terms, they will probably not apply for an extension agreement. Alternatively, they may have to make changes that favor the mortgagee, such as an increase in the interest rate.

Alternative to Extension Agreement An alternative to an extension agreement has the mortgagee agree informally to a temporary extension without making any changes in the formal recorded agreement between the parties. If the mortgagor is unable to meet all monthly mortgage payments, these too may be waived temporarily or forgiven in whole or in part. For example, simply raising the question of such an agreement suggests that the mortgagor cannot pay the matured principal of the loan. Therefore, some informal arrangement may be made to permit the mortgagor to retain possession of the property in return for

[9]Recasting of mortgages to admit interests not present at the time the mortgages were executed is sometimes necessary. For example, the mortgage may make no provision for an easement of a public utility company that requires access to the rear of the site covered by the mortgage. Since the installation of the services of the utility will normally add to rather than subtract from the value of the security, the mortgagee will usually be glad to approve the change. Nevertheless, it will require a recasting of the mortgage to the extent indicated.

meeting monthly payments, which may or may not include principal installments. The use of this kind of informal agreement can be troublesome, but, in general, if it is reached, the amounts demanded will be adjusted to the present payment capacities of the borrower. Should the borrower's financial condition improve, the lender may again insist that the originally scheduled payments resume.

The use of such an alternative to a definite extension agreement may serve the temporary needs of both mortgagors and mortgagees. If the latter feel that the security amply protects their lien, the mortgagees can afford to be lenient in helping mortgagors adjust their financial arrangements during a difficult period. If the mortgagors also feel that any real equity exists in the property, they will wish to protect it if at all possible.

Transfer of Mortgage to a New Owner

Mortgagors who are unable or unwilling to meet their mortgage obligations may be able to find someone who is willing to purchase the property and either assume the mortgage liability or take the property "subject to" the existing mortgage. The new purchaser may be willing to accept the **transfer of mortgage** if he or she thinks the value of the property exceeds the balance due on the mortgage. In either case, the seller retains personal liability for the debt. However, if the seller is about to default and expects to lose the property anyway, he or she may be willing to take a chance on a new purchaser fulfilling the mortgage obligation. The risk is that the new buyer will default, and the seller will again have responsibility for the debt and get the property back.

Recall that if purchasers acquire the property "subject to" the existing debt, they do not acquire any personal liability for the debt. Thus, they can only lose any equity personally invested to acquire the property. This equity investment may be quite small where the sellers are financially distressed and face foreclosure. Thus, the buyers may have little to lose by taking a chance on acquiring the property subject to the mortgage. If it turns out to be a good investment, they will continue to make payments on the debt, but if they find that the value of the property is unlikely to exceed the mortgage debt within a reasonable time frame, they can simply stop making payments and let the sellers reacquire the property. Thus, we see that in this situation buyers of the property "subject to" a mortgage have in effect purchased an option. The equity that buyers invest is the payment for this option, which allows them to take a chance on the property value increasing after it is acquired. We can therefore see why purchasers might even give the sellers money to acquire a property subject to a mortgage even if the *current* value of the property is less than the mortgage balance.

For example, suppose a property has a mortgage balance of $100,000. Property values in the area are currently depressed, and the owner believes that only $99,000 could be obtained on an outright sale. However, a buyer is willing to acquire the property at a price of $101,000 "subject to" the existing mortgage. Thus, $2,000 is paid for the option of tying up the property in hopes that property values rise above their current level.[10] If the property does not rise in value to more than $100,000 (less any additional principal payments that have been made), the purchaser could simply walk away, and the original owner again becomes responsible for the mortgage. If the property rises in value to more than $101,000, the purchaser stands to make a profit and would continue to make payments on the mortgage.

It should be clear that knowledge of various legal alternatives (e.g., being able to purchase a property "subject to" versus assuming a mortgage) can allow buyers and sellers to arrive at an agreement that best meets their financial objectives. Thus, legal alternatives must often be evaluated in a financial context.

[10] The seller would receive $1,000 [illegible] $1,000 [illegible] receives the economic benefit of $2,000, which is the [illegible] market value of the property.

Voluntary Conveyance

Borrowers (mortgagors) who can no longer meet the mortgage obligation may attempt to "sell" their equity to the mortgagees. For example, suppose that the mortgagors are unable to meet their obligations and face foreclosure of their equity. To save time, trouble, and expense associated with foreclosure, the mortgagees may make or accept a proposal to take title from the mortgagors. If they both agree that the property value exceeds the mortgage balance, a sum may be paid to the mortgagors for their equity. If the value is less than the mortgage balance, the lenders may still be willing to accept title and release the mortgagors from the mortgage debt. This **voluntary conveyance** might be done because the cost of foreclosure may exceed the expected benefit of pursuing that course of action.

When voluntary conveyances are used, title is usually transferred with a warranty or quitclaim deed from mortgagors to mortgagees. The mortgagors should insist upon a release to make sure that they are no longer bound under their note and mortgage, especially in situations where the mortgage balance is near or in excess of the property value. Otherwise, the mortgagors may find that they still have a personal obligation to pay the mortgage note. The conveyance to the mortgagees in exchange for a release from the mortgage debt is frequently referred to as giving *deed in lieu of foreclosure* of the mortgage. A deed in lieu of foreclosure has the advantage of speed and minimizes the expense of transferring the property and the uncertainty of litigation. It also avoids the negative publicity of foreclosure or bankruptcy. A deed in lieu of foreclosure does not cut off subordinate interests in the property. The lender must make arrangements with all other creditors. There are also potential bankruptcy problems. The transfer may be voidable as a preferential transfer. In addition to the legal questions involved in voluntary conveyances, the mortgagee frequently faces very practical financial issues as well. If there are junior liens outstanding, they are not eliminated by a voluntary conveyance. Indeed, their holders may be in a better position than before if the title to the property passes to a more financially sound owner. Unless in some manner these junior liens are released from the property in question—possibly by agreement with their holders to transfer them to other property owned by the mortgagor or even on occasion to cancel them—the mortgagee may find it necessary to foreclose instead of taking a voluntary conveyance because the title conveyed is subject to junior liens. Foreclosure provides the mortgagee with a lawful method of becoming free from the liens of the junior claimants.

Friendly Foreclosure

Foreclosure can be time-consuming and expensive, and there can be damage to the property during this time period. A **"friendly foreclosure"** is a foreclosure action in which the borrower submits to the jurisdiction of the court, waives any right to assert defenses and claims and to appeal or collaterally attack any judgment, and otherwise agrees to cooperate with the lender in the litigation. This can shorten the time required to effect a foreclosure. This also cuts off subordinate liens and provides better protection in case of the borrower's subsequent bankruptcy. A friendly foreclosure normally takes more time than a voluntary conveyance but is less time-consuming than an unfriendly foreclosure. This is discussed in more detail in the next section.

Prepackaged Bankruptcy

The mortgagee must consider the risk that the mortgagor will use the threat of filing for bankruptcy as a way of reducing some of his or her obligation under the original mortgage agreement. Bankruptcy can have significant consequences for secured lenders. To the extent that the collateral securing the debt is worth less than the principal amount of the debt, the deficiency will be treated as an unsecured debt. In a **prepackaged bankruptcy,** before filing the bankruptcy petition, borrowers agree with all their creditors to the terms on which they will turn their assets over to their creditors in exchange for a discharge of liabilities. This can save a considerable amount of time and expense compared with the case where the terms are not agreed upon in advance. The consequences of bankruptcy are discussed further in the last section of this chapter.

Foreclosure

In practice, most mortgagees are not anxious to take property from mortgagors, particularly where the mortgagors have candidly communicated with the mortgagees concerning the default and have made realistic proposals to cure the default over a reasonable period of time. Because the management and disposal of property requires skills that are usually outside of the range of expertise of most lenders and therefore costly to acquire, mortgagees prefer to collect the amounts owed them and are likely to be lenient and patient when circumstances warrant it. Seldom do mortgagees insist upon the exact letter of their contract. Nor do they rush into court to insist upon **foreclosure** at the first evidence of default, but after patience and leniency have been extended to delinquent mortgagors, eventually a settlement becomes necessary and foreclosure proceedings are started.

Judicial Foreclosure

In general, the mortgagee possesses two types of remedies to protect his or her interests in case of default by the mortgagor. First, the lender may obtain **judicial foreclosure:** that is, to sue on the debt, obtain judgment, and execute the judgment against property of the mortgagor. In a judicial foreclosure, property subject to attachment and execution[11] is not limited to the mortgaged property. This judgment may be levied against any of the mortgagor's property not otherwise legally exempt[12] from execution.

Second, the lender may bring a foreclosure suit and obtain a decree of foreclosure and sale. If the sale of the mortgaged property realizes a price high enough to meet the expenses of the sale and the claims of the mortgagee and still leave a balance, this balance goes to the mortgagor. While foreclosure and sale of the property may be undertaken in two separate actions, they are usually pursued simultaneously in practice.

Redemption

Redemption is the process of canceling or annulling a title conveyed by a foreclosure sale by paying the debt or fulfilling the other conditions in the mortgage. It can be accomplished by paying the full amount of the debt, interest, and costs due to the mortgagee. The *equity of redemption*[13] must be asserted prior to foreclosure. Once the foreclosure sale has been confirmed, the mortgagor can no longer redeem the property, except in states that provide for a statutory period for redemption after foreclosure. The right to redeem after foreclosure

[11] *Attachment* is the act or process of seizing property of a debtor by court order [illegible] the debt of a creditor in the event judgment is rendered. *Execution* is the process of [illegible] sheriff or other competent officer to seize and sell property of the debtor [illegible] previously rendered in favor of a creditor.

[12] Most states provide by statute that a certain amount of a [illegible] liability from levy and sale as a result of the [illegible] statutes typically provide that some amount of [illegible] not secured by a purchase-money lien shall be [illegible] provide the [illegible] with a minimum amount of property [illegible] to financial recovery.

[13] The *equity of redemption* is the right of a mortgagor to redeem [illegible] period from the time of default until foreclosure proceedings are begun.

is called the right of *statutory redemption,* which exists in about half of the states. Generally, the period for statutory redemption runs about six months to one year after the foreclosure sale. In a number of states, instead of granting the mortgagor a right to redeem after the foreclosure sale, state laws postpone the sale to provide a longer period of time to pay a debt that is in default.

Sales of Property

The advertising of the sale, the place where it takes place, and the method of sale are governed by state law. While details differ, the results are approximately the same in all states.

Fixing a Price

A mortgage foreclosure sale emanates from the assumption that a public auction is a satisfactory way to realize the best possible price in selling property. Hence, in some jurisdictions the highest bidder gets the property irrespective of its cost, the amount of liens against it, or any other consideration. Despite this requirement of a public sale, in most cases only the mortgagee or the mortgagee and a small number of bidders appear at the foreclosure sale and, as a result, the mortgagee is usually the successful bidder. The mortgagee can use his or her claims as a medium of exchange in the purchase, except for costs, which must be paid in cash. Others must pay cash for their purchases (which may be in the form of a loan obtained from another lender with an agreement granting to it the new mortgage), unless the successful bidder can arrange with the mortgagee to keep his or her lien alive by renegotiating or assuming the existing indebtedness. As a consequence, frequently only the mortgagee makes any serious bid for the property. Because lenders generally prefer to avoid owning and liquidating foreclosed properties, they will normally bid the full amount of their claim only where it is less than or equal to the market value of the security less foreclosure, resale, and holding costs. Rarely will lenders bid in excess of their claim in an attempt to outbid other buyers at the sale.

In a few states an "upset" price is fixed in advance of the sale. This means that an appraisal by agents of the court fixes a minimum value for the property that must be reached in the bidding or the court will refuse to confirm the sale. This is not a common practice because it is quite difficult for the court to fix the price that the property must bring at the foreclosure sale. On the one hand, the court is interested in doing justice to the mortgagor. Since a deficiency judgment may be decreed in case the mortgagee is not completely satisfied from the proceeds of the sale, the lower the price, the larger the deficiency judgment. On the other hand, the mortgagee's rights also must be protected. If the court insists on too high a price, no sale would be effected, and hence the mortgagee would receive no satisfaction of his or her claims.

Deed of Trust

The historical development of the law has commonly led, in some jurisdictions, to the finance of real estate by a **deed of trust** instead of a regular mortgage. There are three parties to a loan secured by a deed of trust. The *borrower* (creator of the trust) conveys the title to the property to be used as security to a *trustee,* who holds it as security for the benefit of the *holder of the note* executed by the borrower when the loan was made. The conveyance to the trustee is by deed, but the transfer is accompanied by a trust agreement, either as a part of the deed or in addition to it, setting forth the terms of the security arrangement and giving the trustee the power of sale in event of default.

The deed of trust is commonly used in Alabama, Arkansas, California, Colorado, the District of Columbia, Delaware, Illinois, Mississippi, Missouri, Nevada, New Mexico, Tennessee, Texas, Utah, Virginia, and West Virginia. Deeds of trust are not used extensively in other states because courts there have held that any conveyance of real estate given to secure a debt is a mortgage, irrespective of the form of the instrument used. This interpretation greatly restricts the trustee's power of sale, often requiring the expense and delay of a court process up to and including foreclosure. States imposing this restriction have sought to ensure that a reasonable sale price and all other appropriate benefits are obtained for both borrower and noteholder before the property is sold.

Where the deed of trust is used according to its terms, the trustee is authorized in case of default to foreclose the borrower's equity by a sale of the property at public auction. After a proper time period for advertisement, the trustee must account to both parties for the proceeds of the sale. The parties are entitled to their share as their interest may appear, after expenses of the sale, including compensation to the trustee, have been met. The deed of trust has the advantage of normally being more expeditious than a mortgage foreclosure.

Deed of Trust and Mortgage Compared

The deed of trust is such a mixture of trust and mortgage law that anyone using it should act under the counsel of a local real estate lawyer. In general, however, the legal rules surrounding the creation and evidence of the debt in the form of a note, rights of the borrower left in possession, legal description of the property, creation of a valid lien on after-acquired property, and recording are the same for mortgages and deeds of trust. Similarly, a property subject to a deed of trust may be sold subject to the deed of trust either with or without an assumption of the debt by the purchaser. Borrowers may sell their interest or borrow money using the interest as security. Technically, borrowers have a reversionary interest in the property, and title to the property reverts to them upon payment of the debt. In the event of failure or refusal of a trustee to execute a reconveyance when the borrowers repay their debt, the trustee may be forced to act by legal process, whereby the borrowers would obtain a court order forcing the trustee to act.

In California, where deeds of trust and mortgages are used side by side, several distinctions are made between the two instruments. Whereas a mortgage may be discharged by a simple acknowledgment of satisfaction on the record, a reconveyance of title is considered necessary to extinguish a deed of trust.[14] Recording requirements for mortgages and deeds of trust also differ. Under the recording laws of most states, mortgage assignments may be, and in some states must be, recorded. Assignments of a deed of trust, however, need not be recorded and in some states are not eligible for recordation. The recording of the original deed of trust gives notice of the lien against the property, and only the trustee has the power to clear the record through a reconveyance of the property.

Nature of Title at Foreclosure Sale

The purchaser of property at a foreclosure sale is, in effect, the purchaser of the rights of the mortgagor whose interests are cut off by the sale. Even though the sale is conducted under court supervision, the court makes no representation concerning the nature of the title that a buyer will receive. Any title defects that existed prior to the foreclosure sale will continue with the title as it passes to the purchaser. If a junior lienor has been omitted in the suit for foreclosure, his or her claims will not be cut off by such suit. As long as lienors' claims are not cut off, the purchaser acquires the property subject to those liens instead of a fee simple unencumbered.

[14] Some states do not require reconveyance to extinguish a deed of trust. Instead, the [illegible] beneficiary of the trust (noteholder) signs a request for release of the deed of trust, which is presented by the borrower to the trustee together with the canceled note, and [illegible]. The trustee issues a release of trust, which is then recorded at the appropriate office [illegible] the county.

Parties to Foreclosure Suit

When the holders of a senior mortgage bring suit to foreclose their mortgage, they must join in the suit all who share the mortgagor's interest. These include not only junior mortgage holders but judgment creditors, purchasers at an execution sale, and trustees in bankruptcy, if any. Failure to include all of these might improve their position with the foreclosure of the senior lien. For example, should the senior mortgagee become the successful bidder at the foreclosure sale, and should a junior lienor of record not be joined in the suit, it is possible that when the senior mortgagee takes title to the land, the junior mortgagee may acquire the position of a senior lienor. To avoid this possibility, every foreclosure action should be preceded by a careful search of the record to discover all junior lien claimants who should be joined in the foreclosure suit.

Should any junior lienors think that they have an equity to protect, they have the right to purchase the property at a foreclosure sale, paying off or otherwise providing for the interests of the claimants whose liens are superior to theirs. It might be, for example, that a senior mortgagee has a $50,000 lien on a property that a junior mortgagee with a $10,000 lien considers to be worth more than $50,000. If the junior lienor does not bid for the property, the senior mortgagee may bid it in for $50,000 (in the absence of other bidders) and cut off the junior lienor's equity, causing a loss to the junior lienor. By taking over responsibility for the senior mortgage, the junior lienor could bid up to $60,000 for the property without providing additional funds. In this event, it is not uncommon for a senior claimant to agree in advance upon the method of settlement of his or her claims. This may include an agreement to renew the senior mortgagee's claim, either with or without a reduction in the amount.

The purchaser at the foreclosure sale takes over the property free of the lien of the mortgage being foreclosed, but also free of all holders of junior liens who have been joined in the foreclosure action. If the senior mortgage holder or a third party purchases the property at a foreclosure sale, all such junior liens are of no further force or effect.

If junior lienholders bring suit for foreclosure, they should not join the senior lienholders in the suit. Instead, they should sue subject to the senior lien, but this means they are not obligated to pay off the senior lienholders. Junior lienholders may prefer to keep the senior mortgage alive. Holders of the senior lien may join the action voluntarily and sometimes do so to make sure that their interests are fully protected. They may wish to have the court determine the amount to be assumed by the purchaser which is due them. Or should there be any questions about the order of priority of this lien, senior lienholders may join the foreclosure action to have this question answered. Again they may have a side agreement with the junior lienors to continue their mortgage unchanged in amount. In case the junior mortgage holders plan to buy the property at the foreclosure sale, they may prefer to pay off the senior lien as well. This must be done with the consent of the lienholders if they are not a party to the suit. This practice represents a redemption of the senior mortgage and follows the English maxim of "redeem up, but foreclose down." This concept is fairly obvious. It simply means that junior mortgagees must honor the prior position of senior mortgagees, but junior mortgagees may wipe out liens junior to theirs. For example, say a property now worth $100,000 is encumbered as follows:

First mortgage, A	$ 90,000
Second mortgage, B	20,000
Third mortgage, C	10,000
Total mortgage liens	$120,000

In a foreclosure action, mortgagee B has a buying power of $110,000 without raising additional funds if he is able to keep the first mortgage undisturbed, or if he refinances it. If he buys the property at the foreclosure sale for no more than $110,000, the third mortgage lien will be completely cut off by foreclosure.

Holders of junior liens destroyed in a foreclosure action are entitled to have the surplus of sale price over senior mortgage claims applied to their claims. If there is no surplus, they are entitled to a judgment for the full amount of their claims. From that time on, they are merely general, unsecured creditors of the mortgagor, unless the latter should own other real estate to which such judgments would attach.

Effect of Foreclosure on Junior Lienors

If a senior mortgage holder brings foreclosure suit and joins junior claimants in the suit, the question arises, "What happens to the claims of those cut off by the foreclosure sale?" Any surplus remaining after satisfying the costs of foreclosure and the claims of the senior lienor is distributed according to the priority rights of junior claims. Sometimes the distribution of this surplus is not as simple as it sounds. Frequent disputes concerning the order of priority require action by the court to establish the order of settlement.

Where a senior mortgage is properly foreclosed, it extinguishes the *lien* of the junior mortgage, but the *debt* secured by the mortgage is unaffected. Where there is no surplus from the foreclosure sale or where it is insufficient to meet all claims, the holders of such claims still maintain their rights to pursue the mortgagors on whatever personal obligation they have incurred by obtaining the mortgage. This legal right may or may not result in satisfaction of the claims of lienholders. Such obligations are not extinguished and may be enforced at some future time should the mortgagors ever recover their economic status sufficiently to make pursuit of claims against them worthwhile.

Deficiency Judgment

While a sale of the mortgaged property may result in a surplus to which the mortgagor is entitled, it may on the contrary be sold at a price that fails to satisfy the claims of the mortgagee. Any deficit is a continuing claim by the mortgagee against the mortgagor. The mortgagor is personally obligated to pay the debt evidenced by the promissory note. Since mortgages may involve one or more specific properties, the mortgagee will normally look to such property to provide primary security for his or her claim, but any deficiency remains the obligation of the mortgagor. Any deficit remaining after a foreclosure and sale of the property is known as a **deficiency judgment.**

Deficiency judgments are unsecured claims—unless the mortgagor owns other real estate—and take their place alongside other debts of the mortgagor. Unlike the mortgage from which such judgment springs, the latter gives the holder no right of preference against any of the non-real estate assets of the debtor.[15] Hence, the value of deficiency judgments is always open to serious question. This is true in part because of the ways by which they can be avoided or defeated.

Debtors seeking to avoid the deficiency judgment may plan accordingly. Since such judgments attach only to real estate or other property that the debtors hold or may acquire in the future, the debtors may see that they do not acquire any future property interests or if they do, they will be careful to have titles recorded in names other than their own.

Considerable sentiment exists in some quarters in favor of legislation to abolish deficiency judgments altogether, leaving mortgagees with only the property to protect their claims. Several states strictly limit the applicability of deficiency judgments. Of course, this increases the possibility that a borrower will walk away from a property if its market value falls below the loan balance.

[15] Deficiency judgments become a lien on all real estate owned by the judgment debtor in the county or counties where the judgment is entered. To the extent that there is equity in the real estate not exempt from execution, the judgment can be considered secured and the creditor can enforce his lien through foreclosure and sale of the property to which the lien attaches.

Taxes in Default

Payment of property taxes is an obligation of the mortgagor. As such, taxes constitute a prior lien against the security. Transfers of title always take into account accrued but unpaid taxes. Mortgages commonly contain tax clauses giving the mortgagee the right to pay taxes not paid regularly by the mortgagor. The amounts so paid are then added to the claims of the mortgagee. While the lien of taxes gives tax-collecting authorities the right to foreclose in case of default, this right is seldom exercised on first or even second default. Instead, the taxing authority from time to time may pursue an alternative policy of selling tax liens with deeds to follow. Since tax liens constitute superior liens prior to the claims of mortgagees if the taxing authorities have observed statutory procedure, and since they customarily carry high effective rates of interest, mortgagees may prefer to maintain the priority claim of tax liens by paying delinquent taxes and adding them to their claims.

If foreclosure becomes necessary, mortgagees include all taxes they have paid. At the time of a foreclosure sale, the purchaser usually is expected to pay all delinquent taxes, thus making the tax status of the property current.

Tax Sales

Where mortgagees do not act to protect their interests against tax liens, sooner or later taxing authorities will bring pressure to collect delinquent taxes. In effect, if not in form, the **tax sale** procedure is intended to parallel that followed in the foreclosure of mortgages. At the time of the tax sale, the purchaser receives a tax certificate, which is then subject to redemption in nearly all states. The period of redemption is usually two or three years. If the property is not redeemed by the delinquent taxpayer within this period, the purchaser at the tax sale is then entitled to receive a deed to the property.

Tax titles are usually looked upon as weak evidence of ownership. The interest of the tax collector is to find someone willing and able to pay taxes for someone else in return for a claim against the property. The collector is not greatly concerned about passing good title. There is no suggestion of warranty. In addition to any defects in title regardless of delinquent taxes, the unconcern of the tax collector may in turn result in added clouds on the title. Among the latter, the following may occur:

1. Because of inaccurate description of the property or incorrect records of ownership, the notice of sale may be defective.
2. The property owner may have been denied due process or his or her day in court.
3. The line of authority for the sale may not be clear.
4. Irregularities and carelessness, even in minor procedural matters, may cause the tax sale to be invalidated.

All of these depend in part upon the recuperative powers of the delinquent taxpayers. If they have lost interest in the property or lack the financial resources to protect their interests, delinquent taxpayers may interpose no objections to the plans of the purchaser at the tax sale. Nevertheless, the risk is great enough to suggest caution and due attention even to minor details before purchasing tax liens.

In the absence of bidders at a tax sale—which might occur in periods of depression or in the sale of inexpensive vacant land—the property usually reverts to the state, the county, or some other local governmental unit. State and local units can be careless and neglect to take steps to realize a fair price when they dispose of property so acquired. A sale by the governmental unit, given full compliance with statutory requirements, normally offers a very short period of redemption after which the mortgagor and the mortgagee lose to the purchaser all rights to the property. Mortgagees should diligently monitor tax sale notices to ensure that their lien rights on property sold at tax sales are not affected.

Bankruptcy

Bankruptcy may be defined as a proceeding in which the court takes over the property of a debtor to satisfy the claims of creditors. The goal is to relieve the debtor of all liabilities, so that he or she may become financially solvent. The potential for bankruptcy under Chapters 7, 11, and 13 of the Bankruptcy Code affects the value of real estate as collateral. Lenders must be aware of the possibility that a borrower may file bankruptcy and must know how such a filing will change their positions. Both real estate investors and lenders must have a basic understanding of their rights in a bankruptcy proceeding to effectively negotiate with one another and resolve their differences short of a bankruptcy proceeding. Although a comprehensive examination of the Bankruptcy Code is beyond the scope of this text, several areas of bankruptcy law of particular importance to real estate investors and lenders are discussed below.

Chapter 7 Liquidation

The purpose of Chapter 7, or "straight bankruptcy," is to give debtors a fresh start by discharging all of their debts and liquidating their nonexempt assets. Chapter 7 is available to any person regardless of the extent of his or her assets or liabilities. A Chapter 7 petition can be filed voluntarily by a debtor or involuntarily by petitioning creditors, except that a farmer may not be forced into an involuntary proceeding.

Upon the filing of a Chapter 7 petition, the court appoints an interim trustee who is charged with evaluating the financial condition of the debtor and reporting at the first meeting of creditors whether there will be assets available for liquidation and distribution to unsecured creditors. The trustee's job is to oversee the liquidation of nonexempt assets and to evaluate claims filed by creditors. The ultimate objective of a Chapter 7 bankruptcy is the orderly liquidation of the debtor's assets and the distribution of the proceeds according to the legal rights and priorities of the various creditor claimants.

A lender whose loan to the debtor is secured by a mortgage on real estate will normally be paid in full if the value of the security exceeds the balance due under the mortgage. To foreclose on the mortgage and sell the debtor's property, the lender must first petition the bankruptcy court. If the debtor is not behind in the mortgage payments and desires to retain the property, he or she may do so by reaffirming the mortgage debt. This means that although the debtor's obligation to repay the debt has been discharged in bankruptcy, the debtor makes a new agreement after the discharge to repay the debt.

Chapter 11

An alternative to Chapter 7 is a Chapter 11 bankruptcy, which is available to owners of a business. Whereas a Chapter 7 bankruptcy normally results in the liquidation of the debtor's assets, a Chapter 11 proceeding looks to the preservation of the debtor's assets while a plan of reorganization to rehabilitate the debtor is formulated. Within 120 days after filing a Chapter 11 bankruptcy petition, this plan of reorganization must be filed by the debtor with the court. The plan must classify the various claims against the debtor's assets and specify the treatment of the debts of each class. In a typical reorganization plan, the rights and duties of the parties are redefined in one of two ways. The plan may restructure the debt to provide for reduced payments over an extended period, or the plan may [illegible] by reducing the debtor's obligation to an amount less than the full claim.

Once a plan is filed, the proponent of the plan, usually the debtor, must [illegible] acceptance. Once holders of two-thirds of the total amount of the claims and [illegible] of the total number of claim holders assent to the plan, the court will analyze the plan and determine whether it meets the technical prerequisites for judicial confirmation. Even if one or more creditor classes dissent, the court can still confirm the plan if it meets certain statutory requirements. This alternative method of confirmation is known as cramdown.

The cramdown provisions under Chapter 11 provide borrowers with the ability to restructure their secured (e.g., mortgage) and unsecured indebtedness by executing a plan of reorganization that outlines the mechanics for getting borrowers back on their feet and states how different classes of claims and interests will be treated. The cramdown provisions are essential to keeping the borrowers whole during a reorganization. Without a cramdown provision, secured lenders could always block the proposed reorganization by refusing to approve the plan and foreclose on the major assets of the borrower.

Under the Bankruptcy Code, a plan of reorganization may seriously impact secured lenders by impairing their claim. Despite this impairment, the plan may be confirmed by the court over the objections of the secured lenders. The law, however, makes some provision for secured lenders who do not approve the plan. One provision allows the borrower to keep the secured property but requires that the lender must receive present or deferred payments having a present value equal to the value of the collateral. A second provision calls for a sale of the collateral with the lender's lien attaching to the proceeds of the sale. A final catch-all provision requires the secured lender's realization of the "indubitable equivalent" of his or her claims.

Chapter 11 bankruptcy proceedings are of great concern to lenders who may find that their security is tied up for years during the reorganization of the debtor's financial affairs. Even lenders holding mortgages on a Chapter 11 debtor's personal residence may find that they are unable to foreclose on their liens where such a foreclosure would interfere with the debtor's plan of reorganization. In sum, the basic object of a Chapter 11 bankruptcy is to provide for a court-supervised reorganization, instead of a liquidation, of a financially troubled business.

Chapter 13

A Chapter 13 petition in bankruptcy, also known as a *wage earner proceeding*, represents an attractive alternative to the liquidation applied in Chapter 7. Like Chapter 11, a Chapter 13 proceeding envisions the formulation of a plan designed for the rehabilitation of the debtor. Such plans provide that funding of the plan will come from future wages and earnings of the debtor. Any debtor with regular income who has unsecured debts of less than $100,000 and secured debts of less than $350,000 qualifies for Chapter 13 relief. Thus a Chapter 13 bankruptcy is the one most likely to be used by an individual.

The heart of Chapter 13 is the repayment plan, which is proposed by the debtor and, assuming it meets certain tests and conditions, is subject to confirmation by the court over objections of creditors. In a Chapter 13 plan, debtors propose to pay off their obligations and reorganize their affairs. The plan may call for payments over a three- to five-year period. Unlike a Chapter 7 or Chapter 11 bankruptcy that can be filed by debtors only every six years, a Chapter 13 plan can be filed immediately after completion of a prior bankruptcy liquidation or payment plan as long as it is filed in good faith.

During the period covered by the plan, creditors must accept payment as provided in the plan and may not otherwise seek to collect their debts. Assuming successful completion of the plan, debtors receive a discharge of all debts provided for in the plan other than long-term obligations for payments that continue beyond the period of the plan's duration. However, the plan may not modify the rights of mortgagees whose liens are secured only by property used by the debtors as their personal residence. This "preferred treatment" for such mortgagees under Chapter 13 is justified because the success of a reorganization plan could be jeopardized if foreclosure of this mortgage disrupts the affairs of the debtors by forcing them to seek other shelter. Although the plan may not "modify" the rights of secured lenders, lenders desiring to accelerate the balance of any indebtedness upon default to raise the interest rate should be aware of the borrower's right to cure a default in bankruptcy (by making arrangements to pay amounts currently in default over the period of the

plan) and reinstate the mortgage. Thus, although a plan may not "modify" the rights of lenders whose debt is secured by liens on the debtor's personal residence, the filing of a Chapter 13 will likely prevent an imminent foreclosure and allow for repayment of arrearages existing on the date of the filing to be carried over a reasonable period of time. Where the plan calls for curing the arrearages and no modification of the schedule of current payments, courts will normally approve the plan because it does not materially affect the rights of such lenders.

Conclusion

This chapter has discussed the legal instruments and ramifications associated with financing real estate, such as default, foreclosure, and bankruptcy. The probability of one or more of these events occurring and the rights of the parties if it occurs ultimately affects the value of the various property rights. These legal considerations should be kept in mind as we discuss the risks associated with mortgage lending in later chapters. Clearly, the legal rights of borrowers and lenders affect the degree of risk assumed by each party and, thus, the value of entering into various transactions.

The availability of various legal alternatives can be viewed as a way of controlling and shifting risk between the various parties to a transaction. The probability of default or bankruptcy by a borrower and the legal alternatives available to each party affect the expected return to the lender from the loan. In later chapters we will discuss how the amount of the loan relative to the value of the property is used by the lender to control risk. The reader should keep in mind the fact that loan covenants as discussed in this chapter also control the risk.

Key Terms

after-acquired property clause, *22*
assumption of the mortgage, *21*
bankruptcy, *35*
deed of trust, *30*
deficiency judgment, *33*
due-on-sale clause, *19*
extension agreement, *26*
fixture, *22*
foreclosure, *29*
"friendly foreclosure," *28*
future advances, *20*
judicial foreclosure, *29*
junior mortgages, *22*
land contract, *23*
mortgage, *17*
mortgage default, *24*
open-end mortgage, *20*
prepackaged bankruptcy, *28*
promissory note, *17*
purchase-money mortgage loan, *23*
recasting a mortgage, *25*
redemption, *29*
seller financing, *23*
"subject to" the mortgage, *21*
subordination clause, *20*
tax sale, *34*
transfer of mortgage, *27*
voluntary conveyance, *28*
workout, *25*

Useful Web Sites

www.alta.org—American Land Tile Association provides industry and government news, as well as an explanation of consumer interests in land titles.

www.mortgagemag.com—Includes real estate related articles and links to sites covering mortgage banking, legal services, and technology.

dictionary.law.com/—Legal dictionary.

real-estate-law.freeadvice.com/—Many good FAQs about real estate law. Legal advice written by lawyers for non-lawyers

Questions

1. Distinguish between a mortgage and a note.
2. What does it mean when a lender accelerates on a note? What is meant by forbearance?
3. Can borrowers pay off part, or all, of loans any time that they desire?
4. What does "nonrecourse" financing mean?
5. What does "assignment" mean and why would a lender want to assign a mortgage loan?
6. What is meant by a "purchase money" mortgage loan? When could a loan not be a purchase-money mortgage loan?
7. What does default mean? Does it occur only when borrowers fail to make scheduled loan payments?
8. When might a borrower want to have another party assume his liability under mortgage loan?
9. What does a deficiency judgment mean?
10. How does a purchase-money mortgage differ from a land contract?
11. How can mechanics' liens achieve priority over first mortgages that were recorded prior to the mechanics' lien?
12. Name several mortgageable interests in real estate and comment on their risk as collateral to lenders.
13. What is meant by mortgage foreclosure, and what alternatives are there to such action?
14. Explain the difference between a buyer assuming the mortgage and taking title "subject to" the mortgage.
15. What dangers are encountered by mortgagees and unreleased mortgagors when property is sold "subject to" a mortgage?
16. What is the difference between the equity of redemption and statutory redemption?
17. What special advantages does a mortgagee have in bidding at the foreclosure sale where the mortgagee is the foreclosing party? How much will the mortgagee normally bid at the sale?
18. Is a foreclosure sale sometimes desirable or even necessary when the mortgagor is willing to give a voluntary deed?
19. What is a deficiency judgment and how is its value to a lender affected by the Bankruptcy Code?
20. What are the risks to the lender if a borrower declares bankruptcy?

Problems

1. Sedgewick arranged for an open-end mortgage loan from the Second National Bank in amounts up to $50,000. The loan was closed and Sedgewick drew $30,000 initially. Three months later he drew the remaining $20,000. What is the bank's position concerning the possibility of intervening liens?
2. Assume in problem 1 that there was no definite agreement for future advances between Sedgewick and the bank at the time the initial $30,000 loan was closed. Would your answer be different?
3. Last year Jones obtained a mortgage loan for $100,000. He just inherited a large sum of money and is contemplating prepaying the entire loan balance to save interest. What are his rights to prepay the loan?
4. First Bank Company holds a note from Jason Black and a first mortgage on real estate owned by Jason Black to secure it. Mr. Black sold his property to Robert Frasca, and Robert Frasca assumed the mortgage. The bank did not give Mr. Black a release from his debt. Subsequently Mr. Frasca defaulted in payment on the note. After some negotiating, the bank extended the term of the note and increased the interest rate. What is Mr. Black's position at this stage of the transaction?
5. Mort owns a property. Jessica Rosen holds a first mortgage against it, and Alex Nelligan holds a second mortgage. Mort defaults on his mortgage payments. Ms. Rosen forecloses without joining Mr. Nelligan in the foreclosure suit. The property is sold to Shelia McBride at the foreclosure sale. What are Mr. Nelligan's rights?

6. What would your answer be in problem 5 if Mr. Nelligan's mortgage was not recorded?
7. In problem 5, what if Mr. Nelligan was joined in the foreclosure suit but forgot to attend the sale and bid? Does Mr. Nelligan have any other way of getting Ms. Rosen to pay?
8. Bob entered into a land contract to purchase real estate from Sam. The purchase price was to be paid over a 10-year period by monthly amortization. At the end of five years, Bob defaulted, having failed to make his required payments. The contract provided that in event of default, the seller could declare a forfeiture after a period of 30 days and repossess the property. If the court should consider the land contract an equitable mortgage, what might be the rights of Bob and Sam?
9. A debtor has filed a plan to reorganize his affairs under Chapter 13 of the Bankruptcy Code. The plan calls for payment of 10 cents on the dollar to all unsecured creditors over the next three years. The only secured creditor is Last Bank and Trust, whose lien is secured by the debtor's personal residence. The plan calls for curing the present payments in arrears over one year and reducing the scheduled payments by 50 percent for three years. Will the court approve the debtor's plan? Why or why not?
10. Mr. Smith acquired a property consisting of one acre of land and a two-story building five years ago for $100,000. He also obtained an $80,000 mortgage loan from ACE Bank to provide financing to complete the purchase. This year, Mr. Smith constructed another building on the property with his own funds at a cost of $20,000. Mr. Smith has decided after completing the building to approach Duce Bank to borrow and mortgage the new building with a $16,000 loan. Is Duce Bank likely to provide the $16,000 in financing? What other options may Mr. Smith have to consider?
11. Ms. Brown purchased a property consisting of one acre of land and a building for $100,000 five years ago. She obtained an $80,000 mortgage loan from ABC bank at that time. The building was very old and Ms. Brown has just had it torn down. She now wants to build a new building. Ms. Brown hopes to finance construction with ABC Bank and will call them soon to discuss financing the new project. How will ABC Bank evaluate the possibility of making another loan to Ms. Brown?

Chapter 3

The Interest Factor in Financing

Financing the purchase of real estate usually involves borrowing on a long- or short-term basis. Because large amounts are usually borrowed in relation to the prices paid for real estate, financing costs are usually significant in amount and weigh heavily in the decision to buy property. Individuals involved in real estate finance must understand how these costs are computed and how various provisions in loan agreements affect financing costs and mortgage payments. Familiarity with the mathematics of compound interest is essential in understanding mortgage payment calculations, how loan provisions affect financing costs, and how borrowing decisions affect investment returns. It is also important for investment analysis calculations that we examine later in this text. This chapter provides an introduction to the mathematics of finance, sometimes referred to as the "time value of money," or TVM. It forms a basis for concepts discussed in financing single-family properties and income-producing properties, and in funding construction and development projects.

Compound Interest

Understanding the process of compounding in finance requires the knowledge of only a few basic formulas. At the root of these formulas is the most elementary relationship, **compound interest.** For example, if an individual makes a bank deposit of $10,000 that is compounded at an annual interest rate of 6 percent, what will be the value of the deposit at the end of one year? In examining this problem, one should be aware that any compounding problem has four basic components:

1. An initial deposit, or present value of an investment of money.
2. An interest rate.
3. Time.
4. Value at some specified future period.

In our problem, the deposit is $10,000, interest is to be earned at an annual rate of 6 percent, time is one year, and value at the end of the year is what we would like to know. We have four components, three of which are known and one that is unknown.

Compound or Future Value

In the preceding problem, we would like to determine what value will exist at the end of one year if a single deposit or payment of $10,000 is made at the beginning of the year and the deposit balance earns a 6 percent rate of interest. To find the solution, we must introduce some terminology:

PV = **present value,** or principal at the beginning of the year

i = the interest rate

I = dollar amount of interest earned during the year

FV = principal at the end of n years, or **future value**

n = number of years

In this problem, then, PV = $10,000, i = 6 percent, n = one year, and FV, or the value after one year, is what we would like to know.

The value after one year can be determined by examining the following relationship:

$$FV = PV + I_1$$

or the future value, FV, at the end of one year equals the deposit made at the beginning of the year, PV, plus the dollar amount of interest, I_1, earned in the first period. Because PV = $10,000, we can find FV by determining I_1. Since we are compounding annually, FV is easily determined to be $10,600, which is shown in Exhibit 3–1.

Multiple Periods

To find the value at the end of two years, we continue the compounding process by taking the value at the end of one year, $10,600, making it the deposit at the beginning of the second year, and compounding again. This is shown in Exhibit 3–2.

Exhibit 3–2 shows that a total future value of $11,236 has been accumulated at the end of the second year. Note that in the second year, interest is earned not only on the original deposit of $10,000, but also on the interest ($600) that was earned during the first year. *The concept of earning interest on interest is the essential idea that must be understood in the*

EXHIBIT 3–1
Compound Interest Calculation for One Year

$$\begin{aligned} I_1 &= PV \times i \\ &= \$10{,}000(.06) \\ &= \$600 \end{aligned}$$

Future value at the end of one year (n = 1 year) is determined as

$$\begin{aligned} FV &= PV + I_1 \\ &= \$10{,}000 + \$600 \\ &= \$10{,}600 \end{aligned}$$

or

$$\begin{aligned} FV &= PV(1 + i) \\ &= \$10{,}000(1 + .06) \\ &= \$10{,}600 \end{aligned}$$

EXHIBIT 3–2
Compound Interest Calculation for Two Years

$$\$10{,}600(.06) = I_2$$
$$\$636 = I_2$$

and value at the end of two years, or $n = 2$ years, is now

$$\$10{,}600 + I_2 = FV$$
$$\$10{,}600 + \$636 = \$11{,}236$$

compounding process and is the cornerstone of all financial tables and concepts in the mathematics of finance.

From the computation in Exhibit 3–2, it should be pointed out that the value at the end of year 2 could have been determined directly from PV as follows:

$$\begin{aligned} FV &= PV(1 + i)(1 + i) \\ &= PV(1 + i)^2 \end{aligned}$$

In our problem, then, when $n = 2$ years

$$\begin{aligned} FV &= PV(1 + i)^2 \\ &= \$10{,}000(1 + .06)^2 \\ &= \$10{,}000(1.123600) \\ &= \$11{,}236 \end{aligned}$$

From this computation, the \$11,236 value at the end of two years is identical to the result that we obtained in Exhibit 3–2. Being able to compute FV *directly* from PV is a very important relationship because it means that the future value, or value of any deposit or payment left to compound for any number of periods, can be determined from PV by simple multiplication. Therefore, if we want to determine the future value of a deposit made today that is left to compound for any number of years, we can find the solution with the general formula for compound interest, which is

$$FV = PV(1 + i)^n$$

By substituting the appropriate values for PV, i, and n, we can determine FV for any desired number of years.[1]

Other Compounding Intervals

In the preceding section, the discussion of compounding applies to cases where funds were compounded only once per year. Many savings accounts, bonds, mortgages, and other investments provide for monthly, quarterly, or semiannual compounding. Because we will be covering mortgage loans extensively in a later chapter, which involve monthly compounding almost exclusively, it is very important that we consider the other compounding intervals.

When compounding periods other than annual are considered, a simple modification can be made to the general formula for compound interest. To change the general formula:

$$FV = PV(1 + i)^n$$

[1] At this point, the reader may realize that these problems can be solved with a financial calculator. We will illustrate the use of a financial calculator to solve many of the problems in this and other chapters in this book.

where

n = years

i = annual interest rate

PV = deposit

for any compounding period, we divide the annual interest rate (i) by the desired number of compounding intervals *within* one year. We then increase the number of time periods (n) by multiplying by the desired number of compounding intervals *within* one year. For example, let m be the number of intervals *within* one year in which compounding is to occur, and let n be the number of years in the general formula. Then we have

$$FV = PV\left[1 + \frac{i}{m}\right]^{n \cdot m}$$

Therefore, if interest is to be earned on the \$10,000 deposit at an annual rate of 6 percent, *compounded monthly*, to determine the future value at the end of one year, where $m = 12$, we have

$$\begin{aligned} FV &= \$10{,}000\left[1 + \frac{.06}{12}\right]^{1 \cdot 12} \\ &= \$10{,}000(1.061678) \\ &= \$10{,}616.78 \end{aligned}$$

If we compare the results of monthly compounding with those from compounding annually, we can immediately see the benefits of monthly compounding. If our initial deposit is compounded monthly, we would have \$10,616.78 at the end of the year, compared with \$10,600.00 when annual compounding is used.

Another way of looking at this result is to compute an **effective annual yield** (EAY) on both investments. This is done by assuming that \$10,000 is deposited at the beginning of the year and that all proceeds are withdrawn at the end of the year. For the deposit that is compounded monthly, we obtain

$$\begin{aligned} EAY &= \frac{FV - PV}{PV} \\ &= \frac{\$10{,}616.78 - \$10{,}000.00}{\$10{,}000} \\ &= 6.1678\% \end{aligned}$$

The result can be compared with the effective annual yield obtained when annual compounding is used, or

$$\begin{aligned} EAY &= \frac{\$10{,}600 - \$10{,}000}{\$10{,}000} \\ &= 6\% \end{aligned}$$

From this comparison, we can conclude that the effective annual yield is higher when monthly compounding is used. This comparison should immediately illustrate the difference between computing interest at a *nominal* annual rate of interest and computing interest at the same nominal annual rate of interest, *compounded monthly*. Both deposits are compounded at the same nominal annual rate of interest (6 percent); however, one is compounded 12 times at a monthly rate of (.06 × 12), or .005, on the ending monthly balance, while the other is compounded only once, at the end of the year at the rate of .06. It is customary in the United States to use a nominal rate of interest in contracts, savings accounts, mortgage notes, and other transactions. How payments will be made or interest accumulated (i.e., annually, monthly, daily) is then specified. It is up to the parties involved in the transaction to ascertain the effective annual yield.

From the above analysis, one result should be very clear. Whenever the nominal annual interest rates offered on two investments are equal, the investment with the more frequent compounding interval within the year will always result in a higher effective annual yield. In our example, we could say that a 6 percent annual rate of interest compounded monthly provides an effective annual yield of 6.168 percent.[2]

Other investments offer semiannual, quarterly, and daily compounding. In these cases, the basic formula for compound interest is modified as follows:

Compounding Interval		Modified Formula
Semiannually,	$m = 2$	$FV = PV\left[1+\frac{i}{2}\right]^{n\cdot 2}$
Quarterly,	$m = 4$	$FV = PV\left[1+\frac{i}{4}\right]^{n\cdot 4}$
Daily,	$m = 365$	$FV = PV\left[1+\frac{i}{365}\right]^{n\cdot 365}$

For example, if a deposit of \$10,000 is made and an annual rate of 6 percent compounded daily is to be earned, we have

$$FV = \$10{,}000\left[1+\frac{.06}{365}\right]^{1\cdot 365}$$
$$= \$10{,}000(1.061831)$$
$$= \$10{,}618.31$$

and the effective annual yield would be 6.1831 percent. If the money was left on deposit for two years, the exponent would change to 2×365, and FV at the end of two years would be \$11,274.86.

Throughout this book, we will also follow the convention of using nominal rates of interest in all problems, examples, and so on. Hence, the term *interest rate* means a *nominal*, annual rate of interest. This means that when comparing two alternatives with *different* compounding intervals, the nominal interest rate should not be used as the basis for comparisons. In these cases, the concept of effective annual yield should be used when developing solutions.

Calculating Compound Interest Factors

Finding a solution to a compounding problem involving many periods is very awkward because of the amount of multiplication required. Calculators that are programmed with compound interest functions eliminate much of the detail of financial calculations. Another approach for finding solutions to compound interest problems can be used by calculating interest factors that can be used to solve many problems. *We will illustrate how these factors are calculated so the reader will understand the link between the mathematics of*

[2] Many savings institutions that compound savings monthly or daily usually quote a nominal annual rate of interest but point out that if funds are left on deposit for one year, a higher effective annual yield will be earned.

EXHIBIT 3–3
Interest Factors for an Amount of \$1 at Compound Interest for Various Interest Rates and Compounding Periods

	Rate			
Year	6%	10%	15%	20%
1	1.060000	1.100000	1.150000	1.200000
2	1.123600	1.210000	1.322500	1.440000
3	1.191016	1.331000	1.520875	1.728000
4	1.262477	1.464100	1.749006	2.073600
5	1.338226	1.610510	2.011357	2.488320

finance and calculators that have been programmed to provide solutions more efficiently. We also do this so that in the event that problems with many parts and multple inputs must be solved, the reader may break the problem down and solve it in steps by using the necessary factors.

To become familiar with the development of these tables, interest factors for annual compounding (now referred to as IF) for the future value (FV) of \$1 for various interest rates are shown in Exhibit 3–3. In the problem discussed earlier, we wanted to determine the future value of a \$10,000 deposit compounded at an annual rate of 6 percent after one year. Looking at the 6 percent column in Exhibit 3–3 corresponding to the row for one year, we find the interest factor 1.060000. When multiplied by \$10,000, this interest factor gives us the solution to our problem.

$$FV = \$10{,}000(FVIF,\ 6\%,\ 1\ \text{yr.})$$
$$= \$10{,}000(1.060000)$$
$$= \$10{,}600$$

The interest factor for the future value of \$1, at 6 percent for one year (abbreviated as $FVIF$, 6%, 1 yr.) is 1.060000—the same result had we computed $(1 + .06)^1$, or 1.06 from the general formula for compound interest. In other words,

$$(FVIF,\ 6\%,\ 1\ \text{yr.}) = (1 + .06)^1 = 1.06$$

Calculators can be used to determine interest factors in Exhibit 3–3 for many combinations of interest rates and time periods. These factors allow us to find a solution to any compounding problem as long as we know the deposit (PV), the interest rate (i), and the number of periods (n) over which annual compounding is to occur. For example, by using keystrokes on a calculator, we can calculate the factor for 6 percent interest and one year as follows:

$$PV = \$1$$
$$i = 6\%$$
$$n = 1$$
$$\text{PMT} = 0$$
$$\text{Solve for } FVIF \text{ as future value} = 1.06$$

Similarly, if we wanted the factor for 10 percent interest and four years, we would have:

$$PV = \$1$$
$$i = 10\%$$
$$n = 4$$
$$\text{PMT} = 0$$
$$\text{Solve for } FVIF = 1.464100$$

Question: What is the future value of $5,000 deposited for four years compounded at an annual rate of 10 percent?

Solution: $FV = \$5{,}000(FVIF,\ 10\%,\ 4\text{ yrs.})$
$= \$5{,}000(1.464100)$
$= \$7{,}320.50$

As was the case with the interest factors for annual compounding, interest factors for *monthly* compounding for selected interest rates and years have been computed from the modified formula $PV(1 + i/12)^{n\cdot 12}$ and are compiled in Exhibit 3–4. To familiarize the student with these interest factors, selected interest rates and periods have been chosen and factors have been calculated are shown in Exhibit 3–4.

In our earlier problem, we wanted to determine the future value of a $10,000 deposit that earned interest at an annual rate of 6 percent, compounded *monthly*. This can be easily determined by choosing the factor for 6 percent and 12 months, or one year, in Exhibit 3–4. That factor is 1.061678. Hence, to determine the value of the deposit at the end of 12 months, or one year, we have

$$FV = \$10{,}000(MFVIF,\ 6\%,\ 12\text{ mos.})$$
$$= \$10{,}000(1.061678)$$
$$= \$10{,}616.78$$

In other words, the interest factor for a 6 percent rate of interest compounded *monthly* for one year ($MFVIF$, 6%, 12 mos.) is 1.061678, which is the same result that we would obtain if we expanded $(1 + .06/12)^{1\cdot 12}$ by multiplying, or

$$(MFVIF,\ 6\%,\ 12\text{ mos.}) = \left[1+\frac{.06}{12}\right]^{1\cdot 12} = 1.061678$$

EXHIBIT 3–4
Interest Factors for an Amount of $1 at Compound Interest for Various Interest Rates and Compounding Periods

Month	Rate 6%	Rate 8%	
1	1.005000	1.006670	
2	1.010025	1.013378	
3	1.015075	1.020134	
4	1.020151	1.026935	
5	1.025251	1.033781	
6	1.030378	1.040673	
7	1.035529	1.047610	
8	1.040707	1.054595	
9	1.045911	1.061625	
10	1.051140	1.068703	
11	1.056396	1.075827	
12	1.061678	1.083000	
Year			Month
1	1.061678	1.083000	12
2	1.127160	1.172888	24
3	1.196681	1.270237	36
4	1.270489	1.375666	48

Note the letter M in our abbreviation for the *monthly compound interest equation.* Instead of writing $(1 + .06/12)^{1\cdot 12}$ and expanding the equation to obtain the monthly interest factor, we simply indicate that a monthly interest factor was calculated and then included in Exhibit 3–4. Note that we use the abbreviation ($MFVIF$, 6%, 12 mos.). When M is not included in the abbreviation, *annual* compounding is assumed, and those annual interest factors should be calculated. Hence when we are calculating the interest factors shown in Exhibit 3–4, this enables us to find the solution to any *monthly* compounding problem as long as we know the deposit (PV), the interest rate (i), and the number (n) of months or years over which compounding is to occur.

Question: What is the future value of a single $5,000 deposit earning 8 percent interest, compounded monthly, at the end of two years?

Solution: $FV = \$5{,}000\left[1+\frac{.08}{12}\right]^{2\cdot 12}$
$= \$5{,}000(MFVIF,\ 8\%,\ 24\text{ mos.})$
$= \$5{,}000(1.172888)$
$= \$5{,}864.44$

Expanding the Use of Financial Calculators

Finding a solution to a compounding problem involving many periods may be greatly simplified with the use of a calculator. Calculators programmed with compound interest functions eliminate the need for financial tables for many problem situations. We will present alternative solutions to most of the time value of money problems in the remainder of this text using the general format of a financial calculator. Refer to your specific calculator manual to confirm whether all operations are similar. Unless specified otherwise, the solutions assume that payments are made at the *end* of each period, and that money spent is (−) and money received is (+). When solving problems, we will use the following format:

n = number of years, unless stated otherwise
i = interest rate per year, unless stated otherwise
PV = present value
PMT = payments
FV = future value

Solutions will follow the format above, with the unknown variable being solved listed last. Most solutions are rounded to six decimal places.

For example, in the problem discussed earlier, we wanted to determine the future value of a $10,000 deposit compounded at an annual rate of 6 percent after one year.

Solution: n = 1 year
i = 6%
PMT = 0
PV = −$10,000
FV = $10,600

(Note that this solution is the same as what would have been obtained had we calculated the factor 1.060000 shown in Exhibit 3–3. However, when a calculator is used, the intermediate step in which the FVIF is calculated is eliminated.)

Web App

What rate can you earn on your savings today? Go to a Web site like **www.bankrate.com** that has interest rates on certificates of deposit (CDs) and see what the current rate is for a five-year CD. Assuming you have $10,000 today, how much will that accumulate to after five years at the rate you found on the Web site?

The same problem compounded monthly would follow the format listed below. Note: Several calculators have a function for a number of periods. In such cases, the number of periods and interest are typically stated on an annual basis, and the number of periods is entered separately.

Solution: $n = 12$ (1 year × 12 periods per year)
$i = .5\%$ (6%/12 periods per year)
$PMT = 0$
$PV = -\$10{,}000$
$FV = \$10{,}616.78$

(Note that this solution is the same as what would have been obtained had we calculated the factor 1.061678 shown in Exhibit 3–4.)

The same problem compounded daily would look like this.

Solution: $n = 365$ (1 year × 365 periods per year)
$i = .0164$ (6%/365 periods per year)
$PMT = 0$
$PV = -\$10{,}000$

Solve for FV: $FV = \$10{,}618.31$

Question: What is the future value of $5,000 deposited for four years compounded at an annual rate of 10 percent?

Solution: $n = 4$ years
$i = 10\%$
$PMT = 0$
$PV = -\$5{,}000$
$FV = \$7{,}320.50$

Question: What is the future value of a single $5,000 deposit earning 8 percent interest, compounded monthly, at the end of two years?

Solution: $n = 24$ (2 years × 12 periods)
$i = .666\%$ (8%/12 periods)
$PMT = 0$
$PV = -\$5{,}000$
$FV = \$5{,}864.44$

Present Value

In the preceding section, we were concerned with determining value at some time in the *future*; that is, we considered the case where a deposit had been made and compounded into the future to yield some unknown future value.

In this section, we are interested in the problem of knowing the future cash receipts for an investment and of determining how much should be paid for the investment at *present*. The concept of present value is based on the idea that money has time value. Time value simply means that if an investor is offered the choice between receiving $1 today or receiving $1 in the future, the proper choice will always be to receive the $1 today because this $1 can be invested in some opportunity that will earn interest, which is always preferable to receiving only $1 in the future. In this sense, money is said to have *time value*.

When determining how much should be paid *today* for an investment that is expected to produce income in the *future*, we must apply an adjustment called **discounting** to income received in the future to reflect the time value of money. The concept of present value lays the cornerstone for calculating mortgage payments, determining the true cost of mortgage loans, and finding the value of an income property, all of which are very important concepts in real estate finance.

A Graphic Illustration of Present Value

An example of how discounting becomes an important concept in financing can be seen from the following problem. Suppose an individual is considering an investment that promises a cash return of $10,600 at the end of one year. The investor believes this investment should yield an annual rate of 6 percent. The question is how much should the investor pay *today* if $10,600 is to be received at the *end* of the year and the investor requires a 6 percent return compounded annually on the amount invested?

The problem can be seen more clearly by comparing it with the problem of finding the compound value of $1 discussed in the first part of this chapter. In that discussion, we were concerned with finding the future value of a $10,000 deposit compounded monthly at 6 percent for one year. This comparison is depicted in Exhibit 3–5.

In Exhibit 3–5 note that with compounding, we are concerned with determining the *future value* of an investment. With discounting, we are concerned with just the opposite concept; that is, what *present value* or *price* should be paid *today* for a particular investment, assuming a desired rate of interest is to be earned?

Because we know from the preceding section that $10,000 compounded annually at a rate of 6 percent results in a future value of $10,600 at the end of one year, $10,000 is the present value of this investment. However, had we not done the compounding problem in the preceding section, how would we know that $10,000 equals the present value of the investment? Let us again examine the compounding problem considered in the previous section. To determine future value, recall the general equation for compound interest:

$$FV = PV(1 + i)^n$$

EXHIBIT 3–5
Comparison of Future Value and Present Value

		Month						
		2	4	6	8	10	12	
Compounding at 6%	$10,000	⟶						Future value(?)
Discounting at 6%	Present value(?)	⟵						$10,600

In our present value problem, PV becomes the *unknown* because FV, or the future value to be received at the end of one year, $n = 1$ year, is *known* to be \$10,600. Because the interest rate (i) is also known to be 6 percent, PV is the only value that is not known. PV, the present value or amount we should pay for the investment today, can be easily determined by rearranging terms in the above compounding formula as follows:

$$FV = PV(1+i)^n$$

$$PV = FV\frac{1}{(1+i)^n}$$

In our problem, then, we can determine PV directly by substituting the known values into the above expression as follows:

$$\begin{aligned} PV &= FV\frac{1}{(1+i)^n} \\ &= \$10{,}600\frac{1}{(1+.06)^1} \\ &= \$10{,}600\frac{1}{1.06} \\ &= \$10{,}600 \times (.943396) \\ &= \$10{,}000 \end{aligned}$$

Note that the procedure used in solving for the present value is simply to multiply the future value, FV, by 1 divided by $(1 + i)^n$. We know from the section on compounding that in our problem $(1 + i)^n$ is $(1 + .06)^1$ or ($FVIF$, 6%, 1 yr.), which equals 1.06. Dividing 1 by 1.06 yields .943396. This result is important in present value analysis because it shows the relationship between future value and present value.

Because we see from Exhibit 3–5 that the discounting process is the opposite of compounding, to find the present value of any investment is simply to compound in a "reverse sense." This is done in our problem by taking the reciprocal of the interest factor for the compound value of \$1 at 6 percent, $1 \div 1.06$ or .943396, which we abbreviate as ($PVIF$, 6%, 1 yr.), multiplying it by the future value of the investment to find its present value. We can now say that \$10,600 received at the end of one year, when discounted by 6 percent, has a present value of \$10,000. Alternatively, if we are offered an investment that promises to yield \$10,600 after one year and we want to earn a 6 percent annual return, we should not pay more than \$10,000 for the investment (it is on the \$10,000 present value that we earn the 6 percent interest).

Calculating Present Value Interest Factors

Because the discounting process is the reverse of compounding, and the interest factor for discounting $1 \div (1 + i)^n$ is simply the reciprocal of the interest factor for compounding, a series of present value interest factors have been developed. Exhibit 3–6 contains a sample of factors to be used when discounting.

In our problem, we want to know how much should be paid for an investment with a future value of \$10,600 to be received at the end of one year if the investor demands an annual return of 6 percent. The solution can be found by calculating or selecting the ($PVIF$, 6%, 1 yr.) or from the 6 percent column in Exhibit 3–6, or .943396. The \$10,600 future value can now be multiplied by .943396, resulting in a present value (PV) of \$10,000. To

EXHIBIT 3–6
Interest Factors for the Present Value Reversion of \$1 for Various Interest Rates and Time Periods

	Rate		
Year	6%	10%	15%
1	.943396	.909091	.869565
2	.889996	.826446	.756144
3	.839619	.751315	.657516
4	.792094	.683013	.571753
5	.747258	.620921	.497177
6	.704961	.564474	.432328
7	.665057	.513158	.375937

help the reader understand these concepts, this present value factor also may be determined using a financial calculator as follows:

Calculator Solution:
n = 1 year
i = 6%
PMT = \$0
FV = \$1
Solve for present value:
PV = .943396

Question: How much should an investor pay today for a real estate investment that will return \$20,000 at the end of three years, assuming the investor desires an annual return of 15 percent interest on the amount invested?

Solution:
$$\begin{aligned} PV &= \$20{,}000 \times \frac{1}{(1+.15)^3} \\ &= \$20{,}000(PVIF, 15\%, 3 \text{ yrs.}) \\ &= \$20{,}000(.657516) \\ &= \$13{,}150.32 \end{aligned}$$

The investor should pay no more than \$13,150.32 today for the investment promising a return of \$20,000 after three years if a 15 percent return on investment is desired.[3]

Expanding the Use of Calculators for Finding Present Values

As was the case with compounding, financial calculators allow us to calculate present value solutions *directly*, as they have been programmed to calculator factors internally and then complete the required operations to present a final answer. Our problem can be solved with a calculator as follows:

[3] An accepted convention in finance is that when one refers to a percentage return on investment, a nominal annual interest rate is assumed. If solutions are computed based on different compounding intervals within a year, such as monthly, the solution should be designated as an *annual rate of interest compounded monthly*. The latter solution may then be converted, if desired, to an effective annual yield, as shown previously.

Calculator Solution:

n = 3 years	PMT = 0	Solve for present value:
i = 15%	FV = \$20,000	PV = −\$13,150.32

Because we can use the discounting process to find the present value of a future value when *annual* compounding is assumed, we can also apply the same methodology assuming *monthly* discounting. For example, in our illustration involving monthly compounding, the future value of \$10,000 at an annual rate of interest of 6 percent compounded monthly was \$10,616.80. An important question an investor should consider is how much should be paid today for the future value of \$10,616.80 received at the end of one year, assuming that a 6 percent return compounded *monthly* is required?

We could answer this question by finding the reciprocal of the formula used to compound monthly, $1 \div (1 + i/12)^{1 \cdot 12}$, and multiply that result by the future value of \$10,616.78 to find the present value (PV). We may calculate this factor with a calculator as:

Calculator Solution:
FV = \$1
PMT = 0
n = 12 mos.
i = .06 ÷ 12
Solve for present value:
PV = .941905

Many factors have been calculated and included in table form shown in Exhibit 3–7.

In our problem, we want to determine the present value of \$10,616.80 received at the end of one year, assuming a desired rate of return of 6 percent, compounded monthly. By going to the 6 percent column and the row corresponding to one year (12 months) and selecting the interest factor .941905, we can now multiply \$10,616.80 × (.941905) = \$10,000 and see that \$10,000 is the maximum amount one should pay today for the investment.

EXHIBIT 3–7
Interest Factors for the Present Value Reversion of \$1 for Various Interest Rates and Time Periods

	Rate			
Month	6%	8%	9%	
1	.995025	.993377	.992556	
2	.990075	.986799	.985167	
3	.985149	.980264	.977833	
4	.980248	.973772	.970554	
5	.975371	.967323	.963329	
6	.970518	.960917	.956158	
7	.965690	.954553	.949040	
8	.960885	.948232	.941975	
9	.956105	.941952	.934963	
10	.951348	.935714	.928003	
11	.946615	.929517	.921095	
12	.941905	.923361	.914238	
Year				Month
1	.941905	.923361	.914238	12
2	.887186	.852596	.835831	24
3	.835645	.787255	.764149	36
4	.787098	.726921	.698614	48

Alternatively, if the reader is comfortable with the derivation of these interest factors and the discounting process, a solution may be found more directly with a calculator as follows:

Calculator Solution:
n = 1 year × 12 periods = 12
i = 6% ÷ 12 periods = .5%
PMT = 0
FV = 10,616.80
Solve for present value:
PV = −\$10,000

Question: How much should an investor pay to receive \$12,000 three years (36 months) from now, assuming that the investor desires an annual return of 9 percent compounded *monthly?*

Solution: PV = \$12,000($MPVIF$, 9%, 36 mos.)
= \$12,000(.764149)
= \$9,169.79

Calculator Solution:
n = 3 × 12 = 36
i = 9% ÷ 12 = .75%
PMT = 0
FV = 12,000
Solve for present value:
PV = −\$9,169.79

The investor should pay no more than \$9,169.79 for the investment, or the present value (PV) of the investment is \$9,169.79. (Again note the use of M in our abbreviation designating monthly discounting.)

Compound or Future Value of an Annuity

The first section of this chapter dealt with finding the compound or future value of a *single deposit* or payment made only once, at the beginning of a period. An equally relevant consideration involves a series of equal deposits or payments made at equal intervals. For example, assume deposits of \$1,000 are made at the *end* of each year for a period of five years and interest is compounded at an annual rate of 5 percent. What is the future value at the end of the period for a series of deposits plus all compound interest? In this case, the problem involves equal payments (P) or deposits made at equal time intervals. This series of deposits or payments is defined as an **annuity**. Because we know how to find the answer to a problem where only one deposit is made, it is logical and correct to assume that the same basic compounding process applies when dealing with annuities. However, that process is only a partial solution to the problem because we are dealing with a series of deposits that occur annually.

Calculator Solution:

$n = 6$
$i = 10\%$
$PV = 0$
$PMT = -\$800$

Solve for future value:

$FV = \$6{,}172.49$

The same procedure used for compounding annuities for amounts deposited or paid annually can also be applied to monthly annuities. A very simple modification can be made to the formulation used for annual annuities by substituting $i/12$ in place of i and adding the number of compounding periods per year (m) in the annual formulation, as follows:

$$FVA = P\left[1+\frac{i}{12}\right]^{n\cdot m-1} + P\left[1+\frac{i}{12}\right]^{n\cdot m-2} + \cdots + P$$

or

$$FVA = P\cdot\sum_{t=1}^{n\cdot m-1}\left[1+\frac{i}{12}\right]^{t} + P$$

However, in this formulation, $n\cdot m$ represents months. Deposits or payments, P, are made monthly and are constant in amount. Hence, the interest factors used to compound each monthly deposit may be added (as they were for annual deposits in Exhibit 3–8), and a new series for compounding monthly annuities can be computed. This has been done for selected interest rates and years.[6]

Question: An investor pays \$200 per month into a real estate investment that promises to pay an annual rate of interest of 8 percent compounded *monthly*. If the investor makes consecutive monthly payments for five years, what is the future value at the end of five years?

Solution: FVA = \$200(*MFVIFA*, 8%, 60 mos.)
= \$200(73.476856)
= \$14,695.37

Calculator Solution:

$n = 5 \times 12 = 60$ months
$i = 8\%/12 = .666\%$
$PV = 0$
$PMT = -\$200$

Solve for future value:

$FV = \$14{,}695.34$

In this case, the value of payments earning interest at an annual rate of 8 percent compounded monthly = \$14,695.37.

[6] Like annual compounding, this formulation assumes that deposits are made at the *end* of each month, or that an ordinary annuity is being compounded.

Present Value of an Annuity

In the preceding section, our primary concern was to determine the future value of an annuity, or constant payments received at equal time intervals. In this section, we consider the **present value of an annuity (*PVA*)**, or the series of annual income receipts the investment produces over time. Because an investor may have to consider a series of income payments when deciding whether to invest, this is an important problem. Recall that when dealing with the present value of a single receipt, or ending value, PV, we took the basic formula for compounding interest and rearranged it to determine the present value of an investment as follows:

$$FV = PV(1+i)^n$$
$$PV = FV \div (1+i)^n$$
$$PV = FV\cdot\frac{1}{(1+i)^n}$$

To consider the present value of an annuity, or PVA, we need only consider the sum of individual present value for all receipts. This can be done by modifying the basic present value formula as follows:

$$PVA = R\frac{1}{(1+i)^1} + R\frac{1}{(1+i)^2} + R\frac{1}{(1+i)^3} + \cdots + R\frac{1}{(1+i)^n}$$

or this can be written as

$$PVA = R\cdot\sum_{t=1}^{n}\frac{1}{(1+i)^t}$$

Note in this expression that each receipt, R, is discounted for the number of years corresponding to the time when the funds were actually received. In other words, the first receipt would occur at the end of the first period and would be discounted only one period, or $R\cdot[1\div(1+i)^1]$. The second receipt would be discounted for two periods, or $R\cdot[1\div(1+i)^2]$, and so on.

Assuming an individual is considering an investment that will provide a series of annual cash receipts of \$500 for a period of six years, and the investor desires a 6 percent return, how much should the investor pay for the investment today? We can begin by considering the present value of the \$500 receipt in year 1, as shown in Exhibit 3–10. Note that the present value of the \$500 receipt is discounted for one year at 6 percent. This is

EXHIBIT 3–10
Present Value of \$500 per Year (discounted at 6 percent annually)

Year	Receipt		IF		Present Value
1	\$500 × (*PVIF*, 6%, 1 yr.)	=	\$500 × .943396	=	\$ 471.70
2	500 × (*PVIF*, 6%, 2 yrs.)	=	500 × .889996	=	445.00
3	500 × (*PVIF*, 6%, 3 yrs.)	=	500 × .839619	=	419.81
4	500 × (*PVIF*, 6%, 4 yrs.)	=	500 × .792094	=	396.05
5	500 × (*PVIF*, 6%, 5 yrs.)	=	500 × .747258	=	373.63
6	500 × (*PVIF*, 6%, 6 yrs.)	=	500 × .704961	=	352.48
	Also		\$500 × 4.917324	=	\$2,458.66*

*Rounded.

done because the income of $500 for the first year is not received until the end of the first period, and our investor only wants to pay an amount today (present value) that will assure a 6 percent return on the amount paid today. Therefore, by discounting this $500 receipt by the interest factor for 6 percent, or .943396, the present value is $471.70. Note that the second $500 income payment is received at the end of the second year. Therefore, it should be discounted for *two* years at 6 percent. Its present value is found by multiplying $500 by the interest factor for 6 percent for two years, or .889996, giving a present value of $445. This process can be continued for each receipt for the remaining three years (see Exhibit 3–10). The present value of the entire series of $500 income payments can be found by adding the series of receipts discounted each month in the far right-hand column, which totals $2,458.66.

However, because the $500 series of payments is constant, we may simply sum all interest factors to obtain one interest factor that can be multiplied by $500 to obtain the same present value (see Exhibit 3–10). The sum of all interest factors for 6 percent is 4.917324. When 4.917324 is multiplied by $500, the present value, $2,458.66, found in the lengthy series of multiplications carried in Exhibit 3–10, is again determined.

Now that the reader has been introduced to the equations and interest factors that result from these equations, a solution can be found directly using a financial calculator as follows:

Calculator Solution:

$n = 6$	$PMT = -\$500$	Solve for present value:
$i = 6\%$	$FV = 0$	$PV = \$2{,}458.66$

Use of the Present Value of an Annuity Factors

As we have illustrated, the interest factors in Exhibit 3–10 may be summed, as long as the income payments are equal in amount and received at equal intervals. The sums of *IF*s for various interest rates, now referred to as (*PVIFA*, *i*%, *n* yrs.), have been compiled in table form and are listed in Exhibit 3–11. In our problem, we want to determine the present value of $500 received annually for six years, assuming a desired annual rate of return of 6 percent. How much should an investor pay for this total investment today and be assured of earning the desired return? We can solve this problem by computing the solution with a calculator or by looking at Exhibit 3–11, finding the 6 percent column, and looking down the column until we locate the *IF* in the row corresponding to six years. The *IF* is 4.917324. Thus

$$\begin{aligned} PVA &= \$500(PVIFA,\ 6\%,\ 6\text{ yrs.}) \\ &= \$500(4.917324) \\ &= \$2{,}458.66 \end{aligned}$$

This solution corresponds to that obtained in Exhibit 3–10.

Question: An investor has an opportunity to invest in a rental property that will provide net cash returns of $400 per year for three years. The investor believes that an annual return of 10 percent should be earned on this investment. How much should the investor pay for the rental property?

Solution: $$\begin{aligned} PVA &= \$400(PVIFA,\ 10\%,\ 3\text{ yrs.}) \\ &= \$400(2.486852) \\ &= \$994.74 \end{aligned}$$

EXHIBIT 3–11
Interest Factors for the Present Value of an Ordinary Annuity of $1 per Period for Various Interest Rates and Time Periods

	Rate			
Year	5%	6%	10%	15%
1	.952381	.943396	.909091	.869565
2	1.859410	1.833393	1.735537	1.625709
3	2.723248	2.673012	2.486852	2.283225
4	3.545951	3.465106	3.169865	2.854978
5	4.329477	4.212364	3.790787	3.352155
6	5.075692	4.917324	4.355261	3.784483
7	5.786373	5.582381	4.868419	4.160420
8	6.463213	6.209794	5.334926	4.487322

The investor should pay no more than $994.74 for the investment property. With that amount a 10 percent return will be earned. (Again, note the use of the letter *A* after *PVIF* indicating an annuity is being evaluated.)

A more direct solution to this problem can be found by using a financial calculator as follows:

Calculator Solution:
$n = 3$
$i = 10\%$
$PMT = -\$400$
$FV = 0$
Solve for present value:
$PV = \$994.74$

Based on the logic used in discounting annuities paid or received annually, the same procedure can be applied to cash receipts paid or received *monthly*. In this case, the formula used to discount annual annuities is simply modified to reflect monthly receipts or payments, and the discounting interval is changed to reflect monthly compounding:

$$PVA = P\left[\frac{1}{1+\frac{i}{12}}\right]^{1} + P\left[\frac{1}{1+\frac{i}{12}}\right]^{2} + \cdots + P\left[\frac{1}{1+\frac{i}{12}}\right]^{n\cdot m}$$

where payments (P) occur monthly, the exponents represent months running from 1 through $n \cdot m$, and *PVA* represents the present value of an annuity received over $n \cdot m$ months.

Like annual discounting, computation of the present value of an annuity can be very cumbersome if one has to expand the above formula for each problem, particularly if the problem involves cash receipts or payments over many months. Hence, a series of interest factors have been computed by expanding the above formula for each monthly interval and adding the resulting interest factors (this was performed with discounting annual annuities in Exhibit 3–10). Like the annual tables, the factors in Exhibit 3–12 are labeled *Present Value of Ordinary Annuity of $1 per Period* because the period in this case is one month. Hence, if an

EXHIBIT 3–12
Interest Factors for the Present Value of an Ordinary Annuity of $1 per Period for Various Interest Rates and Time Periods

	Rate		
Month	6%	8%	
1	.995025	.993377	
2	1.985099	1.980176	
3	2.970248	2.960440	
4	3.950496	3.934212	
5	4.925866	4.901535	
6	5.896384	5.862452	
7	6.862074	6.817005	
8	7.882959	7.765237	
9	8.779064	8.707189	
10	9.730412	9.642903	
11	10.677027	10.572420	
12	11.618932	11.495782	
Year			Month
1	11.618932	11.495782	12
2	22.562866	22.110544	24
3	32.871016	31.911806	36
4	42.580318	40.961913	48

investor wants to know how much he or she should pay today for an investment that would pay $500 at the end of each month for the next 12 months and earn an annual rate of 6 percent compounded monthly on the investment, the investor can easily compute the solution with a calculator or determine it by consulting Exhibit 3–12. Looking to the 6 percent column and dropping down to the row corresponding to 12 months, you find the factor 11.618932. Multiplying $500 by 11.618932 results in $5,809.47, or the amount that the investor should pay today if a 6 percent rate of return compounded monthly is desired.

The calculator solution would be:

Calculator Solution:
n = 12 months
i = 6% ÷ 12 = .005000%
PMT = $500
FV = 0
Solve for present value:
PV = $5,809.47

Question: A real estate partnership predicts that it will pay $300 at the end of each month to its partners over the next six months. Assuming the partners desire an 8 percent return compounded monthly on their investment, how much should they pay?

Solution: PVA = $300(*MPVIFA*, 8%, 6 mos.)
= $300(5.862452)
= $1,758.74

Calculator Solution:
n = 6 months PMT = −$300 Solve for present value:
i = 8% ÷ 12 = .6666% FV = 0 PV = $1,758.74

Accumulation of a Future Sum

The previous two sections have dealt with compounding and discounting single payments on annuities. In some instances, however, it is necessary to determine a series of payments necessary to *accumulate a future sum,* taking into account the fact that such payments will be accumulating interest as they are deposited. For example, assume we have a debt of $20,000 that must be repaid in one lump sum at the end of five years. We would like to make a series of equal annual payments (an annuity) at the end of each of the five years, so that we will have $20,000 at the end of the fifth year from the accumulated deposits plus interest. Assuming that we can earn 10 percent interest per year on those deposits, how much should each annual deposit be?

In this case, we are dealing with accumulating a future sum. Exhibit 3–5 indicates that we will be compounding a series of deposits (P), or an annuity, to achieve that future value. Hence, we can work with the procedure for determining future values by compounding as follows:

$$P(FVIFA,\ 10\%,\ 5\text{ yrs.}) = \$20{,}000$$
$$P(6.105100) = \$20{,}000$$
$$P = \$20{,}000 \div 6.105100$$
$$= \$3{,}275.95$$

Calculator Solution:
n = 5
i = 10%
PV = 0
FV = $20,000
Solve for annual payments:
PMT = −$3,275.95

This computation merely indicates that when compounded at an annual interest rate of 10 percent, the unknown series of equal deposits (P) will result in the accumulation of $20,000 at the end of five years. Given the interest factor for compounding an annual annuity (*FVIFA*) from Exhibit 3–9, 6.105100, we know that the unknown deposit, P, when multiplied by that factor will result in $20,000. Hence, by dividing $20,000 by the interest factor for compounding an annual annuity, we can obtain the necessary annual payment of $3,275.95. The result tells us that if we make deposits of $3,275.95 at the end of each year for five years, and each of those deposits earns interest at an annual rate of 10 percent, a total of $20,000 will be accumulated at the end of five years.

We can see from the above computation that dividing $20,000 by 6.105100 is equivalent to multiplying $20,000 by (1 ÷ 6.105100), or .163797, and the same $3,275.95 solution results. The factor .163797 is referred to in real estate finance as a **sinking-fund factor (SFF),** which is also used in other applications in real estate. In the case of monthly payments, if we want to know what monthly payments would be necessary to pay off the

\$20,000 debt at the end of five years, taking into account that each deposit will earn an annual rate of 10 percent compounded monthly, we can obtain a calculator solution as follows:

Calculator Solution:
$n = 5 \times 12 = 60$
$i = 10\% \div 12 = .008333$
$PV = 0$
$FV = \$20,000$
Solve for monthly payments:
$PMT = -\$258.27$

Required monthly payments would be \$258.27.

Determining Yields, or Internal Rates of Return, on Investments

Up to now, this chapter has demonstrated how to determine future values in the case of compounding and present values in the case of discounting. Each topic is important in its own right, but each has also provided tools for determining an equally important component used extensively in real estate financing, that is, calculating rates of return or **investment yields.** In other words, the concepts illustrated in the compounding and discounting processes can also be used to determine rates of return, or yields, on investments, mortgage loans, and so on. These concepts must be mastered because procedures used here will form the basis for much of what follows in succeeding chapters.

We have concentrated previously on determining the future value of an investment made today when compounded at some given rate of interest, or the present investment value of a stream of cash returns received in the future when discounted at a given rate of interest. In this section, we are concerned with problems where we know what an investment will cost today and what the future stream of cash returns will be, but we do not know what **yield,** or **rate of return** (compounded), will be earned if the investment is made.

Investments with Single Receipts

In many cases, investors and lenders are concerned with the problem of what rate of compound interest, or investment yield, will be earned if an investment is undertaken. To illustrate the investment yield concept, assume an investor has an opportunity today to buy an unimproved one-acre lot for \$5,639. The lot is expected to appreciate in value and to be worth \$15,000 after seven years. What rate of interest (or investment yield) would be earned on the \$5,639 investment in the property if it were made today, held for seven years, and sold for \$15,000?

To solve for the unknown rate, we can formulate the problem as follows:

$$PV = R \cdot \frac{1}{(1+i)^n}$$

$$\$5,639 = \$15,000 \cdot \frac{1}{(1+i)^7}$$

We want to know the annual rate of compound interest, i, that, when substituted into the above equation, will make the \$15,000 receipt equal to the \$5,639 investment outlay, or present value, today.

Unfortunately, there is no "easy way" of finding a solution to the unknown, or i, directly. What follows are a number of approaches to finding it. (*For readers familiar with TVM concepts and financial calculators, the material that follows may be lightly reviewed.*)

The trial-and-error approach is one way to solve for i. A value for i is estimated; then the equation is solved to ascertain whether the future value, or \$15,000, when discounted to present value, PV, will equal \$5,639. When the correct value for i is found, the solution for present value should yield \$5,639.

How do we begin the search for i? One way is to simply guess a solution. Let's try 10 percent. Mathematically we ask, if

$$PV = \$15,000 \frac{1}{(1+.10)^7}$$

is PV = \$5,639?

Solving for PV, we have

$$PV = (\$15,000)(.513158)$$
$$= \$7,697$$

We note that \$7,697 or PV is much greater than the desired PV, or \$5,639. This means that the yield, or rate of compound interest earned on the investment, is *greater* than 10 percent. Hence, we must continue the discounting process by increasing i.

Our next "trial" will be 15 percent. Substituting, we have

$$PV = \$15,000 \frac{1}{(1+.15)^7}$$
$$= \$15,000(.375937)$$
$$= \$5,639.06$$

This time PV equals \$5,639. This "guess" was correct. From this result, we have determined that the yield or internal rate of return, i, earned on the investment is equal to 15 percent. We have, in essence, "removed" interest compounded at the rate of 15 percent for seven years from the \$15,000 receipt of cash, leaving the initial deposit, or present value, of \$5,639.

When trying to find the yield in which only one future value is involved, we can use an alternative approach where the interest factor, $PVIF$, in the financial tables is first determined as follows:

$$\$5,639 = \$15,000(PVIF\ ?\%, 7\ \text{yrs.})$$
$$\$5,639.06 \div \$15,000 = (PVIF\ ?\%, 7\ \text{yrs.})$$
$$.375937 = (PVIF\ ?\%, 7\ \text{yrs.})$$

The above calculations show that the interest factor is .375937, but we still do not know the interest rate. However, we do know that the time period over which the investment is to appreciate in value is seven years. Because $PVIF$ is .375937 and the term of investment is seven years, the interest tables in Exhibit 3–6 allow us to easily find the correct interest rate. Since the cash return of \$15,000 is a single receipt, we need only locate an IF for the present value reversion of \$1 equal to .375937 in the row corresponding to seven years for some interest rate. We begin the search for the interest rate by choosing an arbitrary interest rate, say 6 percent. The 6 percent table in Exhibit 3–6 shows that the IF in column 4 for seven years is .665057, which is larger than .375933. Moving to the 10 percent table, the IF for seven years is .513158, which is lower than the IF at 5 percent but comes closer to the IF we are looking for. If we continue this trial-and-error process, the 15 percent table indicates that the

IF in column 4 for seven years is .375937; therefore, the interest rate we desire is 15 percent. We know this is the correct interest factor because \$15,000 (.375937) = \$5,639.06.

A more time efficient approach to finding the yield or internal rate of return is by using a financial calculator. For calculators that have the capability to solve for yields such as required by the problem at hand, we have:

Calculator Solution:
$n = 7$
$PV = -\$5,639$
$PMT = 0$
$FV = \$15,000$
Solve for investment yield:
$i = 15\%$

What does this interest rate, or yield, mean? It means that the \$5,639 investment made today, held for seven years, and sold for \$15,000, is equivalent to investing \$5,639 today and letting it compound annually at an interest rate of 15 percent (note the correspondence between the terms *interest rate* and *yield*).[7] This fact can be determined with the following computation:

$$FV = \$5,639(FVIF,\ 15\%,\ 7\text{ yrs.})$$
$$= \$5,639(2.660020)$$
$$= \$15,000$$

This calculation simply shows that \$5,639 compounded annually at an interest rate of 15 percent for seven years is \$15,000. Hence, making this investment is equivalent to earning a rate of return of 15 percent. This rate of return is usually referred to as the *investment yield* or the **internal rate of return.**

Calculator Solution:
$n = 7$
$i = 15\%$
$PV = -\$5,639$
$PMT = 0$
Solve for future value:
$FV = \$15,000$

The internal rate of return integrates the concepts of compounding and present value. It represents a way of measuring a return on investment, expressed as a compound rate of interest, over the entire investment period. For example, if an investor is faced with making an investment in an income-producing venture, regardless of how the cash returns are patterned, the internal rate of return provides a guide or comparison for the investor. It tells the investor what the equivalent compound interest rate will be on the investment being considered. In the example of the unimproved one-acre lot, the 15 percent yield or internal rate of return is equivalent to making a deposit of \$5,639 and allowing it to compound annually

[7] We are now using the terms *yield* and *internal rate of return* for *i*, instead of the interest rate. It is generally accepted practice to use these terms when evaluating most investments. The term *interest rate* is generally used when loan terms are being quoted by lenders. The two concepts are very similar, but the reader should become accustomed to these differences in usage.

at an interest rate of 15 percent for seven years. After seven years, the investor would receive \$15,000, which includes the original investment of \$5,639 plus all compound interest. With the internal rate of return known, the investor can make an easier judgment about what investment to make. If the 15 percent return is adequate, it will be made; if not, the investor should reject it.[8]

The concepts of the internal rate of return or yield, present value, and compounding are indispensable tools that are continually used in real estate finance and investment. The reader should not venture beyond this section without firmly grasping the concepts that have been explained. These concepts form the basis for the remainder of this chapter and the chapters which follow.

Yields on Investment Annuities

The concepts illustrated for a single receipt of cash (when the unimproved lot was sold) also apply to situations where a *series* of cash receipts is involved. Consequently, a yield or internal rate of return also can be computed on these types of investments.

Suppose an investor has the opportunity to make an investment in real estate costing \$3,170 that would provide him with cash income of \$1,000 at the end of *each year* for four years. What investment yield, or internal rate of return, would the investor earn on the \$3,170? In this case, we have a series of receipts that we wish to discount by an unknown rate to make the present value of the \$1,000 annuity equal the original investment of \$3,170. We need to find a solution for i in this problem, or the rate of interest that will make the present value of the \$1,000 four-year annuity equal to \$3,170. Using our shorthand notation, we have

$$\$3,170 = \$1,000(PVIFA,\ ?\%,\ 4\text{ yrs.})$$

Recalling the notation for the present value of an annuity PVA, we have

$$PVA = R \cdot \sum_{t=1}^{n} \frac{1}{(1+i)^t}$$

Substituting gives

$$\$3,170 = 1,000 \cdot \sum_{t=1}^{n} \frac{1}{(1+i)^t}$$

Using our shorthand notation, we can express our problem as follows:

$$PVA = R(PVIFA,\ ?\%,\ 4\text{ yrs.})$$
$$\$3,170 = \$1,000(PVIFA,\ ?\%,\ 4\text{ yrs.})$$
$$\$3,170 \div \$1,000 = (PVIFA,\ ?\%,\ 4\text{ yrs.})$$
$$3.170000 = (PVIFA,\ ?\%,\ 4\text{ yrs.})$$

Calculator Solution:
$n = 4$
$PV = -\$3,170$
$PMT = \$1,000$
$FV = 0$
Solve for investment yield:
$i = 10\%$

[8] When comparing different investments, the investor must also consider any differences in risk. This topic is discussed in later chapters.

EXHIBIT 3–13
Illustration of the Internal Rate of Return (IRR) and Components of Cash Receipts

	Year 1	2	3	4
Investment (balance)	$3,170	$2,487	$1,736	$ 910
IRR at 10%	317	249*	174*	91*
Cash received	$1,000	$1,000	$1,000	$1,000
Less: Cash yield at 10%	317	249	174	90*
Recovery of investment	$ 683	$ 751	$ 826	$ 910
Investment (beginning of year)	$3,170	$2,487	$1,736	$ 910
Less: Recovery of investment	683	751	826	910
Investment (end of year)	$2,487	$1,736	$ 910	$ 0

*Rounded.

This procedure is similar to solving for the yield, or internal rate of return, on single receipts discussed in the preceding section, except that we are now dealing with an annuity (note the use of the letter *A* after *PVIF* in our abbreviated formula). Using the same procedure as before, we solve for the interest factor for a four-year period that will correspond to some interest rate. To determine what the interest rate is, search the factors in Exhibit 3–11 in the four-year row until you find a column containing a factor very close to 3.1700. A careful search reveals that the factor will be found in the 10 percent column (the reader should verify this). Hence, based on this procedure, we have determined that the investment yield or internal rate of return (*IRR*) on the $3,170 invested is 10 percent. A more in-depth analysis of what the internal rate of return means is presented in Exhibit 3–13.

When the internal rate of return is computed, two characteristics are present (see Exhibit 3–13). One is the *recovery of capital* in each period, and the other is *interest earned* in each period. In other words, when the *IRR* is computed based on the $3,170 investment and the $1,000 received each year, *implicit* in the *IRR* computation is the *full recovery* of the $3,170 investment *plus* interest compounded annually at 10 percent. Hence, the 10 percent investment yield is really a rate of compound interest earned on an outstanding investment balance from year to year. Of the total $4,000 received during the four-year period, total interest earned is $830 and capital recovery is $3,170.

Monthly Annuities: Investment Yields

A similar application for investment yields can be made in cases where monthly cash annuities will be received as a return on investment. For example, assume that an investor makes an investment of $51,593 and will receive $400 at the end of each month for the next 20 years (240 months). What annual rate of return, compounded monthly, would be earned on the $51,593? The solution can be easily determined with the following procedure:

$$
\begin{aligned}
R(MPVIFA, ?\%, 20 \text{ yrs.}) &= PVA \\
\$400(MPVIFA, ?\%, 20 \text{ yrs.}) &= \$51{,}593 \\
(MPVIFA, ?\%, 20 \text{ yrs.}) &= \$51{,}593 \div \$400 \\
&= 128.9825
\end{aligned}
$$

Calculator Solution:

$n = 20 \times 12 = 240$
$PV = -\$51{,}593$
$PMT = \$400$
$FV = 0$

Solve for investment yield:

$i\text{(monthly)} = 0.5833\%$
$i\text{(annualized)} = .005833 \times 12$, or 7%

As was the case with finding the *IRR* for investments with annual receipts, we find the interest factor for the present value of an ordinary annuity of $1 per month for 20 years for an interest rate compounded monthly (note the *M* in our shorthand notation), which is 128.9825. Hence, the *IRR* is 7 percent compounded monthly on the $51,593 investment. Both the recovery of $51,593 and the $44,407 in interest were embedded in the stream of $400 monthly cash receipts over the 20-year period.

Effective Annual Yields: Extensions

Earlier in this chapter, we dealt with the problem of determining equivalent annual yields in cases where there were more than one compounding interval within a year. In our example, we showed the effective annual yield for a $10,000 investment compounded annually, monthly, and daily to be 6, 6.1678, and 6.1831 percent, respectively. In many situations, we may already know the *effective annual yield (EAY)* and would like to know what the *nominal annual rate* of interest compounded monthly (or for any period less than one year) must be to earn the desired effective annual yield. For example, we considered a problem in which compounding occurred monthly based on a nominal annual rate of interest of 6 percent. Because compounding occurred in monthly intervals, an effective annual interest rate larger than the nominal rate resulted. Assuming that we wanted to know what the nominal annual rate of interest, compounded *monthly*, would have to be to provide a desired *EAY* of 6 percent, we can employ the following formula, where *ENAR* is the **equivalent nominal annual rate,** compounded monthly:

$$ENAR = [(1 + EAY)^{1/m} - 1] \cdot m$$

In our problem, we would have

$$
\begin{aligned}
ENAR &= [(1 + .06)^{1/m} - 1] \cdot 12 \\
&= [(1 + .06)^{.083333} - 1] \cdot 12 \\
&= [1.004868 - 1] \cdot 12 \\
&= .0584106 \text{ or } 5.84106\% \text{ (rounded)}
\end{aligned}
$$

To illustrate this concept, if we have investment A, which will provide an effective annual yield of 6 percent, and we are considering investment B, which will provide interest compounded monthly, we would want to know what the equivalent nominal annual rate (*ENAR*) of interest, compounded monthly, would have to be on investment B to provide the *same* effective annual yield of 6 percent. That rate would be an annual rate of 5.84106 percent compounded monthly.

$$FV = \$1(MFVIF,\ 5.84106\%,\ 12 \text{ mos.})$$
$$= \$1\left[1 + \frac{.0584106}{12}\right]^{12}$$
$$= \$1.06 \text{ (rounded)}$$

From our example, we know that the *EAY* is (\$1.06 − \$1.00) ÷ \$1.00, or 6 percent. Hence, we now know that an investment of equal risk, with returns compounded *monthly,* must have an annual nominal rate of interest of at least 5.84106 percent to provide us with an equivalent, effective annual yield of 6 percent. Obviously, this application can be modified for any investment with different compounding periods by altering *m* in the above formula.

Calculator Solution:
- n = 12 months
- i = 5.84106 ÷ 12 = .486755%
- PV = −\$1
- PMT = 0

Solve for future value:
- FV = \$1.06

Solving for Annual Yields with Partial Periods: An Extension

Many investments produce monthly cash flows but call for investment returns to be calculated as an annual return (with annual compounding periods). Furthermore, the investment may be sold within a year (say, after five months into a calendar year). How can monthly cash flows that may also include periods within a calendar year be expressed as an annual rate of interest? Consider the following example.

An investment is made in the amount of \$8,000 and the contract calls for investment returns to be reported as compounded annually. Monthly cash flows of \$500 are received for 17 months. What is the *annual* return on the investment? This can be determined as follows:

Step 1:

Calculator Solution:
- n = 17 months
- i = ?
- PMT = 500
- PV = −\$8,000
- FV = 0

Solve for i:
- i = .682083

Step 2: The monthly interest rate of .682083 can now be used to determine the annual rate as follows:

Calculator Solution:
- PV = −\$1
- i = .682083
- PMT = 0
- n = 12
- FV = ?

Solve for FV:
- FV = 1.084991

Step 3: The annual rate of interest would be:
$FV - PV$ = 1.084991 − 1.000 = .084991 or 8.5%

Therefore, this investment over a 17-month period has produced an *effective annual yield* (*EAY*) of 8.5 percent. Note that this yield is much higher than an annual rate, compounded monthly, which would be .682083 × 12 = 8.19 percent.

Conclusion

This chapter introduced and illustrated the mathematics of compound interest in financial analysis. Although this may be a review for many readers, a thorough understanding of this topic is essential in real estate finance. The concepts and techniques introduced in this chapter are used throughout the remainder of this text to solve a variety of problems encountered in real estate finance. In the following two chapters, we apply the mathematics of finance to the calculation of mortgage payments and the effective cost of various alternative mortgage instruments. Later we apply the mathematics of finance to the analysis of income property investments. This chapter illustrated the use of financial tables, interest factors, and how these tables and factors can be found using a financial calculator. These tables were included to help the reader to understand the process of compounding, discounting, and finding internal rates of return by using interest factors. The tables are not necessary to solve any of the problems in the remainder of the book. In fact, an alternative calculator solution is also provided for many of the problems. The interest factor solutions are shown only so that the readers can see the mathematics behind the calculator solutions. As we move toward more advanced material, it is assumed that readers can obtain the solutions using a financial calculator or by using a spreadsheet program on a personal computer.

Key Terms

annuity, 53
compound interest, 40
discounting, 49
effective annual yield (*EAY*), 43
equivalent nominal annual rate (*ENAR*), 67
future value (*FV*), 41
future value of an annuity (*FVA*), 54
internal rate of return (*IRR*), 64
investment yield, 62
present value (*PV*), 41
present value of an annuity (*PVA*), 57
rate of return, 62
sinking-fund factor (*SFF*), 59
yield, 62

Useful Web Sites

www.bai.org—Good source of current market rates on various financial instruments as well as discussion of ways to properly compare investments with different payment patterns.

www.interest.com—This site provides the current average mortgage rates, a mortgage calculator, and basic information on home buying.

www.interestratecalculator.com—This site provides a mortgage calculator, and then displays an amortization graph, annual table, monthly payment chart, etc.

www.bankrate.com—Source of interest rates for CDs and other investments.

Questions

1. What is the essential concept in understanding compound interest?
2. How are the interest factors (IFs) in Exhibit 3–3 developed? How many financial calculations are used to calculate IFs in Exhibit 3–3?
3. What general rule can be developed concerning maximum values and compounding intervals within a year? What is an equivalent annual yield?
4. What does the time value of money (TVM) mean?
5. How does discounting, as used in determining present value, relate to compounding, as used in determining future value? How would present value ever be used?
6. What are the interest factors (IFs) in Exhibit 3–9 and how are they developed? How may financial calculators be used to calculate IFs in Exhibit 3–9?
7. What is an annuity? How is it defined? What is the difference between an ordinary annuity and an annuity due?
8. Why can't interest factors for annuities be used when evaluating the present value of an uneven series of receipts? What factors must be used to discount a series of uneven receipts?
9. What is the sinking-fund factor? How and why is it used?
10. What is an internal rate of return? How is it used? How does it relate to the concept of compound interest?

Problems

1. Jim makes a deposit of $12,000 in a bank account. The deposit is to earn interest annually at the rate of 9 percent for seven years.
   a. How much will Jim have on deposit at the end of seven years?
   b. Assuming the deposit earned a 9 percent rate of interest compounded quarterly, how much would he have at the end of seven years?
   c. In comparing (*a*) and (*b*), what are the respective effective annual yields? (*Hint:* Consider the value of each deposit after one year only.) Which alternative is better?
2. Would you prefer making a $25,000 investment that will earn interest at the rate of 7 percent compounded monthly or making the same $25,000 investment at 8 percent compounded annually. (*Hint:* Consider one year only.)
3. Jones can deposit $5,000 at the end of each six- month period for the next 12 years and earn interest at an annual rate of 8.5 percent, compounded semiannually. What will the value of the investment be after 12 years? If the deposits were made at the beginning of each period, what would the value of the investment be after 12 years?
4. Suppose you deposit $1,250 at the end of each quarter in an account that will earn interest at an annual rate of 15 percent compounded quarterly. How much will you have at the end of four years?
5. Suppose you deposit $2,500 at the end of year 1, nothing at the end of year 2, $750 at the end of year 3, and $1,300 at the end of year 4. Assuming that these amounts will be compounded at an annual rate of 9 percent, how much will you have on deposit at the end of five years?
6. Suppose you have the opportunity to make an investment in a real estate venture that expects to pay investors $750 at the end of each month for the next eight years. You believe that a reasonable return on your investment should be 17 percent compounded monthly.
   a. How much should you pay for the investment?
   b. What will be the total sum of cash you will receive over the next eight years?
   c. Why is there such a large difference between (*a*) and (*b*)?
7. An investor is considering an investment that will pay $2,150 at the end of each year for the next 10 years. He expects to earn an annual return of 18 percent on his investment. How much should he pay today for the investment? How much should he pay if the investment returns are paid at the beginning of each year?
8. An investor can make an investment in a real estate development and receive an expected cash return of $45,000 after six years. Based on a careful study of other investment alternatives, she believes that an 18 percent annual return compounded quarterly is a reasonable return to earn on this investment. How much should she pay for it today?

9. Walt is evaluating an investment that will provide the following returns at the end of each of the following years: year 1, $12,500; year 2, $10,000; year 3, $7,500; year 4, $5,000; year 5, $2,500; year 6, $0; and year 7, $12,500. Walt believes that he should earn an annual rate of 9 percent on this investment, compounded monthly. How much should he pay for this investment?
10. John is considering the purchase of a lot. He can buy the lot today and expects the price to rise to $15,000 at the end of 10 years. He believes that he should earn an investment yield of 10 percent annually on his investment. The asking price for the lot is $7,000. Should he buy it? What is the internal rate of return on the investment if John purchases the property for $7,000 and is able to sell it 10 years later for $15,000?
11. The Dallas Development Corporation is considering the purchase of an apartment project for $100,000. They estimate that they will receive $15,000 at the end of each year for the next 10 years. At the end of the 10th year, the apartment project will be worth nothing. If Dallas purchases the project, what will be its internal rate of return? If the company insists on a 9 percent return compounded annually on its investment, is this a good investment?
12. A corporation is considering the purchase of an interest in a real estate syndication at a price of $75,000. In return, the syndication promises to pay $1,020 at the end of each month for the next 25 years (300 months). If purchased, what is the expected internal rate of return, compounded monthly? How much total cash would be received on the investment? How much is profit and how much is return of capital?
13. An investment in a real estate venture will provide returns at the end of the next four years as follows: year 1, $5,500; year 2, $7,500; year 3, $9,500; and year 4, $12,500. An investor wants to earn a 13 percent *annual* return on her investment. How much should she pay for the investment? Assuming that the investor wanted to earn an annual rate of 13 percent compounded *monthly*, how much would she pay for this investment? Why are these two amounts different?
14. A pension fund is making an investment of $100,000 today and expects to receive $1,500 at the end of each month for the next five years. At the end of the fifth year, the capital investment of $100,000 will be returned. What is the internal rate of return on this investment?
15. A loan of $50,000 is due 10 years from today. The borrower wants to make annual payments at the end of each year into a sinking fund that will earn interest at an annual rate of 10 percent. What will the annual payments have to be? Suppose that the monthly payments earn 10 percent interest, compounded monthly. What would the annual payments have to be?
16. An investor has the opportunity to make an investment that will provide an effective annual yield of 10 percent. She is considering two other investments of equal risk that will provide compound interest monthly and quarterly, respectively. What must the equivalent nominal annual rate (*ENAR*) be for each of these two investments to ensure that an equivalent annual yield of 10 percent is earned?
17. An investment producing cash flows in the amount of [illegible] per month [illegible] period of 28 months. The investor pays $24,000 for the investment [illegible] investor's returns must be reported on a basis equivalent [illegible] would be the equivalent annual interest rate reported to the investor? [illegible] rate compounded monthly for this investment?
18. An investment is expected to produce the following annual [illegible] cash flows:

year 1: $5,000	year 4: $5,000
year 2: $1,000	year 5: $6,000
year 3: $0	year 6: $863.65

    The investment is affected to cost $13,000 today.
    a. What will be the IRR on this investment?
    b. Prove your answer in (a) by showing how much of each year's cash flows are recovery of the $13,000 investment and how much cash flow represents return on investment.

Chapter 4

Fixed Rate Mortgage Loans

This chapter deals with various approaches to pricing and structuring fixed interest rate mortgage loans. By *pricing* a loan, we refer to the rate of interest, fees, and other terms that lenders offer and that borrowers are willing to accept when mortgage loans are made. As a part of the pricing process, we also stress the supply and demand for loanable funds, the role of inflation, and how both affect the rate of interest. As to loan structuring, we review the many innovations in mortgage payment patterns that have evolved from changes in the economic environment.

Another major objective of this chapter is to illustrate techniques for determining the yield to the lender and actual cost to the borrower when various provisions exist in loan agreements. Lenders on real estate commonly include various charges and fees in addition to the interest rate as a condition of making a loan. These charges may include loan discounts, origination fees, prepayment penalties, or prepaid interest. In addition, various amortization or loan repayment schedules can be agreed upon by the borrower and lender to facilitate financing a particular real estate transaction. Because these provisions often affect the cost of borrowing, the methodology used to compute the yield to the lender (cost to the borrower) is heavily stressed. Although much of the focus in this chapter is on single family residential loans, many of these concepts are also important in commercial mortgage lending, a topic that is taken up in a later chapter.

Determinants of Mortgage Interest Rates: A Brief Overview

Changing economic conditions have forced the real estate finance industry to go through an important evolution. These changing conditions now require lenders and borrowers to have a better understanding of the sources of funds used for lending and the nature of how risk, economic growth, and inflation affect the availability and cost of mortgage funds.

When considering the determinants of interest rates on mortgage loans used to finance single family residences, we must also consider the demand and supply of mortgage funds. Most mortgage lenders are intermediaries, or institutions that serve as conduits linking flows of funds from savers to borrowers. Borrowers use the savings in the form of mortgage credit. The market rate of **interest** on mortgage loans is established by what borrowers are willing to pay for the use of funds over a specified period of time and what lenders are willing to accept in the way of compensation for the use of such funds. On the demand side of the market, it can be safely said that the demand for mortgage loans is a **derived demand,** or determined by the demand for housing.

The demand for housing is generally determined by the number of households desiring housing, household income, size, age, tastes, preferences for other goods, and the interest rate that must be paid to acquire mortgage credit. Hence, the demand for housing establishes, in large part, the demand for mortgage credit at various rates of interest.

The supply side of the mortgage market is established by what interest rates lenders are willing to accept when providing funds to borrowers. The amount of credit that they are willing to supply is a function of their cost of attracting funds from savers, the cost of managing and originating loans, losses from loan defaults and foreclosures, and, in the case of fixed interest rate loans, potential losses due to unexpected changes in interest rates after a loan is made.

When supplying funds to the mortgage market, lenders also consider returns and the associated risk of loss on alternative investments in relation to returns available on mortgages. Hence, the mortgage market should also be thought of as part of a larger capital market, where lenders and investors evaluate returns available on mortgages and all competing forms of investment, such as bonds, stocks, and other alternatives, and the relative risks associated with each. Should lenders believe that a greater return can be earned by making more mortgage loans (after taking into account the costs and the risk of loss) than would be the case if they invested in corporate bonds or business loans, more funds would be allocated to mortgage loans, and vice versa. Hence, lender decisions to allocate funds to mortgages are also made relative to returns and risk on alternative loans and investment opportunities.

The Real Rate of Interest: Underlying Considerations

When discussing market interest rates on mortgages, we should keep in mind that these interest rates are based on a number of considerations. We pointed out earlier that the supply of funds allocated to mortgage lending in the economy is, in part, determined by the returns and risks on all possible forms of debt and investment opportunities.

One fundamental relationship that is common to investments requiring use of funds in the economy is that they earn at least the **real rate of interest.**[1] This is the minimum rate of interest that must be earned by savers to induce them to divert the use of resources (funds) from present consumption to future consumption. To convince individuals to make this diversion, income in future periods must be expected to increase sufficiently from interest earnings to divert current income from consumption to savings. If expected returns earned on those savings are high enough to provide enough future consumption, adequate amounts of current savings will occur.

Interest Rates and Inflation Expectations

In addition to the real rate of interest, a concern that all investors have when making investment decisions is how *inflation* will affect investment returns. The rate of inflation is of particular importance to investors and lenders making or purchasing loans made at fixed rates of interest over long periods of time. Hence, when deciding whether to make such commitments, lenders and investors must be convinced that interest rate commitments are sufficiently high to compensate for any expected loss in purchasing power during the period that the investment or loan is outstanding; otherwise, an inadequate real return will be earned. Therefore, a consensus of what lenders and investors expect inflation to be during

[1] If the reader can visualize an investment portfolio containing investments in all productive activities in the economy based on the weight that any particular activity has to the total value of all productive activity in the economy, the rate of current earnings on such a portfolio would be equivalent to the real rate of interest. Such a rate would also be the rate required by economic units to save rather than consume from current income.

the time that their loans and investments are outstanding is also incorporated into interest rates at the time investments and loans are made.

To illustrate the relationship between the **nominal interest rate,** or the contract interest rate agreed on by borrowers and lenders, and real rates of interest, suppose a \$10,000 loan is made at a nominal or contract rate of 10 percent with all principal and interest due at the end of one year. At the end of the year, the lender would receive \$11,000, or \$10,000 plus \$10,000 times (.10). If the rate of inflation during that year was 6 percent, then the \$11,000 received at the end of the year would be worth about \$10,377 (\$11,000 ÷ 1.06). Thus, although the nominal rate of interest is 10 percent, the *real* rate on the mortgage is just under 4 percent (\$377 ÷ \$10,000 = 3.77%). Therefore, we conclude that if the lender wanted a 4 percent real rate of interest, the lender would have to charge a nominal rate of approximately 10 percent to compensate for the expected change in price levels due to inflation.[2]

We can summarize by saying that the nominal interest rate on any investment is partially determined by the real interest rate *plus a premium* for the expected rate of inflation. In our example, the real rate of 4 percent plus an inflation premium of 6 percent equals 10 percent. Note that this premium is based on the rate of inflation *expected* at the time that the loan is made. The possibility that inflation will be more or less than expected is one of many risks that lenders and investors must also consider.

Interest Rates and Risk

In addition to expected inflation, lenders and investors are also concerned about various *risks* undertaken when making loans and investments. Lenders and investors are concerned about whether interest rates and returns available on various loans and investments compensate adequately for risk. Alternatively, will a particular loan or investment provide an adequate risk-adjusted return?

Many types of risk could be discussed for various investments, but they are beyond the scope of this book. Consequently, we will focus on risks affecting mortgage loans. Many of these risks are, however, present to greater and lesser degrees in other loans and investments.

Default Risk

One major concern of lenders when making mortgage loans is the risk that borrowers will default on obligations to repay interest and principal. This is referred to as **default risk,** and it varies with the nature of the loan and the creditworthiness of individual borrowers. The possibility that default may occur means that lenders must charge a premium, or higher rate of interest, to offset possible loan losses. Default risk relates to the likelihood that a borrower's income may fall after a loan is made, thereby jeopardizing the receipt of future mortgage payments. Similarly, a property's value could fall below the loan balance at some future time, which could result in a borrower defaulting on payments and a loss to the lender.

Interest Rate Risk

An additional complication in lending and investing arises from the uncertainty in today's world about the future supply of savings, demand for housing, and future levels of inflation. Thus, interest rates at a given point in time can only reflect the market consensus of what

[2] Actually the nominal rate of interest should be $(1.06 \times 1.04) - 1$, or 10.24 percent, if a real rate of 4 percent is desired. For convenience throughout this text, we will *add* the real rate and premium for expected inflation as an approximation to the nominal interest rate. We should point out that the relationship of expected inflation and interest rates has long been a subject of much research. While we show a very simple, additive relationship in our discussion, there may be interaction between real interest rates and inflation. The specific relationship between the two is not known exactly. Hence, the student should treat this discussion at a conceptual or general level of interpretation.

these factors are expected to be. Investors and lenders also incur the risk that the interest rate charged on a particular loan may be insufficient should economic conditions change drastically *after* a loan is made. The magnitude of these changes may have warranted a higher interest rate when the loan was made. The uncertainty about what interest rate to charge when a loan is made can be referred to as **interest rate risk.**

For example, **anticipated inflation** may have been 6 percent at the time our \$10,000 loan was made. But if *actual* inflation turns out to be 8 percent, this means the interest rate that should have been charged is 12 percent. In this case, we say that the anticipated rate of inflation at the time the loan was made was 6 percent. However, because **unanticipated inflation** of 2 percent occurred, the lender will lose \$200 in purchasing power (2 percent of \$10,000) because the rate of interest was too low. This does not mean that lenders did not charge the "correct" interest rate *at the time the loan was made*. At that time, the inflation was expected to be 6 percent. Therefore, to be competitive, a 10 percent interest rate had to be charged. However, the additional 2 percent was unanticipated by all lenders in the market. It is unanticipated inflation that constitutes a major component of interest rate risk to all lenders.

The possibility that too low an interest rate was charged at the time the loan was made is a major source of risk to the lender. Hence, a premium for this risk must also be charged or reflected in the market rate of interest. Interest rate risk affects all loans, particularly those that are made with fixed interest rates, that is, where the interest rate is set for a lengthy period of time when the loan is made. Being averse to risk, lenders must charge a premium to incur this risk.

Prepayment Risk

Residential mortgage loans typically allow borrowers to prepay loans without penalty. This gives borrowers the option to prepay the loan. If loans are prepaid when interest rates fall, lenders must forgo the opportunity to earn interest income that would have been earned at the original contract rate. As funds from the prepaid loans are reinvested by lenders, a lower rate of interest will be earned. When interest rates increase, however, the loan is not as likely to be prepaid. The risk that the loan will be prepaid when interest rates fall below the loan contract rate is referred to as **prepayment risk.**

Other Risks

There are additional risks that lenders and investors consider that may vary by type of loan or investment. For example, the *liquidity* or *marketability* of loans and investments will also affect the size of the premium that must be earned. Securities that can be easily sold and resold in well-established markets will require lower premiums than those that are more difficult to sell. This is called **liquidity risk.**

Legislative risk is another risk associated with mortgage lending that also may result in a premium. It can refer to changes in the regulatory environment in which markets operate; for example, regulations affecting the tax status of mortgages, rent controls, state and federal laws affecting interest rates, and so on, are all possibilities that lenders face after making loans for specified periods of time. Lenders must assess the likelihood that such events may occur and be certain that they are compensated for undertaking these risks when loans are made.

A Summary of Factors Important in Mortgage Loan Pricing

We can now see that the interest rate charged on a particular mortgage loan will depend on the real interest rate, anticipated inflation, interest rate risk, default risk, prepayment risk, and other risks. These relationships can be summarized in general as follows:

$$i = r + p + f$$

In other words, when pricing or setting the rate of interest (i) on a mortgage loan, the lender must charge a premium (p) sufficiently high to compensate for default and other risks and a premium (f) that reflects anticipated inflation to earn a real rate of interest (r), which is competitive with real returns available on other investment opportunities in the economy. If lenders systematically *underestimate* any of the components in the above equation, they will suffer real economic losses.

Pricing decisions by lenders are rendered complex because mortgage loans are made at fixed interest rates for long periods of time. For example, if we assume that a mortgage loan is to be made with a one-year maturity, the interest rate charged at origination should be based on what the lender expects each of the components discussed above to be during the coming year. More specifically,

$$i_t = r_1 + p_1 + f_1$$

or the mortgage interest rate (i) at origination (time t) would be based on the lender's expectations of what the real rate of interest, the rate of inflation, and risk premiums (for risks taken in conjunction with making the mortgage loan over and above the level of risk reflected in the real rate of interest) should be for the term of the loan.

Development of Mortgage Loan Payment Patterns

Given the many types of financial instruments that have evolved in recent years, there is no longer a "common" or "standard" loan pattern available in residential financing. Prior to the 1970s, changes in mortgage instruments generally occurred gradually. When changes did occur, they were considered major. This pattern of gradual change existed for many years because of a relatively stable economic environment characterized by *very low rates of inflation*. Because of volatility in interest rates and inflation during the 1970s, changes in the design of mortgage loan instruments have now become very common. To gain insight into the structural changes in mortgage loan payment patterns and why they have evolved into the various forms available today, we briefly review the history of this evolutionary process and the economic influences that have forced the many changes that we observe today.

Early Loan Patterns

Prior to the 1930s and 1940s, a very common practice in mortgage lending was the requirement of a substantial down payment from borrowers trying to purchase housing. Lenders would limit maximum loan amounts to 50 percent of property value, and the term of the loan would vary. Five years was commonly the maximum term available. Payments were generally "interest only," with the full loan balance due after five years. At that time, it would be expected that another loan would be made, usually for a lesser amount as the borrower saved on his or her own account and applied those savings to reduce the amount of the loan.

Based on the above description, a few relationships should be obvious to the reader. First, mortgage loans were considered very risky and only relatively wealthy individuals could qualify for a mortgage loan because of the large down payment required by the lender. Second, lenders considered the borrower's ability to repay the loan far more important than the collateral value represented by the real estate; consequently, the borrower's ability to earn income and retire the debt "on his own" was critical in the lending decision. Finally, the loan could be called, or not renewed, after five years, which presented the possibility that if economic conditions were unfavorable the borrower could be required to repay the full loan balance at that time.

EXHIBIT 4–1
Monthly Payments and Loan Balance (constant amortization loan)

(1) Month	(2) Opening Balance ×	(3) Interest (.12 ÷ 12)	(4) Amortization	(3) + (4) Monthly Payment*	(2) − (4) Ending Balance
1	$60,000.00	$600.00	$166.67	$766.67	$59,833.33
2	59,833.33	598.33	166.67	765.00	59,666.66
3	59,666.66	596.67	166.67	763.34	59,499.99
4	59,499.99	595.00	166.67	761.67	59,333.32
5	59,333.32	593.33	166.67	760.00	59,166.65
6	59,166.65	591.67	166.67	758.34	58,999.98
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
360	166.67	1.67	166.67	168.34	-0-

*Monthly payments decline by $1.67, or the amount of monthly amortization ($60,000 ÷ 360) times the monthly interest rate (.12 ÷ 12). In this case we have ($60,000 ÷ 360)(.12 ÷ 12), or $1.67.

The Constant Amortization Mortgage Loan (CAM)

After the depression, the U.S. economy experienced a relatively long period of economic prosperity characterized by relatively high real growth and low rates of inflation. As employment and real income increased, lenders began to recognize the possibility that longer-term loans could be made because households were earning greater real incomes. This influence resulted in lower risks to lenders, since households were more likely to repay their debt and housing values were not likely to decline. Hence, lenders were willing to make a longer-run assessment of both the borrower and the collateral when making lending decisions.

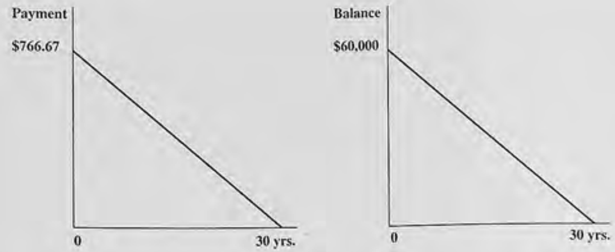
Given the economic environment just described, lenders devised the **fully amortizing loan**, a longer-term loan with monthly payments consisting of partial repayment of principal (**amortization** means the process of loan repayment over time). Indeed, a first effort to accomplish this was referred to as the **constant amortization mortgage (CAM)** loan. Payments on CAMs were determined first by computing a constant amount of each monthly payment to be applied to principal. Interest was then computed on the monthly loan balance and added to the monthly amount of amortization. The total monthly payment was determined by adding the constant amount of monthly amortization to interest on the outstanding loan balance. An example of a CAM is as follows: a loan was made for $60,000 for a 30-year term at 12 percent (annual rate compounded monthly); payments were to be made monthly and were to consist of *both* interest and amortization (or reduction of principal), so that the loan would be repaid at the end of 30 years.[3]

Amortization was determined by dividing the number of months or term of the loan (360) into the loan amount ($60,000) resulting in a reduction of principal of $166.67 per month. Interest would be computed on the outstanding loan balance and then be added to amortization to determine the monthly payment. An illustration of the payment pattern and loan balance is shown in Exhibit 4–1.

The computations in Exhibit 4–1 show that the initial monthly payment of $766.67 included amortization of $166.67, plus interest computed on the outstanding loan balance. The total monthly payment would decline each month by a constant amount or $1.67 (.01 × $166.67). The loan payment and balance patterns are shown in Exhibit 4–2.

[3]Actually, mortgage interest rates were much lower than 12 percent in the postdepression period, and the term of the loan would have been closer to 20 years. We are using 12 percent interest and a 30-year term so that our later examples will be comparable with this one.

EXHIBIT 4–2
Loan Payment and Balance Patterns (constant amortization loan)



By instituting the constant amortization mortgage, lenders recognized that in a growing economy, borrowers could partially repay the loan over time, through the *amortization process*, as opposed to being left to their own devices to reduce the loan balance when the term of the loan ended, which was the case with the shorter-term, "interest only" loan pattern previously discussed.

While the constant amortization payment pattern was considered an improvement, it was still very conservative because it placed primary emphasis on the amortization of the loan and gave much less recognition to the fact that in an economy with long periods of sustained real growth, a borrower's income was more likely to increase, not decline. Therefore, the prospect that a borrower's ability to repay debt more slowly from an income stream that was expected to grow seemed to be reasonable enough to warrant further modification in mortgage lending instruments. Indeed, the CAM was a relatively short-lived phenomenon and quickly gave rise to the more familiar fully amortizing, constant payment mortgage loan, to which we now turn.

Fully Amortizing, Constant Payment Mortgage Loan (CPM)

The most common loan payment pattern used in real estate finance from the postdepression era to the present, and one which is still very prevalent today, is the fully amortizing, **constant payment mortgage (CPM).** This loan payment pattern is used extensively in financing single family residences and in long-term mortgage lending on income-producing properties such as multifamily apartment complexes and shopping centers. This payment pattern means simply that a level, or constant, monthly payment is calculated on an original loan amount at a fixed rate of interest for a given term. Like the CAM, payment includes interest and *some* (though not a constant) repayment of principal. At the end of the term of the CPM loan, the original loan amount, or **principal,** is completely repaid, or fully amortized, and the lender has earned a fixed rate of interest on the monthly loan balance. However, the amount of amortization varies each month with the CPM loan.

To illustrate how the monthly loan payment calculation is made, we turn to our previous example of a $60,000 loan made at 12 percent interest for 30 years. What are the constant monthly mortgage payments on this loan, assuming it is to be fully amortized at the end of 30 years? Based on our knowledge of discounting annuities from the preceding chapter, the problem is really no more than finding the present value of an annuity and can be formulated as follows:

$$PV = \sum_{t=1}^{n} \left[\frac{R_t}{1 + \frac{i}{12}} \right]^t$$

where

PV = present value

R = annuity (constant payment)

i = fixed interest rate on mortgage

n = number of months loan will remain outstanding

because R is a constant, this is also equivalent to

$$PV = R \cdot \sum_{t=1}^{n} \frac{1}{\left(1 + \frac{i}{12}\right)^t}$$

Calculator Solution:

$n = 30 \times 12 = 360$
$i = 12 / 12 = 1$
$PV = -\$60{,}000$
$FV = 0$

Solve for payment:
$PMT = \$617.17$

In this case, we are interested in solving for R, or the constant monthly payment (annuity) that will fully repay the loan amount (PV) and earn the lender 12 percent interest compounded monthly. Using the shorthand notation developed in the previous chapter, we can also determine the monthly payment on the $60,000 loan as shown in Exhibit 4–3.

Looking again at the calculation of the monthly mortgage payment in Exhibit 4–3, we should give particular attention to the following step in the solution:

$$(MP) \text{ Monthly payment} = \$60{,}000 \div 97.218331$$

which is also equivalent to:

$$= \$60{,}000(1 \div 97.218331)$$
$$= \$60{,}000(.010286126)$$
$$= \$617.17$$

Note that dividing $60,000 by the *IF* 97.218331 is identical to multiplying $60,000 by (1 ÷ 97.218331), or .010286126. This simple fact enables us to simplify calculations of this kind considerably.

Mortgage Loan Constants

Prior to the widespread use of financial calculators, manually performing multiplication was easier and more convenient than long division, particularly when decimals were involved.

EXHIBIT 4–3
Determining Constant Monthly Payments—Fully Amortizing Mortgage

Monthly payments × (*MPVIFA*, 12%, 360 mos.) = $60,000
Monthly payments × 97.218331 = $60,000
Monthly payments = $60,000 ÷ 97.218331
= $617.17

EXHIBIT 4–4
Monthly Mortgage Loan Constants (column 6, Appendix B)

		Interest Rate			
Years	Months	9%	10%	11%	12%
5	60	.020758	.021247	.021742	.022244
10	120	.012668	.013215	.013775	.014347
15	180	.010143	.010746	.011366	.012002
20	240	.008997	.009650	.010322	.011011
25	300	.008392	.009087	.009801	.010532
30	360	.008046	.008776	.009523	.010286

Consequently, a series of new interest factors, called **loan constants**, were developed for various interest rates and loan maturities. These loan constants enable a simple multiplication to be made ($60,000 × .010286126) to determine monthly mortgage payments instead of the more awkward division ($60,000 ÷ 97.218331). The factor used for multiplication in our example, .010286126, is the loan constant for 360 months at 12 percent interest. This means that a factor multiplied by the original principal gives the payments necessary to amortize (or pay off) principal and earn interest on the unamortized loan balance at a given interest rate over a prescribed number of years. It is customary to refer to this factor as the *loan constant* in mortgage lending. The term *loan constant* continues to be a part of the vocabulary of the real estate finance industry. It is used as a part of negotiation, loan structuring, and other discussions between lenders and borrowers. The loan constant can be multiplied by any beginning loan amount to obtain the monthly mortgage payments necessary to amortize the loan fully by the maturity date.[4]

Exhibit 4–4 provides a sample of monthly loan constants for various interest rates and loan maturities. Returning to our problem of finding the monthly mortgage payment for a $60,000 loan made at 12 percent for 30 years, we locate the 12 percent column and look down until we find the row corresponding to 30 years where the loan constant is .010286 (rounded).[5]

Analysis of Principal and Interest

It should be obvious that the sum of all mortgage payments made over the 30-year (360 months) period is $617.17 × 360, or $222,181.20. This amount is far greater than the original loan of $60,000. Why are the total payments so much higher than the amount of the loan? The reason is that interest must be paid monthly over the entire term of the loan on the outstanding loan balance. This relationship is shown in Exhibit 4–5.

The pattern developed in Exhibit 4–5 shows in month 1 a beginning mortgage balance, or loan principal, of $60,000. The monthly payment, which was calculated to be $617.17, includes interest of $600.00 in the first month. Interest is determined by multiplying the beginning loan amount of $60,000 by the annual rate of 12 percent divided by 12 months (.12 ÷ 12) to obtain monthly interest of $600. The difference between $617.17 (column 2) and $600.00 (column 3) gives the amount of loan amortization or principal reduction (column 4) of $17.17 during the first month. The beginning loan balance of $60,000 less the principal reduction in the first month of $17.17 gives the balance at the end of the first month of $59,982.83, which provides the beginning balance for the interest calculation in the second month. This process continues through the 360th month, or to the end of the 30th year, when the loan balance diminishes to zero.

[4] With a financial calculator, the loan constant can be calculated as $n = 360$, $i = .12 \div 12$, $PV = -1$, solve for PMT: $PMT = .010286126$.

[5] Because of rounding (to six decimal places), the loan constant is .010286. When we multiply $60,000 by the rounded constant, we get a monthly payment of $617.16. The more exact solution is $617.17. Hence, readers should be aware that small discrepancies between their solutions and ours may occur when financial calculators are used, because calculator solutions may be rounded off to eight or more decimal places. We have attempted to carry out solutions to at least six decimal places.

EXHIBIT 4–5
Fully Amortizing Loan Pattern, $60,000 Loan at 12 Percent Interest for 30 Years

Month	Beginning Loan Balance	Monthly Payment	Interest (.12 ÷ 12)	Amortization*	Ending Loan Balance
1	$60,000.00	$617.17	$600.00	$17.17	$59,982.83
2	59,982.83	617.17	599.83	17.34	59,965.49
3	59,965.49	617.17	599.65	17.52	59,947.97
4	59,947.97	617.17	599.48	17.69	59,930.28
5	59,930.28	617.17	599.30	17.87	59,912.41
6	59,912.41	617.17	599.12	18.05	59,894.36
⋮	⋮	⋮	⋮	⋮	⋮
358	1,815.08	617.17	18.15	599.02	1,216.06
359	1,216.06	617.17	12.16	605.01	611.06
360	611.06	617.17	6.11	611.06	-0-

*Amortization increases each month by the factor 1 + i/12; that is, 17.17(1.01) = 17.34, etc.

The initial, relatively low principal reduction shown in column 6 in Exhibit 4–5 results in a high portion of interest charges in the early monthly payments. Note that the ending loan balance after the first six months (column 6) is $59,894.36; thus only $105.64 has been amortized from the original balance of $60,000 after six months. Interest paid during the same six-month period totals $3,597.38. The explanation for the high interest component in each monthly payment is that the lender earns an annual 12 percent return (1 percent monthly) on the outstanding monthly loan balance. Because the loan is being repaid over a 30-year period, obviously the loan balance is reduced only very slightly at first and monthly interest charges are correspondingly high. Exhibit 4–5 also shows that the pattern of high interest charges in the early years of the loan reverses as the loan begins to mature. Note that during the last months of the loan, interest charges fall off sharply and principal reduction increases.

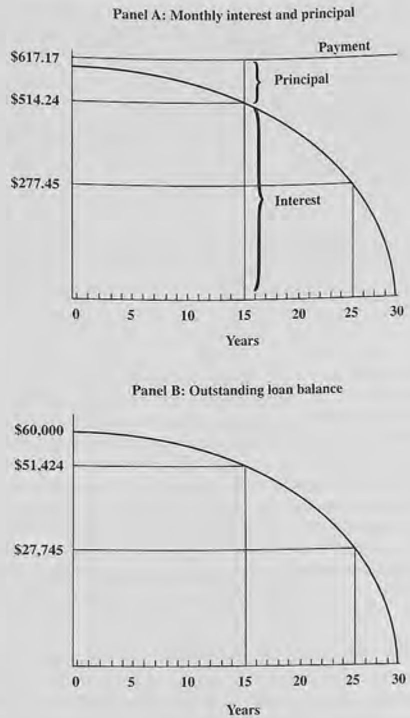
Interest, Principal, and Loan Balance Illustrated

Exhibit 4–6 (panel A) illustrates the loan payment pattern over time, by indicating the relative proportions of interest and principal in each monthly payment over the 30-year term of the loan. Exhibit 4–6 (panel B) shows the rate of decline in the loan balance over the same 30-year period. It is clear that the relative share of interest as a percentage of the total monthly mortgage payment declines very slowly at first. Note in panel A that halfway into the term of the mortgage, or after 15 years, interest still makes up $514.24 of the $617.17 monthly payment and principal the difference ($617.17 − $514.24 = $102.93). Further, the loan balance (panel B) is approximately $51,424. Total mortgage payments of $111,090.60 ($617.17 × 180 months) have been made through the 15th year, with approximately $8,576 (or $60,000 − $51,424) of the loan repaid at that point. This pattern reverses with time. Note in panel A that after 25 years, interest makes up only $277.43 of the monthly payment, and the loan balance (panel B) has declined sharply to $27,745.

Constant Payment and Constant Amortization Loans: A Comparison

At this point, it is instructive to compare the payment and loan balance patterns of the constant payment and constant amortization loans. Although the constant amortization mortgage (CAM) was not used for an extensive period of time, the change to the constant payment mortgage (CPM) was a dramatic modification in mortgage lending instruments.

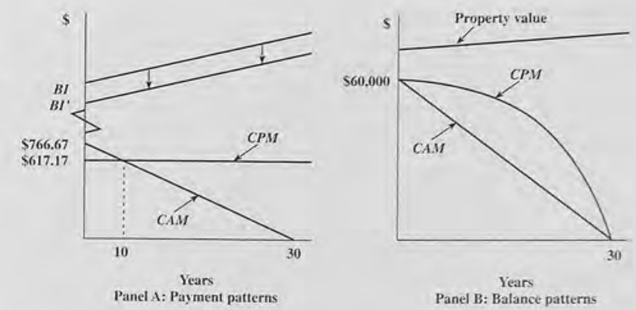
EXHIBIT 4–6
Monthly Payment, Principal, Interest, and Loan Balances for a Constant Payment Mortgage



and the forces that brought this change about, and its impact on borrowers and lenders, should be understood.

Exhibit 4–7 compares loan payment patterns (panel A) and mortgage loan balance patterns (panel B) for types of mortgages with the same loan terms. To make this comparison, we consider the same $60,000 loan made at 12 percent for 30 years. A very important pattern shown in panel A is the significant reduction in the initial monthly payment for the CPM compared with the CAM. Recall that if the CAM were made, the initial monthly payment would have been $766.67. If a CPM were made, however, the initial monthly payment would be $617.17. The reason for such a large difference in initial payments ($149.50) is that while the $766.67 CAM payment *declines* through time, the $617.27 CPM remains *level* throughout the life of the loan. It should be stressed, however, that the present value of both payment streams is equal to $60,000. This equivalency results from the fact that although the CPM is below that of the CAM for approximately 10 years (dashed line, panel A), beyond the 10th year the CPM payment exceeds the CAM payment. Hence, the present value of the difference between all monthly payments prior to the 10th year (where CAM

EXHIBIT 4–7
Comparison of Monthly Payments and Loan Balances (constant payment versus constant amortization loans)



> CPM) is eventually offset by the present value of monthly payments beyond year 10 (where CPM > CAM for the next 20 years).

Another important pattern emerges in panel B of Exhibit 4–7. The CPM loan balance always exceeds that of the CAM prior to the 360th month, because the rate of amortization for the CPM is far less than that of the CAM. In other words, with a CAM, more of each monthly payment represents amortization of principal compared with the monthly payment of the CPM. Hence, the CPM loan balance is reduced more slowly. This can be seen easily, as the initial monthly interest charge for both loans would be 12 percent times 12 [.01 × ($60,000) = $600]. For the CAM, amortization would be $766.67 − $600 = $166.67, leaving a balance of $59,833.33. In the case of the CPM, we would have $617.17 − $600.00 = $17.17, leaving a balance of $59,982.83. Hence the CPM, with its lower payment, reduces the loan balance more slowly. More total interest will be earned by the CPM lender over the 30-year loan period, although the lender's return will be 12 percent, compounded monthly, in each case.

While the mechanics of the payment and balance patterns are interesting, an *economic interpretation* of the difference in the two mortgage payments and its impact in the marketplace is equally important. Looking back to panel A of Exhibit 4–7, we have already pointed out that the initial monthly payment for a CPM was considerably less compared with that of a CAM. This significant reduction in payment also meant that more households with the same general income levels could *qualify* for a constant payment mortgage than for a constant amortization mortgage. This point is illustrated in panel A, which shows that if borrowers were required to have a minimum beginning income of (BI) to qualify for a CAM, lenders could require a lower income (BI') if a CPM were made and still have the same cushion or protection against default (or $BI - CAM = BI' - CPM$). In this case, borrower income could be lower by $149.50, or an amount equal to the difference in the initial CAM payment of $766.67 and the CAM payment of $617.17. This shift to the CPM pattern, however, was based on the fact that lenders were convinced that borrower incomes would increase and that property values (PV, panel B) would either remain steady or increase over time. In an economy experiencing real economic growth with relatively stable prices, increases in income and property values would reduce borrower default risk associated with a CPM loan. Hence, this fundamental change to the CPM pattern occurred after lenders realized the ability of households to meet mortgage payments from *future income*, as well as *current income*, was not as risky as first believed. Further, as real incomes increased, property values were likely to remain higher than the outstanding loan balance over the term of the loan; hence, the collateral value of the real estate relative to the more slowly declining mortgage loan balance was considered by lenders to be adequate.

Determining Loan Balances

Because most mortgage loans are repaid before they mature, mortgage lenders must be able to determine the balance on a fully amortized CPM loan at any time. As previously indicated, even though most loans are made for terms of 25 or 30 years, nationwide statistics indicate that households move because of job changes, purchases of different houses, and so on. Hence, mortgages are usually repaid from 8 to 12 years after they are made. Therefore, it is very important to know what the loan balance will be at any time when financing real estate with this type of mortgage.There are many ways to find loan balances. We will demonstrate several approaches in this section.

Calculator Solution:

$n = 20 \times 12 = 240$
$i = 12\% \div 12 = 1\%$
$PMT = -\$617.17$
$FV = 0$

Solve for mortgage balance:

$PV = \$56{,}051.02$

To illustrate one approach, let us return to the previous example of the \$60,000 CPM loan made at 12 percent interest for a term of 30 years. After 10 years, the borrower decides to sell the property and to buy another one. To do so, the existing loan must be paid off. How much will have to be repaid to the lender after 10 years? We could construct a loan balance schedule as in Exhibit 4–5; however, this is time-consuming and unnecessary. Finding loan balances for CPMs can be accomplished in two easier ways. First, one can simply find the present value of the \$617.17 payments at the 12 percent contract rate of interest *for the 20 years remaining until maturity*. For example:

$$\begin{aligned}\text{Mortgage balance } (MB) &= \$617.17(MPVIFA,\ 12\%,\ 20\text{ yrs.})\\ &= \$617.17(90.819416)\\ &= \$56{,}051.02\end{aligned}$$

The unpaid balance after 10 years is \$56,051.02. This exercise also points out another interesting fact. Because the payments include interest and a reduction of principal each month, by "removing" all interest from all remaining payments, it follows that only the principal can remain. Discounting the \$617.17 monthly payments at an annual rate of 12 percent compounded monthly is a process that really amounts to "removing interest" from the payments. Hence, after "removing interest" by discounting, we ascertain that the unamortized or unpaid balance must be \$56,051.02.

An alternative method for finding mortgage balances at any time in the life of the mortgage is to divide the interest factor for the accumulation of \$1 per period (FVA), for the year in which the balance is desired, by the accumulation of \$1 per period factor for the original term of the mortgage, and then to subtract that result from 1. The result of this computation is the loan balance expressed as a percentage of the original amount. This is referred to as the **monthly loan balance factor (MLBF).** To illustrate:

$$1 - \frac{(MFVIFA,\ 12\%,\ 10\text{ yrs.})}{(MFVIFA,\ 12\%,\ 30\text{ yrs.})} = \%\text{ loan balance}$$

$$1 - (230.03869 \div 3494.9641) = 93.42\%$$

Calculator Solution:
% of loan balance:

$$1 - \frac{FV \text{ at } n = 10 \text{ yrs.}}{FV \text{ at } n = 30 \text{ yrs.}}$$

FV at 10 years:

$n = 120,\ i = 1\%,\ PMT = -1,\ PV = 0$

Solve for FV: \$230.03869
FV at 30 years:

$n = 360,\ i = 1\%,\ PMT = -1,\ PV = 0$

Solve for FV: \$3,494.9641

$1 - (\$230.03869 \div \$3{,}494.9641) = 93.42\%$

This is a more general formula that can be used regardless of the original dollar amount of the loan or payments because it gives a solution in percentage form. In this case, we determine that approximately 93.42 percent, or \$56,052, of the original loan balance (\$60,000) is still outstanding. This solution is nearly the same result that we obtained by discounting. The difference is due to rounding.

Calculator Solution:

$PV = -\$60{,}000$
$n = 10 \times 12 = 120$
$i = 12\% \div 12 = 1\%$
$PMT = \$617.17$

Solve for future value:

$FV = \$56{,}050.24$ (difference due to rounding of payment)

Another way of finding a loan balance using a financial calculator is to calculate future value (FV). This may be done by entering payments (PMT), the initial loan amount as a present value (PV), the number of periods (n) (e.g., months) that the loan has been amortized, and the interest rate (i). (FV) can be then calculated as the outstanding loan balance.

It should also be noted that many financial calculators may be purchased with a loan amortization function preprogrammed in them. Finding a loan balance becomes simply a matter of inputting the loan information and pressing an amortization key.

Loan Closing Costs and Effective Borrowing Costs: Fully Amortized Loans

Loan closing costs are incurred in many types of real estate financing, including residential property, income property, construction, and land development loans. Closing costs can generally be placed in one of three categories: statutory costs, third-party charges, and additional finance charges.

Statutory Costs

At the same time that a mortgage loan is closed between borrower and lender, certain charges for legal requirements pertaining to title transfer, recording of the deed, and other fees required by state and local law are usually charged to the buyer of the property, who is usually the borrower. These **statutory costs** are usually collected at the title closing.

which may occur at the same time as the loan closing. In some states the lender may conduct both the loan and title closing. These statutory charges are made for services performed by governmental agencies for the borrower; consequently, they do not provide income to the lender. As such, statutory costs should not be included as additional finance charges because they do not affect the cost of borrowing. These charges would generally have to be paid even if a property was bought for cash and no financing was involved.

Third-Party Charges

Charges for services such as legal fees, appraisals, surveys, past inspection, and title insurance are called **third-party charges.** Like statutory charges, these charges may occur even if the buyer paid cash to buy a property. If a loan is made, charges for these services may be collected by the lender or title company at a title closing, but they are in turn paid out to third parties; hence, they usually do not constitute additional income to the lender and are usually not associated with financing the real estate being purchased.

Additional Finance Charges

Closing costs that do affect the cost of borrowing are additional finance charges levied by the lender. These charges constitute additional income to the lender and must be included as a part of the cost of borrowing. Generally, lenders refer to these additional charges as *loan fees*. Loan fees are intended to cover expenses incurred by the lender for processing loan applications, preparation of loan documentation and amortization schedules, obtaining credit reports, and any other expenses that the lender believes should be recovered from the borrower. Sometimes these charges are itemized separately in the loan closing statement, and sometimes they are grouped under the general category of *loan origination fees*. These fees are generally the "fixed cost" element of originating mortgage loans.

Lenders usually charge these costs to borrowers when the loan is made, or "closed," rather than charging higher interest rates. They do this because if the loan is repaid soon after closing, the additional interest earned by the lender as of the repayment date may not be enough to offset the fixed costs of loan origination. For example, assume that the prevailing interest rate on a $60,000 mortgage is 12 percent and the lender will incur expenses equal to $1,000 to close the loan. If the lender chose to increase the interest rate to 12.25 percent to recover these origination costs, an additional $150 (approximately) would be collected during the first year ($60,000 × .0025). If the loan was repaid after the first year, the lender would not recover the full $1,000 in origination costs. This is why lenders attempt to "price" these origination costs separately.

Another charge, which may be itemized separately or included in the overall category of loan origination fees, is **loan discount fees,** or **points.**[6] This charge also represents an additional finance charge, but its primary purpose is to *raise the yield* on a mortgage loan. In the context of real estate lending, loan discounting amounts to a borrower and lender negotiating the terms of a loan based on a certain loan amount. The lender then discounts the loan by charging a fee, which will be deducted from the contract loan to the borrower. Payments made by the borrower, however, are based on the contract amount of the loan. For example, assume a borrower and lender agree on a $60,000 loan at 12 percent interest for 30 years. The lender actually disburses $58,200 to the borrower by including a loan discount charge of 3 percent (points), or $1,800. The borrower is required to repay $60,000 at 12 percent interest for 30 years. However, because the borrower actually receives $58,200 but must repay $60,000 plus interest, it is clear that the actual borrowing cost to the buyer is greater than 12 percent.

[6] Lenders in some areas of the country refer to loan discounts as "discount points" or simply "points." In conventional mortgage lending, the borrower usually pays this charge, which adds to financing costs. In this chapter, we are concerned with conventional lending situations where the borrower pays the loan discount as a part of origination fees.

Why do pricing practices such as discounting to increase yields exist? Many reasons have been advanced. One reason given by lenders is that mortgage rates tend to be somewhat "sticky" in upward and downward moves. For example, suppose that the prevailing rate is 12 percent and market pressures push rates upward. However, instead of one lender moving the rate to perhaps 12.25 or 12.50 percent, the lender may still quote 12 percent as the loan rate but charge loan discount points.

Another reason is because many mortgage loans are originated by lenders who have entered into contracts with investors to sell them a specific number, or dollar amount, of such loans. Such contracts with investors may require that loans are to be sold to yield investors a *rate of interest* very close to the rate that lenders expect to charge borrowers. Therefore, in order for originating lenders to earn a profit, points must be changed to borrowers to provide lenders with revenue for performing services to borrowers.

Another situation that may provide lenders with an opportunity to earn revenue would be a case where interest rates decline before the date that the loan is originated but after the date on which the lender and investor agree on the yield on mortgages to be sold. In this case, loans will be originated at a lower interest rate, and the lender will charge discount points in order to offset the decline in interest rates being charged to borrowers.

Another reason for loan discount fees is that lenders believe that, in this way, they can better price the loan to the *risk* they take. For example, in the beginning of this chapter we referred to the risk premium component (p) of the interest rate. However, the risk for some individual borrowers is slightly higher than it is for others. Further, these loans may require more time and expense to process and control. Hence, discount points may be charged by the lender (in addition to origination fees) to compensate for the slightly higher risk.

The practice of using loan origination fees and discount points has historically prevailed throughout the lending industry. It is important to understand (1) that these charges increase borrowing costs and (2) how to include them in computing effective borrowing costs on loan alternatives when financing any real estate transaction.

Loan Fees and Borrowing Costs

To illustrate loan fees and their effects on borrowing costs in more detail, consider the following problem: A borrower would like to finance a property for 30 years at 12 percent interest. The lender indicates that an origination fee of 3 percent of the loan amount will be charged to obtain the loan. What is the actual interest cost of the loan?

We structure the problem by determining the amount of the origination fee [.03 × ($60,000) = $1,800]. Second, we know that the monthly mortgage payment based on $60,000 for 30 years at 12 percent will be $617.17. Now we can determine the effect of the origination fee on the interest rate being charged as follows:

Contractual loan amount	$60,000
Less: Origination fee	1,800
Net cash disbursed by lender	$58,200
Amount to be repaid:	
Based on $60,000 contractual loan amount, $617.17 for 30 years	

In other words, the amount actually disbursed by the lender will be $58,200, but the repayment will be made on the basis of $60,000 plus interest at 12 percent compounded monthly, in the amount of $617.17 each month. Consequently, the lender will earn a yield on the $58,200 actually disbursed, which must be greater than 12 percent.

Using a financial calculator, we can calculate the **effective interest cost** of the loan, assuming it is outstanding until maturity, as 12.41 percent. This yield is obviously higher than the 12 percent contract, or nominal, rate of interest specified in the note or mortgage.

Calculator Solution:

$n = 30 \times 12 = 360$
$PMT = -\$617.17$
$PV = \$58,200$
$FV = 0$

Solve for yield:

i (monthly) = 1.034324%
i (annualized) = 12.41%

This computation forms the basis for a widely used rule of thumb in real estate finance; that is, for every 2 percentage points in the origination fee charged the borrower, the effective cost to the borrower, or investment yield earned by the lender, increases by approximately one-fourth of a percent above the contract rate. Note that in our solution, we obtained an effective rate of 12.41 percent, versus 12.375 percent using the approximation. While this estimate is close to the yield calculated in one example, we have assumed that the loan remains outstanding until maturity. However, most loans on the average are "prepaid" or paid off long before maturity. Hence, this rule of thumb, while helpful, generally provides a very rough estimate of the effective cost (yield) for most mortgage loans.[7]

Truth-in-Lending Requirements and the Annual Percentage Rate

Because of problems involving loan fees and the potential abuse by some lenders of charging high fees to unwary borrowers, Congress passed a federal Truth-in-Lending Act.[8] As a result of this legislation, the lender must disclose to the borrower the **annual percentage rate (*APR*)** being charged on the loan. Calculation of the *APR* is generally made in the manner shown in the preceding example. The *APR* in this case would be disclosed at closing to the borrower by rounding the effective interest rate up or down to the nearest one-eighth of a percent. In this case, the 12.41 percent effective rate would be rounded to the nearest one-eighth of a percent and disclosed to be 12.375 percent. The *APR*, then, does reflect origination fees and discount points and treats them as additional income or yield to the lender regardless of what costs, if any, the fees are intended to cover.[9]

Loan Fees and Early Repayment: Fully Amortizing Loans

An important effect of loan fees and early loan repayment must now be examined in terms of the effect on interest cost. We will show in this section that when loan fees are charged and the loan is paid off before maturity, the effective interest cost of the loan increases even further than when the loan is repaid at maturity.

To demonstrate this point, we again assume our borrower obtained the \$60,000 loan at 12 percent for 30 years and was charged an \$1,800 (3 percent) loan origination fee. At the

[7] This rule of thumb will become very inaccurate if the payoff period is very short relative to the maturity and when the level of interest rates increases.

[8] See Regulation Z of the Federal Reserve Board, 12 C.F.R., sec. 226, as amended.

[9] Generally the *APR* disclosed to the borrower is the effective interest rate computed under the assumption that the loan will be outstanding until maturity rounded to the *nearest* one-eighth percent. If the reader desires greater accuracy in these computations, consult *Computational Procedures Manual for Supplement 1 to Regulation Z of the Federal Reserve Board: Calculator Instructions* (Office of the Comptroller of the Currency, February 1978).

end of *five years*, the borrower decides to sell the property. The mortgage contains a due-on-sale clause; hence, the loan balance must be repaid at the time the property is sold. What will be the effective interest cost on the loan as a result of both the origination fee and early loan repayment?

To determine the effective interest cost on the loan, we first find the outstanding loan balance after five years to be \$58,598.16. To solve for the yield to the lender (cost to the borrower), we proceed by finding the rate at which to discount the monthly payments of \$617.17 *and* the lump-sum payment of \$58,598.16 after five years so that the present value of both equals \$58,200, or the amount actually disbursed by the lender.

This presents a new type of discounting problem. We are dealing with an annuity in the form of monthly payments for five years *and* a loan balance, or single lump-sum receipt of cash, at the end of five years. To find the yield on this loan, we proceed as follows:

$$\$58{,}200 = \$617.17(MPVIFA, ?\%, 5 \text{ yrs.}) + \$58{,}598.16(MPVIF, ?\%, 5 \text{ yrs.})$$

This formulation simply says that we want to find the interest rate (?%) that will make the present value of both the \$617.17 monthly annuity and the \$58,598.16 received at the end of five years equal to the amount disbursed. Take special note that the two interest factors used in the above formulation are different. One factor, *MPVIF*, is used to discount the single receipt or loan balance. The other factor, *MPVIFA*, will be used to discount the payments, or monthly annuity. Hence, we cannot use the method of dividing the disbursement by the monthly annuity to find an interest factor, as we did above, because we also have the loan balance of \$58,598.16 to take into account. Fortunately this problem is easy to solve with a financial calculator, as shown below.

Calculator Solution:

1. Solve for remaining balance:

$n = 25 \times 12 = 300$
$i = 12\% \div 12 = 1\%$
$PMT = -\$617.17$
$FV = 0$

Solve for remaining balance:

$PV = \$58,598.16$

2. Next, solve for the interest payment, holding a 30-year loan for 5 years and discounted by the loan origination fee:

$n = 5 \times 12 = 60$ $PV = \$58,200$
$PMT = -\$617.17$ $FV = -\$58,598.16$

Solve for yield:

i (monthly) = 1.069%
Annual interest = 1.069% × 12 = 12.82%

An Excel template is included on the CD that accompanies this book that calculates the same yield as this example.

From the above analysis, we can conclude that the actual yield (or actual interest cost) that we have computed to be approximately 12.82 percent is higher than both the contract interest rate of 12 percent and the 12.41 percent yield computed assuming that the loan was outstanding until maturity. This is true because the \$1,800 origination fee is earned over only 5 years instead of 30 years, which is equivalent to earning a higher rate of compound interest on the $58,200 disbursed. Hence, when this additional amount earned is coupled with the 12 percent interest being earned on the monthly loan balance, this increases yield to 12.82 percent.[10]

Another point is that the 12.82 percent yield is not reported to the borrower as the "annual percentage rate" required under the Truth-in-Lending Act. The reason is that neither the borrower nor lender knows for certain that the loan will be repaid ahead of schedule. Therefore, 12.375 percent will still be reported as the *APR* and 12 percent will be the contract rate, although the actual yield to the lender in this case will be 12.82 percent. It should be remembered that the annual percentage rate under truth-in-lending requirements never takes into account early repayment of loans. The *APR* calculation takes into account origination fees, but always assumes the loan is paid off at maturity.

Relationship between Yield and Time

Based on the preceding discussion, we can make some general observations about the relationship of mortgage yields and the time during which mortgages are outstanding. The first observation is that the effective interest cost on a mortgage will always be equal to the contract rate of interest when no finance charges are made at the time of loan origination or repayment. This follows because, as we saw in Exhibit 4–6, the level payment pattern assures the lender of earning only a given annual rate of interest, compounded monthly, on the monthly outstanding loan balance. Hence, the outstanding mortgage balance can be repaid at any time, and the lender's yield (borrower's cost) will not be affected. It will be equal to the contract rate of interest.

The second observation is that if origination or financing fees are charged to the borrower, the following occurs: (1) the effective yield will be higher than the contract rate of interest, and (2) the yield will increase as repayment occurs sooner in the life of the mortgage. These relationships can be explained by referring to Exhibit 4–8, where the two curves, *A* and *B*, represent the mortgage yield pattern under two assumptions. Curve *A* represents the effective yield, or cost, when no financing fees are charged to the borrower. In our previous example, the yield would remain at 12 percent, equal to the contract rate of interest regardless of when the loan is repaid; hence, the horizontal line is over the range of 0 to 30 years. Curve *B* represents a series of loan yields computed under the assumptions that a 3 percent origination fee is charged to the borrower and that the loan is prepaid in various years prior to maturity. In our example, we note that the yield earned by the borrower is 15.26 percent if the loan is repaid one year after closing and that it diminishes and eventually equals 12.41 percent after 30 years. Hence, we can again conclude that if financing fees are charged to the buyer, the effective yield to the lender (cost to the borrower) can range from one that is extremely high if prepaid, say, after one year (the yield in that case would be approximately 15.26 percent) to a yield that would be considerably lower if repaid at maturity, or 12.41 percent. If a borrower knows when he or she expects to repay a loan, this method of computing the effective borrowing cost should be used. This is particularly important if the borrower is comparing alternative loans with different terms.

Prepayment Penalties

Many borrowers mistakenly take for granted that a loan can be prepaid in part or in full anytime before the maturity date. This is not the case; if the mortgage note is silent on this matter, the borrower may have to negotiate the privilege of early repayment with the lender.

[10] If the loan is repaid in less than one year, the yield becomes larger and approaches infinity should the loan be repaid immediately after closing.

Web App

There are numerous companies offering mortgage rate information on the Internet, such as **www.Countrywide.com.** Find a quote for a 15-year fixed rate mortgage on a $150,000 primary residence valued at $200,000. What is the current interest rate, discount points, and other lender fees for the loan you found?

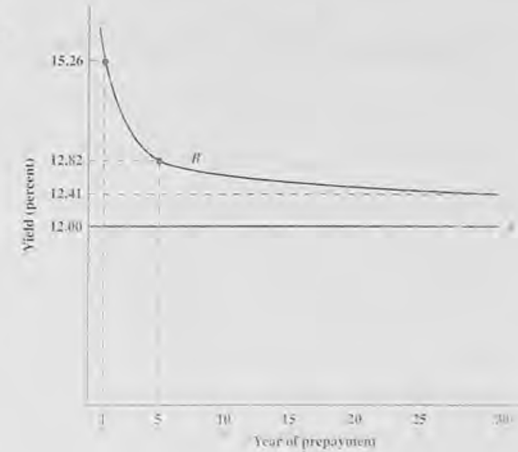
Calculate the effective cost of the mortgage over the lifetime of the loan. Calculate the effective cost of paying off the mortgage after seven years. How do these rates compare to the stated APR? What accounts for the discrepancy between the effective rate and the APR?

However, many mortgages provide explicitly that the borrower can pay a **prepayment penalty** should the borrower desire to prepay the loan.

One rationale for a prepayment penalty is that the lender may be trying to recover a portion of loan origination costs not charged to the borrower at closing. This may have been done by the lender to compete for the loan by making initial closing costs lower for the borrower. Another reason for prepayment penalties is that the lender has agreed to extend funds for a specified time, 30 years in our present example. Early payment from the lender's view may represent an unanticipated inflow of funds that may or may not be readily reinvested in periods when mortgage rates are stable or are expected to decline. However, if interest rates undergo a sustained increase over long periods of time, lenders usually welcome early repayments since they may be able to loan out funds again at higher rates of interest.

Another reason for prepayment penalties is that they are not included in the computation of the *APR*; hence, they are not included in the *APR* disclosure to the borrower. Borrowers may not be able to determine the effect of these penalties on borrowing costs and, therefore, the penalties represent a technique lenders use to increase yields. Some states have begun prohibiting the enforceability of prepayment penalties to individuals financing residences if the loan has been outstanding more than some specified minimum number of years. Also,

EXHIBIT 4–8
Relationship between Mortgage Yield and Financing Fees at Various Repayment Dates



in areas where penalties are allowed, lenders may waive them if the buyer of a property agrees to originate a new loan with the same lender.

Because of the use of prepayment penalties, we want to know the effective mortgage loan yield (interest cost) when both a loan discount fee and a prepayment penalty are charged on the loan. To illustrate, we consider both the effects of the 3 percent loan discount and a 3 percent prepayment penalty on the outstanding loan balance for the $60,000, 30-year loan with a contract interest rate of 12 percent used in the preceding section. We assume the loan is the effective interest cost to the borrower (yield to the lender). To solve for the yield, mortgage funds actually disbursed in this case will be $60,000 minus the origination fee of $1,800, or $58,200. Taking the loan discount fee into account, we want to find the discount rate which, when used to discount the series of monthly payments of $617.17 plus the outstanding loan balance of $58,598.16 and the prepayment penalty of $1,758 (3 percent of $58,598.16), or a total of $60,356, will result in a present value equal to the amount of funds actually disbursed, $58,200.

This is done as follows:

$$\$58,200 = \$617.17(MPVIFA, ?\%, 5 \text{ yrs.}) + \$60,356(MPVIF, ?\%, 5 \text{ yrs.})$$

Following the same thinking used in the previous section, we note that a 3 percent origination fee and a 3 percent prepayment penalty are unlikely to increase the yield of this loan beyond 14 percent. Using a financial calculator, we find the answer to be 13.25 percent. With a 3 percent origination fee, early payment in the fifth year, and a 3 percent prepayment penalty, we see that the effective yield on the loan will increase to about 13.25 percent.

Calculator Solution:

$n = 5 \times 12 = 60$
$PMT = -\$617.17$
$PV = \$58,200$
$FV = -\$60,356$

Solve for effective yield:

i (monthly) = 1.10425%
Annual interest = 13.25%

In this case, the *APR* will still be disclosed at 12.375 percent, which reflects the loan discount only, not the prepayment penalty, and assumes the loan is repaid at the end of 30 years. The actual yield computed here of 13.25 percent is a marked difference from both the loan contract rate of 12 percent and the disclosed *APR* of 12.375 percent.

Charging Fees to Achieve Yield, or Pricing FRMs

In the preceding examples, we have developed the notion of the effective borrowing costs and yield from a given set of loan terms. However, we should consider how these are determined by lenders when "pricing" a loan. As we discussed earlier in the chapter, lenders generally have alternatives in which they can invest funds. Hence, they will determine available yields on those alternatives for given maturities and weigh those yields and risks against yields and risks on mortgage loans. Similarly, competitive lending terms established by other lenders establish yields that managers must consider when establishing loan terms. By continually monitoring alternatives and competitive conditions, management establishes loan offer terms for various categories of loans, given established underwriting and credit standards for borrowers. Hence, a set of terms designed to achieve a competitive yield on

categories of loans representing various ratios of loan-to-property value (70 percent loans, 80 percent loans, etc.) are established for borrowers who are acceptable risks. These terms are then revised as competitive conditions change.

If, based on competitive yields available on alternative investments of equal risk, managers of a lending institution believe that a 13 percent yield is competitive on 80 percent mortgages with terms of 30 years and expected repayment periods of 10 years, how can they set terms on all loans made in the 80 percent category to ensure a 13 percent yield? Obviously, one way is to price all loans being originated at a contract rate of 13 percent. However, management may also consider pricing loans at 12 percent interest and charging either loan fees or prepayment penalties or both to achieve the required yield. Why would lenders do this? Because (1) they have fixed origination costs to recover, and (2) competitors may still be originating loans at a contract rate of 12 percent.

To illustrate how fees for all loans in a specific category can be set, we consider the following solution:

Calculator Solution:

$PV = -1$
$i = 12\% \div 12 = 1\%$
$n = 30 \times 12 = 360$
$FV = 0$

Solve for payment:

$PMT = .010286$
$n = 10 \times 12 = 120$

Solve for loan balance:

$FV = .934180$
$i = 13\% \div 12 = 1.083333\%$

Solve for PV:

$PV = .9453$

The result $PV = .9453$ means that the net disbursement at loan closing should be 94.53 percent, or 94.5 percent (rounded), of the loan amount. Therefore if the loan is priced by offering terms of 12 percent interest and a 5.5 percent origination fee (100% − 94.5%) and the loan is repaid in 10 years, management will have its 13 percent yield.

Other Loan Patterns

In all of our previous examples, we have assumed that all loans have been *fully amortizing*; that is, the loan balance is zero on the maturity date. While this assumption applies in most single family residential loan situations, when dealing with income producing real estate, this is not always the case. In situations when loan payments must be structured to fit a specific requirement of the real estate transaction, the loan may call for a partial, zero, or negative amortization pattern.

Partially Amortizing Constant Payment Loans

In many cases, loans may be structured to accomplish one or more goals. For example, the borrower may desire (1) a payment that is lower than what would be available with a fully amortizing loan, and/or (2) a nonzero outstanding loan balance on the maturity date. This can be shown in the following example: A borrower and lender agree that a

\$60,000 loan made at 12% interest for 30 years will have a \$40,000 balance (sometimes referred to as a **balloon payment**) on the maturity date. It will have constant monthly payments.

To solve for those payments, we modify the equation that was used to calculate the CPM with full amortization as follows:

$$PV = \sum_{t=1}^{n} \frac{R_t}{\left(1+\frac{i}{12}\right)^t} + \frac{FV_n}{\left(1+\frac{i}{12}\right)^n}$$

The above equation differs in that the term FV is introduced and represents the desired outstanding balance (also frequently referred to as a balloon payment), at period n, or maturity.

The calculator solution for our problem can be modified as follows:

Calculator Solution:
$n = 12 \times 30 = 360$
$i = 12/12 = 1$
$PV = -\$60,000$
$FV = \$40,000$
Solve for (R) payment:
$PMT = \$605.72$

Note that the payment is now \$605.72, which is less than the \$617.17 payment that we calculated for the fully amortizing loan. We should also point out that procedures for calculating loan balances, *APRs*, effective costs of borrowing, and so on, which were explained above, may all be modified by introducing values for FV to the desired results.

We should also point out that the payment as a percent of the loan amount is \$605.72 ÷ \$60,000 = .010095. The latter is sometimes referred to as the **pay rate**, which is different from the *loan constant* that would apply if the loan was fully amortizing. The loan constant would be \$617.17 ÷ \$60,000 = .010286.

Zero Amortization, or "Interest Only" Loans

Another pattern for fixed interest rate and constant payment loans that is frequently used in real estate finance is referred to as the **"interest only" loan.** As the name implies, constant monthly payments will be "interest only." Returning to our example, we find the loan balance FV at maturity will be \$60,000. This loan structure will produce a monthly payment of \$600.

Calculator Solution:
$n = 360$
$i = 12/12 = 1$
$PV = -\$60,000$
$FV = \$60,000$
Solve for (R) or payment (PMT):
$PMT = \$600.00$

Alternatively, because the loan is interest only, the payment is simply the loan interest or 12%/12 × \$60,000 = \$600.

Increasing Loan Balances, or Negative Amortization

A final category of fixed rate, constant payment loans to be discussed in this chapter is referred to as a **negative amortization** loan. This pattern may occur when: (1) the borrower and lender agree that the loan balance at maturity will be *greater* than the initial loan amount; that is, $FV > PV$, or (2) payments are Negotiated to be lower than the periodic interest due on the loan.

To illustrate the first case, if we assume that the amount due at maturity will be \$80,000, then monthly payments will be \$594.28. This result can be obtained as shown in the calculation solution below.

Calculator Solution:
$n = 360$
$i = 12/12$
$PV = -\$60,000$
$FV = \$80,000$
Solve for payment (PMT):
$PMT = \$594.28$

We should also point out that the *pay rate*, calculated as \$594.28 ÷ \$60,000, is now equal to .009905. This is lower than the monthly interest rate, which is .12 ÷ 12, or .010000. When the pay rate used to determine monthly payments is *less* than the interest rate specified in the note, also referred to as the "accrual rate," negative amortization occurs. This is because payments are not large enough to meet monthly interest requirements. The difference between payments actually made and those that would be made on an "interest only" loan are deferred and become additional amounts owed by the borrower to the lender. These amounts must also earn interest. The rate at which they earn interest is usually the same rate as the interest rate on the note. In this example, it would be 12% ÷ 12, or .010000 per month.

The second example for negative amortization loans is to set the desired payment pattern, and then to solve for the loan balance that will include negative amortization. For example, in the above problem, if we assume that the loan is negotiated with monthly payments *preset* at \$400, the loan balance at the end of year five could be calculated as:

Calculator solution:
$PV = \$60,000$
$n = 60$
$i = 12/12$
$PMT = \$400$
Solve for loan balance (FV):
$FV = \$76,333.93$

Note that because the monthly payments have been set at \$400, which is below the \$600 in monthly interest being accrued, \$200 per month in interest is *not being collected*. Over the 60 month period, this amount must be added to the loan balance and also must earn 12 percent interest compounded monthly. This results in a total of \$16,333.93 being added to the loan balance. Note that the balance outstanding at the end of year 5 is now \$76,333.93. When compared to the initial loan amount of \$60,000, we can see that negative amortization has increased the loan balance by \$16,333.93.

"Interest Only" Option Mortgages

Many innovations in mortgage lending have occurred in recent years. One such innovation is the "interest only option mortgage." This loan gives the borrower the option of making monthly payments at interest only plus the *option* of making full or partial principal payments during the "interest only" period. For example, a loan is made for \$100,000 at 6 percent interest for 30 years. For the first 10 years, monthly payments will be interest only, and for the next 20 years payments are made so as to reduce the loan balance to zero at the end of the 30th year. In this case, payments would be as follows:

Calculator Solution:

1st 10 years:
PV = −\$100,000
i = 6%
n = 10 × 12 = 120
FV = \$100, 000

Compute payments:
$PMTs$ = \$500

Next 20 years:
PV = \$100,000
i = 6%
n = 12 × 20 = 240
FV = 0

Compute payments:
PMT = \$716.43

Based on our example, interest only payments would be \$500 each month for the first 10 years. Payments would then increase to \$716.43 each month for the next 20 years, resulting in a zero loan balance at the end of 30 years.

To consider a more complicated case where the borrower chooses: (1) to make interest only payments for the first two years, (2) then exercises the option to increase monthly payments by \$200, thereby reducing principal for 12 months during year 3, (3) then making interest only payments again through year 10, and (4) then making the necessary payments to achieve full amortization at the end of year 30, we would have:

Calculator Solutions:

(a) PMTs years 1–2 (interest only):
PV = −\$100,000
n = 360
FV = \$100,000
i = 6%

Calculate payment (PMT):
PMT = \$500

(b) Balance end of year 3: Payments increased to \$700:
PV = −\$100,000
n = 12
i = 6%
PMT = \$700

Calculate future value (FV):
FV = \$97,532.89 (balance EOY_3)

(c) PMTs years 4–10 (resumption of interest only):
PV = −\$97,532.89
n = 7 × 12 = 84
i = 6%
FV = \$97,532.89

Calculate payments:
PMT = \$487.66

(d) PMTs Years 11–30 (to achieve zero balance EOY_{30}):
PV = −\$97,532.89
n = 20 × 12 = 240
i = 6%
FV = 0

Calculate payments:
PMT = \$698.75

In this case, payments in (a) would start as \$500 interest only during years 1 and 2. Then in (b) payments increase by \$200 at the borrower's option to \$700 during year 3. During year 3, a \$200 monthly contribution to principal occurs, reducing the loan balance to \$97,532.89 at the end of year 3. In (c), the borrower resumes the interest only payments of \$487.66 beginning in year 4 through year 10. In order to fully amortize the loan by the end of year 30, payments in (d) rise to \$698.75 beginning in year 11 through year 30.

Amortization Schedules and Callable Loans

A final variation in loan structuring to be included in this section is a commonly used provision in which an amortization schedule, if specified in the note, is different from the maturity date. For example, two parties may agree that a \$100,000 fully amortizing loan will be made at 12 percent interest with monthly payments calculated based on a 30 year *amortization schedule*. However, both parties agree that the loan *will be*, or may be, **callable** at the lender's option, at the end of 10 years. In this case, payments can be calculated as follows:

Calculator Solution:
PV = −\$100,000
i = 12 ÷ 12 = .010000
n = 30 × 12 = 360
FV = 0

Calculate payments:
PMT = \$1,028.61 (monthly)

Balance:
PV = − 100,000
$PMTs$ = 1,028.61
i = 12 ÷ 12 = .010000
n = 12 × 10 = 120

Calculate FV:
FV = \$93, 418.59

If the loan is called at the end of 10 years, the amount due would be the balance at that time, or \$93,418.59 (reader should verify). This loan structure is used by borrowers and lenders (1) to keep monthly loan payments lower than they would be if a fully amortizing loan was made for 10 years, (2) to keep the loan maturity relatively short at 10 years, and (3) to achieve some loan amortization even though the loan is paid after 10 years.

By now, the reader should be aware that depending on the objectives of the borrower and lender, loans can be *structured* to achieve many results. **Loan structuring** is usually described as a process of adjusting loan terms to calibrate loan payments, loan balances, amortization rates, and so on, to achieve desired results. Such results usually include lower monthly payments than what would be available under a fully amortizing structure. However, it could also be that another objective is sought, such as having a desired loan balance at maturity.

Reverse Annuity Mortgages (RAMs)

In recent years **reverse annuity mortgages**[11] have become important, particularly as a greater percentage of the home-owning population is approaching retirement and seeking ways to supplement their retirement income. For example, assume that a household owns a residential property worth \$500,000 today. They would like to use the value of the property to supplement their retirement income with a RAM. A lender agrees to make a loan in an amount not to exceed \$250,000 for a period of 10 years. However, instead of giving the borrower cash in the amount of \$250,000, the lender agrees to let the borrower take down the loan in monthly installments over the life of the mortgage. The lender will

[11] These are also known as home equity conversion mortgages (HECMs).

charge an interest rate of 10 percent on the loan. What will be the maximum monthly payments that the lender will make to the borrower under these terms? We can solve for this as follows:

$$FV = PMT \times MFVIFA, \text{ 120 months, (10\% interest)}$$

$$\$250{,}000 = PMT \times MFVIFA, \text{ 120 months, (10\% interest)}$$

Calculator Solution:
$FV = -\$250{,}000$
$i = 10\% \div 12$
$PMT = ?$
$n = 120$
$PV = 0$
Solve for $PMT = \$1{,}220.44$

Looking at this example, note that the borrower can supplement his income by drawing $1,220.44 from the lender each month for 120 months, at the end of which time the lender will be owed a total of $250,000. If the property has retained its value of $500,000, the homeowner would have $250,000 in equity at the end of ten years. If the borrower made no more drawn, the loan balance would continue to increase at ten percent until the property is sold on the owner dies.

Exhibit 4–9 shows the monthly payment pattern and loan balances for our RAM example. To determine RAM loan balances, we reverse the procedure used in our previous FRM examples; that is, we solve for *future value* (FV) and not present value. As shown in the exhibit, instead of declining loan balances that are characteristic of fully amortizing mortgage loans, RAM mortgage balances *increase* over time. For example, after three years our RAM loan balance would be:

$PMT = \$1220.44$	$i = 10\%$
$n = 36$	Compute future value (FV):
$PV = 0$	$FV = \$50{,}992.21$

The balance at the end of any year can be determined by changing the values for n and resolving for future value.

EXHIBIT 4–9
RAM Draw and Balance Patterns

Year	Draw per Month	Balance EOY
1	$1220.44	$15,335.52
2	1220.44	32,276.87
3	1220.44	50,992.21
4	1220.44	71,667.28
5	1220.44	94,505.30
6	1220.44	119,738.97
7	1220.44	147,612.73
8	1220.44	178,405.23
9	1220.44	212,422.11
10	1220.44	250,000.00

Reverse Annuity Mortgages—RAMs

Concept Box 4.1

With the baby boomers advancing in age and many having a substantial amount of equity in residential housing, reverse annuity mortgages (RAMs), also known as home equity conversion mortgages (HECMs), have been developed. These loans are designed to help seniors "unlock" the equity by borrowing against property value, thereby supplementing their retirement income. Most mortgage loans are *federally insured* and require borrowers to consult with an approved reverse mortgage counselor. Borrowers should be aware of the following general qualifications:

- Applicant must be 62 years of age or older.
- The borrower must have title to the home and the home must be the borrower's primary residence.
- Borrowers can generally qualify as follows:
  - —age 62, 50 percent of value, 10 years or expected life
  - —age 72, 60 percent of value, 10 years or expected life
  - —age 82, 70 percent of value, 10 years or expected life
- As is the case with other mortgage loans, RAMs usually require certain up-front costs, including organization fees (points), mortgage insurance, loan servicing fees, and other closing costs.
- Draw-downs may be taken in one lump sum, monthly payments, or through a line of credit. This loan may give the borrower the option of making draw-downs when desired. In this event, interest is charged at prevailing rates on the monthly outstanding balance.
- Borrowers must continue to maintain the residence and pay property taxes and hazard insurance.
- The sum of all draw-downs plus interest does not have to be paid back until death or the homeowner permanently leaves the home.

Useful Web sites:

aarp.org/money/revmort
reversemorg.org
ushud.gov/buying/rvrsmort.cfm

Conclusion

In this chapter, we discussed various approaches to pricing and structuring fixed interest rate mortgage loans. We saw that the price or interest rate on the loan depends on a number of factors, including various types of risk that affect mortgage lenders. It is important to keep these risk factors in mind as we consider future chapters dealing with alternative mortgage instruments which are often designed in ways that alter risk characteristics. Although the focus of this chapter has been on residential mortgages, the concepts and calculations are equally important for commercial mortgages, which also are discussed in later chapters. We will find that the riskiness of the mortgage is also a factor in the risk and expected rate of return for investors in real estate income properties.

Key Terms

amortization, 77
annual percentage rate (*APR*), *88*
anticipated inflation, *75*
balloon payment, *94*
callable loans, *97*
constant amortization mortgage (CAM), *77*
constant payment mortgage (CPM), *78*
default risk, *74*
derived demand, *72*
effective interest cost, *88*
fully amortizing loan, *77*
graduated payment mortgage (GPM), *106*
interest, *72*
"interest only" loan, *94*

interest rate risk, *75*
legislative risk, *75*
liquidity risk, *75*
loan closing costs, *85*
loan constants, *80*
loan discount fees, *86*
loan structuring, *97*
monthly loan balance factor (MLBF), *84*
negative amortization, *95*
nominal interest rate, *74*
pay rate, *94*
points, *86*
prepayment penalty, *91*
prepayment risk, *75*
principal, *78*
real rate of interest, *73*
reverse annuity mortgage (RAM), *97*
statutory costs, *85*
third-party charges, *86*
tilt effect, *105*
unanticipated inflation, *75*

Useful Web Sites

www.mortgage-loan-search.com—This site supplies information on types of mortgages, recommended refinancing options, prequalifications vs. preapproval, and tips on saving money on your mortgage.

www.nahb.com—National Association of Home Buyers provides industry news, new home listings, and remodeling information.

www.Countrywide.com—National lender that provides mortgage rate information on their Web site.

http://www.freddiemac.com/pmms/pmms30.htm—This is a good site for finding fixed rate and points for 30 year mortgages.

Questions

1. What are the major differences between CAM and CPM loans? What are the advantages to borrowers and risks to lenders for each? What elements do each of the loans have in common?
2. Define *amortization*.
3. Why do the monthly payments in the beginning months of a CPM loan contain a higher proportion of interest than principal repayment?
4. What are loan closing costs? How can they be categorized? Which of the categories influence borrowing costs and why?
5. Does repaying a loan early ever affect the actual or true interest cost to the borrower?
6. Why do lenders charge origination fees, especially loan discount fees?
7. What is the connection between the Truth-in-Lending Act and the annual percentage rate (*APR*)?
8. Does the annual percentage rate always equal the effective borrowing cost?
9. What is meant by a real rate of interest?
10. What is a risk premium in the context of mortgage lending?
11. When mortgage lenders establish interest rates through competition, an expected inflation premium is said to be part of the interest rate. What does this mean?
12. A mortgage loan is made to Mr. Jones for $30,000 at 10 percent interest for 20 years. If Mr. Jones has a choice between a CPM and a CAM, which one would result in his paying a greater amount of total interest over the life of the mortgage? Would one of these mortgages be likely to have a higher interest rate than the other? Explain your answer.
13. What is *negative amortization*?

Problems

1. A borrower obtains a fully amortizing CPM mortgage loan for $125,000 at 11 percent interest for 20 years. What will be the monthly payment on the loan? What would the initial six payments be with a CAM?
2. A fully amortizing mortgage loan is made for $80,000 at 9 percent interest for 25 years. Payments are to be made monthly. Calculate:
   a. Monthly payments.
   b. Interest and principal payments during month 1.
   c. Total principal and total interest paid over 25 years.
   d. The outstanding loan balance if the loan is repaid at the end of year 10.

   e. Total monthly interest and principal payments through year 10.
   f. What would the breakdown of interest and principal be during month 50?
3. A constant payment, fully amortizing mortgage loan is made for $100,000 at 8 percent interest for 30 years. What would payments be if they are calculated:
   a. Monthly.
   b. Quarterly.
   c. Annually.
   d. Weekly.
4. Regarding problem 3, how much total interest and principal would be paid over the entire 30-year life of the mortgage in each case? Which payment pattern would have the greatest amount of interest payable over the 30-year term of the loan? Why?
5. A fully amortizing mortgage loan is made for $100,000 at 8 percent interest for 20 years.
   a. Calculate the monthly payment for a CPM mortgage.
   b. What will the *total* of payments be for the entire 20-year period? Of this total how much will be interest?
   c. Assume the loan is repaid at the end of 8 years. What will be the outstanding balance? How much total interest will have been collected by then?
   d. The borrower now chooses to reduce the loan balance by $5,000 at the end of year 5.
      (1) What will be the new loan maturity assuming that loan payments are not reduced?
      (2) Assume the loan maturity will not be reduced. What will the new payments be?
6. A 30-year fully amortizing mortgage loan was made 10 years ago for $75,000 at 10 percent interest. The borrower would like to prepay the mortgage balance by $10,000.
   a. Assuming he can reduce his monthly mortgage payments, what is the new mortgage payment?
   b. Assuming the loan maturity is shortened and using the original monthly payments, what is the new loan maturity?
7. A fully amortizing mortgage is made for $100,000 at 7.5 percent interest. If the monthly payments were $1,000 per month, when will the loan be repaid?
8. A fully amortizing mortgage is made for $80,000 for 25 years. Total monthly payments will be $900 per month. What is the interest rate on the loan?
9. A partially amortizing mortgage is made for $60,000 for a term of 10 years. The borrower and lender agree that a balance of $20,000 will remain and be repaid as a lump sum at that time.
   a. If the interest rate is 9 percent, what must monthly payments be over the 10-year period?
   b. If the borrower chooses to repay the loan after 5 years instead of at the end of year 10, what must the loan balance be?
10. An "interest only" mortgage is made for $80,000 at 12 percent interest for 10 years. The lender and borrower agree that monthly payments will be constant and will require *no* loan amortization.
   a. What will the monthly payments be?
   b. What will be the loan balance after 5 years?
   c. If the loan is repaid after 5 years, what will be the yield to the lender?
   d. Instead of being repaid after 5 years, what will be the yield if the loan is repaid after 10 years?
11. A partially amortizing loan for $90,000 for 10 years is made at 8 percent interest. The lender and borrower agree that payments will be monthly and that a balance of $20,000 will remain and be repaid at the end of year 10. Assuming 2 points are charged by the lender, what will be the yield if the loan is repaid at the end of year 10? What must the loan balance be if it is repaid after year 4? What would be the yield to the lender if the loan is repaid at the end of year 4?
12. A loan for $50,000 is made for 10 years at 8 percent interest and *no monthly payments* are scheduled.
   a. How much will be due at the end of 10 years?

b. What will be the yield to the lender if it is repaid after 8 years? (Assume monthly compounding.)

c. If 1 point is charged in (*b*) what will be the yield to the lender?

13. John wants to buy a property for $105,000 and wants an 80 percent loan for $84,000. A lender indicates that a fully amortizing loan can be obtained for 30 years (360 months) at 12 percent interest; however, a loan origination fee of $3,500 will also be necessary for John to obtain the loan.

    a. How much will the lender actually disburse?

    b. What is the effective interest cost to the borrower, assuming that the mortgage is paid off after 30 years (full term)?

    c. What is the annual percentage rate (*APR*) that the lender must disclose to the borrower? (Recall that APRs are rounded up or down to the nearest 1/8 percent.)

    d. If John pays off the loan after five years, what is the effective interest charge? Why is it different from the *APR* in (*c*)?

    e. Assume the lender also imposes a prepayment penalty of 2 percent of the outstanding loan balance if the loan is repaid within eight years of closing. If John repays the loan after five years with the prepayment penalty, what is the effective interest cost? Why is it different from the *APR* in (*c*)?

14. A lender is considering what terms to allow on a loan. Current market terms are 9 percent interest for 25 years for a fully amortizing loan. The borrower, Rich, has requested a loan of $100,000. The lender believes that extra credit analysis and careful loan control will have to be exercised because Rich has never borrowed such a large sum before. In addition, the lender expects that market rates will move upward very soon, perhaps even before the loan is closed. To be on the safe side, the lender decides to extend to Rich a CPM loan commitment for $95,000 at 9 percent interest for 25 years; however, the lender wants to charge a loan origination fee to make the mortgage loan yield 10 percent. What origination fee should the lender charge? What fee should be charged if it is expected that the loan will be repaid after 10 years?

15. A borrower is faced with choosing between two loans. Loan A is available for $75,000 at 10 percent interest for 30 years, with 6 points to be included in closing costs. Loan B would be made for the same amount, but for 11 percent interest for 30 years, with 2 points to be included in the closing costs. Both loans will be fully amortizing.

    a. If the loan is repaid after 15 years, which loan would be the better choice?

    b. If the loan is repaid after five years, which loan is the better choice?

16. A reverse annuity mortgage is made with a balance not to exceed $300,000 on a property now valued at $700,000. The loan calls for monthly payments to be made to the borrower for 120 months at an interest rate of 11 percent.

    a. What will the monthly payments be?

    b. What will be the RAM balance at the end of year 3?

    c. Assume that the borrower must have monthly draws of $2,000 for the first 50 months of the loan. Remaining draws from months 51 to 120 must be determined so that the $300,000 maximum is not exceeded in month 120. What will draws by the borrower be during months 51 to 120?

17. A borrower and lender agree on a $200,000 loan at 10 percent interest. An amortization schedule of 25 years has been agreed on; however, the lender has the option to "call" the loan after 5 years. If called, how much will have to be paid by the borrower at the end of 5 years?

18. **Comprehensive Review Problem:** A mortgage loan in the amount of $100,000 is made at 12 percent interest for 20 years. Payments are to be monthly in each part of this problem.

    a. What will monthly payments be if:

    (1) The loan is fully amortizing?

    (2) It is partially amortizing and a balloon payment of $50,000 is scheduled at the end of year 20?

    (3) It is a nonamortizing, or "interest only," loan?

    (4) It is a negative amortizing loan and the loan balance will be $150,000 at the end of year 20?

    b. What will the loan balance be at the end of year 5 under parts *a* (1) through *a* (4)?

    c. What would be the interest portion of the payment scheduled for payment at the end of month 61 for each case (1) thru (4) above?

    d. Assume that the lender charges 3 points to close the loans in parts *a* (1) through *a* (4). What would be the APR for each?

    e. If the loan is prepaid at the end of year 5, what will be the effective rate of interest for each?

    f. Assume conditions in *a* (1) except that payments will be interest only for the first 3 years (36 months). If the loan is to fully amortize over the remaining 17 years, what must the monthly payments be from year 4 through year 20?

    g. Refer to *a* (4) above, where the borrower and lender agree that the loan balance of $150,000 will be payable at the end of year 20:

    (1) How much total interest will be paid from all payments? How much total amortization will be paid?

    (2) What will be the loan balance at the end of year 3?

    (3) If the loan is repaid at the end of year 3, what will be the effective rate of interest?

    (4) If the lender charges 4 points to make this loan, what will the effective rate of interest be if the loan is repaid at the end of year 3?

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19. **Excel.** Refer to the "Ch4 Eff Cost" tab in the Excel Template. Suppose another loan is available that is an 11 percent interest rate with 6 points. What is the effective cost of this loan compared to the original example on the template?

20. **Excel.** Refer to the "Ch4 GPM" tab in the Excel Template. How would the loan balance at the end of year 7 change if the payments increase by 5 percent each year instead of 7.5 percent?

Appendix

Inflation, Mortgage Pricing, and Payment Structuring

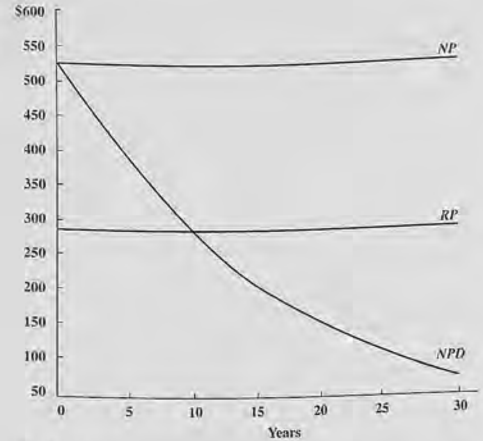
The fully amortizing, constant payment mortgage has been the most widely used mortgage instrument in the United States for some time. In more recent times, particularly during the 1970s and early 1980s, inflation and its effect on this "standard" mortgage instrument have caused problems for both lenders and borrowers. Because of these problems, a number of different mortgage instruments have been proposed as alternatives to the standard mortgage instrument. In this section, we outline the problems that inflation has brought for both borrowers and lenders who have relied on the standard mortgage instrument. Also included is a detailed description of the graduated payment mortgage. This mortgage is also a fixed interest rate mortgage and may be used in place of the constant payment mortgage, particularly during periods of rising interest rates.

Effects on Lenders and Borrowers

How does inflation relate to mortgage lending and cause difficulty for lenders and borrowers desiring to make constant payment loans with fixed interest rates? The answer to this question can be easily illustrated. Let's assume initially that a $60,000 loan is made at a time when no inflation is expected. The loan is expected to be outstanding for a 30-year period. Because there is no inflation, an inflation premium (f) is not required; hence, the lender will earn a return equivalent to the riskless interest rate (r), plus a premium for risk (p) over the period of the loan.[1] We assume that the interest rate charged under such assumptions would be 4 percent, representing a 3 percent real rate of interest and a risk premium of 1 percent over the period of the loan. Assuming a constant payment, fixed interest rate loan made in an inflationless environment, the lender would collect constant payments of approximately $286 per month, based on the loan constant for 4 percent and 30 years. This amount is shown in Exhibit 4A–1 as a straight

[1] Actually the interest rate charged will be related to the expected repayment period that may occur before maturity. However, this will not alter the concept being illustrated. The figures chosen here are arbitrary. Some studies indicate that the real rate of interest has historically been in the 1 to 3 percent range and risk premium on mortgages in the 2 to 3 percent range.

EXHIBIT 4A–1
Real and Nominal Values of Mortgage Payments



NP = Nominal payments.
RP = Real payments.
NPD = Nominal payments deflated.

line (*RP*) over the life of the loan and represents the series of *constant real payments* necessary to earn the lender a 3 percent fixed real return plus a 1 percent risk premium each year that the loan is outstanding.

Now assume that the same loan is made in an inflationary environment where a 6 percent rate of inflation is expected to prevail during each year that the loan is outstanding. The interest rate on the mortgage loan would now have to increase to approximately 10 percent for the lender to earn the same real return. This includes the base rate of 4 percent earned when no inflation was expected, plus an inflation premium of 6 percent.[2] Given that the standard mortgage instrument is to be used, the lender must now collect approximately $527 a month (rounded). This new payment pattern is shown in Exhibit 4A–1 as the horizontal line labeled *NP*, representing a constant series of nominal payments received over the term of the loan. Hence, included in the series of nominal payments are amounts that will provide the lender with a 4 percent basic rate of interest representing a real return and risk premium, plus a 6 percent inflation premium over the 30-year loan term.

In our example, an expected inflation rate of 6 percent caused an 84 percent rise in the monthly mortgage payments from $286 to $527, or $241 per month. Why is there such a significant increase in these monthly payments? The reason can be easily seen by again examining curve *NPD* in Exhibit 4A–1. This curve represents the real value of the monthly payments that the lender will receive over the 30-year loan period. It is determined by "deflating" the $527 nominal monthly payments by the rate of inflation.[3] The *NPD* curve is important because the lender, realizing that inflation is going to occur, expects that the constant stream of $527 payments to be received over time will be worth less and less because of lost purchasing power. Hence, to receive the full 10 percent interest necessary to leave enough for a 4 percent real return and risk premium over the life of the loan, more "real dollars" must be collected in the *early* years of the loan (payments collected toward the *end* of the life of the mortgage will be worth much less in purchasing power).

To illustrate, let's examine the deflated or real value of the $527 payments collected each month, as represented by the curve *NPD*. Note that for about the first 10 years of the loan life, the real value of these payments is greater than those for the 4 percent loan. However, after 10 years, the real value of these payments falls below the payments required on the 4 percent loan. However, even though the two payment streams differ, the real value of the nominal payment stream is equal to the required real payments at 4 percent, or *NPD* = *RP*.

[2] The nominal interest rate would actually be $(1 + .04)(1 + .06) - 1$, or 10.24 percent. However, as indicated earlier, we use 10 percent to simplify calculations.

[3] Deflating an income stream is done by computing the monthly inflation factor $.06 \div 12$, or .005, and multiplying $\$527(1 \div 1.005)^1$ in the first month, $\$527(1 \div 1.005)^2$ in the second month, and so on, until the end of year 30.

This means that from the stream of nominal $527 monthly receipts, the lender will ultimately earn the same real value as a stream of $286 payments or 4 percent on investment after deflating the nominal payments by the inflation rate. However, in order to earn the same real interest rate, the real value of the payment stream (*NPD*) must be greater than *RP* in the early years, since it will fall below *RP* in the later years. This relationship is referred to as *tilting* the real payment stream in the early years to make up for the loss in purchasing power in later years.

This **tilt effect** also has a considerable impact on the borrower. Recall that with no inflation the borrower faced a $286 payment; however, with inflation a $527 monthly payment is necessary. When the loan is first originated, the difference in the two payments is about $241 per month and represents an additional amount of real or current dollars that the borrower must allocate from current real *income* to meet mortgage payments.

Over time, this burden moderates. For example, by the end of the first year, the real value of the $527 payments deflated by the 6 percent rate of inflation would be about $497 per month and the borrower's real income will have increased by 3 percent, or by the real rate of growth in the economy. At that time, the borrower will have more real income to pay declining real mortgage payments. The important point is that even though the borrower's income is increasing in both real and nominal terms each year, it is not enough to offset the tilt effect in the early years of a loan. From this analysis, it becomes apparent from Exhibit 4A–1 why it is so difficult for first-time home buyers to qualify for constant payment, fixed interest rate loans during periods of rising inflation. With the general rate of inflation and growth in the economy, borrower incomes will grow gradually or on a year-by-year basis. However, as expected inflation increases, lenders must build estimates of the full increase into current interest rates "up front," or *when the loan is made*. This causes a dramatic increase in required real monthly payments relative to the borrower's current real income.

One final observation about the tilt effect is that, as the rate of inflation increases, the tilt effect increases. In Exhibit 4A–2, we show the effect of an increase in inflation from 6 percent in our previous example to 8 percent per year. Note that nominal monthly payments increase from $527 to $617 per month, the latter figure based on an increase in the mortgage interest rate to 12 percent. The impact of the tilt effect on a constant payment loan when inflation is expected to be 8 percent can be seen relative to the effect when inflation was expected to be 6 percent. Note that when the $617 monthly payments are deflated at 8 percent (*NPD* @ 8%) for inflation, the burden of the real payments to be made by the borrower increases relative to the real payments required when inflation was 6 percent in the early years of the loan. The curve corresponding to monthly payments deflated at 8 percent indicates that the real value of monthly payments on the 12 percent mortgage exceeds the real value of payments on the 10 percent mortgage for about the first 10 years of the loan term. This is true even though the lender will earn a 4 percent real return on both mortgages after inflation. Further, if we again assume that the "average" borrower's real income will increase by 3 percent, regardless of the rate of inflation, as inflation increases from 6 percent to 8 percent, it is clear that the borrower will have to allocate even more current real income to mortgage payments. This indicates that in the early years of the mortgage, the burden of

EXHIBIT 4A–2
Relationship between Real and Nominal Payments at Various Rates of Inflation

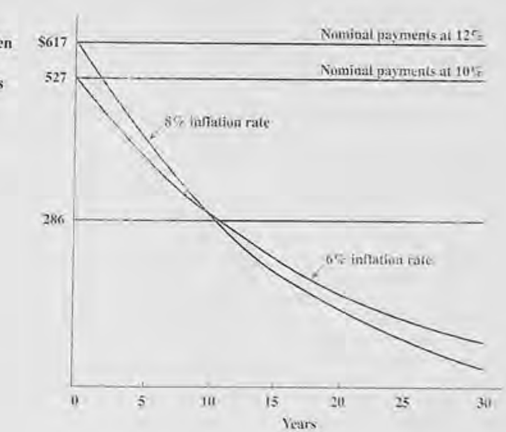


EXHIBIT 4A–3
Comparison of GPM Payments and Standard Constant Payments ($60,000, 30-year maturity, various interest rates)

	Interest Rate				
	10%	11%	12%	13%	14%
Constant Payments	$526.54	$571.39	$617.17	$663.72	$710.94
GPM Payments Graduated (7.5% annually)					
1	$400.22	$436.96	$474.83	$513.71	$553.51
2	430.24	469.73	510.44	552.24	595.03
3	462.51	504.96	548.72	593.66	639.65
4	497.19	542.83	589.87	638.18	687.63
5	534.48	583.55	634.11	686.04	739.20
6–30	574.57	627.31	681.67	737.50	794.64

the tilt effect on borrowers increases as the rate of inflation increases. This increased burden is due solely to (1) the nature of the mortgage instrument, that is, a constant payment, fixed interest rate mortgage, and (2) the rate of inflation. Further, the tilt effect makes it even more difficult for borrowers to qualify for loans based on their current income and make payments from current income. To partially overcome the tilt effect, lenders have designed a mortgage loan that retains a fixed rate of interest but includes a series of stepped-up payments that are lower in the earlier years, thereby better matching borrowers' incomes, and then rising over time. These loans are known as graduated payment mortgages (GPMs).

The Graduated Payment Mortgage (GPM)

In an attempt to deal with the problem of inflation and its impact on mortgage interest rates and monthly payments, lenders have instituted new mortgage instruments. One such instrument is the **graduated payment mortgage (GPM)**. The objective of a GPM is to provide for a series of mortgage payments that are *lower* in the initial years of the loan than they would be with a standard mortgage loan. GPM payments then gradually increase at a predetermined rate as borrower incomes are expected to rise over time. The payment pattern thus offsets the tilt effect to some extent, reducing the burden faced by households when meeting mortgage payments from current income in an inflationary environment.[4]

An example of the payment pattern for the graduated payment mortgage is illustrated in Exhibit 4A–3. The exhibit contains information on how payments should be structured for the 30-year, $60,000 loan used in our previous examples. GPMs can have a number of plans allowing for differences in initial payment levels, rates of graduation, and graduation periods.[5] Exhibit 4A–3 contains information on one of the more popular payment plans in use today. This plan allows for a 7.5 percent rate of graduation in monthly payments over 5 years, after which time the payments level off for the remaining 25 years. Computing initial payments on a mortgage of this kind is complex and is illustrated at the end of this appendix.[6]

Looking at the information contained in Exhibit 4A–3, we see that for a standard constant payment mortgage (CPM) loan of $60,000 originated at 12 percent for 30 years, the required constant monthly payments would be $617.17. A GPM loan made for the same amount and interest rate, where the monthly payments are increased (graduated) at the end of each year at a predetermined rate of 7.5 percent, begins with an initial payment of approximately $474.83. This initial payment will then increase by 7.5 percent per year to an amount equal to $681.67 at the beginning of year 6 and will remain constant from that point until the end of year 30. Compared with $617.17 in the constant payment mortgage, GPM payments are initially lower by $142.34 in the first year. The difference becomes smaller over time. The graduated payment level reaches approximately the same payment under the standard mortgage between the fourth and fifth years after origination. GPM payments exceed constant payments by $64.50 ($681.67 − $617.17) beginning in year 6. GPM payments then remain at the $681.67 level for the remaining 25 years of the loan term.

[4] The Federal Housing Administration initiated the first widely accepted graduated payment plan under its Section 245 program. For more detail, see the *HUD Handbook 4240.2* rev., Graduated Payment Mortgage Program, Sect. 245. These handbooks are available from HUD regional insuring offices.

[5] For a current update on plans available, contact a regional insuring office of the FHA, which is a division of the Department of Housing and Urban Development.

[6] Although we discuss GPMs relative to single family lending, this type of loan also could be used to structure debt financing for income-producing properties where mortgage loan payments are designed to match income growth from rents collected over time.

EXHIBIT 4A–4
Comparison of Mortgage Payment Patterns (Loan amount = $60,000, Maturity = 30 years, Interest 12% *GPM* add: 7.5% graduation rate, 5 years)

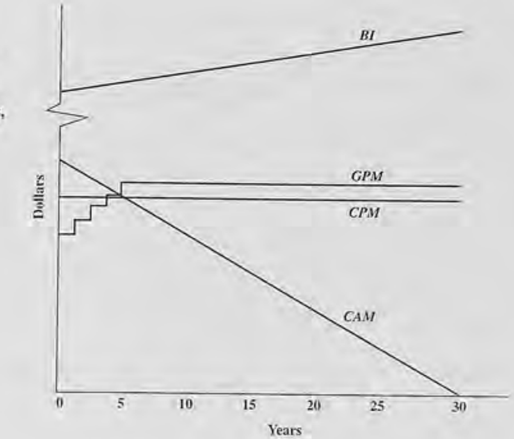


Exhibit 4A–4 provides a comparison of payment patterns for a graduated payment mortgage (GPM), a constant payment mortgage (CPM), and a constant amortization mortgage (CAM). GPM payments are based on the 7.5 percent graduation plan. All three loans are assumed to be originated for $60,000 at 12 percent interest for 30 years. Note that the GPM is below that of the CPM for approximately five years, at which point the GPM payments begin to exceed CPM payments. The reason for this pattern should be obvious. Under either payment plan, the yield to the lender must be an annual rate of 12 percent compounded monthly, assuming no origination fees, penalties, and so on. Therefore, because the GPM payments are below those of the CPM in the early years, GPM payments must eventually exceed the level payment on the CPM loan to "make up" for the lower payments on the GPM in the early years. Hence, if the borrower chooses the GPM in our example, the payments will exceed those of a standard CPM mortgage from years 6 to 30.

The advantages of the GPM program are obvious from the borrower's standpoint. The initial payment level under the GPM plan shown in Exhibit 4A–4 is significantly lower than under the CPM plan. Further, in the early years, GPM payments correspond more closely to increases in borrower's income (*BI*). Hence, the burden of the tilt effect requiring borrowers to allocate more current real dollars for mortgage payments from current real income in an inflationary environment is reduced somewhat with the GPM. Based on this analysis, it is easy to conclude that the GPM significantly reduces monthly payments for borrowers in the early years of the mortgage loan, corresponds more closely to increases in borrower income, and therefore may increase the demand for mortgage credit by borrowers.

When judged relative to the CAM, the CPM and GPM clearly provide for initial payments that are far below payments required for the CAM with the same terms. It is important to stress that higher rates of inflation have caused a modification in mortgage instruments over time. Even though all three mortgage instruments provide the same yield (12 percent), changes in mortgage payments have clearly been structured to reduce initial payments. This has been done with the expectation that growth in real incomes and expected inflation will extend into the future resulting in sufficiently high borrower incomes to repay the debt while reducing initial payments sufficiently to reduce the payment burden at the time of loan origination.

Outstanding Loan Balances: GPMs

Because the initial loan payments under GPM plans are usually lower than payments necessary to cover the monthly interest, the outstanding loan balance under the GPM will *increase* during the initial years of the loan. It will remain higher than that of the standard CPM mortgage until full repayment occurs at maturity. A comparison of loan balances for a GPM and a standard mortgage, based on the 12 percent, $60,000, 30-year terms used in our previous examples, is shown in Exhibit 4A–5.

Exhibit 4A–6 indicates that the mortgage balance with the GPM *increases* until approximately year 5, when it begins to decline until it reaches zero in year 30. Hence, if a borrower sold this property during the first four years after making a

EXHIBIT 4A–5
Loan Balances for Graduated Payment and Constant Payment Mortgages as Compared with Expected House Value

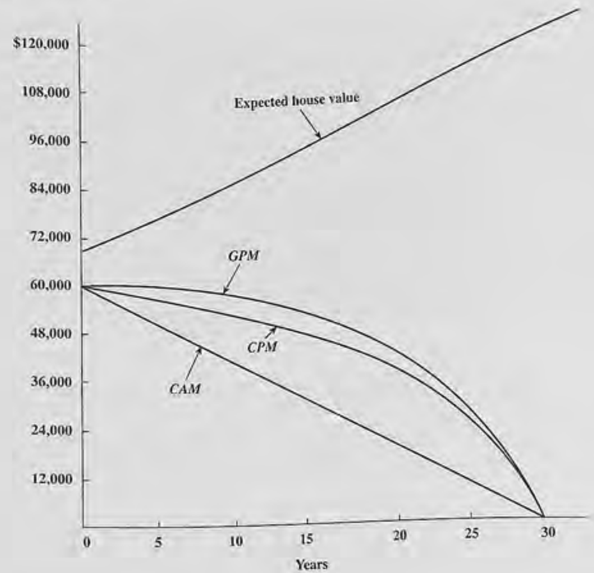


EXHIBIT 4A–6
Determining Loan Balance on a GPM ($60,000 loan, 12%, 30 years, 7.5 % rate of graduation)

eXcel
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Year	Beginning Balance	Required Monthly Interest Payment	GPM Payment	First Month Loan Amortization	Change in Balance	Ending Balance
1	$60,000.00	$600.00	$474.83	$125.17	$1,587.47	$61,587.47
2	61,587.47	615.87	510.44	105.43	1,337.12	62,924.59
3	62,924.59	629.25	548.72	80.53	1,021.32	63,945.91
4	63,945.91	639.46	589.87	49.59	628.93	64,574.84
5	64,574.84	645.75	634.11	11.64	147.62	64,722.46*
6	64,722.46	647.22	681.67	(34.45)	(436.91)	64,285.55

*Maximum balance. During the sixth year, the payments ($681.67) will exceed required interest ($647.22), and loan amortization will begin.

GPM loan, more would be owed than originally borrowed. The loan balance increases during the first four years after origination because the initial GPM payments are lower than the monthly interest requirements at 12 percent. Therefore, no amortization of principal occurs until payments increase in later periods. To illustrate, in our previous example, the interest requirements under a GPM after the first month of origination would be $60,000 × (.12 ÷ 12), or $600.00. The GPM payments during the first year of the loan are only $474.83, which are less than the monthly interest requirement of $600.00. The difference, or $125.17, must be added to the initial loan balance of $60,000, as if that difference represented an additional amount *borrowed* each month. This $125.17 monthly difference is **negative amortization.** Further, this shortfall in interest must also accumulate interest at the rate of 12 percent compounded monthly. Hence, during the first year, $125.17 per month plus monthly compound interest must be added to the $60,000 loan balance. This process amounts to compounding a monthly annuity of $125.17 at 12 percent per month and adding that result to the initial loan balance to determine the balance at year-end. The amount added to the loan balance at the end of the year will be $125.17 (*MFVIFA*, 12%, 12 mos.) or $125.17(12.682503) = $1,587.47.

Calculator Solution:

$n = 12$
$i = 12\% \div 12 = 1\%$
$PMT = \$474.83$
$PV = -\$60{,}000$

Solve for loan balance:
$FV = \$61{,}587.47$

Alternate Calculator Solution:

$n = 12$
$i = 12\% \div 12 = 1\%$
$PMT = \$125.17$
$PV = 0$

Solve for *additional* loan balance:
$FV = -\$1{,}587.47$

The importance of the increasing GPM loan balance and negative amortization can be seen in relationship to the property value also (see Exhibit 4A–5). It is important to note the "margin of safety," or difference between property value and loan balance. This margin is much *lower* when a GPM loan balance is compared with that of a CPM. This makes a GPM loan riskier to the lender than a CPM, because more consideration must be given to *future* market values of real estate and *future* borrower income. For example, let's assume that the GPM borrower decides to sell a property after five years. When compared with the CPM, the lender will have received relatively lower monthly payments up to that point. Further, because of negative amortization the proceeds from sale of the property must be great enough to repay the loan balance that has increased relative to the original amount borrowed. In short, with a GPM, the lender must now be more concerned about trends in real estate values because resale value will constitute a more important source of funds for loan repayment.

GPM Mortgage Loans and Effective Borrowing Costs

A closing note in this appendix considers the question of the effective interest cost and GPMs. In the absence of origination fees and prepayment penalties, the yield on GPMs, like yields on CAMs and CPMs, is equal to the contract rate of interest as specified in the note because the GPM, like the CPM, is a fixed interest rate mortgage. This is true whether or not the GPM loan, like CAM and CPM loans, is repaid before maturity. However, to the extent points or origination fees are charged, the effective yield on a GPM will be *greater* than the contract rate of interest, and it will increase the earlier the loan is repaid. When computing yields on GPMs originated with points, the same procedure should be followed as described with the standard CPM; that is, the interest rate making the stream of GPM payments equal to the funds disbursed after deducting financing fees is the effective cost of the loan. Where origination fees are charged on GPMs, the authors have computed results that are very close to those computed for standard mortgage loans with the same terms and origination fees. This is true regardless of the loan amount or rate of graduation on the GPM. In the GPM discussed above, for example, if 3 points are charged and the loan is repaid after five years, the effective cost would be about 12.78 percent, compared with 12.82 on a CPM with the same terms.[7] Is a borrower better off or worse off with a GPM or a CPM loan? Generally, if a standard loan and a GPM are originated at the same rate of interest and have the same fees, there will be little, if any, difference in their effective costs. However, because the graduated payment pattern reduces the tilt effect, the borrower is definitely better off with a GPM *if it can be obtained at the same interest rate* as the standard mortgage.

Would a GPM generally be available at the same interest rate as a standard CPM mortgage? It would appear that because of the additional risk taken by the lender—in the form of an increasing loan balance due to negative amortization in the early years of the loan and lower initial monthly cash flows received from reduced payments—the GPM lender would require a *higher risk premium* than the CPM lender. Hence, all things being equal, a slightly higher interest rate may be required on a GPM than on a CPM. This would tend to neutralize some of the positive features of the GPM compared with the CPM.

Graduated Payment Mortgages—Further Extensions

As explained in the chapter, the mechanics of determining monthly payment streams and loan balance are relatively straightforward for FRMs. However, when designing a GPM

[7] Computations for the effective interest cost on GPMs are much more difficult than those for the CPM because the amount disbursed must be set equal to a series of seven annuities, representing different payments for 12 periods in each of the six years, with the final annuity payment covering years 6 to 30. Similarly, when finding loan balances, we may use for GPMs the same procedure demonstrated for CPMs; that is, the remaining payment streams would be discounted at the contract rate of interest and the present value would be determined. However, determining loan balances on GPMs may involve discounting a series of one or more annuities spanning many different 12-month intervals if any remaining CPM payments differ. For an illustration of how to calculate payments for GPMs see the following section.

structure, the reader should be aware that the rate of graduation, number of years during which payments will graduate, term, and interest rate will vary, depending on the goals of the borrower and lender and the loan market that it is being designed to serve.

Perhaps the most complex problem associated with a GPM is *establishing the initial monthly payment*. For example, in Exhibit 4A–3 monthly payments for various GPMs were illustrated. Each group of monthly payments was assumed to increase at the rate of 7.5 percent beginning in year 2. However, the reader may be wondering how the initial payment is determined and, perhaps more importantly, how one may go about designing a structure for payment patterns requiring a graduated or stepped up repayment schedule. For example, in the case of our 12 percent GPM mortgage, we note that the initial payment would be $474.83. How was that payment determined?

To answer this question, we provide what appears to be a difficult solution. Upon closer examination, however, we will see that it is an application of the present value formulas that we have learned. It is important to recall that for the GPM, as was the case with the CAM, the present value of all payments discounted at the contract rate of interest will equal the initial loan amount. This concept is very important and must be kept in mind as we work through the problem at hand. What follows is a general formula for determining the initial monthly payment for a GPM:

$$PV = \left[MP_1 \cdot \sum_{t=1}^{12} \frac{1}{(1+i/12)^t}\right]$$

$$+ \left[MP_1(1+g)^1 \cdot \sum_{t=1}^{12} \frac{1}{(1+i/12)^t} \cdot \frac{1}{(1+i/12)^{12}}\right]$$

$$+ \left[MP_1(1+g)^2 \cdot \sum_{t=1}^{12} \frac{1}{(1+i/12)^t} \cdot \frac{1}{(1+i/12)^{24}}\right]$$

$$+ \left[MP_1(1+g)^3 \cdot \sum_{t=1}^{12} \frac{1}{(1+i/12)^t} \cdot \frac{1}{(1+i/12)^{36}}\right]$$

$$+ \left[MP_1(1+g)^4 \cdot \sum_{t=1}^{12} \frac{1}{(1+i/12)^t} \cdot \frac{1}{(1+i/12)^{48}}\right]$$

$$+ \left[MP_1(1+g)^5 \cdot \sum_{t=1}^{300} \frac{1}{(1+i/12)^t} \cdot \frac{1}{(1+i/12)^{60}}\right]$$

where

PV = loan amount

i = contract interest rate

MP_1 = monthly payments during year 1

g = rate of graduation in the monthly payment

While the computation appears to be complex, a relatively simple solution for MP_1 is obtainable for our $60,000, 12 percent, 30-year *GPM* with a graduation rate of 7.5 percent. Note that the expressions containing the Σ's are simply the interest factors for the present value of an annuity (*MPVIFA*) presented in Chapters 3 and 4. The terms $1 \div (1 + i/12)^{12}$, $1 \div (1 + i/12)^{24}$, and so on, are simply the *MPVIF* factors also discussed in Chapters 3 and 4. These factors correspond to various 12-month intervals during which monthly payments will be greater than the previous 12-month period. However, in any given year, monthly payments (unknown) will remain constant during that year. Hence, what we have in our case example are six different groups of unknown monthly annuities, which, when discounted by the contract rate of interest on the mortgage (i), must equal the initial amount of the loan. This process is usually referred to as discounting *grouped cash flows* and is a problem encountered frequently in real estate finance.

Essentially, our problem involves finding MP_1, which is the only unknown. We know the loan amount $60,000, the monthly interest rate $i \div 12 = .01$, and the term of the loan (360 months). Further, we know that *MP* in years 2, 3, 4, 5, and 6 will be equal to MP_1, increased by $(1 + g)^1$, $(1 + g)^2$, $(1 + g)^3$, $(1 + g)^4$, and $(1 + g)^5$, respectively, where $g = .075$. Given this information, MP_1 can be found by assembling the information as shown in Exhibit 4A–7.

Looking at Exhibit 4A–7, we see that column 1 corresponds to the payments for years 1 to 30. Column 2 merely indicates that payments during each year will be increased at the rate of 7.5 percent per year, which is equivalent to compounding MP_1 (unknown) by 1.075 for each year's set of payments *beginning* in year 2. In other words, we are solving for payments in year 1 which will remain the same for 12 months, and then increase by 1.075 beginning in year 2. Hence, column 3 is simply the compound interest factor for the rate of graduation (7.5 percent) applied to MP_1.

In Exhibit 4A–7, column 4 contains the *MPVIFA* at 12 percent. This factor is, in effect, being used to discount the six different series of monthly payments *within* the interval during which they will occur. For example, in each of the first five years, 12 monthly payments will be received and must be discounted for that 12-month interval, hence the factor 11.255077. From years 6 to 30, 300 payments will be received and must be discounted for that interval, hence the factor 94.946551.

Column 5 contains the *MPVIF* factor which must be used to discount each series of monthly annuities back to time period zero or present value. In other words, column 4 discounts the 12 monthly payments *within* the 12-month interval. Column 5 is necessary because each series of grouped payments is not received all at once; instead, the series received during the second year has a lower present value than the series received in the first year. Hence, each series must be discounted again by

EXHIBIT 4A–7
Worksheet for Solving for Initial *GPM* Payments

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(1)	(2)	(3)	(4)	(5)	(6)
Payment Period	Payment	Graduated Payment Factor	*MPVIFA*	*MPVIF*	(3 × 4 × 5)
MP_1	$= MP_1(1.0)$	1.0	11.255077	—	11.255077
MP_2	$= MP_1(1 + .075)$	1.075000	11.255077	.887449	10.737430
MP_3	$= MP_1(1 + .075)^2$	1.155625	11.255077	.787566	10.243594
MP_4	$= MP_1(1 + .075)^3$	1.242297	11.255077	.698925	9.772473
MP_5	$= MP_1(1 + .075)^4$	1.335469	11.255077	.620260	9.323008
MP_{6-30}	$= MP_1(1 + .075)^5$	1.435629	94.946551	.550450	75.030751
				Total	126.362333

the *MPVIF* factor for one year, the third year must be discounted for two years, and so on.

Finally, column 6 is simply the product of columns 3, 4, and 5. Note that these factors are additive because we have been able to express each series of payments (MP_2, MP_3, MP_4, MP_5, and MP_{6-30}) in terms of MP_1 because we know that each succeeding period's payment will increase by same rate of graduation $(1 + g)$. Careful inspection of the equation shows that *MPVIFA*, *MPVIF*, and $1 + g$ may be factored, multiplied, and added. This is in essence what we have done in Exhibit 4A–7. Hence the equation reduces to

$$MP_1(126.362333) = \$60{,}000$$

$$MP = \$474.83$$

Because we know that MP_2 will be 1.075 times greater than *MP*, we have $474.83(1.075) or $510.44 and so on. The reader may now complete the calculations and verify the payments in the 12 percent column in Exhibit 4A–3.

This formula and procedure have widespread application in real estate finance whenever one is faced with a series of payments which are scheduled to increase after given time intervals at any specified rate of increase.[8] The student is also encouraged to think about how the schedule and formula may change if different rates of graduation over different periods of time are desired.

Regarding loan balances for GPMs, once the mortgage payments are known, balances can be determined at any time by finding the present value of the remaining payments. This is done by discounting those payments by the contract rate of interest, taking into account any grouped cash flows in the remaining series, and discounting them appropriately. As for effective interest costs, any origination fees should be subtracted from the loan amount (*PV*). Then, given the GPM payments and balance, a new series for *MPVIFA* and *MPVIF* at a rate higher than 12 percent would be used to discount the payments and balances until the present value of all cash inflows equals the net amount of funds disbursed.

A-1. Why do monthly mortgage payments increase so sharply during periods of inflation? What does the tilt effect have to do with this?

A-2. As inflation increases, the impact of the tilt effect is said to become even more burdensome on borrowers. Why is this so?

[8] This procedure can be programmed into many financial calculators and spreadsheets. Many calculator manufacturers have already preprogrammed this procedure in memory. An explanation can usually be found in the accompanying manual under graduated payment mortgages and/or discounting grouped cash flows.

Problems

A-1. A homeowner purchases a property for $70,000. He finances the purchase with a GPM carrying a 12 percent interest rate. A 7.5 percent rate of graduation will be applied to monthly payments beginning each year after the loan is originated for a period of five years. The initial loan amount is $63,000 for a term of 30 years. The homeowner expects to sell the property after seven years.

a. If the initial monthly payment is $498.57, what will payments be at the beginning of years 2, 3, 4, and 5?

b. What would the payment be if a CPM loan was available?

c. Assume the loan is originated with two discount points. What is the effective yield on the GPM?

A-2. Mr. Qualify is applying for a $100,000 GPM loan for [illegible] years at an interest rate of [illegible] percent. Payments would be designed so as to graduate at the rate of 7.5 percent for three years beginning with payments in the second year.

a. What would monthly payments be for Mr. Qualify in each of the first [illegible] years of the loan?

b. What would the loan balance be on the GPM at the end of year 3?

c. If the lender charged 4 points in origination fees, what would be the effective interest cost on this loan after five years?

A-3. **Excel.** Refer to the "Ch4 GPM" tab in the Excel template. How would the initial payment change if the payments increase by 5 percent each year instead of 7.5 percent?

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Chapter 5

Adjustable Rate Mortgages

In the preceding chapter, we discussed the evolution of fixed interest rate mortgage instruments, giving particular attention to payment patterns. We saw how payment structures have evolved in response to changes in the economic environment, particularly when the impact of inflation on interest rates and mortgage payments was considered. While many of those changes alleviated problems faced by *borrowers*, depending on the degree of uncertainty in expectations of inflation and interest rates, those remedies may be inadequate from the viewpoint of *lenders*. These inadequacies stem from the fact that although payment patterns can be altered to suit borrowers as expectations change, the constant amortization mortgage (CAM), constant payment mortgage (CPM), and graduated payment mortgage (GPM) are all originated in *fixed interest rates* and all have *predetermined payment patterns*. Consequently, neither the interest rate nor payment pattern will change, regardless of economic conditions. Loans made at fixed interest rates may cause serious problems for lenders who must pay market interest rates on savings because market interest rates may change suddenly, and lenders who have made an overabundance of fixed interest rate mortgages may encounter serious difficulty as interest costs on savings rise relative to interest revenues from mortgage loans.

This chapter deals with a variety of mortgages that are made either with *adjustable* interest rates (called **adjustable rate mortgages—ARMs**) or with variable payment provisions that change with economic conditions. These instruments differ from fixed interest rate mortgages (FRMs) in that they are designed to adjust in one or more ways to changes in economic conditions. Rather than making mortgages with fixed rates of interest over long periods of time, these mortgages provide an alternative method of financing through which lenders and borrowers *share* the risk of interest rate changes, or **interest rate risk**. This enables lenders to match changes in interest costs with changes in interest revenue more effectively and thus provide borrowers with potentially lower financing costs.

In this chapter, we begin by discussing the price level adjusted mortgage (PLAM), which is one type of variable payment mortgage. Although not used widely, the PLAM illustrates many of the problems that must be considered by lenders and borrowers in financial decision making. We then consider ARMs and issues relative to how they are "priced." As a part of the analysis of ARMs, we investigate the effects of limitations on (1) interest rate changes, (2) payment increases, and (3) negative amortization and the resultant effects on ARM loan yields. We also consider how these mortgages should be priced relative to FRMs and other ARMs made on different loan terms. At the conclusion of the chapter, we consider the shared appreciation mortgage (SAM), whose repayment terms are partially based on appreciation in property values.

ARMs and Lender Considerations

To this point, we have considered *borrower* concerns regarding mortgage loans. More specifically, we have concerned ourselves with how payment patterns have been modified to offset problems caused by the "tilt effect," thereby making more households eligible for loans. To complete the discussion of mortgage lending, we must briefly consider problems faced by *lenders* and their cost of funds.

Recall from the previous chapter that we approached the tilt effect and GPMs with fixed interest rates from the perspective of borrowers. We indicated that because of the tilt problem, borrowers had an increasingly difficult time qualifying for loans in inflationary times, even though their incomes may have been rising. From the perspective of *lenders*, fixed interest rate mortgages are a potential problem regardless of what the payment pattern may be (i.e., a CAM, CPM, or GPM). One major problem with FRMs is that the interest rate is fixed on the date of origination and remains fixed until the loan is repaid. Hence, from the day of origination, lenders are underwriting the risk of any significant changes in the implicit components of mortgage interest rates, that is, the real rate of interest (r), the risk premium (p), and the premium for expected inflation (f). To the extent that lenders underestimate any or all of these components at the time of mortgage origination, they will incur a financial loss. For example, assume that a mortgage loan for $60,000 is made for 30 years at 10 percent interest with an expected repayment period of 10 years. This mortgage would require monthly payments of about $527 (rounded). Should such a loan be made, it must follow that the consensus of lenders at the time the loan is made is that a 10 percent rate of interest is sufficiently high to compensate them for all forms of risk bearing expected to occur over the time that the loan is expected to be outstanding. If over that time, one or more of the components of the mortgage interest rate (i) are significantly higher than was anticipated at the time of origination, lenders will suffer a loss.[1] If, for example, lenders make an inaccurate prediction of inflation and unanticipated inflation occurs, warranting a 12 percent interest rate instead of 10 percent, the magnitude of the loss to the lender is determined as follows:

$$\begin{aligned} PV &= \$527(MPVIFA, 12\%, 120 \text{ mos.}) + MB(MPVIF, 12\%, 120 \text{ mos.}) \\ &= \$527(69.700522) + \$54{,}563(.302995) \\ &= \$53{,}264 \end{aligned}$$

The loss would be equal to $60,000 − $53,264 = $6,736. Hence, in this case, a 2 percent rate of **unanticipated inflation** would result in a financial loss of $6,736, [illegible] percent of the loan amount. Based on this example, it should be easy to see the relationship between *interest rate risk* and potential losses to lenders. That there is always some additional risk because of the *uncertainty* about expected levels of each of the components of i is one of the reasons why a risk premium, p, is demanded by lenders

[1] There are many reasons why lenders may inaccurately predict the components of i over the expected repayment period. Monetary growth may expand or contract, causing changes in the rate of inflation (f). General economic activity may expand (contract), resulting in a change in the general level of investment and employment, thereby affecting real interest rates and default risk (r and p).

To the extent that this uncertainty about future levels of r and f increases, p will also increase, and vice versa.[2]

Calculator Solution:

1st Step: Determine Mortgage Balance:

$n = 20 \times 12 = 240$ (# of remaining payments)

$i = 10\% \div 12 = .8333\%$ (stated interest rate)

$PMT = \$527.00$

$FV = 0$

Solve for PV of payments:

$PV = -\$54{,}610$

2nd Step: Discount Payments and Mortgage Balance at 12%:

$n = 10 \times 12 = 120$

$i = 12\% \div 12 = 1\%$

$PMT = \$527$

$FV = \$54{,}610$

Solve for PV of mortgage balance:

$PV = -\$53{,}279$

$\text{Loss} = \$60{,}000 - 53{,}279 = \$6{,}721$

Note: Calculator answer differs due to rounding.

It should be noted that losses incurred by lenders result in gains to borrowers. Of course, one could argue that if interest rates declined, then lenders would gain. However, when this occurs, borrowers usually try to refinance their loans. This pattern implies that with fixed interest rate lending, risk bearing is not "symmetric," or evenly balanced; that is, lenders bear the risk of loss when interest rates increase, which is not equally offset by gains if interest rates decline because borrowers can usually prepay loans and will do so when interest rates decline. This prepayment risk problem has also motivated lenders to turn to ARMs and other loan instruments.

The Price Level Adjusted Mortgage (PLAM)

One *concept* that has been discussed as a remedy for the uncertainty problem for lenders is the **price level adjusted mortgage (PLAM)**. Recall from the discussion in the previous chapter on the determinants of mortgage interest rates, i—an expected real rate of interest (r), a risk premium (p), and an expected inflation (f)—we displayed the following equation:

$$i = r + p + f$$

We also indicated that perhaps the most difficult variable in the equation to predict was a premium for expected inflation (f). To help reduce interest rate risk, or the uncertainty of inflation and its effect on interest rates, it has been suggested that lenders should *originate*

[2] The reader should realize that there will always be some likelihood that expected levels of r and f will not always be accurate because of *unanticipated* changes. During some time periods, when economic conditions are stable, the uncertainty in these estimates is likely to be less, whereas in other periods, uncertainty may be greater. Hence, the *uncertainty* of these estimates is what causes interest rate risk and, in turn, larger or smaller risk premiums.

mortgages at interest rates that reflect expectations of the real interest rate plus a risk premium for the likelihood of loss due to default on a given mortgage loan, or $r + p$.

After estimating initial values for r and p, the PLAM loan balance would be adjusted up or down by a *price index*. Payments would then be based on a new loan balance, adjusted for inflation. This would shift the risk of changes in market interest rates brought about by inflation (f) to borrowers and relieve lenders of the difficult task of forecasting future interest movements when originating loans. The lender would still bear the risk of any unanticipated change in r or p.[3]

PLAM: Payment Mechanics

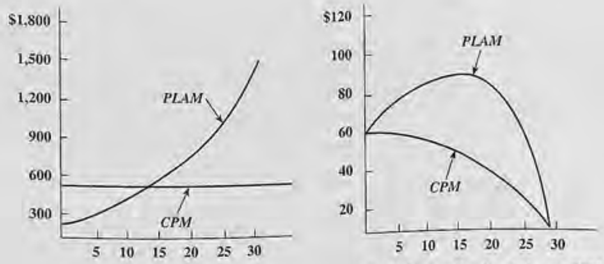
An example of a PLAM loan would have payments based on a rate of interest consisting only of expectations for r and p for an expected maturity period. Payments would be adjusted periodically, based on the indexed value of the *mortgage balance* for the remaining loan term. To illustrate, assume that a mortgage is made for \$60,000 for 30 years at an interest rate of 4 percent, or a lender's estimate of $r + p$. The lender and borrower may agree that the loan balance will be indexed to the Consumer Price Index (CPI) and adjusted annually. Initial monthly payments would be based on \$60,000 at 4 percent for 30 years, or approximately \$286. After one year, the loan balance, based on a 30-year amortization schedule for the 4 percent interest rate, would be about \$58,943. If it is assumed that the CPI increased by 6 percent during the first year of the loan, the *loan balance* at the end of year 1 would become \$58,943 (1.06), or \$62,480. This balance would be repaid over 29 remaining years. Monthly payments, beginning in the second year, would be based on the higher-indexed loan balance of \$62,480 at the same 4 percent interest rate for 29 years, or \$304 per month. This process would continue each year thereafter: (1) computing the loan balance using an amortization schedule based on a 4 percent interest rate for the remaining term, (2) increasing the balance by the change in the CPI during the next year, and (3) computing the new payment over the remaining loan term.

Assuming inflation continued at an annual rate of 6 percent for the remaining loan term, Exhibit 5–1 shows the nominal payment and loan balance pattern every year for the PLAM loan. There are many patterns that should be pointed out in Exhibit 5–1. Note that the PLAM payments shown in panel A increase at approximately the same rate as the change in the price level, or 6 percent over the life of the loan. This increase in payments continues over the life of the loan even though loan amortization begins to occur as the number of remaining years to maturity declines (see panel B). This pattern of rising payments occurs (1) because of the effect of the increasing price index on the loan balance and (2) each succeeding year's payment is computed over a shorter remaining loan term.[4] It is also interesting to compare the payments on this PLAM to a \$60,000, constant payment FRM made at

[3] Although we are treating each of these variables making up i as independent and additive, they may not be independent and may well interact with one another. For example, the risk premium (p) is partially dependent on the likelihood that a borrower's income and wealth will rise or fall, which may depend on changes in the economy and, hence, the underlying real rate of interest (r). Changes in income would affect the likelihood of default on a loan because of payments rising relative to income (which may rise or fall) or the loan balance exceeding the market value of the house. Similarly, we do not fully understand the relationship between inflation (f) and real growth (r) and possible interaction between them. Hence, the reader should be aware that we are dealing with these influences in a conceptual way to illustrate the importance of each component, but we do not mean to imply that the specification of i is this simplistic.

[4] The reader should realize that the process of adjustments occurring at the end of each year can be viewed as an annual series of new mortgage loan originations. As such, payments may be modified based on different rates of interest or maturities, with the outstanding loan balance always representing the new amount being borrowed. Hence it is possible for changes in interest rates or maturities to be renegotiated or varied by the lender and borrower at any time to moderate or increase monthly payments.

EXHIBIT 5–1
Payments and Loan Balance Patterns, $60,000 PLAM, 4%, Inflation = 6% per Year, versus $60,000 CPM, 10% Interest, 30 Years



Panel A: Monthly payments

Panel B: Outstanding loan balances ($000s)

10 percent for 30 years. Payments on the FRM would be approximately $527, as compared to the initial PLAM payment of $286. Thus, it would appear that many more households could qualify to purchase housing with PLAMs when compared to CPMs.

The PLAM is not without problems, however. Panel B in Exhibit 5–1 shows that the loan balance on the PLAM increases to about 155 percent of the original loan amount, or from $60,000 to approximately $93,000, after 15 years. Although housing prices have appreciated considerably during the 1960s and 1970s, housing is only one of many components making up the CPI. Hence, should prices of other goods represented in the CPI increase faster than housing prices, indexing loan balances to the CPI could result in loan balances increasing faster than property values. When this occurs, borrowers have an incentive to default. This possibility would place a considerable burden on lenders because now, instead of dealing with inflation and fixed interest rate loans, they would have to establish adequate down payment levels for all borrowers, forecast future housing prices, and be assured that the value of the property that serves as collateral for the mortgage would always be greater than the outstanding loan balance. Hence, it is questionable whether the CPI is the proper index to use when adjusting PLAM balances.

A second problem with PLAMs has to do with the relationship between mortgage payments and borrower incomes. It would appear that the tilt problem, discussed in Chapter 4, would be greatly reduced, because payments would be matched more closely with borrower incomes. However, this assumes that both the CPI, which is used to index the PLAM, and borrower incomes change in the same way. A desired ratio between mortgage payments and borrower incomes may be easy to maintain as long as incomes keep pace with increases in the CPI. Over the long run this relationship may be possible as increases in income and mortgage payments "balance out." However, if inflation increases sharply, it is not likely that borrower incomes would increase at the same rate in the short run. During such periods, the payment burden may increase and households may find it more difficult to make mortgage payments. Because of this possibility and the need to develop a desired relationship to mortgage payments, lenders would have to estimate future income for households in different occupational categories and the relationship of that income to inflation. The problems of rising loan balances and payments just discussed make estimating the risk premium (p) that lenders must charge extremely difficult.

A third problem with PLAMs is that the price level chosen for indexation is usually measured on a historical, or ex post facto, basis. In other words, the index is based on data collected in the *previous period* but published currently. Inasmuch as mortgage payments are to be made in the future, historic prices may not be an accurate indication of future

prices. To illustrate, the change in the CPI may have been 10 percent during the past year (published currently). This figure would be used to index the outstanding mortgage balance, which will determine payments during the *next* year. If the rate of increase in the CPI subsequently slowed to 2 percent during the next year, it is easy to see that mortgage payments would be rising at a faster rate (10 percent) than current prices (2 percent) and, perhaps, faster than borrower incomes. Although borrower incomes may have increased by 10 percent in the previous year, the lag between realization of income in one period and higher payments in the next still presents a problem. This lag problem could become even more distorted in our example if the CPI were to decline and then increase. For this reason, many observers believe that if the PLAM programs were adopted extensively, the time intervals between payment adjustment periods would have to be shortened considerably. This time is called an adjustment interval.

In spite of the practical problems with implementing PLAMs, many PLAM features form the framework for understanding ARMs now being offered in the marketplace and the subject of the remainder of this chapter.

ARMs: An Overview

Rather than using changes in the price level as a mechanism to adjust mortgage interest rates and payments, lenders are choosing a variety of mortgages with *interest rates* that are *indexed to other market interest rates*. By choosing indexes based on interest rates rather than on a price index, lenders partially avoid having to estimate real interest rates and risk premiums for the entire period that loans are expected to be outstanding. With ARMs, lenders are, in effect, making a loan, with terms that are updated to current interest rate levels at the end of each adjustment period. By using an interest rate index instead of an ex post measure of inflation based on the CPI or any other price index, lenders earn expected yields based on *expected future values* for r, p, and f over a future period of time. Because interest rates are a reflection of lender and borrower expectations of r, p, and f over specific future periods of time, revisions of ARMs are always based on future expectations. The terms of a mortgage are tied to an index of such rates and are continuously updated in the market. Hence, an ARM provides for adjustments that are more timely for lenders than a PLAM because values for r, p, and f are revised at *specific* time intervals to reflect market expectations of future values for *each* component of i *between adjustment dates*. For example, the value for f, or expected inflation, is based on an estimate of *future* prices rather than a past measure as exemplified in the CPI or other price indexes. Similarly, values for r and p are based on the market's current assessment of borrower incomes, housing values, and other risks in the prospective economic environment between adjustment dates.

ARM Basics Illustrated

We can begin to illustrate ARM mechanics with a simple example. An ARM for $60,000 with an *initial* interest rate of 10 percent is originated with a term of 30 years, but its payments are to be adjusted at the end of 1 year based on an interest rate determined by a specified index at that time. Based on these initial loan terms, monthly payments would be approximately $527 per month for the first year, and the balance at the end of the year would be $59,666. If the market index were to rise at the end of one year and change the interest rate on the ARM to 12 percent, payments would be determined based on the outstanding loan balance for 29 years as follows:

$$
\begin{aligned}
MP &= \$59{,}666(MLC,\ 12\%,\ 348\text{ mos.}) \\
&= \$59{,}666(.010324) \\
&= \$616\text{ (rounded)}
\end{aligned}
$$

Hence, the new 12 percent interest rate on the ARM at the end of the first year is an updated estimate of the components of i for the *coming year*.

Calculator Solution:

Find New Payments at 12%:

$n = 29 \times 12 = 348$
$i = 12\% \div 12 = 1\%$
$PV = \$59{,}666$
$FV = 0$

Solve for payments:

$PMT = \$616$

At least three general observations should be made concerning our simple example.

1. The use of ARMs does not completely eliminate the possibility of lenders realizing losses because of *interest rate risk*. In our first example, the yield to the lender on the ARM during the first year was 10 percent. If market rates move to 12 percent *the day after* the ARM is originated, the lender would sustain a 2 percent loss for the remaining 12-month period during year one. Obviously, this loss would be eliminated if the adjustment period was reduced to one day, or the loss could be reduced to the extent the adjustment period was less than one year.

2. The longer the payment **adjustment interval**, the greater the interest rate risk to the lender. Hence, the expected yield to the lender on such a mortgage should be greater. This idea will be elaborated later in the chapter.

3. Finally, as the lender assumes *less* interest rate risk, the borrower incurs *more* interest rate risk, depending on the nature of the index chosen and the frequency of payment adjustments. This point can be appreciated if one thinks of a FRM where the lender assumes the full risk of future interest rate changes and compares it to an ARM with payments adjusting freely with market conditions. Clearly, in the latter case the borrower would be assuming more interest rate risk and the lender less. Because the borrower assumes more risk, the *initial interest rate, or start rate,* on an ARM should generally be *less* than that on a FRM. Further, because the lender is shifting interest rate risk to the borrower, the lender should also expect, at the time of loan amortization, to earn a lower yield on an ARM over the term of the loan.

Other ARM Characteristics

The following list contains a description of some of the more important terms used when dealing with adjustable rate mortgages:

- *Index.* The **index** is the interest rate series (such as one from the list below) agreed on by both the borrower and the lender and over which the lender has no control. This index may be very short-term or long-term in nature and will be used to reset the interest rate on an ARM on the the reset date. Some commonly used indexes are:
  —Interest rates on one-year Treasury securities or Treasury indexes with a specific maturity (6 months, 10 years, etc.).
  —The average cost-of-funds index (COFI) for the 11th FHLB District.
  —The London Interbank Offered Rate (LIBOR)—for various loan periods.
- *Margin.* A constant **spread,** or premium in addition to the index chosen for an ARM, is known as the **margin.**

- *Composite rate.* The sum of the interest rate based on the index chosen plus the margin used to establish the new rate of interest for ARMs on each reset date is called the **composite rate.** It can differ from the initial interest rate on the origination date.
- *Expected "start rate."* The **expected start rate** is based on the index chosen plus the margin on the loan closing date. Because the lender is assuming less interest rate risk than the borrower, it will almost always be lower than rates on FRMs.
- *Actual "start rate," or initial interest rate.* The **actual start rate** is determined by competitive market conditions among lenders at the time ARM loan commitments are made. It may be the same as or lower than the expected start rate. When the initial, or actual, start rate is *lower* than the expected start rate, it is sometimes referred to as a "teaser rate."
- *Teaser rate.* When the actual start rate is very low when compared to the expected start rate, this is usually an indication that lenders are actively competing and are willing to offer a lower initial rate of interest **(teaser rate)** in order to attract borrowers. The issue that borrowers must determine is whether they are getting a true discount or whether the lower rate of interest will be deferred interest which will be added to the loan balance.
- *Reset date.* The point in time when mortgage payments will be adjusted is called the **reset date.** This time period is usually six months or one year. However, it could be as long as every three to five years, or it could be as short as one month or less.
- *Negative amortization.* To the extent the interest in a given period exceeds the periodic payment, the difference in interest may be compounded at current rates and added to the outstanding loan balance. When additions to the outstanding loan balance are allowed in the loan agreement, such amounts are referred to as **negative amortization** (see the discussion in the previous chapter).
- *Limitation, or caps.* Maximum increases allowed in payments, interest rates, maturity extensions, and negative amortization (or loan balances) on reset dates are called **caps.**
- *Floors.* Maximum reductions in payments or interest rates on reset dates are called **floors.**
- *Assumability.* The ability of the borrower to allow a subsequent purchaser of a property to assume a loan under the existing terms.
- *Discount points.* As with FRMs, these points or fees are also used with ARMs to increase the lender's yield.
- *Prepayment privilege.* Most *residential* borrowers usually have the option to prepay without penalty. However, because prepayment is a privilege and not a right, lenders may charge penalties if a loan is prepaid within a certain period of time.
- *Conversion option.* The right of an ARM borrower to convert to a FRM. Depending on the agreement, this conversion option may be exercised by the borrower at will or only after a specific period of time. Lenders also may charge a fee for this option.

Clearly many other combinations of the above provisions could be used to allocate interest rate risk between the lender and borrower, depending on borrower qualifications and willingness to assume risk. Space does not allow for an in-depth analysis of all of these combinations. What we will provide, however, is a framework which should provide the necessary tools that can be used to analyze any given set of ARM provisions.

Additional Basic ARM Loans

3/1, 5/1, and 7/1 "Hybrid ARMs"

Another frequently used category of ARMs is sometimes referred to as *hybrid* ARMs. This category combines elements of FRMs for periods of 3, 5, or 7 years, after which interest rates are reset and the loan becomes an ARM. Subsequent payments are usually reset every year for the remaining maturity period. For example, a 3/1 hybrid would mean a three-year fixed rate after which the interest rate would become adjustable, tied or an index, and would be reset each year thereafter. ARM payments on such a loan, with a 30-year maturity and an initial rate of 6 percent, would begin with fully amortizing monthly payments like a FRM made for a period of 30 years. For the first three years, payments would be:

(A) years 1–3:

PV = −$100,000	FV = 0
i = 6%	Solve for payment (PMT):
n = 360	PMT = $599.55

On the reset date at the end of three years, the reset rate would be based on the prevailing index and margin agreed on by borrower and lender. For example, at the end of three years, if the ARM rate has risen to 6.5 percent, payments for the first year thereafter (year 4) would be based on the balance at the end of year 3, or $96,084.

(B) Beginning of year 4:

PV = −$96,084	FV = 0
i = 6.5%	Solve for payment (PMT):
n = 324	PMT = $629.88

In this example, for the first 3 years, payments would be the same as a $100,000 FRM made at 6 percent for 30 years, or $599.55. At the end of three years, the loan balance would be $96,084, the interest rate would be reset at 6.5 percent (assumption), and payments during year 6 would become $629.88. Payments would be recalculated on the reset date every year thereafter.

As discussed above, possible variations on a hybrid loan could consist of the payments in years 1 to 3 being "interest only" with payments beginning in year 4 being based on the ARM index at the end of year 3. Because this ARM variation would be interest only, the loan balance beginning in year 4 would remain at $100,000. Payments beginning in year 4 would be recalculated based on the prevailing interest rate plus amortization of loan principal over 27 years. Payments would then be recalculated on each reset date at the beginning of each of the remaining 27 years.

"Interest Only" Option ARMs

Among the varieties of ARM loans, two forms appear to be gaining more acceptance. The first is the "interest only" option ARM. This ARM requires that the borrower pay interest monthly with the *option* as to the amount of any repayment of principal. Interest payments vary in accordance with the underlying index and margin. For example, a $100,000 ARM with an initial rate of 6 percent for 30 years and a 1 year reset period would require monthly interest only payments as follows:

$$\text{Monthly payment} = \text{Loan amount} \cdot (\text{Interest rate} \div 12)$$
$$= \$100{,}000 \cdot (.06 \div 12)$$
$$= \$500$$

If, at the beginning of the next year (the reset date), the index has increased and the new interest rate becomes 8 percent, the new monthly payment becomes:

$$= \$100{,}000 \cdot (.08 \div 12)$$
$$= \$666.67$$

Note that in both cases, payments are interest only and do not include any amortization of principal. In the event that at the end of year 1, the borrower chose the option to make payments in excess of the interest due, which would fully amortize the loan balance over the remaining 29 years, instead of interest-only payments of $666.67, new payments would be:

PV = −$100,000	FV = 0
n = 29 X 12 = 348	Calculate payments (PMT):
i = 8%	PMT = $739.95

The payment at the beginning of year 2 would be $739.95, of which $73.27 would be applied to reduce principal. When monthly compound interest is applied to $73.27 at 8 percent, the loan amortization for the year is $912.20. (This can be seen by calculating PMT = $73.27, n = 12, i = 8%, and FV = $912.20.) When this amount is subtracted from $100,000, it produces a loan balance at the end of year 2 of $99,087.79. It should be pointed out that with an option ARM, the borrower may choose to change monthly payments frequently throughout the life of the loan. For example, at the end of year 3, the borrower could choose payments to become interest only again. However, the loan agreement also may require that at some point, say after 10 years, interest-only monthly payments must stop and all further payments must begin to include principal so as to fully or partially amortize the loan balance at maturity.

Importance of the "Teaser Rate" on ARMs

As has been pointed out, interest rates and monthly payments on ARMs are reset after expiration of a specific time interval (commonly one year). As has also been pointed out, the interest rate on the reset date will be based on the index chosen by the borrower plus a fixed margin. However, it is important to understand what is referred to as the *"teaser rate."*

The *initial rate of interest* on an ARM is effective on the day that the ARM *closes* and is used to calculate monthly payments during the *first year.* To illustrate: on the date of closing the ARM loan, if one year treasuries are 4 percent and the margin is 2 percent, it would be logical to assume that the expected initial, or start, rate used to compute mortgage payments would be 6 percent. However, the initial rate *does not necessarily* have to be 6 percent. This is because at the point of origination, lenders are free to compete with other lenders by offering borrowers different initial interest rate points, other financing fees, and the like. For this reason, when the initial interest rate quoted on an ARM is *below* the prevailing market index rate plus the margin, it is sometimes referred to as a "teaser rate." Lenders use teaser rates to attract borrowers and compete for business with other lenders. However, the teaser rate will usually prevail only from the date of loan origination until the *first reset date.* On that date, the teaser rate ceases to exist and the interest rate and payments will be calculated based on the prevailing index plus the margin. Interest rates and payments will be reset each year thereafter based on the index plus margin for the remaining life of the loan.

In our example, if we assume that when the ARM is closed, with interest at the prevailing market rate of 6 percent, a teaser rate of 1.5 percent is offered by the lender, monthly payments for the *first year* would be:

Payments Based on Teaser Rate:	
PV = −\$100,000	*FV* = 0
i = 1.5%	Calculate payment (*PMT*):
n = 30 years	*PMT* = \$345.12

This payment is far lower than would be the case if the loan was originated at 6 percent interest. For example, interest-only payments would be \$500 at 6 percent interest. Or, if the payment was based on a fully amortizing 30-year-loan schedule, it would be \$607.32.

The Teaser Rate and the Accrual Rate

Recall in the above example that the teaser rate was set at 1.5 percent when the prevailing rate on one-year treasuries (4 percent) plus the margin would indicate that prevailing interest rates, or expected start rate, should be in the range of 6 percent. It is also possible that the loan agreement may specify that during the first year, interest will *accrue* at 6 percent even though payments may be based on the teaser rate of 1.5 percent. If this is the case, the difference between the teaser rate and the accrual rate will be included in the loan balance with interest. Therefore, on the reset date payments will be based on the outstanding loan balance which will have this difference, plus interest, added to the loan balance (negative amortization).

Step 1: Loan Balance EOY 1:	
PMT = \$345.12	*PV* = −\$100,000
i = 6%	Calculate future value (*FV*):
n = 12 mos.	*FV* = \$101,910.53 (balance)
Step 2: New Payment on Reset Date at 6.5% Interest:	
PV = −\$101,910.53	*FV* = 0
i = 6.5%	Calculate payments (*PMT*):
n = 29 years	*PMT* = \$651.43

Note that if the loan agreement specifies that the difference between what the initial rate on the ARM would have been if payments were based on the market rate of 6 percent (the accrual rate) and the teaser rate of 1.5 percent will be accrued in the loan balance, then the loan balance on the reset date (\$101,910.53) will be greater than the initial amount of the loan (\$100,000.00) because of negative amortization. (This addition to the loan balance may be calculated as the difference in monthly interest accrued at 6 percent, or \$500, less the amount paid, \$345.12, or \$154.88 compounded monthly at 6 percent.) This results in \$1,910.53 being added to the loan balance. This provision may become even more important if the reset date is scheduled for two, three, or more years after the origination date. In this event, the loan balance may increase by an even greater amount because of more accrued interest (negative amortization).

"Payment Shock"

This can occur if large increases in monthly payments occur on the reset date. This can happen when the index to which the ARM interest rate is tied has increased considerably. **Payment shock** can be even more serious for ARMs originated at teaser rates.

In the above example we determined that when the ARM is originated at a 1.5 percent teaser rate, monthly payments are \$345.62. As shown in our example, at the beginning of year 2, payments could increase to \$651.43. This amounts to over an 80 percent increase in monthly payments. An increase of this magnitude is sometimes referred to as payment

shock. Depending on the borrower's income, other assets, and the value of the property on the reset date, this shock could result in financial difficulty and force the borrower to default. *For this reason, use of a very low teaser rate to qualify a borrower based on their current ability to make monthly payments may create future problems when it is time for interest rates to be reset.*

Risk Premiums, Interest Rate Risk, and Default Risk on ARMs

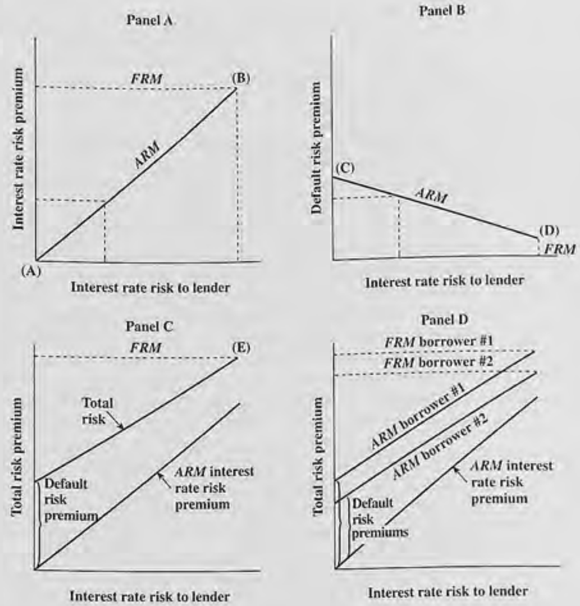
It is very difficult to determine how expected yields will vary among ARMs containing different repayment characteristics. However, for any given class of borrowers, the expected yield (cost) of borrowing with an ARM generally depends on the ARM provisions described in detail earlier: (1) the initial interest rate, (2) the index to which the interest rate is tied, (3) the margin, or spread, over the index chosen for a given ARM, (4) discount points charged at origination, (5) the frequency of payment adjustments, and (6) the inclusion of caps or floors on the interest rate, payments, or loan balances. The loan amount and each of the six characteristics listed will determine the cash outflow or amount loaned, expected monthly payments, and the expected loan balance for an expected time period from which an expected yield (internal rate of return) can be computed. In addition to understanding how each of the above relationships is likely to affect the expected yield (or cost of borrowing), further complications include understanding how combinations of these terms may *interact* over time and possibly amplify or reduce *default risk* to the lender.

While much has been said about benefits to lenders from shifting interest rate risk to borrowers, there are added risks that lenders must assume with ARMs. The combination of the six characteristics also affects default risk either (1) by the ability of the borrower to make mortgage payments or (2) by increasing the loan balance too high in relation to the value of the house, assuming negative amortization is allowed. While we discuss lender underwriting standards used to gauge default risk in more detail in a later chapter, we also want to stress the importance of default risk in our present discussion.

A useful way to approach the relationships between interest rate risk and default risk for an individual and lender is to examine panel A of Exhibit 5–2. The exhibit shows the risk premium (*p*) demanded by the lender on the vertical axis and interest rate risk assumed by the lender on the horizontal axis. Looking at line A–B in the exhibit, we see that as more interest rate risk is assumed by the lender (less by the borrower), the lender will demand a higher risk premium. Hence, the interest rate risk curve is positively sloped. In the extreme, if the lender assumes all interest rate risk (point B) this would be equivalent to the amount of interest rate risk assumed with a FRM. Note that when the lender assumes no interest rate risk, the borrower is assuming all interest rate risk. This is represented by the intersection of the interest rate risk line at the origin of the diagram (point A).

When interest rate risk assumed by the borrower increases (as would be the case with an ARM with *no cap* on payments or the interest rate), *default risk* assumed by the lender increases (see panel B). Default risk is greatest at point C, where there are no restrictions on ARM interest rates or payments, because the borrower faces a greater likelihood that unanticipated changes in interest rates may cause significant increases in payments ("payment shock") relative to income. Hence, the likelihood of default is greater when the borrower assumes all interest rate risk. However, as more interest rate risk is assumed by the lender, we should note in panel B that risk of borrower default declines because payment shock to the borrower is restricted when caps on payments or interest rates are used. In essence, by assuming more interest rate risk, the lender absorbs more shock, thereby reducing *borrower* default risk. This pattern is exhibited in panel B where the default risk curve is shown as negatively related to the risk premium demanded by the lender as interest rate risk to the lender increases. However, the level of default risk never declines below the risk assumed by the lender on a fixed rate mortgage (point D), which is also coincident with the lender's assumption of all interest rate risk (point B in panel A).

EXHIBIT 5–2
The Relationship between Interest Rate Risk, Default Risk, and Risk Premiums



The total risk curve (see panel C of Exhibit 5–2) establishes the risk premium demanded by the lender for both risks (interest rate risk and default risk) assumed under various ARM terms. The total amount of risk assumed by the lender corresponds to various combinations of ARM terms ranging from the assumption of all interest rate risk by the borrower (panel A, point A) to the assumption of all interest rate risk by the lender (panel A, point B) coupled with the amount of default risk incurred by the lender given different levels of interest rate risk (panel B). Hence, panel C shows the total risk premium the lender should earn, given levels of interest rate risk and default risk that correspond to various levels of interest rate risk. However, the total risk premium should not exceed the total premium that would be earned on a FRM (panel C, point E).

Panel D in Exhibit 5–2 shows the relationship between total risk and the risk premium demanded by the lender for *different borrowers*. Note that the amount of *interest rate risk* remains the same for each borrower; however, *default risk* differs. Hence, the premium charged by the lender on ARMs will vary, depending on the amount of default risk being assumed for each borrower, (1) or (2), and how that default risk interacts with expected changes in interest rate risk. We should point out that many other non-interest-rate factors can cause default such as loss of employment, divorce, and so on. We focus here only on how default risk changes with fluctuations in interest rates.

Exhibit 5–2 is appropriate only for specific borrowers, however. To date, the exact relationship between default risk and interest rate risk for many different classes of borrowers has not been studied extensively. Hence, you cannot generalize the example shown to all

borrowers and lenders in the mortgage market. However, it is safe to say that ARM loans will only be made to an individual borrower as long as the expected benefits to the lender from shifting interest rate risk exceed potential default losses. Similarly, as long as a given borrower is willing to undertake interest rate risk in exchange for paying a lower risk premium to a lender, the ARM will be acceptable to the borrower.

While Exhibit 5–2 graphically portrays the risk/return trade-off faced by lenders and borrowers, ARM terms may be structured in many ways to provide a trade-off between interest rate and default risk that is satisfactory to both. These terms could include many possible combinations of initial interest rates, margin, points, the index chosen, frequency of payment adjustments, caps on payments, and so on. We will explore various combinations of ARM terms later in this chapter.

From the above discussion, then, mortgage lending (borrowing) can be viewed as a process of *pricing risk*, with the expected yield being the return received (paid) by lenders (borrowers) for making loans with terms under which lenders and borrowers bear various amounts of risk. The terms utilized in construction of an ARM (e.g., initial rate, index, adjustment period, caps) are simply the "tools" at the disposal of borrowers and lenders to negotiate and allocate the amounts of interest rate and default risk being shared.[5]

Expected Yield Relationships and Interest Rate Risk

While the contracting process used by lenders and borrowers to allocate risk is a complicated one, there are some general relationships regarding interest rate risk and yields that can be employed in this process. The following general relationships regarding interest rate risk may be useful when comparing ARMs with FRMs and comparing ARMs containing different loan provisions with one another. The relationships focus on the effects of interest rate risk on ARM yields, given the conclusion that an ARM will never be made unless the expected benefit to a lender from shifting interest rate risk to a borrower exceeds expected losses from default risk. Proceeding with this assumption when evaluating ARM terms, interest rate risk, and expected yields to lenders, we should consider the following relationships:

1. At the time of origination, the *expected* yield on an ARM should be less than the *expected* yield on a FRM, to the extent that benefits to lenders from shifting interest rate risk exceed increases in default risk to borrowers. Otherwise, the borrower and lender will always prefer a FRM. Coincident with the lower expected ARM yield, the *initial interest rate* on an ARM will *usually* be less than that of a FRM.[6]

2. Adjustable rate mortgages tied to short-term indexes are generally riskier to borrowers than ARMs tied to long-term indexes because the former are generally more variable than long-term interest rates. Therefore, the more risk-averse ARM borrowers will generally prefer ARMs tied to a longer-term index and they should be willing to pay more (a higher risk premium and expected yield to the lender). Less risk averse borrowers will prefer a shorter-term index and will expect to pay less for taking additional interest rate risk. Borrowers who prefer no interest rate risk will choose a fixed rate mortgage and will pay the highest total risk premium to the lender.

[5] If risk could be quantified, or reduced to some unit quantity such as dollars, an agreement could be devised that would specify exactly how much risk was being shared. However, because risk is an abstract concept, this is not possible. This is the reason why borrowers and lenders include various provisions in contracts to share risk under any set of unknown future economic conditions.

[6] Although the initial interest rate on an ARM should generally be less than that of a FRM, in cases where short-term interest rates are greater than long-term rates and an ARM is tied to a short-term rate, it is possible that the initial rate on an ARM may be greater than an initial interest rate on a FRM. However, the *expected yield* on an ARM should be lower because yields are computed to maturity, which includes expected future interest rate patterns.

3. Coincidentally with (2), ARMs with shorter time intervals between adjustments in payments are generally riskier to borrowers than those with longer time periods because, although an ARM may be tied to a short-term index, the adjustment period may not coincide with the index. For example, an ARM may be adjusted every *three* years based on the value of the *one-year* index at the time of adjustment. Hence, the more frequent the adjustment interval, the lower the interest rate risk to lenders because ARM payments will reflect current market conditions irrespective of the index chosen. Borrowers preferring no adjustment in payments will choose FRMs.

4. To the extent ARMs contain maximum caps on interest rate adjustments, the interest rate risk incurred by borrowers will be lower. Hence, the expected yield realized by lenders should be higher than if no restrictions were present. The expected yield will vary with the size of the limitations. When floors are used, the risk to the borrower is greater because of the limit placed on the decline in the interest rate used to compute ARM payments in any given year. Borrowers who prefer certainty in payments and interest rates will choose a FRM, which will always provide the highest *expected* yield to the lender.

5. If an ARM has negative amortization due to a payment cap, then the effect of changes in interest rates will not materially reduce interest rate risk to borrowers or the expected yield to lenders because any interest forgone because of limitations or caps will be deferred and become a part of the loan balance. Any amounts of negative amortization will also accrue compound interest and must be eventually paid by borrowers.

More Complex ARM Features

In the preceding section, we described some general relationships regarding ARM loan terms, risk bearing, and what lenders (borrowers) should expect to yield (pay) over the life of the ARM contract, or repayment period. We must point out, however, that lenders and borrowers also negotiate certain *initial* loan provisions that (1) will be known at the point of origination and (2) will affect expected yields. Once the index frequency of payment adjustments, rates of payments, and negative amortization have been negotiated, the magnitude of the effect on lenders and borrowers will be determined solely by future market conditions. However, the initial terms on ARMs, or the loan amount, maturity, initial interest rate, margin, and discount points, are quantifiable and can be negotiated with complete certainty at the time the loan is made. These initial loan terms will reflect the net effect of (1) the amount of interest rate risk assumed by the lender as determined by the index chosen, adjustment period, any caps or negative amortization, and (2) the amount of default risk assumed by the lender as determined by the amount of interest rate risk shifted to a specific borrower. Exhibit 5–3 contains a summary of hypothetical loan terms being quoted on three ARMs and one FRM.

A careful review of these loans reveals considerable differences in terms. We note that the initial interest rate for ARM I is 8 percent, for ARM II it is 9 percent, and for ARM III it is 11 percent, while the fixed interest rate mortgage is quoted at 14 percent. Why is this?

A quick review of the terms for ARM I shows that it has the same terms (*b*) to (*f*) as ARMs II and III; however, characteristics (*g*) to (*i*) reveal that future payments and interest rates are *unrestricted* since there are no caps on payments or interest rates. These terms may now be compared with ARM II, which has a cap of 7.5 percent between any adjustment period plus a provision for negative amortization. ARM III has an interest rate cap of 2 percent between adjustment periods and 5 percent over the life of the loan. When all three ARMs are compared, it is clear that the borrower is assuming more interest rate risk with ARM I than with any of the other ARMs. Hence, the expected yield on ARM I to the lender should be *less*, when compared with other ARMs, for an otherwise qualified borrower (i.e., a borrower with an acceptable level of default risk under all three ARM choices).

EXHIBIT 5–3
Comparison of Hypothetical Loan Terms

Contents	ARM I	ARM II	ARM III	FRM
(*a*) Initial interest rate, or start rate	8%	9%	11%	14%
(*b*) Loan maturity	30	30	30	30
(*c*) Maturity of instruments making up index	1 year	1 year	1 year	—
(*d*) Percent margin above index	2%	2%	2%	—
(*e*) Adjustment interval, or reset date	1 year	1 year	1 year	—
(*f*) Points	2%	2%	2%	2%
(*g*) Payment cap	None	7.5%	—	—
(*h*) Interest rate cap	None	None	2%, 5%*	—
(*i*) Negative amortization	—	Yes	—	—

*2 percent maximum annual increase, 5 percent total increase over the loan term.

Because the *expected yield* should be *less* for ARM I, the *initial interest rate* will also generally be *lower* than each of the initial rates shown for the other ARM alternatives. Given that all ARMs are tied to the same index and have the same margin and discount points, the only way to "price" ARM I to achieve a lower expected yield is to *reduce* the initial interest rate relative to the other ARMs. ARM I should also have the largest discount, or spread, relative to the interest rate on the FRM. This would be expected because the borrower is bearing all interest rate risk; hence, the lender should expect to earn a lower risk premium and therefore a lower *yield* on ARM I when compared with the FRM (again, default risk is assumed to be acceptable for this borrower if ARM I is made).

Using a lower initial rate as an inducement for borrowers to accept more interest rate risk and unrestricted payments in the future is obviously only one of many combinations of terms that may be used to differentiate ARM I from ARMs II and III and from the FRM. For example, the lender could keep the initial rate on ARM I the same as that offered on ARM II, but reduce the margin on ARM I or charge fewer discount points, or both. Other terms, such as the choice of index, payment adjustment intervals, and so on, could also be varied with these three terms to accomplish the same objectives.

Moving to ARMs II and III in Exhibit 5–3, we note that both have initial interest rates that are greater than the initial rate on ARM I. The interest rate on ARM II is greater than that of ARM I because ARM II has a cap on payments that reduces payment uncertainty for the borrower.

When ARM III is compared to ARMs I and II, the interest rate risk assumed by the lender is clearly greater because payments are limited by interest rate caps. In this case, should market interest rates rise, the interest rate cap would restrict interest payments and not allow the lender to recover any lost interest. When compared with ARMs I and II, ARM III provides that more interest rate risk will be borne by the lender. Hence, it should be originated at a higher initial rate of interest.

Important note should be taken of other possibilities in Exhibit 5–3. If other terms, such as the index and adjustment interval, were to be changed, we would also expect changes in the initial loan terms. Suppose that in ARM I an index based on securities with longer maturities were to be chosen or payment intervals were longer than those shown. We would then expect either or all of the initial rate, index, or points to increase because of lower interest rate risk to the borrower; the risk is less because indexes tied to securities based on longer maturities are not as volatile as those based on shorter maturities. Obviously the same would hold true for the other ARMs if a longer-term index and payment interval were used. Indeed, if such changes were made to the other ARMs, they would become more like a FRM. If longer-term indexes and lower caps were used on ARMs II and III, interest rate risk bearing would become greater for the lender; hence, the expected yield earned by the lender should approach that of a FRM as of the date of origination.

ARM Payment Mechanics

To illustrate how payment adjustments and loan balances are determined over the term for the ARMs in Exhibit 5–3, consider the example of a loan amount of $60,000 with a term of 30 years. We assume that the ARM interest rate will be adjusted annually. Hence, the first adjustment will occur at the beginning of the second year. At that time, the composite rate on the loan will be determined by the index of one-year U.S. Treasury securities, plus a 2 percent margin. If we assume (1) that the index of one-year Treasury securities takes on a pattern of 10, 13, 15, and 10 percent for the *next* four years, based on forward rates in existence at the time each ARM is originated, and (2) that monthly payment and interest rate adjustments are made annually, what would payment adjustments, loan balances, and expected yields be for an ARM with these assumed characteristics?

No Caps or Limitations on Payments or Interest Rates

The first case to consider is ARM I, where payments are unrestricted or allowed to move up or down with the index without limit. What would be the payment pattern on such an ARM given that the expected distribution of future interest rates actually occurred? This unrestricted case, where no limitations apply to payments or interest, is straightforward to deal with.

The first four columns of Exhibit 5–4 contain the data needed for our computations. Note that we assume that the initial interest rate is 8 percent for the first year, but after the first year the index *plus* the 2 percent margin establish what the payment will be. From the beginning of year 2 through the beginning of year 5 the interest rates used to determine payments are 12, 15, 17, and 12, respectively, based on our assumptions. As previously pointed out, ARMs tied to the same index may vary with respect to the initial rate of interest, the margin, and, perhaps, discount points offered by lenders. These components are usually set by competitive conditions in the lending area and are the primary variables (along with caps or other restrictions) with which lenders compete when pricing loans. Lenders have no control over the index and, therefore, must rely on other components with which to compete when pricing the loan.

The payments column of Exhibit 5–4 is based on a series of relatively simple computations. They are carried out as though a new loan is originated at the end of each year based on a new rate of interest, as determined by the index plus the margin, applied to the outstanding loan balance. For example, the initial mortgage payment (MP) is determined as

$$MP = \$60{,}000(MLC,\ 8\%,\ 360\text{ mos.})$$
$$= \$60{,}000(.007338)$$
$$= \$440.28$$

EXHIBIT 5–4
Summary Data and Results: ARM I (unrestricted case)

(1)	(2)		(3)		(4)	(5)	(6)
Year	Index	+	Margin	=	Interest Rate	Payments	Balance†
1					8%*	$440.26	$59,499
2	10%		2%		12	614.25	59,255
3	13		2		15	752.27	59,106
4	15		2		17	846.21	58,990
5	10		2		12	617.60	58,639

*Initial rate.
†Rounded.

The mortgage balance (MB) at the end of the first year will be

$$MB_1 = \$440.28(MPVIFA,\ 8\%,\ 348\text{ mos.})$$
$$= \$59{,}499$$

At the beginning of year 2, payments would be computed based on a new interest rate of 12 percent for the remaining loan term of 348 months. Hence, the new payment would be

$$MP_2 = \$59{,}502(MLC,\ 12\%,\ 348\text{ mos.})$$
$$= \$614.25$$

The mortgage loan balance at the end of the second year would be

$$MB_2 = \$614.30(MPVIFA,\ 12\%,\ 336\text{ mos.})$$
$$= \$59{,}255$$

The process of (1) computing the loan balance, based on the interest rate applicable during the year for which the balance is desired, and (2) computing the new payment, based on any change in the index at the end of the appropriate adjustment interval, would continue after each adjustment interval over the remaining life of the loan.

Calculator Solution:

1st Step: Determine 1st Year Payment:
$n = 30 \times 12 = 360$
$i = 8\% \div 12 = .66666\%$
$PV = \$60{,}000$
$FV = 0$

Solve for payment: $PMT = -\$440.26$

2nd Step: Determine 1st Year MB:
$n = 29 \times 12 = 348$
$i = 8\% \div 12 = .66666\%$
$PMT = -\$440.26$
$FV = 0$

Solve for MB: $PV = \$59{,}499$

3rd Step: Determine 2nd Year Payment:
$n = 29 \times 12 = 348$
$i = 12\% \div 12 = 1\%$
$PV = \$59{,}499$
$FV = 0$

Solve for payment: $PMT = -\$614.25$

4th Step: Determine 2nd Year MB:
$n = 28 \times 12 = 336$
$i = 12\% \div 12 = 1\%$
$PMT = -\$614.25$
$FV = 0$

Solve for MB: $PV = \$59{,}255$

Looking again at Exhibit 5–4, we carry out the computations using the hypothetical interest rate pattern. Assuming no restrictions or caps on interest rates or payments, we see considerable variation in monthly payments. Depending on interest rate changes, payments increase by over 39.5 percent and decline by as much as 27 percent during the first five years. For borrowers who have a strong aversion to interest rate risk and the coincident variability in payments, the unrestricted ARM, tied to a short-term instrument, may not be desirable. One final pattern should be noted in Exhibit 5–4: regardless of the interest rate pattern chosen, the loan is amortizing. The rate of amortization will differ, however, depending on the rate of interest in effect at each adjustment interval.

The default risk associated with ARM I should also be clear from Exhibit 5–4. Note that although the initial payment level is low, the variation in payments over the five-year period is great. Clearly, for a borrower to take this risk, the lender must view the borrower's future income or present and future wealth as sufficient to cover significant changes in monthly payments.

Payment Caps and Negative Amortization

We now consider ARM II where the lender and borrower have agreed that to moderate possible interest rate fluctuations in the future, there will be a payment cap, or a maximum rate at which *payments* can increase between adjustment intervals. This maximum rate of increase will be 7.5 percent per year. In this case, however, any difference between payments and interest that should be earned, based on unrestricted changes in interest rates, will be *added* to the loan balance. As previously discussed, this type of ARM contains both a *payment cap* and *negative amortization*.[7]

Because this ARM allows for a payment cap and negative amortization, the receipt of more cash flow is pushed further into the future than in the unrestricted case. Therefore, interest rate risk to the lender is somewhat greater than with ARM I, so we assume that the initial rate on the mortgage is quoted to be 9 percent while the margin will remain at 2 percent. Exhibit 5–5 contains computations of the payment and loan balance patterns for the ARM just described. As shown in the exhibit, based on an unrestricted change in our hypothetical pattern of interest rates, monthly payments in the second year would be \$615.18, or 27.4 percent higher than the \$482.77 payment required during the first year. A payment of \$615.18 would obviously be greater than the 7.5 percent maximum allowable increase; hence, the payment would be capped at \$518.98, or 7.5 percent more than \$482.77. However, *because this ARM requires negative amortization*, the difference between interest charged during year 2, or 12 percent, and the amount actually paid will be added to the outstanding loan balance plus compound interest.

Negative amortization is computed by using the method shown for the GPM in Chapter 4. Exhibit 5–5 contains a breakdown of interest and amortization for ARM II. Note that during the first year when loan payments are computed at 9 percent interest, monthly amortization occurs and the loan balance is reduced. After the first year, monthly payments must be computed *first* based on the unrestricted interest rate (column 3) to determine whether payments will increase at a rate greater than 7.5 percent. If uncapped payments would exceed 7.5 percent, then the payment cap (column 4) becomes operative and actual payments will be restricted to a 7.5 percent increase. The monthly interest that is *accruing* on the loan balance at the unrestricted rate is (.12 ÷ 12)\$59,590 = \$595.90 (column 6). However, the payment that will actually be made is \$518.98. The difference, \$76.92 (column 7), must be added to the loan balance with compound interest. Hence, the difference in year 2, \$76.92 per month, is compounded at 1 percent per month (column 8) resulting in an increase of \$975.54 in the loan balance.[8]

[7] Most residential ARM programs do not include negative amortization. However, we include this example to illustrate how mortgage payment mechanics can be modified to include negative amortization when necessary.

EXHIBIT 5–5
Determination of Payment Limits (negative amortization: ARM II, with payment cap = 7.5 percent annually)

(1) Beginning of Year	(2) Balance (rounded)	(3) Uncapped Payment	(4) Payment Capped at 7.5 Percent
1	\$60,000	\$482.77	\$482.77
2	59,590	615.18	518.98
3	60,566	768.91	557.90
4	63,128	903.79	599.74
5	66,952	700.96	644.72

(5) Monthly Interest Rate	(6) Monthly Interest (5) × (2)	(7) Monthly Amortization (4) − (6)	(8) MFVIFA@ monthly rate from (5)	(9) Annual Amortization (7) × (8)
.09 ÷ 12	\$450.00	\$32.77	12.507596	\$409.87
.12 ÷ 12	595.90	(76.92)	12.682503	(975.54)
.15 ÷ 12	757.08	(199.18)	12.860378	(2,561.53)
.17 ÷ 12	894.31	(294.57)	12.980582	(3,823.69)
.12 ÷ 12	669.52	(24.80)	12.682503	(314.53)

Payments in the third year of the ARM are determined by again establishing whether uncapped payments would increase by more than 7.5 percent. To determine this, we find that the loan balance, which includes the previous year's negative amortization, is \$59,590 + \$975.54 = \$60,566 (rounded). The *unrestricted* interest rate of 15 percent for the remaining 336 months is used to compute the uncapped payment. Uncapped payments based on the unrestricted rate of 15 percent would be \$768.91. This is a 48 percent increase from \$518.98; hence, the payment will again be capped at a 7.5 percent increase, and negative amortization will be computed on the interest shortfall, compounded at 15 percent monthly, and added to the loan balance. This process is repeated for each adjustment interval over the life of the loan.[9] Actual loan balances with payments capped at 7.5 percent are shown in Exhibit 5–6.

Another observation regarding ARM II (see Exhibit 5–5) has to do with the increase in both the payment and loan balance during year 5 even though there is a significant decline in the interest index from 17 to 12 percent. This occurs because the loan balance has increased, due to past negative amortization, to \$66,952 at the end of year 4. Even though the interest rate declines to 12 percent, monthly interest will be \$669.52, which is in excess of the maximum 7.5 percent increase from the \$599.74 payment in the preceding year. Hence, payments would increase by 7.5 percent, even though interest rates have declined.

An *alternative* method that may be used to find loan balances for the ARM illustrated in Exhibits 5–5 and 5–6 is shown in the calculator sequence described below. Note in step 2 that even though payments due in year 2 have been increased by 7.5 percent to \$518.98, they remain lower than interest due which is \$595.90 (the accrued rate of 12% ÷ 12, or 1%

[8] Using a calculator: PMT = \$76.92, i = 12% ÷ 12, n = 12, FV = \$975.54

[9] ARMs with negative amortization provisions usually limit increases in the loan balance during the life of the loan because it is possible for the loan balance to increase to a level that exceeds the value of the property serving as security for the loan. Consequently, lenders and borrowers must agree that if a prespecified maximum is reached, the lender must either forgo further accumulation of interest in the loan balance or require that monthly payments be increased at that time.

EXHIBIT 5–6
ARM II: Loan Balances When Payments Are Capped at 7.5 Percent Annually (negative amortization allowed)

Year	Index	Margin	Interest Rate	Beginning of Year Balances	Payments	Less: Annual Amortization	End of Year Loan Balances
1	—	—	9%*	$60,000	$482.77	409.87	$59,590
2	10%	2%	12	59,590	518.98	(975.54)	60,566
3	13	2	15	60,566	557.90	(2,561.53)	63,128
4	15	2	17	63,128	599.74	(3,823.69)	66,952
5	10	2	12	66,952	644.72	(314.53)	67,267

*Origination rate.

* $59,590.08). Furthermore, when the interest rate of 12 percent is used for *i* in the calculator sequence and the future value (*FV*) is solved for, the loan balance increases to $60,566 (rounded). When compared to the loan balance of $59,590 at the end of year 1, negative amortization of $975 (rounded) has occurred. This coincides with the amount shown in Exhibit 5–5 (column 9) during year 2 and consists of $76.92 per month compounded at a monthly rate of 12 percent (or 12% ÷ 12 = .01). The reader should read both Exhibits 5–5 and 5–6 and review the process involved to better understand results from the alternative calculator solution shown below.

Alternative Calculator Solution for Determining Loan Balances and Negative Amortization for ARM in Exhibits 5–5 and 5–6:

Step 1: Determine First Year Payment:

PV = $60,000
$n = 30 \times 12 = 360$
i = 9%/12 = .750%
$FV = 0$

Solve for payment (PMT):

PMT = $482.77

Step 2: Determine Balance at End of First Year:

PV = $60,000 (from above)
PMT = $482.77 (from above)
i = 9%/12 = .750% (from above)
$n = 1 \times 12 = 12$

Solve for future value (FV):

FV = $59,590.08

Step 3: Determine Payment for Second Year:

PMT = $482.77 × 1.075 = $518.98

Step 4: Determine Balance at End of Second Year:

PV = $59,590.08 (balance at end of first year calculated above)
PMT = $518.98 (from above)
i = 12%/12 = 1%
$n = 1 \times 12 = 12$

Solve for future value (FV):

FV = $60,565.61

Repeat steps 2 through 4 for remaining years.

Interest Rate Caps

The final case that we consider with ARMs is a common pattern in which interest rates are capped or limited (see Exhibit 5–7). In ARM III, the increase in interest rates is limited to 2 percent during any one adjustment interval (year in our example) and to a *total* of 5 percent over the life of the loan. If interest rates ever exceed these caps, payments are limited. Hence, the interest rate cap also acts as a payment cap because the maximum increase in interest rate determines the maximum increase in mortgage payments. This means that if the index plus the margin exceeds these caps, the lender will lose any amount of interest above the capped rates.[10] Exhibit 5–7 illustrates the payment mechanics of ARM III, where the interest rate quoted at origination, 11 percent, is higher than it is with ARMs I and II because the latter two have unrestricted interest rates while ARM III has interest rate caps. Therefore, the lender is taking more interest rate risk with ARM III because of the possibility that the cap will be exceeded and interest will be lost. To compensate for this possibility, the lender will charge a higher initial interest rate and should expect to earn a higher expected yield.

The payment patterns shown in Exhibit 5–7 are determined from the loan balance established at the end of each adjustment interval. Payments are then computed based on the indicated rate of interest for the remaining term. Results of computations show that, compared with ARM I (the unrestricted case), payments on ARM III are higher initially, and then remain generally lower than payments on ARM I for the remaining term. Hence, borrowers would have to have more income to qualify for ARM III and default risk to the lender should be lower. The loan balances for both ARMs are about the same in year 5. ARM III payments begin at a higher level than those of ARM II, because of the higher initial rate of interest, and remain higher over the term of the loan. However, because of negative amortization, loan balances over time for ARM II are significantly higher than for ARM III.

Expected Yields on ARMs: A Comparison

In the preceding sections, we examined three kinds of ARMs with provisions commonly used in real estate lending. Other considerations are also important to lenders and borrowers. One important issue is the *yield* to lenders, or *cost* to borrowers, for each category of loan. Given the changes in interest rates, payments, and loan balances, it is not obvious what these yields (costs) will be.

Computing Yields on ARMs

To compare yields on ARMs, the yield (cost) to the lender (borrower) must be computed for each alternative by solving for the internal rate of return, or the rate of discount. This

EXHIBIT 5–7
Summary Data and Results: ARM III Interest Rates Capped at 2 Percent, 5 Percent (no negative amortization allowed)

Year	Index + Margin	Capped Interest Rate	Payments	Balance
1		11%	$571.39	$59,730
2	12%	12	616.63	59,485
3	15	14	708.37	59,301
4	17	16	801.65	59,159
5	12	12	619.37	58,807

[10] In many cases, ARMs may contain floors as well as a cap. In our example, this would mean that a maximum reduction of 2 percent in the mortgage rate would be allowed, regardless of the decline in the index. These floors have limited effectiveness, however, because if a significant decline in the index occurs and the loan agreement allows for prepayment, borrowers may refinance with a new mortgage loan at a rate that is lower than the floor would allow.

rate makes the present value of all expected mortgage payments and the loan balance in the year of repayment equal to the initial loan amount less discount points (or $58,800) for each alternative. To illustrate, consider the case of the *unrestricted* ARM I which is paid off in year 5. Using data from Exhibit 5–4, we compute the internal rate of return (or yield) as shown in Exhibit 5–8.

From the computations shown in Exhibit 5–8, we see that the solution is approximately 13.0 percent.[11] This means that even though the *initial* rate of interest was 8 percent and the forward rates of interest are expected to range from 8 to 17 percent over the five-year period, the *expected* yield (cost) is 13.0 percent. Hence, by computing the internal rate of return we have a result that can be compared among alternative ARMs.

Before comparing results for each ARM considered, we examine the computational procedure used in Exhibit 5–8. Essentially, we are discounting a series of grouped cash flows. In the present case, we are dealing with five groups of monthly cash flows and a single receipt (the loan balance). Note that we discount each group of monthly cash flows by using the present value of a monthly annuity factor of 13 percent (column 3). However, this procedure gives us a present value for a *one-year group* of 12 monthly payments and does not take into account that the cash flows occurring from years 2 through 5 are not received during year 1. Hence, each of the grouped cash flows must be discounted again by the present value of $1 factor to recognize that the present value of each group of cash flows is not received at the same time. This is carried out in column 4. The loan balance, or $58,639, is then discounted as a lump sum.

Summary Observations: ARMs, Borrower, Lender, and Market Behavior

Recalling the graphic analysis of the risk premium and the relationship between interest rate and default risk in Exhibit 5–2, we now show how risk premiums demanded for ARMs I to III would fall on the total risk curve in Exhibit 5–9. This diagram basically indicates that in moving from ARM I to ARM III, interest rate risk to the lender increases. However, based on panel B in Exhibit 5–2, we recall that as interest rate risk increases to the lender, default risk for a specific borrower declines due to interest rate changes. Following the market rule that benefits to the lender (from shifting interest rate risk to the borrower) *must exceed* expected default risk for the ARM to be originated, we see in Exhibit 5–9 that the total risk premium, and hence the expected yield to the lender, increases as we move from ARM I to ARM III. All expected ARM yields remain below that of the FRM, as they should.

We also know that, in general, the initial interest rate and expected yield for all ARMs should be lower than that of a FRM on the day of origination. The extent to which the initial rate and expected yield on an ARM will be lower than that on a FRM or another ARM depends on the terms relative to payments, caps, and so on. Terms that are more unrestricted and shift more interest rate risk to the borrower will generally have initial interest rates that are discounted furthest from FRMs. They will also be discounted from ARMs containing caps on payment and interest rate increases. Hence, when a borrower is faced with selecting from a given set of ARMs with different terms

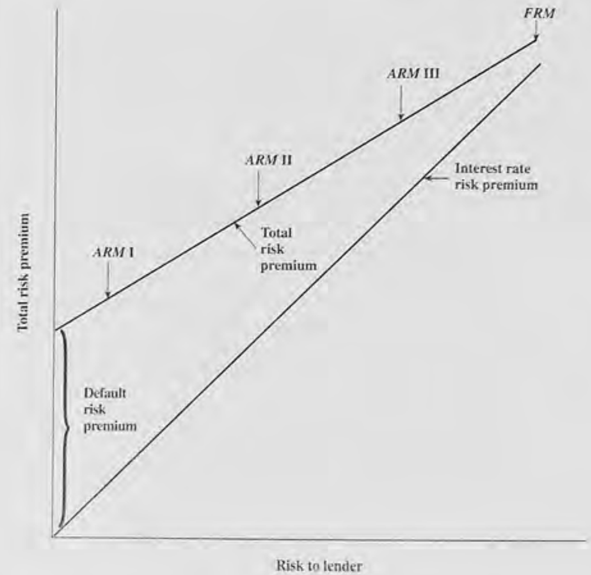
EXHIBIT 5–8
Computing the IRR for an Unrestricted ARM, Payoff at End of Year 5

(1) Year	(2) Monthly Payments		(3) *MPVIFA,* 13%, 12 Months		(4) *MPVIF,* 13%, Years 1–5		(5) *PV*
1	$440.28	×	11.196042	×	—	=	$4,929.39
2	614.30	×	11.196042	×	.878710	=	6,043.53
3	752.27	×	11.196042	×	.772130	=	6,503.22
4	846.21	×	11.196042	×	.678478	=	6,428.04
5	617.60	×	11.196042	×	.596185	=	4,122.43
5	$58,639.00	×	—	×	.523874	=	30,719.45
							$58,746.06*

*Desired *PV* = $58,800; *IRR* approximately 13 percent.

[11] Using a financial calculator yields a solution of 13.0 percent. We will rely on this result in our discussion.

EXHIBIT 5–9
Ranking ARMs Based on Total Risk



Web App

Many lenders offer mortgage rate information online. Use a search engine like **www.Yahoo.com** or **www.google.com** to find a lender offering an adjustable rate mortgage (ARM). Find out as many things as you can about how the mortgage works, e.g., what is the initial rate? What index is used for the adjustments? What is the margin over the index? How often does it adjust? What is the term of the loan? Are there any caps or floors on the loan? How does the rate on the ARM compare to the rate for a fixed rate mortgage? Which would you choose?

and expectations of forward interest rates, an expected yield must be calculated before a comparison among adjustable rate mortgages and a fixed rate mortgage can be accomplished. While there is no guarantee that the *expected* yield calculated at origination will be the actual yield or cost of funds over the term of the ARM, the expected yield represents the *best estimate* of the cost of an ARM based on information available at the time of origination.

The Flexible Payment Option ARM

This ARM combines many of the features that have been covered thus far into one instrument, and it is probably the most complex ARM available to borrowers. A list of the features and observations regarding **option ARMs** includes the following:

1. The initial rate is usually a teaser rate, or one that is far below the expected initial rate. This is used to reduce the initial monthly payment.
2. During the second month, the rate typically adjusts to the fully indexed rate (i.e., the rate determined by the index, plus the margin).
3. The ARM rate adjusts each month thereafter with no monthly limits on the increase. However, there are usually maximums, or caps, on the maximum total increase over the life of the loan.
4. Regardless of changes in interest rates, payment adjustments occur annually and increases are usually capped at 7.5 percent per year for a period of up to five years.
5. Differences between payments and interest accruals are treated as negative amortization and added to the loan balance. Loan balance limits are usually handled in two ways:
   a. Caps. Loan balances cannot exceed 110 percent to 125 percent (negotiated) of the amount borrowed. When the specific cap limit is reached, payments must increase and include enough principal reduction to fully repay the loan at maturity.
   b. Conversion to full amortization. In some cases, at the end of 5 or 10 years, monthly payments will be adjusted to whatever level is required to fully amortize the loan balance over the remaining loan term.

Conclusion

In this chapter, we have shown how mortgage loan terms can be modified to incorporate variable interest rates. Loans with adjustable interest rates become necessary from time to time, depending on the rate of economic expansion and expected rates of inflation. In many situations, when the expected rate of inflation accelerates and becomes more uncertain, questions arise as to whether borrowers or lenders will bear the risk of future interest rate changes. During these times, fixed interest rate lending becomes very costly to borrowers because fixed interest rates and mortgage payments increase at a greater rate than borrower incomes. This imbalance between loan payments and borrower incomes motivates both borrowers and lenders to seek ways to modify loan agreements so that real estate purchases can be financed at loan payment levels that are commensurate with current borrower incomes. ARM loans provide one solution to the imbalance problem. Through a variety of options, including the benchmark index chosen for ARM interest rates, the volatility of the index, frequency of payment adjustment, annual and over-the-loan life interest rate caps, and negative amortization and other features, lenders and borrowers can negotiate loans and payment structures that result in interest rate risk-sharing agreements that are satisfactory to all parties.

Key Terms

adjustable rate mortgage (ARM), *112*
adjustment interval, *118*
caps, *119*
composite rate, *119*
expected start rate, *119*
floors, and actual *119*
index, *118*
interest rate risk, *112*
margin, *118*
negative amortization, *119*
option ARMs, *136*
payment shock, *122*
price level adjusted mortgage (PLAM), *114*
reset date, *119*
spread, *118*
tesser rate, *119*
unanticipated inflation, *113*

Useful Web Sites

www.homeadvisor.msn.com/financing/guides/arms.asp—This site is provided by MSN. It gives information on adjustable rate mortgages and compares them to fixed rate mortgages.

www.hud.gov—Department of Housing and Urban Development

www.va.gov—Veterans Association Web site

www.freddiemac.com—Federal Home Loan Mortgage Corporation

www.mbaa.org—Mortgage Bankers Association of America

www.aba.com—America Banker Association

www.pueblo.gsa.gov/cic_text/housing/handbook/handbook.txt—Provided by U.S. Federal Reserve's Office of Thrift Supervision. Answers frequently asked questions about Adjustable Rate Mortgages, describes how ARMs work, and provides a means of comparing two different loans.

www.fanniemae.com/homebuyers/homepath/—Provided by Fannie Mae. Information, tools, and resources for consumers on getting a mortgage, buying, or refinancing a home.

http://www.freddiemac.com/pmms/pmmsarm.htm—This is a good site for finding Monthly Average Commitment Rate And Points On 1-Year Adjustable-Rate Mortgage.

Questions

1. In the previous chapter, significant problems about the ability of borrowers to meet mortgage payments and the evolution of fixed interest rate mortgages with various payment patterns were discussed. Why didn't this evolution address problems faced by lenders? What have lenders done in recent years to overcome these problems?
2. How do inflationary expectations influence interest rates on mortgage loans?
3. How does the price level adjusted mortgage (PLAM) address the problem of uncertainty in inflationary expectations? What are some of the practical limitations in implementing a PLAM program?
4. Why do adjustable rate mortgages (ARMs) seem to be a more suitable alternative for mortgage lending than PLAMs?
5. List each of the main terms likely to be negotiated in an ARM. What does pricing an ARM using these terms mean?
6. What is the difference between interest rate risk and default risk? How do combinations of terms in ARMs affect the allocation of risk between borrowers and lenders?
7. Which of the following two ARMs is likely to be priced higher [illegible] ARM A has a margin of 2 percent and is tied to [illegible] payments adjustable every two years; payments cannot increase by more than 10 percent from the preceding period; the term is 30 years and no assumption or points will be allowed. [illegible] a margin of 3 percent and is tied to a one-year index with payments adjusted each year; payments cannot increase by more than 10 percent from the preceding period; the term is 30 years and no assumption or points are allowed.
8. What are forward rates of interest? How are they determined? What do they have to do with indexes used to adjust ARM payments?
9. Distinguish between the initial rate of interest and expected yield on an ARM. What is the general relationship between the two? How do they generally reflect ARM terms?
10. If an ARM is priced with an initial interest rate of 8 percent and a margin of 2 percent (when the ARM index is also 8 percent at origination) and a fixed rate mortgage (FRM) with constant payment is available at 11 percent, what does this imply about inflation and the forward rates in the yield curve at the time of origination? What is implied if a FRM were available at 10 percent? 12 percent?

Problems

1. A price level adjusted mortgage (PLAM) is made with the following terms:

   Amount = $95,000

   Initial interest rate = 4 percent

   Term = 30 years

   Points = 6 percent

   Payments to be adjusted at the beginning of each year.

   Assuming inflation is expected to increase at the rate of 6 percent per year for the next five years:

   a. Compute the payments at the beginning of each year (*BOY*).

   b. What is the loan balance at the end of the fifth year?

   c. What is the yield to the lender on such a mortgage?

2. A basic ARM is made for $200,000 at an initial interest rate of 6 percent for 30 years with an annual reset date. The borrower believes that the interest rate at beginning of year (*BOY*) 2 will increase to 7 percent.

   a. Assuming that a fully amortizing loan is made, what will monthly payments be during year 1?

   b. Based on (*a*) what will the loan balance be at the end of year (*EOY*) 1?

   c. Given that the interest rate is expected to be 7 percent at the beginning of year two, what will monthly payments be during year 2?

   d. What will be the loan balance at the *EOY* 2?

   e. What would be the monthly payments in year 1 if they are to be interest only?

   f. Assuming terms in (*e*), what would monthly interest-only payments be in year 2?

3. A 3/1 hybrid ARM is made for $150,000 at 7 percent with a 30-year maturity.

   a. Assuming that fixed payments are to be made monthly for three years and that the loan is fully amortizing, what would be the monthly payments? What will be the loan balance after three years?

   b. What would new payments be beginning in year 4 if the interest rate fell to 6 percent and the loan continued to be fully amortizing?

   c. In (*a*) what would monthly payments be during year 1 if they were interest only? What would payments be beginning in year 4 if interest rates fell to 6 percent and the loan became fully amortizing?

4. An ARM for $100,000 is made at a time when the expected start rate is 5 percent. The loan will be made with a teaser rate of 2 percent, for the first year, after which the rate will be reset. The loan is fully amortizing, has a maturity of 25 years and payments will be made monthly.

   a. What will be the payments during the first year?

   b. Assuming that the reset rate is 6 percent at the beginning of year (*BOY*) 2, what will payments be?

   c. By what percentage will monthly payments increase?

   d. What if the reset date is three years after loan origination and the reset rate is 6 percent, what will loan payments be beginning in year 4 through year 25?

5. An option ARM is made for $200,000 for 30 years. The start rate is 5 percent and the borrower has the option to (1) make monthly interest-only payments or (2) increase payments to pay down loan principal at any time. However, after the 10th year the loan payments must be sufficient to fully amortize the loan at maturity.

   a. If the borrower makes interest-only payments for the first year, what will payments be?

   b. If at the beginning of year (*BOY*) 2 the reset rate remains at 5 percent and the borrower decides to increase monthly payments by $50 for the entire year, what will payments be? What will the loan balance be at the end of year (*EOY*) 2?

   c. What if at the beginning of year 3, the reset rate is 6 percent and the borrower decides to make payments for the remaining 28 years so as to fully amortize the loan. What will payments be?

6. A borrower has been analyzing different adjustable rate mortgage (ARM) alternatives for the purchase of his new home. The borrower anticipates owning the home for five years. The lender first offers a $150,000, 30-year ARM with the following terms:

   Initial interest rate = 6 percent

   Index = 1-year Treasuries

   Payments adjusted each year

   Margin = 2 percent

   Interest rate cap = None

   Payment cap = None

   Negative amortization = Not allowed

   Discount points = 2 percent

   Based on estimated forward rates, the index to which the ARM is tied is forecasted as follows: Beginning of year *BOY* 2 = 7 percent; *BOY* 3 = 8.5 percent; *BOY* 4 = 9.5 percent; *BOY* 5 = 11percent.

   Compute the payments, loan balances, and yield for the unrestricted ARM for the five-year period.

7. Refer to problem 2. As a second ARM alternative, assume the borrower can borrow $150,000 for 30 years with the following terms:

   Initial interest rate = 7 percent

   Index = 1-year Treasuries

   Payments adjusted each year

   Margin = 2 percent

   Interest rate cap = None

   Payment cap = 5 percent increase in any year

   Negative amortization = Yes

   Discount points = 2 percent

   Based on estimated forward rates, the index to which the ARM is tied is forecasted as follows: Beginning of year *BOY* 2 = 7 percent; *BOY* 3 = 8.5 percent; *BOY* 4 = 9.5 percent; *BOY* 5 = 11 percent.

   Compute the payments, loan balances, and yield for the ARM for the five-year period.

8. Refer to problem 2. Assume that a lender offers a 30-year, $150,000 adjustable rate mortgage with the following terms:

   Initial interest rate = 7.5 percent

   Index = 1-year Treasuries

   Payments adjusted each year

   Margin = 2 percent

   Interest rate cap = 1 percent annually; 3 percent lifetime

   Discount points = 2 percent

   Based on estimated forward rates, the index to which the ARM is tied is forecasted as follows: Beginning of year *BOY* 2 = 7 percent; *BOY* 3 = 8.5 percent; *BOY* 4 = 9.5 percent; *BOY* 5 = 11 percent.

   Compute the payments, loan balances, and yield for the ARM for the five-year period.

9. MakeNu Mortgage Company is offering home buyers a new mortgage instrument called the Stable Home Mortgage. This mortgage is composed of both a fixed rate and an adjustable rate component. Mrs. Maria Perez is interested in financing the purchase of a new home. The home, which costs $100,000, is to be financed by Stable Home Mortgages (SHM) on the following terms:

   a. The SHM requires a 5 percent down payment, costs the borrower 2 discount points, and allows 75 percent of the mortgage to be fixed and 25 percent to be adjustable. The fixed portion of the loan is for 30 years at an annual interest rate of 10.5 percent. Having neither an interest rate nor payment cap, the adjustable portion is also for 30 years with the following terms:

Initial interest rate = 9 percent
Index = 1-year Treasuries
Payments adjusted each year
Margin = 2 percent
Interest rate cap = None
Payment cap = None

The projected one-year U.S. Treasury-bill index, to which the ARM is tied, is as follows: *BOY* 2 = 10 percent; *BOY* 3 = 11 percent; *BOY* 4 = 8 percent; *BOY* 5 = 12 percent.

Calculate Mrs. Perez's total monthly payments and end-of-year loan balances for the first five years. Calculate the lender's yield, assuming Mrs. Perez repays the loan after five years.

b. Repeat part (*a*) under the assumption that the initial interest rate is 9.5 percent and there is an annual interest rate cap of 1 percent.

10. A mortgage loan is made for $100,000 for a 30-year period at 12 percent interest. The borrower and lender have negotiated a monthly payment of $800.
    a. What will be the loan balance at the end of year 5? Year 30?
    b. How much interest will be paid and accrued as negative amortization in year 1? Year 5?
11. **Excel.** Refer to the "Ch5 ARM No Caps" tab in the Excel template. Suppose the index goes to 18 percent in year 5. What is the effective cost of the unrestricted ARM?
12. **Excel.** Refer to the "Ch5 ARM Int Cap" tab in the Excel template. Suppose the index goes to 18 percent in year 5. What is the effective cost of this ARM? What cap affected the rate in year 5?
13. **Excel.** Refer to the "Ch5 ARM Pmt Cap" tab in the Excel template. Suppose the index goes to 18 percent in year 5. What is the effective cost of the ARM? Does the payment cap keep the effective cost from rising?

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Chapter 6

Residential Financial Analysis

In previous chapters, we have considered the analytics of various types of mortgages used in real estate finance. This chapter extends those concepts to various questions related to the financing of owner-occupied residential properties. Questions raised include how to compare two loans with different loan terms (e.g., amount of loan, interest rate), how to decide whether to refinance or prepay a loan, and whether a loan assumption is desirable. We will also evaluate the effect of below-market financing on the sale price of a house. This is important because one must often pay a higher price for a home that appears to have favorable financing.

Incremental Borrowing Cost

We begin by considering how to evaluate two loan alternatives where one alternative involves borrowing additional funds relative to the other. For example, assume a borrower is purchasing a property for $100,000 and faces two possible loan alternatives. A lender is willing to make an 80 percent first mortgage loan, or $80,000, for 25 years at 12 percent interest. The same lender is also willing to lend 90 percent, or $90,000, for 25 years at 13 percent. Both loans will have fixed interest rates and constant payment mortgages. How should the borrower compare these alternatives?

To analyze this problem, emphasis should be placed on a basic concept called the **marginal,** or **incremental, cost of borrowing.** Based on the material presented in earlier chapters, we know how to compute the effective cost of borrowing for one specific loan. However, it is equally important in real estate finance to be able to compare financing alternatives whereby the borrower can finance the purchase of real estate in more than one way or under different lending terms.

In the problem at hand, we are considering differences in the amount of the loan and the interest rate. A loan can be made for $80,000 for 25 years at 12 percent, or $90,000 can be borrowed for 25 years at 13 percent interest. Because there are no origination fees, we know from Chapter 4 that the effective interest cost for the two loans will be 12 percent and 13 percent, respectively. However, an important cost that the borrower should compute is the cost to acquire the incremental or additional $10,000, should he choose to take the $90,000 loan over the $80,000 loan. At first glance, you may think that because the interest rate on the $90,000 loan is 13 percent, the cost of acquiring the additional $10,000 is also 13 percent. This is *not* so. Careful analysis of the two loans reveals that if the borrower wants to borrow the additional $10,000 available with the $90,000 loan at 13 percent, he or she also must pay an *additional* 1 percent interest on the first $80,000 borrowed. This increases the cost of obtaining the additional $10,000 considerably. The $90,000 loan has a larger payment due not only to the additional $10,000 being borrowed but also to the higher interest rate being charged on the entire amount. To determine the cost of the additional $10,000, we must consider how much the additional payment will be on the $90,000 loan compared with the $80,000 loan.[1] This difference should then be compared with the additional $10,000 borrowed. This can be done as follows:[2]

	Loan Amount		Loan Constant		Monthly Payments
Alt. II at 13%	$90,000	×	.0112784	=	$1,015.05
Alt. I at 12%	80,000	×	.0105322	=	842.58
Difference	$10,000		Difference		$ 172.47

We want to find the annual rate of interest, compounded monthly, that makes the present value of the difference in mortgage payments, or $172.47, equal to $10,000, or the incremental amount of loan proceeds received. As previously discussed, one approach is to solve directly for the interest factor. We have

$172.47(*MPVIFA*, ?%, 25 yrs.) = $10,000

Calculator Solution:

$n = 25 \times 12 = 300$
$PV = -\$10{,}000$
$PMT = \$172.47$
$FV = 0$

Solve for incremental cost of borrowing:
$i = 20.57\%$ (annual)

A financial calculator indicates that the answer is 20.57 percent. Hence, if our borrower desires to borrow the additional $10,000 with the $90,000 loan, the cost of doing so will be more than 20 percent, a rate considerably higher than 13 percent. This cost is referred to as the marginal, or incremental, cost of borrowing. The 13 percent rate on the $90,000 loan can be thought of as a weighted average of the 12 percent rate on the $80,000 loan and the 20.57 percent rate on the additional $10,000. That is,

$$\left[\frac{80{,}000}{90{,}000}\times 12\%\right]+\left[\frac{10{,}000}{90{,}000}\times 20.57\%\right]= 12.95\% \text{ or } 13\% \text{ (rounded)}$$

The borrower must consider this cost when evaluating whether the additional $10,000 should be borrowed. If the borrower has sufficient funds so that the $10,000 would not have to be borrowed, it tells the borrower what rate of interest must be earned on funds *not* invested in a property because of the larger amount borrowed. In other words, by obtaining a larger loan ($90,000 versus $80,000), the borrower's down payment will be $10,000 less

[1] Although we use an $80,000 and a $90,000 loan in our example, the calculation can be generalized to other loans that are the same percentage of the property value.

[2] Payments may differ slightly using a financial calculator due to rounding.

than it would have been on the $80,000 loan. Hence, unless the borrower can earn 20.57 percent interest or more on a $10,000 investment of equal risk on funds not invested in the property, he or she would be better off with the smaller loan of $80,000.

If the borrower does not have enough funds for a down payment on the $80,000 loan and needs to borrow $90,000, the incremental borrowing cost indicates the cost of obtaining the extra $10,000 by obtaining a larger first mortgage. There may be alternative ways of obtaining the extra $10,000. For example, if the borrower could obtain a second mortgage for $10,000 at a rate *less* than 20.57 percent, this may be a better alternative than a 90 percent loan.[3] Therefore, the marginal cost concept is also an *opportunity cost* concept in that it tells the borrower the minimum rate of interest that must be earned, or the maximum amount that should be paid, on any additional amounts borrowed.

It should be noted that the 20.57 percent figure we calculated also represents the *return* that the lender earns on the additional $10,000 loaned to the borrower; that is, the *cost* of a loan to the borrower will reflect the *return* on the loan to the lender. Of course, keep in mind that the figures we are calculating do not take federal income tax considerations into account, which are also important in determining returns and costs (see the appendix to this chapter). For example, if the borrower is in a higher tax bracket than the lender, the after-tax cost to the borrower will be less than the after-tax return to the lender.

Early Repayment

We should also note that in this example, the incremental cost of borrowing will depend on when the loan is repaid. For example, if the loan is repaid after five years instead of being held for the entire loan term, the incremental borrowing cost increases from 20.57 to 20.83 percent. To see this, we modify the above analysis to consider that if the loan is repaid after five years, the amount that would be repaid on the $80,000 loan will differ from the amount that would be repaid on the $90,000 loan. Thus, in addition to considering the difference in payments between the two loans, we must also consider the difference in the loan balances at the time the loan is repaid. We can find the incremental borrowing cost as follows:

	Loan Amount		Loan Constant		Monthly Payments	Loan Balance after Five Years
Alt. II at 13%	$90,000	×	.0112784	=	$1,015.05	$86,639.88
Alt. I at 12%	80,000	×	.0105322	=	842.58	76,522.56
Difference	$10,000		Difference		$ 172.47	$10,117.32

Computing the marginal cost, we have

$172.47(*MPVIFA*, ?%, 5 yrs.) + $10,117.32(*MPVIF*, ?%, 5 yrs.) = $10,000

To find the answer, we must find the interest rate that makes the present value of the monthly annuity and lump sum equal to $10,000. The method for doing this was presented in Chapter 3. We can verify that the incremental borrowing cost is now 20.83 percent, the result of early repayment. As we will see in the next section, the impact of early payment may be greater when points are also involved on one or both of the loans.

[3] A lower effective cost for a second mortgage means that the borrower pays less interest each month. However, if the second mortgage has a term less than 25 years, the total monthly payments will be higher with the $80,000 first mortgage and a $10,000 second mortgage than with a $90,000 first mortgage. Thus, some borrowers may prefer to choose a higher effective borrowing cost to have lower monthly payments.

Calculator Solution:

$n = 5 \times 12 = 60$

$PV = -\$10{,}000$

$PMT = \$172.47$

$FV = 10{,}117.32$

Solve for marginal cost:

$i = 1.7360$ (monthly)

$i = 1.7360 \times 12 = 20.83\%$ (annual)

Origination Fees

It should be apparent that the concept of incremental borrowing cost is extremely important when deciding how much should be borrowed to finance a given transaction. In the preceding section, the two alternatives considered were fairly straightforward; the only differences between them were the interest rate and the amount borrowed. In most cases, financing alternatives under consideration will have *different* interest rates as the amount borrowed increases and, possibly, *different* loan maturities. Also, loan **origination fees** will usually be charged on the loan alternatives. This section considers differences in loan fees on two loan alternatives. We will consider differences in loan maturities later.

The first case is the incremental cost of borrowing when loan origination fees are charged on two 25-year loan alternatives. For example, if a $1,600 origination fee (2 points) is charged on the $80,000 loan and a $2,700 fee (3 points) is charged on the $90,000 loan, how does this affect the incremental cost of borrowing? These differences can be easily included in the cost computation as follows.

Differences in amounts borrowed and payments:

	Loan	−	Fees	=	Net Amount Disbursed	Loan		Loan Constant		Monthly Payments
Alt. II at 13%	$90,000	−	$2,700	=	$87,300	$90,000	×	.0112784	=	$1,015.05
Alt. I at 12%	80,000	−	1,600	=	78,400	80,000	×	.0105322	=	842.58
			Difference	=	$ 8,900			Difference	=	$ 172.47

We want to find an annual rate of interest, compounded monthly, that makes the present value of the difference in mortgage payments, or $172.47, equal to $8,900, or the incremental amount of loan proceeds received. Using a financial calculator, we find that the exact answer is 23.18 percent. Hence, the marginal cost increases to about 23.2 percent when the effects of an additional $1,100 in origination fees charged on the $90,000 loan are included in the analysis. Thus, the borrower only benefits from an additional $8,900 instead of $10,000.

Calculator Solution:

$n = 25 \times 12 = 300$

$PV = -\$8{,}900$

$PMT = \$172.47$

$FV = 0$

$i = 1.9316 \times 12 = 23.18\%$

As before, the marginal or incremental cost of borrowing increases if the loan is repaid before maturity. For example, if the loan in the above problem were repaid after five years, the incremental cost would increase to about 24.67 percent.

Incremental Borrowing Cost versus a Second Mortgage

The incremental borrowing cost obviously depends on how much the interest rate increases with the loan-to-value ratio. In the examples considered previously, the interest rate increased from 12 percent to 13 percent (a differential of 1 percent) when the loan-to-value ratio increased from 80 percent to 90 percent. When no points were charged and the loan was held until maturity, the incremental borrowing cost was 20.57 percent. The incremental borrowing cost would increase if the differential between the rate on the 80 percent loan and the 90 percent loan were greater than 1 percent. Conversely, the incremental borrowing cost would decrease if the differential were less than 1 percent.

Because borrowers have a choice between obtaining a 90 percent loan or an 80 percent loan plus a second mortgage for the remaining 10 percent, we would expect the incremental borrowing cost to be competitive with the rate on a second mortgage with the same maturity. In the example, if a second mortgage with a maturity of 25 years can be obtained with an effective borrowing cost that is much less than 20.57 percent, then the 90 percent loan is not competitive; it implies that the 1 percent yield differential between the 90 percent loan and the 80 percent loan is too great. Lenders would have to adjust the differential (or the second mortgage rate) so that the incremental borrowing cost is about the same as the effective cost of a second mortgage.

In Exhibit 6–1, we calculate the incremental borrowing cost for the alternatives discussed earlier, which assume that the loan is prepaid after five years. The exhibit shows how the incremental borrowing cost is affected by the interest rate differential on the 90 percent loan and the 80 percent loan. A 0 percent interest rate differential means that the contract interest rate, which is 12 percent, is the same for both loans. A 1 percent differential means the contract rate is 1 percent higher (e.g., 13 percent for the 90 percent loan).

When the interest rate differential is zero, the incremental cost is the same as the effective cost of the loan. For example, with no points the incremental cost is exactly 12 percent, the same as the interest rate for the 80 percent loan. As the interest rate differential increases, the incremental borrowing cost increases. The incremental cost increases by about the same rate for each loan.

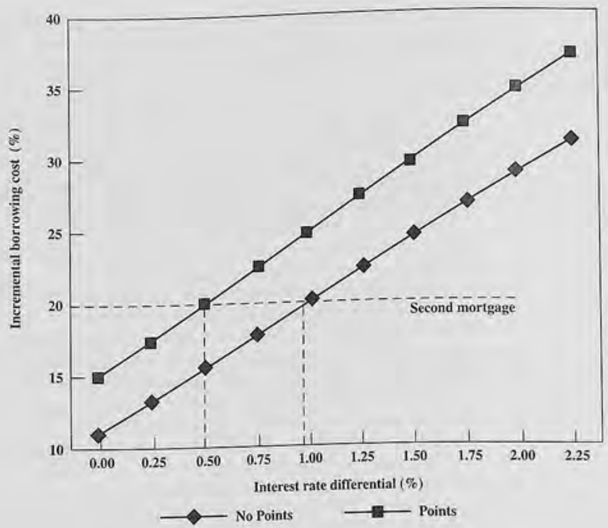
Suppose that a second mortgage for 10 percent of the purchase price (on top of an 80 percent first mortgage) can be obtained with an effective cost of 20 percent with a 25-year maturity. This is added to Exhibit 6–1.[4] This implies that, to be competitive, the 90 percent loan should be priced so that its incremental cost over an 80 percent loan is 20 percent. Suppose lenders expect the loan to be prepaid on average after five years and that they want to charge 2 points on an 80 percent loan and 3 points on a 90 percent loan as we have assumed in the previous examples. This implies that the interest rate differential should be about .50 percent or 50 basis points (see Exhibit 6–1). Alternatively, if lenders do not want to charge any points on either loan, the interest rate differential would have to be about 90 basis points.

Relationship between the Incremental Cost and the Loan-to-Value Ratio

In the previous section, we illustrated the calculation of the incremental borrowing cost for a 90 percent loan ($90,000) with a 13 percent interest rate versus an 80 percent loan ($80,000) with a 12 percent interest rate. Where there were no points and the loan was held

[4] To compare this rate with the incremental borrowing cost, this must be the effective cost of the loan, considering any points and the effect of prepayment.

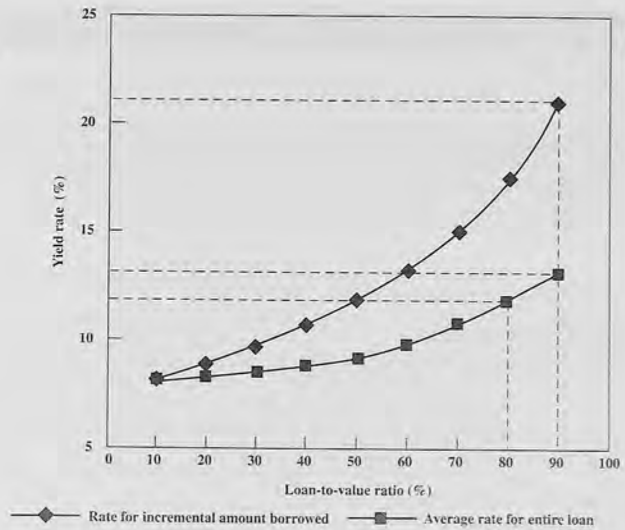
EXHIBIT 6–1
Incremental Borrowing Cost versus Interest Rate Differential



until maturity, the incremental cost was 20.57 percent. The incremental borrowing cost is the amount that lenders require on the amount added to the loan that increases the loan-to-value ratio from 80 percent to 90 percent. As discussed previously, this incremental return should be competitive with the return required for a second mortgage for 10 percent of value. The incremental borrowing cost represents the return that lenders require at the margin for lending additional funds, that is, increasing the loan-to-value ratio, whether this is done with a larger first mortgage or a second mortgage.

In the previous examples, we used the difference in interest rates for the entire loan amount (e.g., the rate on an 80 percent loan versus the rate on a 90 percent loan) to calculate the implied cost of the incremental 10 percent loan. In theory, however, it is the incremental cost of the extra amount loaned that must reflect the equilibrium required rate of return for the level of default risk associated with the additional amount loaned. As the loan-to-value ratio increases, the level of default risk also increases. Thus, we would expect the incremental borrowing cost to rise with the loan-to-value ratio. This, in turn, pulls up the average cost of the entire loan. Exhibit 6–2 shows the relationship between the rate for the incremental amount borrowed (incremental borrowing cost) and the average rate for the entire loan (effective rate for a loan with a particular loan-to-value ratio). To compare the results with the previous examples, the calculations in the exhibit are based on a loan term of 25 years, the assumption that the loan is held until maturity, and no points. Loans are assumed to be made in increments of 10 percent of value. The average and incremental rates are the same for a loan-to-value ratio of 10 percent because this is the first incremental loan amount. The incremental rate then increases as the loan-to-value ratio increases. The incremental rate rises faster than the average rate for the entire loan because the average rate for the entire loan is

EXHIBIT 6–2
Effect of Loan-to-Value Ratio on Loan Cost



a weighted average of the incremental cost of each of the previous incremental costs. This is the familiar relationship between marginal and average costs: that is, the marginal cost pulls up the average cost as long as the marginal cost is greater than the average cost.

The exhibit indicates, for example, that the average cost for an 80 percent loan is 12 percent. The marginal cost of a 90 percent loan is about 21 percent. This implies that the average cost of a 90 percent loan can be approximated as a weighted average as follows:

$$\text{Average cost of 90\% loan} = (80/90 \times 12\%) + (10/90 \times 21\%)$$

$$\text{Average cost of 90\% loan} = 13\%$$

Note that these are the same numbers (rounded) as calculated in the previous section for the same loan when the loan had no points and was held until maturity.[5]

Because the incremental borrowing cost must be competitive with the rate for a second mortgage, the rate for the incremental amount borrowed shown in Exhibit 6–2 should also approximate the market rate for a second mortgage. Because it is inefficient for lenders to make loans with low loan-to-value ratios,[6] however, we may not actually observe quotes for loans at the lower end of the loan-to-value range; that is, a borrower may have to pay the same rate for any loan that is less than 60 percent of value. This means that the incremental

[5] This formula is an approximation because the relative weight of each loan actually changes slightly over time as the loans are amortized. Because each loan is amortized over 25 years, the loan-to-value ratio of the 80 percent loan must drop much faster than that of the 10 percent loan because both loan-to-value ratios must be zero at loan maturity.

[6] The transactions cost would be the same as loans with a higher loan-to-value ratio.

Web App

Private mortgage insurance is a way of getting a loan that is greater than an 80 percent loan to value ratio. Companies like Mortgage Guarantee Insurance Corporation (**www.mgic.com**) offer such loans. Paying for the insurance to get the additional loan (more than 80 percent) is analogous to paying a higher interest rate to get a higher loan-to-value ratio as discussed in the chapter. Go to the MGIC web site and find out more about how private mortgage insurance works and the typical cost. How would you determine the incremental cost of a loan with private mortgage insurance versus one that did not require insurance?

cost and average cost might not actually begin to rise until the loan-to-value ratio exceeds 60 percent.

Differences in Maturities

In the previous examples, the loan alternatives considered had the same maturities (25 years). How does one determine the incremental cost of alternatives that have different maturities as well as different interest rates? Do differences in maturities materially change results? We examine these questions by changing our previous example and assuming that the $90,000 alternative has a 30-year maturity and a higher interest rate. How would the analysis be changed? We first must compute the following information:

	Loan	Payments Years 1–25	Payments Years 26–30
Alt. III at 13%, 30 yrs.	$90,000	$995.58	$995.58
Alt. I at 12%, 25 yrs.	80,000	842.58	–0–
Difference	$10,000	$153.00	$995.58

In this case, we compute the monthly payment for a $90,000, 30-year loan at 13 percent interest, which is $995.58. However, there are two differences in the series of monthly payments relevant to our example. For the first 25 years, the borrower will pay an additional $153.00 per month for alternative III. For the final five-year period, years 26 through 30, the difference between payments will be the full $995.58 payment on alternative III because the $80,000 loan would be repaid after 25 years. Hence, the incremental cost must be computed by considering the payment differences as two annuities or grouped cash flows as follows:

$$\$153.00(MPVIFA, ?\%, 25 \text{ yrs.}) +$$
$$\$995.58(MPVIFA, ?\%, 5 \text{ yrs.})(MPVIF, ?\%, 25 \text{ yrs.}) = \$10,000$$

In the above formulation, the second annuity of $995.58 runs for 5 years, but it is not received until the end of year 25 and therefore must also be discounted for 25 years.[7] We cannot solve directly for the interest factor because there are two unknown factors. Thus,

[7] Alternatively, we could compute the present value of the second annuity as follows: $995.58 (*MPVIFA*, ?%, 30 yrs. − 25 yrs.).

we must use the procedures outlined in Chapter 4 to calculate the yield (cost). Using an estimate of 19 percent and discounting, we get

$$PV = \$153.01(62.590755) + \$995.58(38.549682)(.008980)$$
$$= \$9,921.65$$

Calculator Solution:
Requires cash flow analysis:
Initial flow = −$10,000
Flow 1 = $153.00
\# of times = 300 (years 1–25)
Flow 2 = $995.58
\# of times = 60 (years 26–30)
Solve for *IRR*:
IRR (monthly) = 1.5719%
IRR (annualized) = 18.86%

Because the desired present value is $10,000, the answer must be slightly less than 19 percent. Using a calculator that can solve for an *IRR* with uneven, or grouped, cash flows, we find the solution is 18.86 percent. Hence, the marginal or incremental cost of borrowing the additional $10,000 given that (1) the interest rate increases from 12 percent to 13 percent, and (2) the loan term increases from 25 years to 30 years will be about 18.86 percent. Compare this with the incremental cost of 20.57 percent in the first example where no fees were charged but both maturities were 25 years. The reason the marginal cost is lower in this case is that although a higher rate must be paid on the $90,000 loan, it will be repaid over a longer maturity period, 30 years. Even though the borrower pays a higher rate for the $90,000 loan, there is a benefit to having a longer amortization period (and thus lower monthly payments) on the $90,000 loan.

Note that if the borrower expects to repay the loan before maturity, both the differences in monthly payments and loan balances in the year of repayment must be taken into account when computing the marginal borrowing cost. Also, should any origination fees be charged, the incremental funds disbursed by the lender should be reduced accordingly.

Loan Refinancing

On occasion, an opportunity may arise for an individual to refinance a mortgage loan at a reduced rate of interest. For example, during 1986 and 1992, interest rates fell sufficiently to cause many borrowers to refinance their home mortgages.

The fundamental relationships to know in any **loan refinancing** decision include at least three ingredients: (1) terms on the present outstanding loan, (2) new loan terms being considered, and (3) any charges associated with paying off the existing loan or acquiring the new loan (e.g., prepayment penalties on the existing loan or origination and closing fees on the new loan). To illustrate, assume a borrower made a mortgage loan 5 years ago for $80,000 at 15 percent interest for 30 years (monthly payment). After 5 years, interest rates fall, and a new mortgage loan is available at 14 percent for 25 years. The loan balance on the existing loan is $78,976.50. Suppose that the prepayment penalty of 2 percent must be paid on the existing loan, and the lender who is making the new loan available also requires an origination fee of $2,500 plus $25 for incidental closing costs if the new loan is made. Should the borrower refinance?

In answering this question, we must analyze the costs associated with refinancing and the benefits or savings that accrue because of the reduction in interest charges should the borrower choose to refinance. The costs associated with refinancing are as follows:

Cost to refinance:	
Prepayment penalty: (2% × \$78,976.50)	\$1,580
Origination fee, new loan	2,500
Recording, etc., new loan	25
	\$4,105

Benefits from refinancing are obviously the interest savings that result from a lower interest rate. Hence, if refinancing occurs, the monthly mortgage payment under the new loan terms will be lower than payments under the existing mortgage. Monthly benefits would be \$60.88 as shown:

Monthly savings due to refinancing:	
Monthly payments, existing loan, \$80,000, 15%, 30 years	\$1,011.56
Monthly payments, new loan, \$78,976.50, 14%, 25 years	950.69
Difference in monthly payments	\$ 60.87

One way to approach this problem is to ask whether it is worth "investing," or paying out, \$4,105 (charges for refinancing) to save \$60.87 per month over the term of the loan. Perhaps the \$4,105 could be invested in a more profitable alternative? To analyze this question, we should determine what rate of return is earned on the investment of \$4,105 for 25 years, given that \$60.87 per month represents a savings. Using a financial calculator, we find that the yield on our \$4,105 investment, with savings of \$60.87 per month over 25 years, is equivalent to earning 17.57 percent per year. If another alternative equal in risk, which provides a 17.57 percent annual return, cannot be found, the refinancing should be undertaken. This return appears to be attractive because it is higher than the market rate of 14 percent that must be paid on the new loan. Thus, refinancing is probably desirable.

Early Repayment: Loan Refinancing

If the property is not held for the full 25 years the monthly savings of \$60.87 do not occur for the entire 25-year term, and therefore the refinancing is not as attractive. If we assume the borrower plans to hold the property for only 10 more years after refinancing, is refinancing still worthwhile? To analyze this alternative, note that the \$4,105 cost will not change should the refinancing be undertaken; however, the benefits (savings) will change. The \$60.87 monthly benefits will be realized for only 10 years. In addition, since the borrower expects to repay the refinanced loan after 10 years, there will be a difference between loan balances on the existing loan and the new loan due to different amortization rates. We assume that there will be no prepayment penalty on either loan if they are prepaid 10 years from now.

Loan balance, 15th year—existing loan*	\$72,275
Loan balance, 10th year—new loan†	71,386
Difference	\$ 889

*Based on \$80,000, 15 percent, 30 years prepaid after 15 years.
†Based on \$78,976, 14 percent, 25 years, prepaid after 10 years.

The new calculation comparing loan balances under the existing loan and the new loan terms, should the new loan be made, shows that if refinancing occurs the amount saved with the lower loan balance is \$889. Hence, total savings with refinancing would be \$60.87 per month for 10 years, plus \$889 at the end of 10 years. Do these savings justify an outlay of \$4,105 in refinancing costs? To answer this question, we compute the return on the \$4,105 outlay as follows:

$$\$60.87(MPVIFA, ?\%, 10 \text{ yrs.}) + \$889(MPVIF, ?\%, 10 \text{ yrs.}) = \$4,105$$

Because the loan is repaid early and the monthly savings of \$60.87 will not be received over the full 25-year period, the yield must be below the 17.57 percent yield computed in the previous example. The yield earned due to refinancing will be 14.21 percent per year for the 10-year period.

Calculator Solution:
$n = 10 \times 12 = 120$
$PV = -\$4,105$
$PMT = \$60.87$
$FV = \$889$
Solve for yield:
$i = 14.21\%$

Obviously, this return is lower than the 17.57 percent computed under the assumption the loan will be repaid after 25 years. This is true because the refinancing cost of \$4,105 remained the same, while the savings stream of \$60.87 was shortened from 25 years to 10 years. Although an additional \$889 was saved because of differences in loan balances, it did not offset the reduction in monthly savings that would have occurred from year 10 through year 25. The relationship between the *IRR* and the number of years the loan is held after refinancing is illustrated in Exhibit 6–3. Note that the returns from refinancing are negative if the loan is held for only five years after prepayment. The return rises sharply for each additional year the loan is held after prepayment until it is held for about 15 additional years. In analyzing refinancing decisions, then, we must compare not only costs and benefits (savings), but also the time period one expects to hold a property.[8]

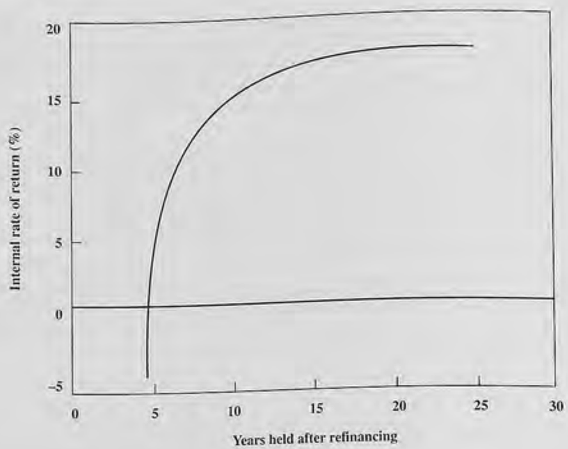
Effective Cost of Refinancing

The refinancing problem can also be analyzed by using an extension of the effective cost concept discussed earlier. We know that points increase the effective cost of a loan. In our problem, the borrower would be making a new loan for \$78,976.50 but must pay \$4,105 in "fees" to do so. Although these fees include the prepayment penalty on the old loan, this can be thought of as a cost of making a new loan by refinancing, or the **effective cost of refinancing.** Thus, the borrower in effect receives \$78,976.50 less \$4,105 or \$74,871.50. Payments on the new loan when made at 14 percent for 25 years would be \$950.69. To find the effective cost where the loan is held to maturity, or 25 years, we proceed as follows:

$$\$950.69(MPVIFA, ?\%, 25 \text{ yrs.}) = \$74,871.50$$

[8] Obviously, the shorter the time period that the borrower expects to be in the home after refinancing, the lower the return on "investing" in refinancing. In fact if the period of time is relatively short, the return could be negative. Hence, if a borrower expects to sell a property within a short time after refinancing, it will be difficult to justify refinancing.

EXHIBIT 6–3
***IRR* from Savings When Refinancing**



Calculator Solution:
$n = 25 \times 12 = 300$
$PV = -\$74{,}871.50$
$PMT = \$950.69$
$FV = 0$
Solve for yield:
$i = 14.86\%$

Using a financial calculator, we obtain an interest rate of 14.86 percent. This can be interpreted as the effective cost of obtaining the new loan by refinancing. Since this cost is *less* than the rate on the old loan (15 percent), refinancing would seem to be desirable.[9] Thus, we arrive at the same conclusion we got when calculating the return on investing in refinancing.

Borrowing the Refinancing Costs

In the above analysis, we assumed that the borrower had to pay (as a cash outlay) the refinancing costs of $4,105. However, it is likely that if the borrower is going to the trouble of refinancing, he or she may also be able to borrow the refinancing costs.[10] How does this affect our analysis?

[9] Any points that had been paid on the old loan would not be relevant since they are a "sunk cost"; that is, they have already been paid and are not affected by refinancing. Thus, only the current interest rate on the old loan should be compared with the effective cost of the new loan.

[10] The borrower will probably have sufficient equity in the home to do so since, if the old loan was held for several years, the borrower has reduced the balance on the old loan and the home may have increased in value.

The borrower now gets a loan for the loan balance of $78,976.50 plus the fees of $4,105.00 for a total of $83,081.50. Payments at the 14 percent rate (assuming the interest rate is still the same) would be $1,000.10.[11] What do we compare this to now that the borrower has no cash outlay when refinancing? The answer is simple. These payments are still less than those on the old loan ($1,011.56). Given that the borrower has lower payments ($11.46) for 300 months without any cash outlay, it is desirable to refinance.[12]

We could, of course, also compute the effective cost of refinancing as we did in the previous section. In this case, the total amount of the loan is $83,081.50; however, the borrower, in effect, only benefits from $78,976.50 (the loan amount less the refinancing costs). Using the payment of $1,000.10 and assuming the new loan is held for the full loan term, we can calculate the effective cost as follows:

$$\$1{,}000.10(MPVIFA, ?\%, 25 \text{ yrs.}) = \$78{,}976.50$$

Solving for the effective interest rate, we obtain an answer of 14.81 percent, which is virtually the same as we obtained in the previous section. The only reason the answer is slightly lower is that the origination fee on the new loan was assumed to remain at $2,500 even though the amount of the loan was increased to cover the refinancing costs.

Calculator Solution:
$n = 25 \times 12 = 300$
$PV = -\$78{,}976.50$
$PMT = \$1{,}000.10$
$FV = 0$
Solve for effective interest rate:
$i = 14.81\%$

Note that whether we calculate a return on investing in refinancing, or we calculate the effective cost of refinancing, we arrive at the same conclusion. Often there are many ways of considering a problem that lead to similar conclusions. It is informative to look at a problem several ways to gain skill in handling the wide variety of financial alternatives one may encounter. Knowing alternative ways of analyzing a problem also reduces the chance of applying an incorrect technique to solve it.

Other Considerations

Biweekly Payment Patterns—Interest Savings and Early Payoff

Generally speaking, when repaying mortgage loans, most borrowers prefer to make monthly payments. However, some borrowers consider *biweekly payment patterns* which may (1) lower the amount of interest over the life of the loan and (2) repay the loan sooner. For example, if a borrower makes a fully amortizing $80,000 loan at 6% for 30 years and is considering a monthly vs. a biweekly payment pattern, a comparison of payments would be as follows:

[11] If this approach were used to analyze the case where the loan was to be repaid early, the additional loan balance on the refinanced loan would have to be considered. This would reduce the benefit of the lower payments.

[12] If the interest rate was higher, then we would also want to consider the incremental cost of the additional $4,105, as considered earlier in the chapter.

Monthly Payments (360)	Biweekly Payments (26 per year)
$PV = -\$80{,}000$	$\$479.60 \div 2$
$i = 6\%$	
$n = 360$	$PMTs = \$239.80$
$FV = 0$	
$PMT = \$479.60$	

The following shows:
(a) The number of payments needed to repay the bi-weekly loan (b) the approximate number of years to maturity and (c) approximate total interest savings over the life of the loan.

Bi-weekly mortgage loan payoff period:

$PV = -\$80{,}000$
$PMT = \$239.80$
$i = 6\% \div 26$*
$FV = 0$
$n = 637$ payments (rounded)
(approx. 24.5 years)

Total Interest Savings:

Total monthly payments	$172,656
Total bi-weekly payments	–152,752
Total interest savings	$ 19,904

*Annual rate of 6% compounded bi-weekly

These calculations show that by choosing the bi-weekly payment pattern, the maturity period would be shortened from 30 years to about 24.5 years and total interest saved would be about $19,904. While it is clear that the borrower would definitely save by making bi-weekly payments, this does not always mean this would be the best choice. One way to think about this choice is to consider whether an alternative investment is available that is of equal risk, that will provide the borrower a return in excess of a 6% rate of interest, *compounded bi-weekly*. However, if such an alternative investment is unavailable, the borrower/investor would be better off "saving interest" by reducing interest costs and making the bi-weekly payments of $239.80. It should also be stressed that this analysis assumes that the borrower has sufficient cash flow to make *either* choice, that is, the bi-weekly or monthly loan payments. Unless enough cash flow is available to the borrower every two weeks, the bi-weekly payment pattern may not be a viable option to begin with.

Early Loan Payoffs

Another question that many borrowers ask is whether loans should be paid off early, or prior to maturity. For example, we assume that a borrower makes a fully amortizing loan for $80,000 at 6 percent interest for 30 years. He makes monthly payments for five years and suddenly receives a large amount of cash (e.g., inheritance) such that he may be able to repay the entire loan balance early. The question is should he do so? This question may be considered as follows:

Loan Balance *EOY* 5:

$PMT = \$479.64$	$FV = 0$
$i = 6\%$	$PV = \$74{,}443$
$n = 360$ mos.	

Assuming that $74,443 becomes available to the borrower with which to repay this loan early, the question is should it be repaid? One issue to consider is the interest savings. This would be:

1. Total Payments equal $479.64 × 300 =	$143,892
2. Less loan balance *EOY* 5	-74,443
3. Interest saved by early repayment	$ 69,449

However, related questions would be whether or not the $74,443 available to repay the loan at the end of year 5 may be reinvested elsewhere and, if so, at what rate of interest. By paying off a loan early that has a 6 percent interest rate, the borrower is in effect "earning" a 6 percent return on the funds used to repay the loan.

1. *Reinvesting at a rate greater than 6 percent.* If this is possible, the borrower would be better off *not* paying off the loan. If the $74,443 available for early payment could be invested elsewhere, say at 7%, the borrower should not pay off the loan early. This way, a spread of 7 percent minus 6 percent, or 1 percent, could be earned on the $74,443.
2. *Reinvesting at a rate below 6 percent.* If this is the case, the borrower would obviously be better off repaying the loan at the end of year 5. For example, if interest rates have fallen to 5 percent, the borrower may repay the loan thereby saving 6 percent. Alternatively, he may choose to refinance the loan at 5 percent. This would provide *savings* based on a spread of 6 percent minus 5 percent, or 1 percent. However, even this choice would be preferable only if alternative investments are available to invest the $74,443 at rates in excess of 5 percent.

Early Loan Repayment: Lender Inducements

After a period of rising interest rates, borrowers may have a loan that has an interest rate below the market rate. Earlier we considered the situation where interest rates have fallen and the borrower may find it beneficial to refinance at a lower interest rate even if additional fees and penalties have to be paid to the lender. Where interest rates have risen considerably, the situation may be the opposite. Banks may be willing to "pay" the borrower to induce him or her to repay the loan early. That is, the lender may offer the borrower a discount to pay off the balance of a below market interest rate loan.[13] How much of a discount should be offered?

Suppose a borrower has a loan that was made 10 years ago. The original loan amount was $75,000 to be amortized over 15 years at 8 percent interest. The balance of the loan is now $35,348, and the payments are $716.74 per month. If the current market interest is 12 percent, then the lender would like to have the loan paid off early so that funds could be loaned to someone else at the market rate. The borrower has no incentive to prepay the loan even if he or she has $35,348 available to do so. However, the bank may be willing to offer the borrower a discount to prepay the loan. Suppose the lender discounts the loan by $2,000, so that only $33,348 must be paid to the lender. Is this attractive to the borrower?

Calculator Solution:

$n = 5 \times 12 = 60$
$PV = -\$33{,}348$
$PMT = \$716.74$
$FV = 0$

Solve for return:

$i = 10.50\%$

By accepting the discount, the borrower, in effect, earns a return on the funds used to repay the loan; that is, by making a payment of $33,348 to the lender, the borrower saves $716.74 per month. To calculate the return earned by prepaying the loan, we have

[13] This is particularly true if the loan is assumable.

$$\$716.74(MPVIFA, ?\%, 5 \text{ yrs.}) = \$33,348$$

Using a financial calculator, we find the return to be about 10.5 percent. Thus, the interest savings represent a 10.5 percent return on the "investment" made to repay the loan.[14] Whether this represents an attractive proposition for the borrower depends on what alternatives he or she has for investing the $33,348.

In the preceding example, we assumed that the borrower had the funds ($33,348) to prepay the below market rate loan. Several other possibilities could be considered. One is that the borrower would refinance some or all of the loan at the market rate. Another is that the borrower wants to increase the loan balance by refinancing. In either case, the lender may still be willing to provide an inducement for the borrower to refinance since the existing loan is at a below market rate. However, the approach taken to analyze the problem depends on whether, on balance, the borrower gives funds to the lender to reduce the loan balance in exchange for the lower payments or the borrower receives additional funds in exchange for an additional loan payment.

Market Value of a Loan

We have considered several problems in which the balance of a loan was determined after payments had been made for a number of years. The balance of the loan represents the amount that the borrower must repay the lender to satisfy the loan contract. (Any prepayment penalties must be added to the loan balance.) The loan balance may be interpreted as the "contract" or "book value" of the loan. However, if interest rates have changed since the origination of the loan, the loan balance will probably not represent the "market" value of the loan.

The **market value of a loan** is the amount that a new lender or investor would pay to receive the remaining payments on the loan. It can be thought of as the amount that could be loaned so that the remaining payments on the loan would give the lender a return equal to the current market rate of interest.

To find the market value of a loan, you simply calculate the present value of the remaining payments at the market rate of interest. For example, suppose a loan was made 5 years ago for $80,000 with an interest rate of 10 percent and monthly payments over a 20-year loan term. Payments on the loan are $772.02 per month. As we know, one way of finding the current balance of the loan is to compute the present value of the remaining loan payments at the *contract* interest rate of 10 percent. We have

$$\begin{aligned}\text{Loan balance} &= \$772.02(MPVIFA, 10\%, 15 \text{ yrs.})\\ &= \$772.02(93.057439)\\ &= \$71,842\end{aligned}$$

To find the market value of the loan, we compute the present value of the remaining payments at the market interest rate. Suppose that rate is currently 15 percent. We have

$$\begin{aligned}\text{Market value} &= \$772.02(MPVIFA, 15\%, 15 \text{ yrs.})\\ &= \$772.02(71.449643)\\ &= \$55,161\end{aligned}$$

[14] The above analysis does not consider the impact of federal income taxes. The IRS has ruled that when a lender discounts a loan such that the borrower does not have to repay the contract loan balance, the discount represents "loan forgiveness" and as such is considered taxable income. Thus, the borrower would have to pay taxes on the $2,000 discount. For an investor in the 40 percent tax bracket, the taxes would be $800. Thus, the net result is as if the borrower only received a discount of $2,000 − $800 = $1,200. This clearly reduces the benefit to the borrower to repay the loan.

Thus the market value of the loan is $55,161 compared to a loan balance of $71,842. The $55,161 is the amount that the lender would receive if the loan were sold to another lender, investor, or the secondary market.[15] We could say that the above loan is selling at a "discount." The amount of the difference in this case would be $71,842 − $55,161 = $16,681. We could also say that the mortgage is selling at a discount of 23 percent of its "face" value.

Calculator Solution:
Loan balance:

$n = 15 \times 12 = 180$
$i = 10\% \div 12 = 0.8333\%$
$PMT = \$772.02$
$FV = 0$

Solve for loan balance:
$PV = \$71,842$

Market value:
(change i to 15%)
$i = 15\% \div 12 = 1.25\%$

Solve for market value:
$PV = \$55,161$

The market value of the loan is lower than the contract loan balance in this example because interest rates have risen relative to the interest rate (10 percent) at which the loan was originated 10 years ago. However, the borrower is required to make payments based on 10 percent even though market rates have risen to 15 percent. This is one reason why adjustable rate mortgages have become more attractive to lenders (see Chapter 5). With an adjustable rate mortgage, the market value of the outstanding loan will not differ as much as a new loan originated at market rates of interest. Indeed, if the interest rate on the outstanding loan could be adjusted at each payment interval and there were no limitations (caps) on the amount of the adjustment, the contract rate on the loan would always equal the market rate. In this event, the loan balance and market value for such a loan would always be equal because future payments would be based on current rates of interest.

Effective Cost of Two or More Loans

Many situations exist where the buyer of a home may be considering a combination of two or more loans (e.g., a first and a second mortgage to finance the home). One situation is the assumption of a loan that has a favorable rate of interest.[16] However, the amount of cash necessary for the buyer to assume a mortgage may be prohibitive. This can occur when the seller has already paid down the balance of the loan and when the home has appreciated in

[15] It is informative to look at an alternative approach that yields the same answer. Suppose we were to make a loan for $71,842 at the market rate of 15 percent for the remaining loan term of 15 years. The payment would be $1,005.49. This is $233.47 higher than the contract payment. If we discount this *difference* in payments for the 15-year period at the market rate we get a present value of $16,681. Subtracting this difference from the loan balance results in the market value of the loan.

[16] In many areas of the United States, properties are sold on assumption. However, in many other areas, the right to sell on assumption is precluded explicitly in the mortgage or by the lender not approving the new buyer. Lending practices vary widely, depending on tradition and economic conditions in a given area.

value since it was originally financed by the seller. Thus, the buyer must use a second mortgage to bridge the gap between the amount available from the loan assumption and the desired total loan amount.

Suppose an individual bought a $100,000 property and made a mortgage loan 5 years ago for $80,000 at 10 percent interest for a term of 25 years. Due to price appreciation the market value of the property has risen in value over the past five years to $115,000. The amount of cash equity required by the buyer to assume the seller's loan would be $39,669, determined as follows:

Purchase price	$115,000
Seller's mortgage balance ($80,000, 10%, 25 yrs., after 5 yrs.)	75,331
Cash equity required to assume	$ 39,669

If the buyer does not have $39,669 in cash, even though he or she desires an assumption, the transaction may not be completed. One alternative open to the buyer who could not make the large cash outlay may be to obtain a second mortgage. However, using a second mortgage will be justified in this case only if the terms of the second mortgage, when combined with the terms on the assumed mortgage, will make the borrower as well or better off than if the entire purchase had been financed with a new mortgage. If the entire purchase can be financed with a new $92,000 loan (80 percent of value) at 12 percent for 20 years, we must know how to combine a second mortgage with the assumed mortgage to determine whether the assumption would be as attractive as the new mortgage loan. Suppose a second mortgage for $16,669 ($92,000 − $75,331) could be obtained at a 14 percent rate for a 20-year term. To analyze this problem, we compute the combined mortgage payments on the assumed loan and a second mortgage loan made for 20 years at 14 percent.

Monthly payment, assumed loan*	$726.96
Monthly payment, second mortgage loan†	207.28
	$934.24

*Based on original $80,000 loan, at 10 percent, for 25 years.
†Based on second mortgage loan of $16,669 at 14 percent, for 20 years.

The combined monthly payments equal $934.24. We now want to compute the effective cost of the combined payments that are made on the combined loan of $92,000. We have

$$\$934.24(MPVIFA, ?\%, 20 \text{ yrs.}) = \$92,000$$

Using a financial calculator, we find an answer of 10.75 percent. This is the cost of obtaining $92,000 with the loan assumption and second mortgage. Since this is less than the cost of obtaining $92,000 with a new first mortgage at a rate of 12 percent, the borrower is still better off with the loan assumption and a second mortgage.[17] It is important to note, however,

[17] It should be apparent that such a high interest rate can be paid on the second mortgage because $75,331, the amount assumed, carries a 10 percent rate and represents about 82 percent of the $92,000 to be financed, while the second mortgage of $16,669 represents only 18 percent. When weighted together by the respective interest rates, the total rate paid on the combined amounts is influenced more by the amount assumed at 10 percent. As an approximation of the average of "blended" rate for the two loans, we have (.82 times 10%) + (.18 times 14%) = 10.72%, which is approximately the same as the answer we found using the present value factors above.

that the preceding analysis does not consider the fact that the seller of the home may have *raised the price of the home* to capture the benefit of the assumable below market rate loan. Later in the chapter, we will consider this in our analysis.

Calculator Solution:
$n = 20 \times 12 = 240$
$PV = -\$92,000$
$PMT = \$934.24$
$FV = 0$
Effective yield:
$i = 10.75\%$

Second Mortgages and Shorter Maturities

In most cases, second mortgages may not be available for a 20-year period. If a five-year term were available on a second mortgage loan at 14 percent interest, would the borrower still be better off by assuming the existing mortgage and taking a second mortgage? To answer this question, we must determine the combined interest cost on the assumed mortgage, which carries a rate of 10 percent for 20 remaining years, and the second mortgage, which would carry a rate of 14 percent for 5 years. This combined rate can then be compared with the current 12 percent rate for 20 years presently available, should the property be financed with an entirely new mortgage loan.

To combine terms on the assumable mortgage and second mortgage, we add monthly payments together as follows:

	Monthly Payments
Assumed loan*	$ 726.96
Second mortgage†	387.86
Total	$1,114.82

*Based on original terms: $80,000, 10 percent, 25 years.
†Based on $16,669, 14 percent, 5 years.

The sum of the two monthly payments is equal to $1,114.82. However, the combined $1,114.82 monthly payments will be made for only five years. After five years, the second mortgage will be completely repaid, and only the $726.96 payments on the assumed loan will be made through the 20th year.

Whether the combined mortgages should be used by the borrower can now be determined by again solving for the combined cost of borrowing. This cost is based on the monthly payments under both the assumed loan and second mortgage, for the respective number of months payments must be made, in relation to the $92,000 amount being financed. These costs are easily seen as the monthly payments of $387.86 on the second mortgage for *5 years* and the monthly payments of $726.96 on the assumed mortgage for *20 years*, both discounted by an interest rate that results in the present value of $92,000.

$$\$387.86(MPVIFA, ?\%, 5 \text{ yrs.}) + \$726.96(MPVIFA, ?\%, 20 \text{ yrs.}) = \$92,000$$

We must find the interest rate that makes the present value of the combined monthly mortgage payments (grouped cash flows) equal to $92,000. Using a financial calculator, we find that the combined interest cost on the existing mortgage assumed for 20 years and the second mortgage for 5 years is 10.29 percent. This combined package of financing must again be compared to the 12 percent interest rate currently available on an \$80,000 mortgage for 20 years. Because the effective cost of the two combined loans is less than the market rate, this is the best alternative. It should be noted, however, that for the first 5 years the combined monthly payments of \$1,114.82, should the assumption and second mortgage combination be made, would be higher than the payments with a new mortgage for \$92,000 at 12 percent for 20 years, which would be \$1,013.00 per month. Although this is offset by the lower \$726.96 payments after five years, the borrower must decide which pattern of monthly loan payments fits his or her income pattern, in addition to simply choosing the loan alternative with the lower effective borrowing cost. A borrower may be willing to pay a higher effective cost for a loan (or combination of loans) that has lower monthly payments.

Calculator Solution:
Requires cash flow analysis:

Initial flow = −\$92,000
Flow 1 = \$1,114.82
Number of times = 60 (years 1–5)
Flow 2 = \$726.96
Number of times = 180 (years 6–20)

Solve for *IRR*:

IRR (monthly) = 0.8573%
IRR (annualized) = 10.29%

In recent years, there have been many new loans that combine features of second mortgage lending, consumer lending, and credit card debt. These are described in Concept Box 6.1.

Effect of Below-Market Financing on House Prices

In many situations, a home buyer may have an opportunity to purchase a home and obtain financing at a below-market interest rate. We have previously discussed one case where the seller of the house had a below-market-rate loan that could be assumed by the buyer. Below-market financing might also be provided by the seller of the home with a *purchase money mortgage*. In this case, the seller provides some or all of the financing to the buyer at an interest rate lower than the current market rate. Indeed, this type of financing is common during periods of tight credit and high interest rates.

Obviously, below-market-rate loans have value to the buyer. However, because the informed seller of the home also recognizes the value of this type of financing, we would expect the seller to increase the price of the house to reflect it. That is, the "price" of the house would be higher with below-market financing than with market rate financing.

We now consider how a buyer would analyze whether to purchase a house with below-market financing if the house price is higher than that of an otherwise comparable home that does not have below-market financing. Suppose a home could be purchased for \$105,000 subject to an assumable loan at a 9 percent interest rate with a 15-year remaining term, a balance of \$70,000, and payments of \$709.99 per month. A comparable home without any special financing costs \$100,000, and a loan for \$70,000 could be obtained at a market rate of 11 percent with a 15-year term. Which alternative is best for the buyer? Note that we are assuming that the two loan amounts are the same. In analyzing this problem, we must consider whether it is desirable for the buyer to pay an additional \$5,000 in cash for the home (additional equity invested) to receive the benefit of lower payments on the below-market loan. The calculations are as follows:

Home Equity Loans (HELs) [illegible] Home Equity Lines of Credit (HELOC)

[illegible]cept Box 6-[illegible]

Many types of second mortgage loans are used by residential property owners to borro[illegible] additional funds after a property has been owned for some time and has appreciated [illegible] value. These loans are generally classified as **home equity loans.** Generally, lenders us[illegible] ally require that borrower-homeowners have accumulated approximately 20 percent of eq[illegible] uity in their properties in order to qualify for home equity loans. Borrowers must also quali[illegible] for financing based on income and credit history. Two of the more popular loans curre[illegible] in use are home equity loans and home equity lines of credit.

HOME EQUITY LOANS (HELs)

These loans provide borrowers with a *lump sum* amount at closing. In addition to the bor[illegible] rower's personal liability on the note, lenders also acquire a second mortgage lien on the prop[illegible] erty. Owner's equity is measured as the difference between the appraised value of the proper[illegible] at the time that the HEL is applied for, minus any loan balance owed on the first lien. For ex[illegible] ample, if a property is currently appraised to be worth \$100,000 and it has an existing first lie[illegible] in an amount of \$40,000, the owner's equity would be \$60,000. This \$60,000 of equity serve[illegible] as security for the home equity loan. In practice, because the security provided by second lien[illegible] is inferior to first liens, HELs are riskier to lenders and will carry a higher rate of interest than tha[illegible] available for first-lien financing. Other characteristics of home equity loans are these:

1. Interest rates may be fixed or adjustable.
2. The loan agreement will specify a maturity period.
3. Payments are usually made monthly.
4. Loan payments may be fully amortizing, partially amortizing, or interest only. In the cas[illegible] of the latter two options, payments will be made for a specified number of months, a[illegible] which point the loan must become either fully amortizing or the remaining balance [illegible] maturity must be repaid.

HOME EQUITY LINES OF CREDIT

Not to be confused with HELs, **home equity lines of credit** (HELOCs) are also availa[illegible] to borrowers. These loans have many characteristics that are similar to consumer credit loan[illegible] Although HELOCs also are secured by second liens, there are many features of HELOCs th[illegible] differentiate them from HELs. For example:

1. Although the loan will be made for a specific maximum amount, that amount is not nec[illegible] essarily disbursed as a lump sum. Funds may be borrowed (drawn down) against the [illegible] as the consumer-borrower desires. However, when the loan balance reaches a maxim[illegible] amount, no further draws may be made.
2. Like credit card payments, borrowers generally have some flexibility as to the amou[illegible] monthly payment that they choose to make. However, lenders will usually insist [illegible] monthly payments be at least some minimum amount. To the extent that borrowe[illegible] choose to make payments that are less than the monthly interest due, the loan balanc[illegible] will increase (negative amortization). Any payments greater than monthly interest d[illegible] will reduce the loan balance.
3. Interest rates are usually adjustable and, like ARM rates, are usually tied to a well-kno[illegible] interest rate index (e.g., the prime rate).
4. Like consumer credit card accounts, amounts borrowed and monthly loan paym[illegible] will determine the loan balance, which may increase or decrease from mont[illegible] month.

Although HELOCs are similar to many consumer credit loans, because of the added secur[illegible] provided by second liens, HELOCs should be available at interest rates below those of cre[illegible] card debt. This is because credit card debit is usually unsecured and is totally depende[illegible] a borrower's personal credit and capacity to repay.

In addition to the interest rate, HELOC borrowers should consider the following issue[illegible]

Home Equity Loans (HELs) and Home Equity Lines of Credit (HELOC) — Concept Box 6.1 (Continued)

1. *Early termination fees.* Because these loans are more like a combination of consumer credit and an ARM, the interest rate is likely to be tied to an index. Consequently, at some future time, interest rates could increase dramatically and borrowers may want to switch to a fixed rate loan. In anticipation of this possibility, HELOC lenders may include a termination fee (similar to a prepayment penalty) in the loan agreement.
2. *Inactivity fees.* Because this loan may be used as a line of credit, if borrowers do not use the line or if they attempt to keep only a small loan balance without terminating the account to avoid the penalty described in (1) (while switching their financing to another lender), a monthly inactivity fee also may be included in the loan agreement. Also, like many credit card loans, there may be an annual renewal or administrative fee associated with this type of loan.

	Down Payment	Payment
Market rate loan	$30,000	$795.62
Loan assumption	35,000	709.99
Difference	$ 5,000	$ 85.63
$85.63 times (*MPVIFA*, ?%, 180 mos.) =		$ 5,000

Using a financial calculator, we find that making the additional $5,000 down payment would result in earning the equivalent of 19.41 percent because of the lower monthly loan payments. Alternatively, should the buyer decide not to pay the additional $5,000, he or she would have to find a return of 19.41 percent on the $5,000 in an investment with comparable risk. Because the 19.41 percent rate is higher than the 11 percent market rate, buying the house with below-market financing appears to be desirable.

Calculator Solution:

$n = 15 \times 12 = 180$
$PV = -\$5{,}000$
$PMT = \$85.63$
$FV = 0$

Solve for yield:

$i = 1.6177\%$ per month

or

$i = 19.41\%$ per year

Assuming a Lower Loan Balance

For simplicity, it was assumed in the above example that the balance of the assumable (below-market) loan was the same as the amount available for a new loan at the market rate. As discussed previously, an assumable loan may have a lower balance than a new market rate loan because the seller has paid down the loan and the home may have increased in value. Suppose the balance on the assumable loan in our example is only $50,000 and monthly payments are $507.13. The buyer, however, needs financing of $70,000, the amount that can normally be borrowed at market rates. The borrower may also obtain a second mortgage of $20,000 for 15 years at a 14 percent rate, with payments of $266.35 per month. Is it still

desirable to assume the loan, take a second mortgage, and pay $5,000 more for the house? We can make the following calculations:

	Down Payment	Payment
Market rate loan	$30,000	$795.62
Loan assumption + Second mortgage	35,000	773.48*
	$ 5,000	$ 22.14

*$507.13 on the $50,000 loan assumption plus $266.35 on the second mortgage.

The return is now −2.90 percent. The buyer is clearly better off by not paying $5,000 more for the house to assume the loan. How much more would the buyer be willing to pay? This is the subject of the next section.

Cash Equivalency

In the previous section, we considered how a buyer could analyze whether a premium should be paid for a home with a below-market-rate loan. We now extend that discussion to consider how much the buyer *could* pay to be indifferent to purchasing the home with a below-market-rate loan or one that must be financed at the market rate.

We will use the example from the last section, where a $70,000 loan could be assumed at a 9 percent rate with a remaining term of 15 years and payments of $709.99 per month. Recall that a comparable home with no special financing available would sell for $100,000 and could be financed at a market rate of 11 percent. How much more than $100,000 could the buyer pay if he or she chose to assume the 9 percent loan and still be as well off as if the property were purchased for $100,000 and financed with an 11 percent loan? We first find the present value of the payments that can be assumed using the *market* rate.

$$\begin{aligned} PV &= \$709.99(MPVIFA,\ 11\%,\ 180 \text{ mos.}) \\ &= \$709.99(87.981937) \\ &= \$62{,}466.30 \end{aligned}$$

This is the market value or **cash equivalent value** of the assumable loan. It represents the price at which the old loan could be sold to a new lender/investor.

Calculator Solution:

$n = 15 \times 12 = 180$
$i = 11\% \div 12 = 0.91666\%$
$PMT = \$709.99$
$FV = 0$

Market value:
$PV = \$62{,}446.30$

By assuming the existing loan balance, the buyer of the house would obtain financing equal to $70,000.00 instead of $62,466.30 for the same $709.99 payment. Thus, the buyer receives a net benefit of $70,000.00 − $62,466.30 = $7,533.70. Therefore, the buyer could pay $7,533.70 more for the home, or $107,534 (rounded).

In the previous section, we calculated that the return to the buyer would be 19.41 percent if an additional $5,000 more, or $105,000, were paid for the home. It is possible to verify that by paying $107,534 for the home, the buyer's return would be exactly 11 percent, the same as the market interest rate on the loan.

Based on the above analysis, the home with the assumable loan could probably sell for as high as \$107,534. The buyer would be paying a cash equivalent value of \$100,000 for the house plus an additional **financing premium** of \$7,534 to obtain the benefit of the below-market-rate loan. The value of the house is still \$100,000. This is referred to as the cash equivalent value of the house. This differs from the *price* paid for the house, which includes the \$7,534 financing premium. The recognition of this premium is important because if we knew that the property had actually sold for \$107,534 but did not consider that it had an assumable below-market-rate loan, we would have an inflated opinion about the real worth of the house. Alternatively, the buyer would never want to agree to pay \$107,534 for the property unless the 9 percent below-market financing could be obtained. During the early 1980s, when below-market-rate loans were common, appraisers were criticized for not taking financing premiums into consideration when using sales of homes with below-market-rate loans as comparables in determining the value of houses that had no special financing.

Note that the amount of cash (equity) invested in the home is \$107,534, \$70,000, or \$37,534. When this is added to the cash equivalent value of the loan of \$62,466, we obtain the cash equivalent value of the property of \$100,000.

Cash Equivalency: Smaller Loan Balance

In the previous section, we determined the indifference price for a property that had an assumable below-market-rate loan. The loan balance was the same as the buyer could obtain with a market rate loan. However, when loan assumptions occur, it is likely that the loan balance is significantly less than would normally be desired. We now modify the example in the last section by considering that the balance of the assumable 9 percent loan is only \$50,000 and the buyer would have to borrow an additional \$20,000 through a second mortgage to obtain the \$70,000 needed. We assume that the second mortgage could be obtained at a 14 percent rate for a 15-year term. We continue to assume that a \$70,000 new first mortgage (70 percent of the house value) could be obtained at an 11 percent rate with a 15-year term.[15] Now how much could the buyer pay for the house and be indifferent to the two methods of financing?

We now find the present value of the *sum* of the payments on the assumable loan (\$507.13) plus payments on the second mortgage (\$266.35), using the 11 percent market rate.

$$PV = \$773.48(MPVIFA,\ 11\%,\ 180\ \text{mos.})$$
$$= \$773.48(87.981937)$$
$$= \$68{,}052.27$$

The difference between the present value (\$68,052.27) and the \$70,000 available at the market rate is \$1,947.73. Thus, the buyer would now pay only an additional \$1,947.73 for the home to get the below-market-rate loan. Thus, the home would probably sell for no more than \$101,950 (rounded). This is considerably less than the \$107,500 obtained where the assumable loan had a balance of \$70,000 instead of \$50,000. There are two reasons that the premium is less: First, because the balance of the assumable loan is less, the saving (from lower payments) is less. Second, because this balance is less than the amount of the loan that could be obtained at the market rate, the benefit from lower payments on the assumable loan is reduced by the necessity of obtaining a second mortgage at a higher interest rate than the rate on a new first mortgage. It is important to realize that when carrying out this analysis, the need for a second mortgage must be considered; otherwise, the benefit of the loan assumption is overstated.

[15] Even if the buyer didn't need a second mortgage, we can only evaluate the benefit of the loan assumption by comparing it with what is currently available in the market. Since market rates are usually based on a loan-to-value ratio of 70 percent or more, a second mortgage must be considered in the analysis.

Calculator Solution:

$n = 15 \times 12 = 180$

$i = 11\% \div 12 = 0.91666\%$

$PMT = \$773.48$

$FV = 0$

Market rate:

$PV = \$68{,}052.27$

Cash Equivalency: Concluding Comments

In the previous two sections, we showed how to analyze the impact of below-market financing on the sale price of a property. It is important to recognize the relationship between the price at which a property sells and any special (e.g., below-market) financing that might be available. Although we have considered several examples of cash equivalency calculations, we have only introduced a few of the possible situations that could arise in practice. At least three additional situations could arise that would affect the analysis.

1. If the below-market financing is not transferable to a subsequent buyer, this means that a previous buyer may not benefit from the below-market-rate loan for its remaining term. This obviously affects any financing premiums that would be paid for properties.
2. Even if below-market loans were always assumable by subsequent buyers, the value of this type of financing over the remaining term of the loan to a subsequent buyer depends on the market rate of interest at the time of subsequent sales. These rates may be higher or lower than rates prevailing at the time that the present owner purchased the property. If market rates at the time the property is sold are no longer greater than the contract rate on the assumable loan, then the subsequent buyer would not pay a premium. Hence, the likelihood of subsequent sales and interest rates at such points in time adds an element of uncertainty to the benefit of assuming any loan and should tend to reduce the amount buyers are willing to pay for such loans.
3. Even if the buyer plans to own the property for a time period exceeding the loan term, interest rates could drop after the loan is assumed. Because borrowers can usually refinance when interest rates drop, a below-market-rate loan has less value if interest rates are expected to fall. In effect, the value of the below-market financing is reduced by the "option" to refinance if interest rates fall.

All of the situations discussed above tend to reduce the premium a buyer would pay for a below-market-interest-rate loan. Thus, our analysis is likely to indicate the *upper limit* on the premium associated with below market rate loans. The best way to verify the value of such premiums is by observing how much more buyers pay for below-market financing in contrast to houses without special financing.

Wraparound Loans

Wraparound loans are used to obtain additional financing on a property while keeping an existing loan in place. The wraparound lender makes a loan for a face amount equal to the existing loan balance plus the amount of additional financing. The wraparound lender agrees to make the payments on the existing loan as long as the borrower makes payments on the wraparound loan. Instead of making payments on the original loan in addition to payments on a second mortgage, the borrower makes a payment only on the wraparound loan.

Suppose a homeowner named Smith has an existing loan with a balance of $90,000 and monthly payments of $860.09. The interest rate on the loan is 8 percent and the remaining loan term is 15 years. From the time Smith originally obtained this loan, the home has risen in value to $150,000. Smith's current loan balance is 60 percent of the current value of the property. He would like to borrow an additional $30,000, which would increase his debt to $120,000, or 80 percent of the property value.

Assume that the current effective interest rate on a first mortgage with an 80 percent loan-to-value ratio is 11.5 percent with a term of 15 years, and the current effective interest rate on a second mortgage for an *additional* 20 percent of value ($30,000) would be 15.5 percent for a term of 15 years.

A lender different than the holder of Smith's existing loan is willing to make a wraparound loan for $120,000 at a 10 percent rate for a 15-year term. Payments on this loan would be $1,289.53 per month. If Smith makes this loan, the wraparound lender will take over the payments on Smith's current loan; that is, Smith will pay $1,289.53 to the wraparound lender, and the wraparound lender will make the $860.09 payment on the original loan. Thus, Smith's payment would increase by $429.44 ($1,289.53 − $860.09) per month. Because the wraparound lender is taking over the payments on the old loan, Smith will actually receive only $30,000 in cash (the $120,000 amount for the wraparound loan less the $90,000 balance of Smith's current loan).

Is the wraparound loan a desirable alternative for Smith to obtain an additional $30,000? The rate on the $120,000 wraparound loan (10 percent) is less than the market rate (11.5 percent) on a new first mortgage for the entire $120,000. Thus, the wraparound loan would be more desirable than refinancing with a new first mortgage.[19] Why would the wraparound lender make a loan that has a lower rate than a new first mortgage? The answer is that the wraparound lender is primarily concerned with earning a competitive rate of return on the *incremental* funds loaned (i.e., the additional $30,000). It is the effective cost of the incremental funds loaned that the borrower also should be concerned about.

What is the cost of the incremental $30,000? This is analogous to determining the incremental borrowing cost of a loan that we discussed at the beginning of the chapter. That is, we want to know the incremental cost of the 80 percent wraparound loan versus the 60 percent existing loan. To get the additional $30,000 on the wraparound loan, the borrower must pay a 10 percent interest rate on the entire $120,000, not solely the additional $30,000. Because the rate on the existing $90,000 is only 8 percent, the incremental cost of the additional $30,000 is greater than 10 percent. The question is whether the incremental cost is more or less than the 15.5 percent rate for a second mortgage of $30,000.

The incremental borrowing cost of the wraparound loan can be determined by finding the interest rate that equates the present value of the additional payment with the additional funds received. We have:

$$\$429.44(MPVIFA, ?\%, 180 \text{ mos.}) = \$30{,}000$$

[19] It is assumed that there are no points on the wraparound loan so that the effective cost of the wraparound loan is 10 percent. The cost of a wraparound loan can be compared with the cost of a new first mortgage because both rates reflect the cost of a loan for $120,000.

Using a financial calculator, we find that the interest rate is 15.46 percent, or about 15.5 percent. This is the same rate as that for a second mortgage, which is what we would expect. The wraparound lender can charge a lower rate on the wraparound loan and still earn a competitive rate on the incremental funds loaned because the existing loan is at a below-market rate. The wraparound rate of 10 percent is, in effect, a weighted average of the rate on the existing loan (8 percent) and the rate on a second mortgage (15.5 percent).[20] If the existing loan were at the market rate for a 60 percent loan, then the wraparound rate would have to be equal to the rate on an 80 percent loan, so that the wraparound lender would earn a rate of return on the incremental funds equal to a second mortgage rate.

Calculator Solution:

$n = 15 \times 12 = 180$

$PV = -\$30{,}000$

$PMT = \$429.44$

$FV = 0$

Effective yield:

$i = 15.46\%$

Is there any reason why the wraparound lender should be willing to make the loan at a rate that is more attractive than a second mortgage? The wraparound loan is, in effect, a second mortgage because the original loan is still intact. Furthermore, the loan-to-value ratio is increased by the same amount with the wraparound loan as it would be with a second mortgage. However, the wraparound loan has one advantage: The wraparound lender makes the payments on the first mortgage loan. Hence, control is retained over default in its payment, whereas if a second mortgage was made, the second mortgage lender would not necessarily be aware of a default on the first mortgage loan and might not be included in foreclosure action resulting from it. In a typical wraparound mortgage agreement, the wraparound lender is obligated to make payments on the original mortgage only to the extent that payments are received from the borrower, and the borrower agrees to comply with all of the covenants in the original mortgage except payment. Any default by the borrower will be realized by the wraparound lender, who may not want to see the property go into foreclosure. The wraparound lender may make advances on the first mortgage and add them to the balance on the wraparound loan, foreclose on its mortgage, or negotiate for the title to the property in lieu of foreclosure, while still making payments on the first lien. Thus, the wraparound lender may be willing to earn an incremental return that is slightly lower than a second mortgage rate.

It should be noted that the original mortgage may contain a prohibition against further encumbrances or a due-on-sale clause that may preclude use of a wraparound loan to access equity in, or finance the sale of, property. In the absence of these restrictions, the original lender may also be willing to work out a deal with Smith that would be attractive to both of them. For example, this lender might offer Smith a new first mortgage at the same 10 percent rate as the wraparound loan (rather than the 11.5 percent market rate on a first mortgage) if Smith agrees to borrow the additional $30,000 from the bank. Again, because the 10 percent rate applies to the entire $90,000 (not only the additional $30,000) the original

[20] The weighted average is (90,000 ÷ 120,000 × 8%) + (30,000 ÷ 120,000 × 15.5%) = 9.875 percent, or about 10 percent, which is the rate on the wraparound loan. Note that the weighted average is less than the 11.5 percent rate on a new $120,000 first mortgage, which indicates that the existing loan is at a below-market rate.

lender can earn an incremental return of 15.5 percent on the incremental funds advanced. Thus, the existing lender can earn a competitive rate of return on the new funds and keep the existing borrower as a customer. The lender still earns only 8 percent on the existing loan, but this would also be true if the borrower gets a second mortgage or a wraparound loan from a different lender. Thus, the original lender may be willing, in effect, to offer the same deal as a wraparound lender by charging a rate on a new first mortgage that is equal to the wraparound rate of 10 percent.[21]

Buydown Loans

The final type of loan situation we consider is the **buydown loan.** With a buydown loan, the seller of the home (frequently a builder) pays an amount to a lender to buy down, or lower, the interest rate on the loan for the borrower for a specific period of time. This may be done in periods of high interest rates to help borrowers qualify for financing. For example, suppose interest rates are currently 15 percent and a purchaser of a builder's home has only enough income to qualify for a loan at a 13 percent fixed rate. Let's assume that the loan will be for $75,000 with monthly amortization based on a 30-year term. Payments based on the market rate of 15 percent would be $948.33 per month. Payments at a 13 percent rate would only be $829.65 per month. Based on the buyer's income, the buyer would qualify to make payments of $829.65 but not $948.33. Suppose the builder wanted to buy down the interest rate from 15 to 13 percent, thereby enabling the bank to make the loan, so that payments are only $829.65 per month for the first five years of the loan term but will increase to $948.33 for the remaining loan term. To accomplish this, the builder would have to make up the difference in payments ($118.68 per month for the five-year period). If this difference were paid by the builder to the lender at the time the loan closed, the amount paid would have to be the present value of the difference in payments, discounted at the market rate of 15 percent. Thus we have

$$\begin{aligned}\text{Buydown} &= \$118.68(MPVIFA,\ 15\%,\ 60\text{ mos.})\\ &= \$118.68(42.034592)\\ &= \$4{,}988.67\end{aligned}$$

The builder would therefore pay $4,988.67 to the lender to buy down the loan. When coupled with the payments received from the buyer, the lender would earn a market rate of 15 percent and be willing to qualify the buyer.

Calculator Solution:

$n = 5 \times 12 = 60$

$i = 15\% \div 12 = 1.25\%$

$PMT = \$118.68$

$FV = 0$

Solve for buydown loan:

$PV = \$4{,}988.67$

[21] This is often referred to as a "blended rate" because the 10 percent rate is a weighted average of the rate on the existing loan and the rate on the incremental funds loaned.

The buydown has the advantage of allowing borrowers to qualify for the loan when their current income might not otherwise meet the lender's payment-to-income criteria. Based on our discussion of cash equivalent value, however, you should realize that the builder will probably have added the buydown amount to the price of the home. Thus, the borrower might be better off bargaining for a lower price on the home and obtaining his or her own loan at the market rate. Probably the same home or a similar one could be obtained for $4,988.67 less without a buydown. The borrower is, in effect, paying $4,988.67 in "points" to lower the interest rate to 13 percent from 15 percent.

It should also be noted that many buydowns are executed with graduated payments for three or five years; that is, they may be initiated with monthly payments of $829.65 and step up each year by a specified amount until $948.33 is reached in the fifth year.

Some buydown programs are also used in conjunction with adjustable rate mortgages, where the initial rate of interest will be bought down. Because initial rates on ARMs are typically lower than those on fixed rate mortgages, this results in even lower initial payments, thereby allowing more buyers to qualify. However, this type of buydown practice has been discouraged because payments may increase considerably, particularly if there is an increase in the market rate of interest. In these cases, payments would rise because of higher market rates and because future payments have not been bought down.

Conclusion

This chapter has illustrated a number of problems concerning residential financing situations that borrowers and lenders might face. In today's era of creative financing, many other examples could be discussed. However, we have chosen examples that illustrate the main concepts and approaches to solving important problems. These can be applied to other situations that you might want to analyze. Thus, this chapter should be viewed as introducing various tools that can be used to handle other types of residential financing problems.

To keep our analysis as straightforward as possible and focus on the key new concepts we wanted to introduce, we have used fixed rate mortgages in all our examples in this chapter. However, the analyses also apply to other types of mortgages.

Although we have analyzed only residential financing problems in this chapter, all of the concepts apply equally to the analysis of income-producing or investment real estate. Thus, in later chapters that deal with income property, we will again refer to many of the concepts introduced here.

Key Terms

biweekly payments, *153*
buydown loan, *168*
cash equivalent value, *165*
effective cost of refinancing, *151*
financing premium, *164*
home equity line of credit, *161*
home equity loan, *161*
incremental cost of borrowing, *141*
loan refinancing, *149*
marginal cost of borrowing, *141*
market value of a loan, *156*
origination fees, *[illegible]*
wraparound loan, *166*

Useful Web Sites

www.businessfinance.com/Wraparound-Mortgage.htm—Examples of wraparound loans.

www.fha-home-loans.com/buydown_fha_loan.htm—Discussion of how FHA buydown loans are structured.

www.bankrate.com—Good source of rates and articles on different kinds of mortgages. Includes some useful mortgage calculators to choose between loan alternatives.

www.mgic.com—Mortgage Guarantee Insurance Corporation, a national provider of private mortgage insurance.

http://www.freddiemac.com/pmms/pmms30.htm—This is a good site for finding fixed rate and points for 30 year mortgages.

http://www.freddiemac.com/pmms/pmmsarm.htm—This is a good site for finding Monthly Average Commitment Rate And Points On 1-Year Adjustable-Rate Mortgage.

http://www.ipdindex.co.uk—This website provides objective measurement and analysis of various properties. The company that runs this website does not invest in the market, and does not offer any direct investment advice, so it tends to be unbiased.

Questions

1. Why do points increase the effective interest rate for a mortgage loan more if the loan is held for a shorter time period than a longer time period?
2. What factors must be considered when deciding whether to refinance a loan after interest rates have declined?
3. Why might the market value of a loan differ from its outstanding balance?
4. Why might a borrower be willing to pay a higher price for a home with an assumable loan?
5. What is a buydown loan? What parties are usually involved in this kind of loan?
6. Why might a wraparound lender provide a wraparound loan at a lower rate than a new first mortgage?
7. Assuming the borrower is in no danger of default, under what conditions might a lender be willing to accept a lesser amount from a borrower than the outstanding balance of a loan and still consider the loan paid in full?
8. Under what conditions might a home with an assumable loan sell for more than comparable homes with no assumable loans available?
9. What is meant by the incremental cost of borrowing additional funds?
10. Is the incremental cost of borrowing additional funds affected significantly by early repayment of the loan?

Problems

1. A borrower can obtain an 80 percent loan at an 8 percent interest rate with monthly payments. The loan is to be fully amortized over 25 years. Alternatively, he could obtain a 90 percent loan at an 8.5 percent rate with the same loan term. The borrower plans to stay in the home for the entire loan term.
   a. What is the incremental cost of borrowing the additional funds? (Hint: The dollar amount of the loan doesn't affect the answer.)
   b. How would your answer change if two points were charged on the 90 percent loan?
   c. Would your answer to part (*b*) change if the borrower planned to be in the home only five years?
2. A potential homeowner has $60,000 to invest in a $280,000 home. He can obtain either a $220,000 loan at 9.5 percent for 20 years or a $180,000 loan at 9 percent for 20 years and a home equity loan/second mortgage of $40,000 at 13 percent for 20 years. All loans require monthly payments and are fully amortizing.
   a. Which alternative should the borrower choose, assuming he will be in the house for the full loan term?
   b. Would your answer change if the borrower plans to be in the home only five years?
   c. Would your answers to (*a*) and (*b*) change if the second mortgage had a 10-year term?
3. A homeowner obtained a fully amortizing mortgage 5 years ago for $95,000 at 11 percent for 30 years. Mortgage rates have dropped, so that a fully amortizing 25-year loan can be obtained at 10 percent. There is no prepayment penalty on the mortgage balance of the original loan, but three points will be charged on the new loan and other closing costs will be $2,000. All payments are monthly.
   a. Should the borrower refinance if he plans to be in the home for the remaining loan term? Assume the homeowner borrows only an amount equal to the outstanding balance of the loan.
   b. Would your answer change if he planned to be in the home only five more years?
4. Secondary Mortgage Purchasing Company (SMPC) wants to buy your mortgage from the local savings and loan. The original balance of your mortgage was $140,000 and was obtained 5 years ago with monthly payments at 10 percent interest. The loan was to be fully amortized over 30 years.
   a. What should SMPC pay if they want an 11 percent return?
   b. How would your answer to part (*a*) change if Secondary Mortgage expected the loan to be repaid after five years?
5. You have a choice between the following two identical homes: Home A is priced at $150,000 with 80 percent financing at a 10.5 percent interest rate for 20 years. Home B is priced at $160,000 with an assumable mortgage of $100,000 at 9 percent interest with 20 years remaining. Monthly payments are $899.73. A second mortgage for $20,000 can be obtained at 13 percent interest for 20 years. All loans require monthly payments and are fully amortizing.
   a. With no preference other than financing, which house would you choose?
   b. How would your answer change if the *seller* of home B provided a second mortgage for $20,000 at the same 9 percent rate as the assumable loan?
   c. How would your answer change if the seller of home B provided a second mortgage for $30,000 at the same 9 percent rate as the assumable loan so that no additional down payment would be required by the buyer if the loan were assumed?
6. A homeowner has lived for 15 years in a home, the value of which has risen to $200,000. The balance on the original mortgage is $100,000 and the monthly payments are $1,100 with 15 years remaining. The homeowner would like to obtain $50,000 in additional financing. A new first mortgage for $150,000 can be obtained at a 12.5 percent rate and a second mortgage for $50,000 at a 14 percent rate with a 15-year term. Alternatively, a wraparound loan for $150,000 can be obtained at a 12 percent rate and a 15-year term. All loans are fully amortizing. Which alternative should the homeowner choose?
7. A home builder is offering $100,000 loans for his homes at 9 percent for 25 years. Monthly payments are based on current market rates of 9.5 percent and are to be fully amortized over 25 years. The home would normally sell for $110,000 without any special financing.
   a. At what price should the builder sell the homes to earn, in effect, the market rate of interest on the loan? Assume that the buyer would have the loan for the entire term of 25 years.
   b. How would your answer to part (*a*) change if the home is resold after 10 years and the loan repaid?
8. A home is available for sale that could normally be financed with a fully amortizing $80,000 loan at a 10 percent rate with monthly payments over a 25-year term. Payments would be $726.96 per month. The builder is offering buyers a mortgage that reduces the payments by 30 percent for the first year and 25 percent for the second year. After the second year, regular monthly payments of $726.96 would be made for the remainder of the loan term.
   a. How much would you expect the builder to have to give the bank to buy down the payments as indicated?
   b. Would you recommend the home be purchased if it was selling for $5,000 more than similar homes that do not have the buydown available?
9. An appraiser is looking for comparable sales and finds a house that recently sold for $200,000. She finds that the buyer was able to assume the seller's fully amortizing mortgage which had monthly payments based on a 7 percent interest rate. The balance on the loan at the time of sale was $140,000 with a remaining term of 15 years (monthly payments). The appraiser determines that if a $140,000 loan was obtained on the same property, monthly payments at the market rate for a 15-year fully amortizing loan would have been 8 percent with no points.
   a. Assume that the buyer expected to benefit from the interest savings on the assumable loan for the entire loan term. What is the cash equivalent value of the house?
   b. How would your answer to part (*a*) change if you assumed that the buyer only expected to benefit from interest savings for five years because he would probably sell or refinance after five years?
10. A borrower is making a choice between a mortgage with monthly payments or biweekly payments. The loan will be $200,000 at 6% interest for 20 years.
    a. How would you analyze these alternatives?
    b. What if the biweekly loan was available for 5.75%. How would your answer change?

Appendix

After-Tax Effective Interest Rate

The preceding chapters have dealt with numerous situations where financing alternatives were evaluated. In all cases, the analysis was made without considering that mortgage interest is tax-deductible. An obvious question is whether consideration of federal income taxes affects the conclusions in our analyses. To gain insight into this question, we first consider the after-tax effective cost of a standard fixed-rate mortgage loan.

Example

Suppose a borrower makes a $100,000 loan with annual payments at a 10 percent rate and a 10-year term. Payments are made on an annual basis to simplify the initial illustration. The annual loan payment is calculated as follows:

Annual payment = $100,000 ÷ (*PVIFA*, 10%, 10 yrs.)
= $100,000 ÷ 6.14439
= $16,275

A loan schedule is calculated in Exhibit 6A–1 for the 10-year loan term. The pretax cost of this loan is simply 10 percent because there are no points or prepayment penalties. We now want to see the effect of interest being tax-deductible. The tax benefit of the interest tax deduction is calculated by multiplying the loan interest each year by the borrower's tax rate. For example, the first year interest is $10,000. At a 28 percent tax rate, this means that the borrower can reduce taxes by $2,800 by deducting the interest.

The after-tax cost of the loan can now be found by subtracting the tax savings from the loan payment. The after-tax cost is calculated in Exhibit 6A–2.

To calculate the after-tax effective cost of borrowing, we need to find the annual compound interest rate that equates the after-tax payments to the initial amount of the loan ($100,000). Calculating this rate indicates an after-tax cost of borrowing of exactly 7.2 percent. This is verified in Exhibit 6A–3.

Adding the present value column in Exhibit 6A–3 results in a net present value of zero, which verifies that the after-tax cost is 7.2 percent.

Now that we have performed the calculations the "long way," you may wonder if the pretax and after-tax costs are in some way related to the borrower's tax rate. There is a very simple relationship in this situation:

After-tax effective cost = (Pretax effective cost) × (1 − tax rate)
= 10% (1 − .28)
= 7.2%

EXHIBIT 6A–1 Loan Schedule

End of Year	Payment	Interest	Principal	Balance
1	$16,275	$10,000	$6,275	$93,725
2	16,275	9,373	6,902	86,823
3	16,275	8,682	7,592	79,231
4	16,275	7,923	8,351	70,880
5	16,275	7,088	9,187	61,693
6	16,275	6,169	10,105	51,588
7	16,275	5,159	11,116	40,472
8	16,275	4,047	12,227	28,245
9	16,275	2,825	13,450	14,795
10	16,275	1,480	14,795	0

EXHIBIT 6A–2 After-Tax Cost of Loan Payment

Year	Payment	After-Tax Value of Deduction*	After-Tax Payment
1	$16,275	$2,800	$13,475
2	16,275	2,624	13,650
3	16,275	2,431	13,843
4	16,275	2,218	14,056
5	16,275	1,985	14,290
6	16,275	1,727	14,547
7	16,275	1,444	14,830
8	16,275	1,133	15,141
9	16,275	791	15,484
10	16,275	414	15,860

*Interest times tax rate

EXHIBIT 6A–3 Net Present Value of After-Tax Payments

Year	*ATCF*	*PVIF*	Present Value
0	−$100,000	$1.00000	−$100,000
1	13,475	0.93284	12,570
2	13,650	0.87018	11,878
3	13,843	0.81174	11,237
4	14,056	0.75722	10,644
5	14,290	0.70636	10,094
6	14,547	0.65892	9,585
7	14,830	0.61466	9,115
8	15,141	0.57338	8,682
9	15,484	0.53487	8,282
10	15,860	0.49894	7,913
Total present value			0

We see that the after-tax borrowing cost is inversely proportional to the complement of the borrower's tax rate; that is, if the tax rate is 28 percent, the complement of the tax rate is 72 percent and the after-tax cost is 72 percent of the pretax cost. (In effect, the entire interest cost is tax-deductible.) This relationship will hold even if the loan is repaid early. The relationship also applies to loans with points if the points are deductible when they are paid. If the points cannot be deducted in the same year they are paid, the relationship will not hold exactly. Even where it doesn't hold exactly, it is usually a good approximation of the effective cost.[22] It should also be clear that the higher the borrower's tax rate, the more the benefit of the interest tax deduction.

Monthly Payments

The above example assumed that the payments on the loan were made annually, for example, at the end of the year, which coincided with the time the borrower received the tax deduction. If the loan payments were monthly, would the answer differ significantly? If we assumed that the buyer realized tax benefits from the interest deductions monthly, then the answer would not change at all. It could be argued that taxes are paid only once each year (on April 15 of the following year!) and thus the tax deduction is not received at the exact same time as the loan payment. However, knowing that the tax benefit from the interest deduction will affect tax forms at the end of the year may also mean that borrowers pay less estimated taxes during the year.[23] Furthermore, borrowers may have less taxes withheld from their monthly pay because they know that the interest will reduce their taxable income at the end of the year. Because of these possibilities, it may be more realistic to assume, when calculating the after-tax cost of financing, that interest deductions occur at different points in time than the mortgage payment. However, even if the tax deduction was not assumed to occur until the end of the year, it would not affect the calculated effective interest rate significantly. Thus, for practical purposes, we can conclude that the after-tax effective monthly interest cost is equal to the pretax effective monthly cost multiplied by the complement of the investor's tax rate (1 − Tax rate).

Effect of After-Tax Interest Cost on Loan Decisions

We have seen that the after-tax effective interest rate is directly proportional to the borrower's tax rate. This will be true as long as the interest is tax-deductible in the year it is paid.[24] When this is true, tax considerations will not affect any of the conclusions regarding selection from alternative mortgages because taxes affect each loan in a similar manner. Thus, we can still compare pretax effective interest costs when choosing a loan and be confident that tax considerations will not affect financing decisions. Similarly, we can compute the incremental borrowing cost, the effective cost of refinancing, and other decision criteria discussed in the preceding chapter on a pretax basis. We do not mean to imply that interest deductions for tax purposes are an unimportant consideration when deciding to borrow money. Clearly, a borrower should consider the tax deductibility of the interest payments as part of the cost of making borrowing decisions. The *higher* a borrower's tax rate, the lower the after-tax cost of borrowing. This affects one's willingness to borrow on investment real estate, as you will see later in the book when we evaluate financial leverage.

Negative Amortization Loans

We have seen that the after-tax effective cost of a loan is equal to the pretax effective cost multiplied by the complement of the investor's tax rate. This is true as long as all interest "charged" on the loan is tax-deductible in the year that the interest is paid. By interest charged we mean the portion of each monthly payment which is *not* principal.

In the case of loans with negative amortization, interest charged will exceed the payment during some or all of the loan term. One example we have discussed is the graduated payment mortgage (GPM). We will now see how the after-tax effective cost is calculated for a loan with negative amortization. Consider a loan for $100,000 at a 10 percent interest rate with *annual* payments of $8,000 per year for the first five years, followed by payments of $12,000 per year until the entire balance is repaid.

Because interest charged is $10,000 (.10 × $100,000) the first year and the payment is only $8,000, negative amortization will be $2,000. This increases the balance of the loan to $102,000 after one year. Interest the second year is, therefore, $10,200 (.10 × $102,000). Proceeding in this manner we can construct the loan schedule in Exhibit 6A–4.

From the exhibit, we see that negative amortization for the first five years increases the balance. In year 6, when the payments increase to more than the interest charged, the loan balance begins to decline. However, it takes until year 15 before the balance decreases below the initial $100,000.

The question now is how much interest can the borrower deduct for tax purposes each year? Most borrowers, at least

[22] For example, if points are charged on loans for *income* property, the relationship may not hold exactly. This is because the timing of the tax deduction for the points may not correspond with the actual payment of the points. Whereas the points are paid at the time the loan is closed, they must be amortized over the loan term for tax purposes. Points paid when purchasing an owner-occupied residence are generally deductible, although points paid when refinancing a residence must be amortized over the loan term.

[23] The IRS requires taxpayers to estimate their tax liability and in many cases quarterly payments must be made to the IRS.

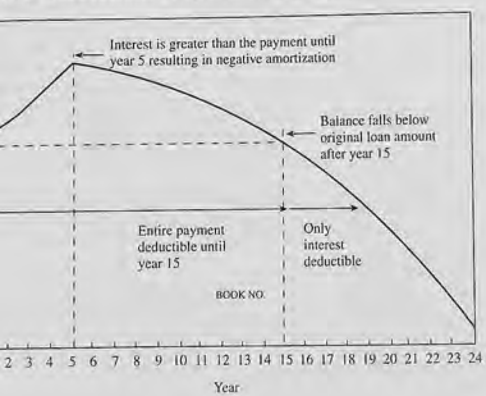
[24] Some alternative mortgages such as the graduated payment mortgage have interest charged (due to negative amortization) which is not deductible in the year it is paid. This is discussed later in this appendix.

A–4 Loan Schedule

inning lance	Payment	Interest	Amortization
0,000	$8,000	$10,000	$(2,000)
2,000	8,000	10,200	(2,200)
4,200	8,000	10,420	(2,420)
6,620	8,000	10,662	(2,662)
9,282	8,000	10,928	(2,928)
2,210	12,000	11,221	779
1,431	12,000	11,143	857
0,574	12,000	11,057	943
9,631	12,000	10,963	1,037
8,594	12,000	10,859	1,141
7,453	12,000	10,745	1,255
6,198	12,000	10,620	1,380
4,818	12,000	10,482	1,518
3,300	12,000	10,330	1,670
1,630	12,000	10,161	1,837
9,793	12,000	9,979	2,021
.	.	.	.
.	.	.	.
.	.	.	.

-occupied homes, compute taxes on a "cash s, their income and expenses for tax purposes are ual cash income and expenditures.[25] For these *urrent tax regulations require that interest de- not exceed the amount of payment*. Thus, in our y $8,000 could be deducted each year during the rs. Starting with year 6, we see that the payment interest. What happens to the interest that could *not* be deducted during the first five years (due to the negative amortization)? The answer is that the borrower can continue to deduct the entire loan payment *until the loan balance is reduced to its initial balance*, in this case, $100,000. Thus, the borrower can deduct the $12,000 payment until year 14. In year 15, the borrower can deduct the $10,161 interest, plus the remaining negative amortization that will reduce the balance to $100,000, or $1,630. After year 15, interest is deducted at the applicable rate in the same manner used on any constant payment mortgage. Exhibit 6A–5 illustrates the relationship among the mortgage payment, interest charges, and loan balance in this example.

A–5 Tax Deductions—Negative Amortization Loan



After-Tax Effective Cost

We now have the information we need to calculate the tax deductions and after-tax effective cost of the loan. We can create the schedule in Exhibit 6A–6.

We could compute the effective cost for the entire loan term or for repayment of the loan at any time prior to the end of the loan term. For purpose of illustration, we will compute the after-tax effective cost for repayment of the loan at the *end* of year 15 when the balance is $99,793. We have the following cash flows:

Year	After-Tax Cash Flow
0	−$100,000
1–5	5,760
6–14	8,640
15	108,492

[25] The alternative is an "accrual basis," where an accrual-based accounting system is used to determine income and expenses.

EXHIBIT 6A–6 After-Tax Payments

Year	Payment	Interest Deductions	Tax* Savings	After-Tax Payment
1	$8,000	$8,000	$2,240	$5,760
2	8,000	8,000	2,240	5,760
3	8,000	8,000	2,240	5,760
4	8,000	8,000	2,240	5,760
5	8,000	8,000	2,240	5,760
6	12,000	12,000	3,360	8,640
7	12,000	12,000	3,360	8,640
8	12,000	12,000	3,360	8,640
9	12,000	12,000	3,360	8,640
10	12,000	12,000	3,360	8,640
11	12,000	12,000	3,360	8,640
12	12,000	12,000	3,360	8,640
13	12,000	12,000	3,360	8,640
14	12,000	12,000	3,360	8,640
15	12,000	11,791	3,302	8,699

*28 percent tax rate.

The *IRR* for the above cash flows is 7.32 percent. Recall that the pretax effective cost was 10 percent; thus, we see that the after-tax effective cost is slightly higher than it would be for a fully amortizing loan, which would have an after-tax effective cost of exactly 7.2 percent. The higher after-tax effective cost for the negative amortization loan occurs because of the *deferral* of interest deductions. During the period of time that the loan balance was increased, less interest is deducted than is charged. The portion of interest that is not tax-deductible during those years becomes deductible from the time the loan balance begins to fall until it reaches the original balance.

Conclusion

The tax deductibility of interest payments reduces the after-tax cost of debt. As long as the entire amount of interest charged in a given year is tax deductible that year, there is a very simple relationship between the pretax cost of a loan and the after-tax cost. The after-tax cost is equal to the pretax cost multiplied by the complement of the borrower's tax rate. That is

$$\text{After-tax cost} = (\text{Pretax cost})(1 - \text{Tax rate})$$

If the entire amount of interest charged is *not* deductible, as was illustrated for negative amortization loans, the effective after-tax cost will be higher than it would be for the fully amortized loan. This results from the delay in receiving the tax deduction. However, even in this situation, multiplying the pretax cost times the complement of the borrower's tax rate provides a close approximation of the after-tax borrowing cost.

If all loans evaluated for tax purposes are treated about the same, taxes do not have to be considered in the analysis since they affect all loans in the same manner and thus "wash out" in the final analysis. Thus, the types of analyses discussed in previous chapters can still be made without explicitly considering taxes. However, tax deductibility of interest is still important when deciding whether to borrow in the first place since it reduces the cost of using debt to finance the purchase of real estate. This is particularly important when determining whether to borrow money for investment property since the after-tax cost of the funds borrowed must be compared with the after-tax return on the property (before considering borrowing money) to see whether it is favorable to use debt to finance the purchase.

Problems

1. A $100,000 loan can be obtained at a 10 percent rate with monthly payments over a 15-year term.
   a. What is the after-tax effective interest rate on the loan, assuming the borrower is in a 30 percent tax bracket and the loan is held only three years? Assume that the benefit of interest deductions for tax purposes occurs at the same time payments are made.
   b. Calculate the after-tax effective cost for the above loan, assuming 5 points are charged and that the points are tax-deductible at the time they are paid.
   c. How does the after-tax cost in part (b) compare with the pretax effective cost of the loan?
2. A mortgage for $100,000 is made with initial payments of $500 per month for the first year. The interest rate is 9 percent. After the first year payments will increase to an amount that makes the loan fully amortizable over the remaining 24 years with constant monthly payments.
   a. Calculate the interest deductions for the loan for the first year.
   b. How much, if any, interest must be deferred until the second year?
   c. How much interest will be deducted in the second year?

Chapter 7

Single Family Housing: Pricing, Investment, and Tax Considerations

In previous chapters, we covered the nature of real estate assets, property rights, a broad range of fixed and adjustable rate mortgage loans, and the loan underwriting process. In this chapter, we focus on single family residential housing as an investment. In doing so, we provide an analysis of homeownership as an alternative to renting, the characteristics of supply and demand for housing, pricing, federal income tax treatment for homeowners, and investing in "distressed" properties. All of the topics in this chapter are essential for prospective investors in housing.

Overview

Homeownership has long been considered to be an important goal for many individuals in the United States. In addition to providing shelter, many view homeownership as an important investment vehicle that is important for personal wealth accumulation. Some have come to think of housing as both a consumption good (shelter) and an investment. As our economy has developed, many institutions have evolved to support the growth in the housing industry. These include financial institutions, developers and builders, mortgage lenders, real estate brokers, the property insurance industry, and many other service providers. Indeed, it has been estimated that housing and related services account for as much as 15 percent of total U.S. output. In addition, federal income tax policy has long favored homeownership by providing for the deductibility of mortgage interest and, under certain conditions, excluding capital gains from taxation when properties are sold. These tax incentives stem from the belief by members of Congress that homeownership encourages stronger social networks, better educational achievement rates, and lower crime rates. Consequently, they have continued to provide special tax incentives to encourage homeownership. What follows is a more detailed examination of factors that influence housing as an investment.

Appreciation in House Prices

One element related to considering housing as an investment is the rate of price appreciation and what drives it. To begin our discussion, it is useful to review a list of important influences on price appreciation, as shown in Exhibit 7–1. Data for all of these concepts are available at the metropolitan statistical area (MSA) level for each metro area (see Web site

EXHIBIT 7–1
Economic Influences on Housing Demand

Increases In	Direction of Impact on Demand
(1) Population growth	+
(2) Household formations	+
(3) Employment	+
(4) Household income	+
(5) Interest rates	–
(6) Federal income tax rates	–
(7) Cost of renting housing	+

references at the end of this chapter). The right-hand column in Exhibit 7–1 shows the direction of influence, holding all else constant, that each variable should have on housing demand. These influences should be interpreted based on *increases* in each variable. For example, increases in population, households, income, and employment, when considered individually, should affect the demand for housing positively. However, increases in interest rates would have a negative effect. Increases in federal income tax rates would have a negative effect. And if the cost of rental housing increases relative to house prices, demand should increase. Obviously, if the change for any of the variables in the above list were in the opposite direction, the impact on housing would be the reverse of what we have discussed (e.g., a decline in interest rates would have a positive effect on housing).

Finally, when attempting to forecast a trend in the above variables, we see two questions of fundamental importance: (1) What drives each variable? (2) Why do changes in the variables *vary by city*? In recent years, population growth has been greatly affected by immigration. It has been estimated that immigration accounted for as much as one-third of the total increase in population during the 1990s. It is also important to note that the growth rate in households paralleled the population increase. As already indicated, households tend to form as younger individuals leave home for college or employment.

Social trends have also tended to increase the number of households. These include delays in the average age at which marriages are occurring, the increasing number of divorces, and the number of people never marrying. These factors result in greater demand for separate, or individual, housing units. Increases in the average life expectancy has also resulted in households occupying housing units for longer periods of time. This, in turn, has reduced "housing turnover," or the inventory of existing housing units that would otherwise be available to younger household groups.

Income and Employment

While growth in population and households is a necessary condition for housing demand, employment is also an important driver of housing affordability. Recent data indicate that U.S. employment growth has averaged about 1.76 percent annually during the past 10 years. Sunbelt cities have enjoyed the greatest growth in employment. The share of the population employed also has increased as more women have joined the labor force. Many of these are single-parent households, which reinforces the demand for more housing units. Although we will discuss the economic base of cities later in the chapter, we should point out that there are differences in the nature of employment opportunities and the types of business that locate in various regions of the United States. The relative desirability of regions that attract businesses (1) affects the ability of households to earn income that they use to acquire housing and (2) also affects house prices. An important item to remember is that the quality and nature of employment and the salaries earned by the labor force also vary by metro area. So while employment growth is important, the quality of jobs and the wages and salaries earned in these occupations are also important. There is a very strong association between house price appreciation and income/employment growth. Therefore, when viewing housing as an investment, we must remember that basic research concerning these trends for cities under consideration is very important.

Interest Rates

Many factors determine interest rates. The more important factors include the supply and demand for loanable funds as the economy expands and contracts and Federal Reserve policy in the course of its management of the monetary system. The Federal Reserve generally has a significant effect on interest rates, which in turn affects housing demand. Because real estate has a "high debt capacity" and many loans are made as a large percentage of property value, monthly payments may rise or fall substantially, depending on changes in interest rates. The effects of interest rate changes also tend to spill over into many areas of the housing industry. These areas include construction, land development, financing, brokerage, inspections, appraisals, and other housing-related service businesses. Because of these far-reaching influences, housing is a very important sector of the economy.

As indicated in Exhibit 7–1, *holding all else constant, increases* in interest rates tend to have a *negative* influence on housing demand. This relationship is somewhat intuitive because as interest rates increase, this is analogous to raising the cost on borrowed capital, thereby raising the cost of financing homeownership. Conversely, as interest rates *fall*, the effects on housing demand tend to be *positive*.

While the effects of interest rates on demand are relatively clear, the *magnitude* of the impact has become more complex to understand in recent years because of a greater variety of mortgage loan options. As discussed in Chapters 4 and 5, these options are no longer limited to fixed rate mortgages (FRMs). Adjustable rate loans (ARMs) and many other types of loans now provide for different rates, loan amortization periods, and other features. In addition, some of the other terms of lending, such as financing fees, prepayment options, and the rigor with which lenders apply underwriting standards, tend to reinforce the direction of mortgage interest rates. For example, during periods of appreciating house prices and/or low interest rates, lenders may tend to be more flexible on such things as credit scores when underwriting. This tends to amplify the effect that interest rates otherwise may have on housing demand.

Renting versus Owning

Another important consideration when analyzing the demand for homeownership investment is the cost of renting. If individuals find that renting is more cost-effective than owning, homeownership may not be a good investment. What follows is a comparative analysis of the relative costs of owning versus renting the *same residence*. The goal of this exercise is to compile all cash flows associated with each form of occupancy, and then calculate the rate of return that will be earned on the funds used to make an equity investment (down payment) if the property is purchased. Alternatively, it is this rate of return that an investor would have to earn on the "down payment" saved if renting is chosen, to make renting the financial equivalent of owning.

The framework for making a comparison between renting and owning is presented in the example summarized in Exhibit 7–2. In this example, we have a property that could be *rented* for $12,000 per year ($1,000 per month) or *purchased* for $150,000 with $30,000 down and financed with a fully amortizing mortgage loan of $120,000 at 7 percent interest for 30 years. Other costs associated with *owning* include maintenance, insurance, and property taxes. In our example, these expenses would not have to be paid if renting is chosen. All other expenses would have to be paid regardless of whether the property is owned or rented, such as utilities, and so on. Because they offset, they do not have to be included in our analysis. Other *assumptions* include (1) a federal income tax rate of 28 percent, (2) escalation in expenses, rents, and property value at 2 percent per year, and (3) a five-year period of

EXHIBIT 7–2 Rent versus Own Analysis of a Personal Residence

excel
www.mhhe.com/bf13e

1. Property Information		**Loan Information**	
Purchase price	$150,000	Loan-to-value ratio	80.00%
Initial rent	$12,000	Loan amount	$120,000
Rental growth rate	2.00%	Interest rate	7.00%
Property growth rate	2.00%	Loan term	30 years
Insurance	$500.00	Payments	12 per year
Maintenance	$500.00	Annual debt service (payment)	$9,580
Expense growth	2.00%	Annual loan constant	7.98%
Marginal tax rate	28.00%	Equity investment/down payment	$30,000
Property tax as % of value	1.50%	Selling expenses	7.00%

2. Annual Loan Schedule						
End of year	0	1	2	3	4	5
Mo. Payments • 12		$ 9,580	$ 9,580	$ 9,580	$ 9,580	$ 9,580
Balance		118,781	117,474	116,072	114,569	112,958
Interest (year)		8,361	8,273	8,179	8,077	7,969
Amortization (year)		1,219	1,307	1,402	1,503	1,612
3. Property Data						
Property value	$150,000	$153,000	$156,060	$159,181	$166,365	$165,612
Rents		12,000	12,240	12,485	12,734	12,989

analysis, at the end of which, the property would be sold (if owned). Selling expenses of 7 percent would have to be paid at that time.

Cash flows associated with our analysis are summarized annually for convenience and presented in Exhibit 7–3. Note that for the ownership alternative, cash flows must be developed both before and after taxes because, as indicated, owners of residential property are provided with special federal income tax treatment (see summary of tax provisions in Exhibit 7–4). This treatment is not available to renters; therefore, cash outflows for renters are the same on a before- and after-tax basis (see part C). Looking to Exhibit 7–3 [illegible] in panel A, we have summarized *before-tax* cash outflows associated with owning. These total $12,830 during year 1. Included in these cash outflows are constant monthly mortgage payments of $798.33 × (12), or $9,580 each year. The tax treatment shown in part B includes allowable deductions for property taxes and mortgage interest. These deductions *reduce* the owner's federal income tax[1] payments and therefore reduce net outflows associated with homeownership. These deductions reduce taxes at a rate of 28 percent, or a total of $2,971 in year 1. Interest deductions decline to $7,969 in year 5 because interest on the loan declines over time. The net annual after-tax cash outflows if owning is chosen are summarized in part D and are $12,830 (from part A) *less* $2,971 in *tax savings* (from part B) resulting in a net outflow of $9,859. If the property is owned, this also means that rent of $12,000 *does not have to be paid*. To complete the annual outflow in our analysis, we must consider rent savings if owning is chosen. This amounts to $12,000 the first year and when included in the analysis produces a net after-tax savings from homeownership of $2,141 as shown in part D. Note that savings in year two are $2,304 and so on. This analysis must be

[1] This assumes that the homeowner itemizes for tax purposes.

EXHIBIT 7–3 Cash Flow Analysis—Rent versus Own

	Year 1	Year 2	Year 3	Year 4	Year 5
A. BT cash flows—owner:					
(1) Property taxes	$ 2,250	$ 2,295	$ 2,341	$ 2,388	$ 2,435
(2) Insurance	500	510	520	530	540
(3) Maintenance	500	510	520	530	540
(4) Mortgage payments (P&I)	9,580	9,580	9,580	9,580	9,580
(5) Cash outflows before taxes	$ 12,830	$ 12,895	$ 12,961	$ 13,028	$ 13,095
B. Tax deductions—owner:					
(1) Property taxes	$ 2,250	$ 2,295	$ 2,341	$ 2,388	$ 2,435
(2) Interest	8,361	8,273	8,179	8,077	7,969
(3) Total deductions	10,611	10,568	10,520	10,465	10,404
(4) Tax savings @ 28%	$ 2,971	$ 2,959	$ 2,945	$ 2,930	$ 2,913
C. Renter status:					
(1) Rents	$ 12,000	$ 12,240	$ 12,485	$ 12,734	$ 12,989
D. Net cash flows—owning:					
(1) Before tax outlays (A.5)	$ (12,830)	$ (12,895)	$ (12,961)	$ (13,028)	$ (13,095)
(2) Tax savings (B.4)	2,971	2,959	2,945	2,930	2,913
(3) After-tax cash flows	(9,859)	(9,936)	(10,016)	(10,190)	(10,182)
(4) Rent saved (C.1)	$ 12,000	$ 12,240	$ 12,485	$ 12,734	$ 12,989
(5) After-tax cash flows—owning	$ 2,141	$ 2,304	$ 2,469	$ 2,635	$ 2,807
E. Before-tax cash flow—for sales occurring in years 1–5:					
(1) Property value	$153,000	$156,060	$159,181	$162,365	$165,612
(2) Less: Selling expenses	10,710	10,920	11,143	11,366	11,593
(3) Less: Mortgage payoff	118,781	117,474	116,072	114,569	112,958
(4) Before-tax cash flow sale	$ 23,509	$ 27,666	$ 31,966	$ 36,430	$ 41,061
F. After-tax cash flow—for sales occurring in years 1–5:					
(1) Property value	$153,000	$156,060	$159,181	$162,365	$165,612
(2) Less: Selling expenses	10,710	10,920	11,143	11,366	11,593
(3) Less: Basis	150,000	150,000	150,000	150,000	150,000
(4) Gain on sale	(7,710)	(4,860)	(1,962)	999	4,019
(5) Less: Exclusion	—	—	—	999	4,019
(6) Tax	0	0	0	0	0
(7) After-tax cash flow (E.4 – F.6)	$ 23,509	$ 27,666	$ 31,966	$ 36,430	$ 41,061
G. ATIRR on equity ($30,000) if sold:					
(1) ATIRR (D.5 + F.7)	–14.50%	3.57%	9.63%	12.34%	13.71%

carried out for each year to assess (1) the net effects of increasing nondeductible expenses such as maintenance and insurance, (2) increasing rents, (3) increasing deductible expenses such as property taxes, and (4) declining deductible expenses such as the interest portion of payments on the mortgage loan.

Finally, we must consider the proceeds from sale of the property. We calculate this for each year in sections E and F of Exhibit 7–3. The before-tax cash flow in section E is simply

the sale price, less selling expenses and the mortgage loan balance. After-tax cash flows must include any taxable gains on sale. The latter is based on the selling price, less selling expenses, less the tax basis for the residence which in this case is the original purchase price.[2] Should a sale occur, the tax consequences are shown to be zero in each of the first three years because the property appreciation rate is not sufficient to offset the selling expenses. Therefore, if the property is sold, the borrower would not recover the initial acquisition price and no taxable gain or deductible loss results. It should be noted that, beginning in year 4, a $999 gain from sale results, as does a $4,019 gain in year 5. However, because of the capital gains exclusions that apply to residential real estate (see Exhibit 7–4), these capital gains are not taxable. The annual after-tax cash flows up to the year of sale and the cash flows produced from sale are combined and internal rates of return are calculated and presented in section G of Exhibit 7–3. Note that if the property was sold at the end of year 1 the *IRR* after tax on the $30,000 investment would be negative. This means that if the property is expected to be sold after only one year, renting may be the wiser choice. However, returns from ownership improve in years 2 though 5, as the annual after-tax cash flows and the property value increase.[3] The *IRRs* during those years indicate that in order to justify renting, an investor would have to earn from 3.5 percent to 13.7 percent on an after-tax basis on *other investments* equal in risk with the $30,000 equity saved to make renting equivalent to owning.[4]

Other Considerations

After we summarize the cash flows associated with owning and renting, a number of additional questions arise. For instance, our example assumes a sale at the end of year 5. Inasmuch as people must have shelter, what should be done with the proceeds from sale after year 5? Will the investor choose to own or rent from the end of year 5 into the future? What if the owner chooses not to sell after year 5, but continues to own for the indefinite future—how should this possibility be analyzed? One guide that may help to answer these questions would be to first consider the likelihood that a sale may occur in a relatively short period of time. Generally, if frequent sales are likely to occur because of employment changes/relocation, renting should tend to become more desirable *unless* house appreciation rates and rents are increasing at significant rates in the area where the residence is located. In the latter case, when a sale occurs, a borrower would be more likely to recover selling expenses and save increasing rents that would otherwise have to be paid. On the other hand, if house prices are expected to remain flat or decline, a short period of occupancy would tend to make renting more favorable. Alternatively, other combinations that could make renting more favorable than owning would include (1) expected rents would have to decline, or (2) non-tax deductible housing expenses (maintenance, insurance, etc.) would have to be expected to increase dramatically, or (3) the initial interest rate available on mortgage loans would have to be much higher than the 7 percent shown in our example.

As to periods beyond five years, it is apparent from Exhibit 7–3 that net benefits from homeownership continue to increase over time. While this pattern cannot be expected

[2] If any improvements or remodeling expenses have been incurred, these should be added to the original purchase price to establish the tax basis for the residence in the year of sale. "Fixing-up" expenses immediately prior to sale may also be included.

[3] To calculate the ATIRR in year 2, one must find the interest rate (discount rate) that makes the present value of $2,141 in year 1 and $2,304 plus $27,666 at the end of year 2 equal to the equity outlay of $30,000.

[4] These other investments would also have to be equal in risk.

EXHIBIT 7–4 Summary of Tax Provisions Important to Residential Housing

I. Tax Treatment of Personal and Qualified Residences*

A. *Interest Deductions and Qualified Residences.* Interest is deductible on "qualified residences." A taxpayer's qualified residences are a personal residence and *one* other residence. The second residence does not have to be used by the taxpayer during the taxable year to be a qualified residence if it is not rented during the year. If it is rented for part of a year, a specified amount of personal use is required (see II.A, below). Interest on three or more homes is not deductible, unless the home is a business or investment property not used personally by the taxpayer. Under certain conditions, mobile homes, boats, trailers, time-shares, and stock in a cooperative housing corporation may be a qualified residence.

B. *Maximum Interest Deductions.* Interest on two types of home mortgage debt is deductible.

(1) Interest is deductible on "acquisition debt," which is *secured debt* used to purchase, build, or substantially improve a qualified residence. Interest on acquisition debt is deductible as long as the debt does not exceed the cost of the residence and its improvements. The maximum amount of indebtedness upon which interest is calculated may not exceed $1,000,000 for couples filing jointly.

(2) Interest is also deductible on "home equity debt." For couples filing jointly, the amount of indebtedness upon which interest is based can be up to the lesser of $100,000 or the amount of equity in the residence. Home equity debt must be secured by a qualified residence.

C. *Points on Mortgage Loans.* The term *points* is used to describe certain charges paid, or treated as paid, by a borrower to obtain a home mortgage. Points may also be called loan origination fees, loan charges, loan discounts, or discount points. Points can be deducted in the year paid if *all* of the following tests are met:

(1) The loan is secured by a qualified residence.

(2) The funds you provided at or before closing, plus any points paid by the seller, were at least as much as the points charged.

(3) If the loan was used to buy or build a home (qualified residence).

(4) The points were computed as a percentage of the principal amount of the mortgage.

(5) The amount is clearly shown on the settlement statement as points charged for the mortgage. The points may be shown as paid from either your funds or the seller's funds.

If the above tests are *not* met, points must be deducted over the life of the loan.

D. *Real Estate Taxes.* Property taxes must be a direct tax on interests in real property. The tax is deductible in the year paid only by the owner of the property upon which the tax was imposed and paid. Generally, prepaid real estate tax can be deducted in the year of the prepayment.

E. *Capital Gain Exclusions.* For sales of a personal residence after 5/6/97, a homeowner may exclude from income $250,000 of gain, and a married couple may exclude up to $500,000 of gain realized on the sale.

(1) Individual must have owned and used the home as a principal residence for at least two of the five years prior to the sale (the two years do not have to be consecutive).

(2) Exclusion applies to only *one* sale every *two* years.

II. Tax Treatment of Second Residences

A. *Interest Deductions.* All rules relating to personal residence interest deductions apply.

B. *Points.* Points paid on loans secured by a second home are amortized and deducted over the life of the loan.

C. *Sale of Second Residence:* Capital Gains Exclusion. Generally only one home (either the primary or secondary) that is used for a majority of the time during the year will be considered the principal residence and will qualify for the exclusion. Second homes do not qualify for the exclusion.

III. Tax Treatment of Second or Vacation Homes

A. If the property is not rented and is owned for personal use only, then deductions are determined as though it is a non-primary, qualified residence (see: I.A above).

B. If the property is owned for personal use and rented for 14 days or less per year, no rents or expenses must be reported.

C. If the property is owned for *both* personal use and rented, all rental income must be reported and all expenses can be deducted. Personal use cannot exceed 14 days or 10% of the number of days for which it was rented (whichever is greater).

D. If the property is owned for both personal use and rented, and the number of days of personal use exceeds 14 days or 10% of the number of days for which it was rented, then all rental income must be reported and deductions are limited to the amount of rental income. Any expenses in excess of rental income may be carried forward to offset income earned in future years.

*Generally based on Internal Revenue Code P 163(h)(4) and P 1.163-10T.

continue with certainty, an examples of the importance of appreciation in house prices and equity investment may be helpful.

If one examines the cash flow analysis again in Exhibit 7–3, it becomes clear that advantages to homeownership are substantial because of house appreciation rates (E.1 and F.1) and the **capital gains exclusion.**

The Rent vs. Own Decision—Other Issues

What has been presented above is a purely financial analysis of owning or renting the same place of residence. In the example, it was apparent that ownership was generally the favored choice, particularly if the property was to be owned and occupied for three years or more. One interesting question that may occur to the reader may be: "Is there a level of *rent* at which benefits from homeowning are eliminated?" To consider this question, we consider an initial rent level of $8,000 rather than $12,000 annually. We *recalculate* the net cash flows in Exhibit 7–3 by changing rent saved (part C) to $8,000 for the first year, which changes results in part D (4) and produces the following after-tax *IRRs* on the $30,000 equity investment:

Revised annual cash flows and ATIRR recalculation:

Year	1	2	3	4	5
D(5) Owning	$ (1,859)	$ (1,776)	$ (1,692)	$ (1,700)	$ (1,526)
F(7) Sale	$23,509	$27,662	$31,966	$36,430	$41,061
ATIRR:	−27.8%	−10.2%	−3.6%	−.4%	1.5%

From this analysis, it is apparent that if the same residence could be rented for $8,000 per year, then based on financial considerations only, the investor would be *indifferent* as to whether the property is owned or rented for 5 years (note: the *IRR* in year 5 is barely positive). It could also be said that almost no advantage exists between the purely financial elements of owning and renting.

Historical Trends

Based on historical trends in the United States, approximately 67 percent of all residential housing is owned and 33 percent is rented. This suggests that homeownership is strongly preferred and has been a good investment. However, there are other issues to consider. Renting could be favored in spite of financial returns on equity in residential ownership for a number of reasons. These include:

1. Need for flexibility because of frequent relocation of employment, family, or other reasons.
2. Lack of funds for a down payment.
3. Credit quality of the resident.
4. No desire to bear the risk of ownership and volatility in house prices.
5. A desire to shift maintenance, security, and management to others.
6. "Bubbles" in house prices. This can occur when house prices rise relative to rents to such an extent that the prospect of further appreciation in prices becomes problematic. This can occur in some housing markets affected by sharp increases in employment tied to highly cyclical industries. Should contraction in employment occur in those industries, housing markets may be be negatively affected.

To the extent that any or all of the above considerations are important to residents, they may be willing to forgo returns available from homeowning and pay an implicit premium or opportunity cost to maintain renter status. For this and other reasons, there are many investors and developers who develop, own, and manage *rental housing units*. We will deal with that type of real estate investment in a later chapter.

Calculating Appreciation Rates—An Extension

When investing in housing, investors will find it useful to know the expected rate of appreciation in house prices (*EAHP*). This is calculated as

$$\frac{HP_1 - HP_0}{HP_0} = EAHP\%$$

where HP_0 is the house price in year zero and HP_1 is the price at the end of year one. To illustrate, if HP_0 = \$100,000 and HP_1 = \$103,000, then the appreciation in house prices for one year is 3 percent, shown as:

$$\frac{\$103{,}000 - \$100{,}000}{\$100{,}000} = 3\%$$

To extend this analysis and provide more perspective for investors, a useful exercise is to consider the **expected appreciation rate on home equity (EAHE).** This concept can be calculated as follows:

$$\frac{HP_1 - HP_0}{HP_0(1 - L/V)} = EAHE\%$$

defining L/V as the **loan-to-value ratio.** Assuming a 3 percent house appreciation rate and an 80 percent loan-to-value ratio, the annual *equity* appreciation rate for a one-year period would be:

$$\frac{\$103{,}000 - \$100{,}000}{\$100{,}000\,(.2)} = EAHE$$

$$\frac{\$3{,}000}{\$20{,}000} = 15.0\%$$

Alternatively, the expected average annual appreciation in home *equity* (EAHE) can be approximated from the average house price appreciation rate of 3 percent by multiplying it by the ratio of house price to equity (*HP/E*), which is 100% ÷ 20%, or 5.0. Using this formulation, we have:

$$EAHP(HP/E) = EAHE$$

$$3\% \cdot 5 = 15.0\%$$

These calculations show that a 3 percent annual average rate of appreciation in house price results in a 15 percent appreciation rate on equity when 80 percent financing is used. This example can be thought of as a method of providing investors with an estimate of unrealized equity gains, which the owner has the option of realizing by selling the residence at various periods of time. This example also provides a very clear example of why investing in housing financed with mortgage loans has provided an extremely powerful financial incentive for households, particularly those interested in long-term wealth accumulation.

Unrealized Annual Rates of Appreciation on Equity

The above calculations provide a good approximation in situations where rate of house appreciation is expected to be a constant or when a rough estimate is adequate for the reader. In cases where the rate of house price appreciation is expected to be different each year, or

should a more exact calculation be needed, the above calculation may be modified as shown in the following example for a \$100,000 property financed with an 80 percent loan.

End of Year	House Price	Appr Rate	Equity	Calculation	EAHE
0	100,000	—	20,000	—	—
1	103,000	3%	23,000	3,000 ÷ 20,000	15.0%
2	105,060	2%	25,060	2,060 ÷ 23,000	9.0%
3	109,262	4%	29,262	4.202 ÷ 25,060	16.8%

Average EAHE:

$$(15.0 + 9.0 + 16.8) \div 3 = 13.6\%$$

Average EAHE (compounded):

$$\sqrt[3]{1.15 \cdot 1.090 \cdot 1.168} = 13.55\%$$

Calculator Solution:
$n = 3$
$PV = -20{,}000$
$FV = 29{,}262$
$PMT = 0$
Solve for (i)
$i = 13.55\%$

As shown in the above example, average expected appreciation in home equity for the three-year time period is 13.6%, or 13.55% compounded annually.

Regional Economic Influences on Property Values

An important concept in real estate analysis is the fact that the house prices are highly *dependent* on the regional or geographic area in which they are located. The demand for properties in local markets is highly influenced by the nature of the industries, businesses, and so on, that are attracted to a region. Business activity and its growth determine employment and income in a region, which influence the demand for all property types. In short, when a real estate analysis is undertaken, the *regional economic drivers* must be identified and a judgment must be made about whether these drivers will provide a source of growth or decline in a region. To determine the latter, trends must be established for the future global outlook for growth in those industries (e.g., computer technology, communication technology, medical-pharmaceutical, and tourism/recreation).

Why do certain kinds of economic activity tend to "cluster" more in some regions and urban areas than others? We do not intend to provide an extensive discussion of the phenomena here as there have been volumes written on this subject by many regional economists. However, we do believe that an understanding of the underpinnings of this economic behavior is critical when thinking about the relative attractiveness of real estate investments. As we will stress in this chapter and in others, making an investment in a specific real estate asset cannot be separated completely from *making an investment in an economic*

During the three years ending in the third quarter of 2005, house price appreciation in the United States averaged about 9.5 percent, a rate significantly higher than its long-term (20 years) average of 5.2 percent. Average rates of appreciation in certain East Coast and West Coast markets also greatly exceeded their respective annual averages (e.g., San Diego, CA: 19 percent versus 9 percent; Washington, DC: 20 percent versus 8 percent). Because of this extraordinary escalation in prices, many observers suspected that a "price bubble" was developing in many housing markets. The term *bubble* is used to describe an extraordinary market condition in which house buyers and speculators cause prices to increase to levels that cannot be sustained. Bubbles tend to "burst" when it is realized that underlying economic factors do not justify the prices being paid for houses. At this point, inventories of new houses and existing houses for sale begin to increase. Speculators begin to sell, placing downward pressure on prices. Some observers believe that when bubbles burst, markets throughout the United States may be affected. Others believe that its effects would be limited only to specific regional markets.

1. *What caused the potential for a bubble to develop?* Recall from our earlier discussions regarding factors affecting demand that it is useful to focus on interest rates and financing as the major causes of the potential bubble that may have developed during 2005–2006. During the recession of 2001–2002, the Federal Reserve adopted a low interest rate policy to provide a stimulus for economic recovery. Some interest rates, including mortgage interest rates, reached 40-year lows. This greatly affected all sectors of the housing market, as it provided a catalyst for homebuilders, first-time home buyers, households seeking to upgrade their housing, sales of second homes, and sales of vacation homes. New and converted condominium sales also increased. Many purchases were made by speculators hoping to buy properties, then resell them for higher prices in a short period of time. In addition to low interest rates, competition among mortgage lenders reduced loan underwriting standards and accommodated speculators. Builders and condominium converters were interested in selling their product as quickly as possible to anyone who could qualify for financing. Speculators were willing to take the risk of purchasing units and borrowing at very high loan-to-value ratios to eventually "flip," or sell, them to others. As long as lenders provided financing at low interest rates, this tended to stimulate demand and added to price escalation. Increased use of ARM financing also made initial mortgage payments very low and tended to reinforce this speculative activity. Lenders remained willing to accommodate this process because they earned fees and interest on loans made to builders, condo converters, speculators, and, ultimately, the final homeowner.
2. *Would such a bubble burst?* What would cause the bubble to burst? By the end of 2005, the Federal Reserve, fearing mounting inflationary pressures, had increased the federal funds rate in an attempt to slow increases in the general price level. Mortgage interest rates also began to increase and housing sales began to slow. Higher interest rates on ARMs also increased mortgage payments for many homeowners and speculators. Fears of significant increases in mortgage payments slowed home buying and reduced the rate of house appreciation, with many investors believing that prices could decline ("burst the bubble").
3. *Can the risk of a housing bubble be averted? Can this risk be hedged?* In many markets, such as commodities, stocks and bonds, and the like, investors can hedge against losses by short selling securities and/or futures contracts or by writing put options. However, hedging against possible losses in the housing market is difficult to accomplish at present. As concerns of a housing bubble increased in the late 2005, discussions regarding hedging house prices increased and new products began to appear.

During 2006, the Chicago Board of Options Exchange (CBOE) and the Chicago Mercantile Exchange (the MERC) are expected to offer *housing futures contracts*. The MERC has announced that it will offer contracts for 10 housing markets (Boston, Chicago, Denver,

Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC). Essentially, house price indexes will be developed for each market, using the Case-Shiller (CS) Housing Price Index. The price per contract will be $250 times the index. For example, if a homeowner in Los Angeles purchases a $525,000 home and wanted to hedge against a price *decline*, he would find the index value for Los Angeles, then determine the number of contracts to purchase. If the CS *index value* for LA was 210.00 and the homeowner wanted to *fully hedge* against a price decline, he will *sell* 10 contracts (the number of contracts is determined as 210 • $250 = $52,500 value per contract and $525,000 [illegible] $52,500 = 10 contracts). To illustrate further if home prices actually *declined* in LA, causing the CS index to decline from 210 to 190, the price of the futures contracts would decline to 190 • $250 = $47,500. The homeowner would then "cover" the position by purchasing 10 contracts. The net proceeds from the sale and purchase transactions would be $52,500 minus $47,500, or a $5,000 profit • 10 contracts, or $50,000. The homeowner could then withstand a loss of up to $50,000 on his house price, or to a level of $475,000 before losing any money. Therefore, in the event the homeowner *had to sell* his property (because of relocation, change in employment, etc.) for $475,000, he would break even.

In the above example, if the homeowner wanted only a *partial hedge* to protect home value, he could sell fewer than 10 contracts. If he wanted to *speculate* in addition to hedging, he could sell 10 or *more* contracts. It should be pointed out that there is no way to perfectly hedge the price of a specific house, unless the price of the house is perfectly correlated with the CS index. This is not likely because the CS index is based on a large sample of all house prices in a given market (LA in this case.). However, it is more likely that the CS index and the price for a specific house will change in the same direction, although the magnitude of the change is likely to differ.

Of course, if the homeowner/investor sold 10 contracts and housing in the LA market increased in price during the next year (assume the CS index increased to 230), the homeowner would have to *cover* or purchase contracts at a *higher price*. In this case, the total cost to cover would be 230 • 250 = $575,000. The investor would lose $50,000 on the hedge but gain $50,000 on the actual price of the house and would break even.

In order to participate in this market, the homeowner would be required to open a trading account with a member firm of the MERC and maintain a deposit equal to 5 percent of the total value of all contract purchases, or 525,000 • .05, or $26,250. This deposit is required and additional amounts would be "called" in the event that the market [illegible] against the investor.

In summary, using futures contracts as a mechanism to hedge is much like purchasing home equity insurance. Other uses of these futures contracts may be to hedge [illegible] rising property values that may make retirement housing more expensive. [illegible] household living in Dallas, TX, may want to retire in the Los Angeles area [illegible] cerned that home prices in LA will rise much faster than prices in Dallas. [illegible] more difficult to purchase a house in LA with the proceeds from a sale in Dallas [illegible] retire. In this case, they could hedge against higher house prices in LA by purchasing [illegible] contract in the Los Angeles market today, then selling upon retirement. The [illegible] wondering whether volatility in house prices is even significant enough to [illegible] shows that major price declines have occurred in the Northeast (1987–199[illegible]) [illegible] area (1986–1994), and in California (1989–1997).

Another product, referred to as a "*Hedgelet*," is now being offered by HedgeS[illegible] It allows investors to purchase quarterly option contracts based on median home [illegible] reported monthly by the National Association of Realtors) in six U.S. cities (Chic[illegible] York, Los Angeles, San Diego, San Francisco, and Miami). This contract specifies [illegible] for each market. The investor must decide whether prices in a market of interest [illegible] or fall below the strike price during the contract period. At the time that the Hedgelet [illegible] purchased, it specifies the cost of the hedge and the return that will be earned [illegible] median home price exceed or fall below the strike price during the contract period.

ousing Bubbles: An Extension — Concept Box 7.1 (Continued)

For example, assume that you are interested in hedging housing prices in the San Francisco area, where the most recent median home price was $729,000. Assuming HedgeStreet sets a quarterly strike price at $729,000 and you believe that the actual median price will be higher than $729,000 by the end of the quarter, you would buy a "yes" Hedgelet, which is now trading at $6.65 per contract.

If you think the median price will be less than $729,000, you would buy a "no" contract trading at $4.75. If the actual number comes in higher than $729,000, the "yes" contract will be worth $10 and the "no" contract will be worth zero. If it comes in lower than $729,000, the "yes" contract will be worth zero and "no" will be worth $10. The payoff in each case remains $10 per contract *regardless of the extent to which actual prices will exceed or fall below the strike price.* The number of Hedgelets that an investor purchases will vary with the extent to which an investor desires to hedge the levels at which prices will be above or below the strike price.

region because the real estate is permanently located in that region. Therefore, the need to know the forces that drive economic growth in an area is essential to the success of an investment.

alogy with the Law of Comparative Advantage

This concept, stated very simply, says that some geographic regions have a comparative advantage over other regions in that certain goods/services can be produced more efficiently and profitably in that region than in other regions. This advantage may exist because of (1) natural advantages (e.g., seaport, minerals, low-cost energy, and beaches), (2) employee characteristics such as a highly trained, educated workforce (e.g., location of universities, workforce training in technical industries), (3) proximity to many major consumer markets (e.g., transportation hub). Regional examples would include high-tech research and development (California, Seattle, Boston), oil and gas exploration (Houston), communication and computer assembly (Austin, Houston, San Diego), medical technology/clinics (Minnesota, Boston), and production of entertainment (Los Angeles). These industries tend to locate in certain geographic areas because land, labor, and capital can be combined cost-effectively or revenues can be enhanced by locating in those regions. This simple concept is very useful in real estate investing because when researching markets for real estate investment opportunities, those markets having industries with the highest likelihood of future growth will have a positive effect on house prices.

Identifying Regional Economic "Drivers" or Base Industries

One obvious way to identify the drivers of economic growth in an area is to identify **base industries,** those businesses producing the greatest *profits.* Unfortunately, data pertaining to profits is difficult to collect on a regional basis because (1) much of it is private information and (2) for publicly owned firms, multiple operating divisions may make profits by region very difficult to break down. As a result, many analysts rely on *employment data* that are collected by the U. S. Department of Labor and by various agencies in all 50 states. The underlying logic for using employment data for real estate investment research is that expanding businesses will have expanding needs for labor. Identifying the number of those

industries with a comparative advantage in that region will help to estimate the number of employees in these industries and, in turn, the number of housing units needed. While employment data are generally thought to be the best tool available for analysis, this method is not ideal because labor may not always be added in direct proportion to increases in revenues or the output of goods and services produced by a company. Furthermore, the method may tend to underestimate the importance of less-labor-intensive businesses in a region that may be very profitable and pay high wages to fewer employees.

Economic Base Analysis—Location Quotients

One widely accepted approach in economic analysis for identifying driver industries in a region—the **economic base**—is to calculate what are referred to as **location quotients.** This is done very simply by using the following relationship:

$$\frac{\left(\dfrac{RE_j}{RE_{TOT}}\right)}{\left(\dfrac{USE_j}{USE_{TOT}}\right)} > 1.0?$$

Terms in this relationship are as follows:

RE = Regional employment

USE = U.S. employment

j = Industry classification

TOT = Total

For example, if we let j represent the computer assembly industrial classification, then this ratio will tell us if the proportion of regional employment (RE) in the computer assembly business (j) as a percentage of total employment in that region (RE_{TOT}) is greater or less than those employed in industry j throughout the United States as a percentage of the total employment throughout the country. If this ratio is *greater* than 1.0, then industry j would be identified as a *base* or *driver industry* for a region because it employs a greater-than-proportionate amount of workers in that industry than is the case for the United States as a whole. Obviously, if the ratio is *less* than 1.0, then that industry would not be a base industry. Industry classifications with ratios less than 1.0 are usually referred to as *supporting industries.* Examples of the latter could be accounting firms, advertising firms, and so on. These supporting businesses are also important for real estate investment particularly for retail establishments, personnel services, and similar firms, all of whom must also lease operating space in properties.

Data classifications for various industries (designated above as j) have been developed and published by the U.S. Office of Management and Budget and are used by the U.S. Department of Labor. This department collects and categorizes data on all employees in the United States. Depending on the level of detail desired, all employment data are broken into several industry classifications. These classifications are referred to as North American Industrial Classification, or NAICS. The data are collected for over 300 metropolitan areas.

Employment Multipliers

This aspect of economic base analysis is conducted to determine how *total employment* in a region is affected by changes in *base employment.* After a complete analysis is conducted for every employment classification (j) in a region and all base employment has been identified with location quotients and totaled, employment in the remaining catagories is totaled.

Then, the ratio of *total* to *basic* employment is calculated. If, for example, total employment in a metropolitan area equals 1,000,000 and base employment or employment in classifications with a location quotient >1.0 totals 400,000, supporting employment would be 600,000. In this case, the total-employment-to-basic-employment multiplier would be 1,000,000 ÷ 400,000 or 2.5. Therefore, if a forecast called for an increase of 40,000 jobs in *all basic* employment categories, it may be the case that total employment would increase by 40,000 × 2.5, or 100,000, of which 60,000 would be supporting employment. Obviously, a real estate investor would like to know how many of the 100,000 expected new jobs would likely result in the construction of new houses, apartments, and office and warehouse space to provide for these workers. An examination of population data would shed light on the expected age distribution and sizes of households. It should be stressed that there can be instances where employment in base industries in a metropolitan area is expected to *decline*. In these instances, total employment rates would be expected to decline by an amount greater than declines in base industry employment.

This method of analysis is not without its shortcomings. Furthermore, this analysis usually provides a snapshot of employment at a point in time. In order to better understand employment relationships, economic base analysis should be done at various points in time so as to identify shifts and trends in an area's employment base.

Supply Overview

When trying to complete the analysis of housing as an investment, we must also consider the supply side of the market. In general, the supply of housing is determined by the relative cost of land, labor, and capital (materials). Two barometers of housing activity that are monitored by investors are housing starts and sales of existing homes. Two observations should be made concerning these data. One is that the supply of new single family housing and sales volumes for existing units are price elastic and highly volatile. The other is that both of the latter relationships are highly influenced by interest rates. Although we include interest rates in our discussion of housing supply, it is also very important on the demand side of the market, as it affects the financing cost that a household must pay from incomes earned primarily from employment.

Other influences on supply costs on a *more local level* include the existence of restrictions such as zoning, building codes, environmental factors, and the physical differences in land terrain and how these vary between locations. These latter influences have a significant impact on costs that builders incur when producing housing. Many of these influences are thought to result in a restriction on supply (new construction), which results in higher house prices. Some MSAs (such as San Francisco, Boston, and others) restrict development density by requiring adherence to very rigid building codes, requiring open space, assessing impact fees, and so on, all of which affect housing availability. Over the long run, this may cause house price appreciation to be greater than in other metro areas. Any investor in the housing market must assess these supply-side factors when making housing choices.

The Influences of Neighborhoods/Municipalities

While the above discussion is important when trying to differentiate among MSAs, a number of other issues are important when trying to select housing among submarkets/municipalities *within* MSAs. A list of important considerations that should be analyzed when making such a selection is contained in Exhibit 7–5. Many of these attributes include services and goods that *must also be acquired* when the *housing investment is made*. Many of these attributes are referred to as **public goods** that are acquired along with housing. These factors have been studied over the years and deemed to be important in driving house price appreciation in different submarkets.

EXHIBIT 7–5 Public Goods and Other Attributes Affecting House Prices in Different Submarkets and Neighborhoods within Metropolitan Areas

Description	Measurements/Indicators
1. Quality of school districts	SAT scores, % of HS graduates that go to college, library facilities
2. Crime rates/police/fire	Data relative to various crime categories per thousand residents, response times
3. Parks/recreation	Relative to size of population, quality of programs
4. Housing market indicators	Number of listings, time on market prior to sale, % of asking price achieved by submarket
5. Quality of utilities	Cost and source of water, electric, gas, sewer. Any assessments related to each
6. Size of submarket	Population, % of nearby land area available for future development, and zoning related to such areas
7. Health care facilities	Number of physicians and beds per thousand residents
8. Building codes/zoning	Restrictions, regulation of construction quality, minimum lot sizes
9. Insurance rates	Premiums by location
10. Noise levels	Proximity to, and decibel levels of (airports, freeways, etc.)
11. Environmental	Open spaces, pollution, water, air, etc.
12. Transportation/access	Distance and travel time to major employment centers airports

Web App

The Federal Home Loan Mortgage Corporation (Freddie Mac) and the Office of Federal Housing Enterprise Oversight publish house price indices. These are available at **www.freddiemac.com/finance/cmhpi** and **www.ofheo.gov/HPI.asp**, respectively. These indices provide a measure of typical price inflation for houses within the United States. Values are calculated nationally, for each state, and for major MSAs.

Using one of these price indices, select one of the MSAs and analyze the growth rate in home prices for the MSA versus the rest of the state and for the nation over the past five years. Are homes in the MSA growing at a slower or faster rate than the rest of the state and nation? If you were doing a rent-versus-own analysis as discussed in this chapter, what growth rate would you assume for home prices in the MSA?

Capitalization Effects: Price Premiums

Many of the attributes in Exhibit 7–5 have been deemed important in explaining differences in house prices among neighborhoods and jurisdictions. However, it is difficult to generalize the extent (dollar amount) to which each factor affects price. There is a concept in the urban economics literature, called the **capitalization effect**, that relates to the quality of the public services that individuals receive *relative to the taxes* (usually property tax and fees) that are paid for these services when they choose to purchase housing in a particular neighborhood or municipality. To the extent that residents perceive that services received have a value greater than the taxes and fees paid for them, *net benefits* may exist. These net benefits are reflected or capitalized in house prices (land prices) because households are willing to pay for these net benefits which can only be obtained by purchasing housing in the location where the benefits are present. For example, if two otherwise identical houses are located in two different neighborhoods or municipalities and one sells for a higher price, the question is, "Which combination of the above influences caused the buyer to pay a higher price?" Was it net benefits from educational quality or some other public good? When housing is viewed this way, it becomes clear that many public good consumption choices are being made *simultaneously* with the housing decision.

Finally, there has also been discussion regarding the **optimal size of cities** or of jurisdictions. This concept has to do with the relationship between the size (population and geographic area) of separate political jurisdictions (townships, cities, etc.) and how cost-effectively they provide services such as education, police protection, and the like. Some argue that there may be cost savings in providing public services as cities (politically defined) get larger and annex surrounding areas. However, there may be a *limit* on size (in terms of both area and/or population) such that when this size is exceeded, (1) costs begin to rise relative to the quality of services delivered or (2) the quality of services begins to deteriorate. Thus, communities in which there exists a balance between size, efficiency, and scale of operations may be producing public services very cost-effectively. This efficiency may be reflected in lower property taxes for the flow of services being produced, which may, in turn, be capitalized in the prices of properties in such jurisdictions.

Pricing Property in Specific Submarkets/Locations

At some point in the acquisition process, after the prospective homebuyers have evaluated the regional drivers affecting house price appreciation, they must estimate whether a specific property in a specific location that is being considered for purchase is *competitively priced.* Prospective buyers want to be sure that they are not "overpaying" for a property. Also, lenders want assurance concerning the price of the property because it will be serving as security for repayment for the mortgage debt and, over time, it must remain sufficiently high to repay the outstanding loan balance in the event of default. While prospective buyer-investors may estimate a value for a property, lenders will usually require that an estimate of value be made by an *independent fee appraiser,* which is someone who specializes in performing appraisals for a fee. An appraiser must be unrelated to the parties to the transaction and must have no vested or financial interest in the property being appraised.

The objective of the appraisal is to establish a **market value,** usually meaning the most probable price that would be paid for a property under competitive market conditions. The reader should understand that this notion of *value* may be different from the *price* that an individual buyer may be willing to pay for the property. For example, one person's *individual preference* for attributes of a property being acquired may be such that she may be willing to pay a significantly higher price for a property than the *majority* of potential buyers in the market. Because the lender is more concerned about what the market price would be in the event of default, the appraiser must make an independent estimate of the most probable price that a property would bring if it were sold under competitive market conditions, where individuals other than the prospective buyer would be bidding. In a sense, the appraiser's estimate of value will help the lender determine whether the price being offered by the borrower-applicant is an "outlier," or a price that is significantly different from what would be paid by most buyers in the market for similar properties. (Although there are some differences in appraisal requirements used in conventional, FHA, and VA mortgage underwriting, the general approaches to estimating value are similar.)

To produce an estimate of value, the appraiser generally begins with an assessment of national, regional, and local economic conditions, stressing income, population, employment, and interest rate trends, which, as discussed above, form the determinants of demand for the property in question. Supply is examined by assessing the relative cost of land and the factors of production (wages, capital). Current market equilibrium conditions in the housing market are then considered by examining the current availability (inventory) of housing units, absorption rates, rental vacancies, and trends in rents to gauge the likelihood of any short-run price movement that may affect the estimate of value. Finally, the appraiser must identify the area-relevant location, or **submarket,** in which the property being valued is viewed as being competitive or substitutable with other properties. This submarket also may be thought of as a neighborhood because of the proximity of retail, educational, religious, and other facilities which may appeal to households with similar income, tastes, and preferences. This is important because, as will be seen, price and other data will be obtained

on properties that have sold recently in this area. These data will serve as a basis for estimating the price for which the property in question is likely to sell.

When estimating the value for the specific property (usually referred to as the "subject property"), the appraiser usually relies on three approaches: the market, cost, and income capitalization approaches. In *residential appraisals,* only two approaches, cost and market, are usually thought to be reliable. The market, or **sales comparison,** approach involves selecting properties in the same submarket or in close proximity to the subject property. Comparables are chosen from those properties that have sold most recently and where adjustments for dissimilarities (such as size of dwelling, lot, amenities) can be kept at a *minimum.* This approach is based on the principle that at the time of the appraisal, buyers should be willing to pay the same price for otherwise identical properties. By adjusting the sale price of comparable properties for dissimilarities, the appraiser is trying to make properties that have recently sold very comparable to the subject property. The adjusted price of the comparables can then be used to price the subject.

The **cost approach** involves estimating the cost to reproduce the structure (less depreciation), and then adding the value of the land (site) to it in arriving at a value. The rationale for this approach is that no knowledgeable buyer would pay *more* for a property than the cost at which can be reproduced. Finally, the income approach is a process whereby comparable residences that are currently renting for income are used to estimate the value of the subject. This process usually involves establishing a ratio between the selling price and income of such recently sold comparables. The rent is then adjusted for dissimilarities with the subject. A comparable rent for the subject is then established and the ratio of price to rent for comparables is used to convert the adjusted rent into a value for the subject. This latter approach is not frequently used when pricing owner-occupied residential properties because it is generally the least reliable method. This is because there are usually few comparable residences that are rented.

Based on these approaches, the appraiser makes a final estimate of value and reports it to the prospective homebuyer and the lender. The lender will review the report and, if in agreement with the approach used by the appraiser, will use the lower of appraised value or the market price in establishing the maximum loan amount. For a more detailed examination of each of these approaches, we now consider a problem example. In the example, we use the uniform appraisal form (see Exhibit 7–6, Panels A and B) required by the Federal National Mortgage Association and Federal Home Loan Mortgage Corporation. Today most residential mortgages utilize this form because it is a part of the required documentation any lender would need if it wished to sell a loan to either of these entities after origination.[3]

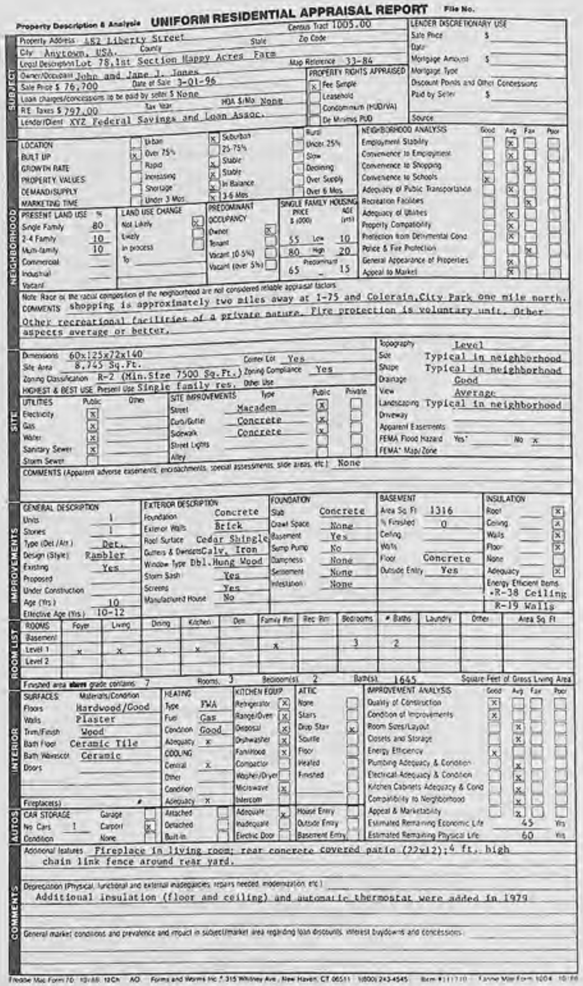
The Sales Comparison Approach

As previously indicated, when using this method, the appraiser estimates the value of a property by comparing the selling prices of properties similar to, and near, the property being appraised. Because no two properties are exactly alike, the appraiser adjusts the values of similar properties (called **comparable properties**) for dissimilarities. These differences are isolated, and adjustments are made by the appraiser, who, using her judgment

[3] For more detailed information see *Underwriting Guidelines, Home Mortgages,* Federal Home Loan Mortgage Corporation. The sale of mortgages to institutions in the secondary mortgage market will be covered in a later chapter. While all residential appraisals are made using the three approaches to value discussed above, additional specifications concerning condition and construction quality of the dwelling being appraised are sometimes included in FHA and VA appraisals. While such specifications are too numerous to be considered here, the following sources provide additional information. For an overview of FHA appraisal policies, see *HUD Handbook 4150.1;* for VA policies, see VA Bulletins and Benefits Circulars.

EXHIBIT 7–6

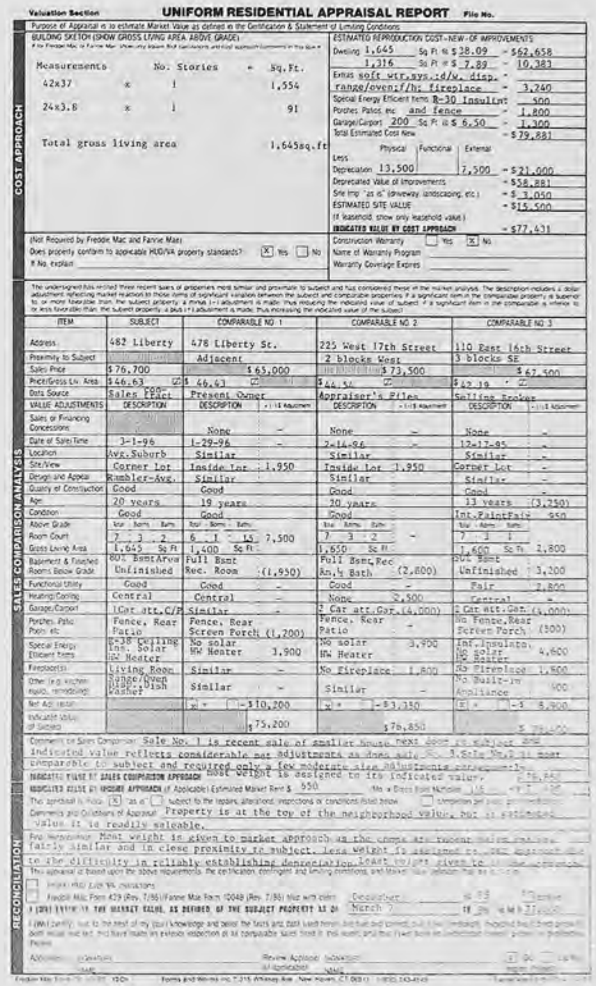
(Panel A) Property Descriptions



and knowledge of current market conditions, establishes what the market value is for each major attribute of a comparable that is different from the subject property. Because the value of the subject property is unknown, the price of the *comparables* will be adjusted until all differences have been taken into account. If this process is carried out correctly, the

EXHIBIT 7–6

(Panel B) Property Valuation



adjusted value of the comparable properties may than be used to approximate the price of the subject property. When selecting the comparables, the appraiser must be careful to establish that the sales of the comparable properties were arm's-length transactions between the buyer and seller. For instance, if a seller was under duress, as in a foreclosure situation, or if a sale was between relatives, such a sale would not be desirable for use as a comparable because the buyer may not have paid a fair market price for the property. Once the appraiser has determined that all comparable sales were arm's-length transactions, the appraiser's process of adjusting the comparable sales can begin.

To illustrate how the appraiser will adjust the comparable sales for any differences between the subject property and the comparable properties, Exhibit 7–6 contains a property description in Panel A and an example of the three approaches to value used in the appraisal process in Panel B. Note that Panel A contains the identification of the property and a general description of the property. Section II of Panel B provides an example of the sales comparison approach to value. Some of the items that the appraiser will have to adjust the comparable properties for are (1) time since the comparable has been sold, (2) location, (3) view, (4) design appeal, (5) quality of construction, (6) age of the property, (7) condition, (8) size of rooms, (9) quality of interior finish, (10) functional utility, (11) type and condition of major systems such as central heat and air, and (12) sale or financing concessions.

When making these adjustments, the appraiser adds to, or subtracts from, the value of the *comparable properties* to reflect the differences in market value between comparable and subject property that are caused by different attributes. If the subject property is superior to the comparable property with regard to a particular attribute, then the appraiser will *add* to the value of the *comparable property*. If the subject property has attributes that are inferior to the comparable property, then the appraiser will *subtract* from the value of the *comparable property*. Recall that the value of the subject is unknown; hence, *adjustments must be made to the comparable properties*. After all adjustments have been made to the comparables, the adjusted values of the comparables should be approximately equal to the value of the subject.

The amount that the appraiser adds to, or subtracts from, the price of a comparable property is an estimate of the *market value* of attributes that are different when comparing the subject with comparable property. For example, in dealing with differences in the *site*, in Panel B (middle) we see that comparables 1 and 2 are both "inferior" to the subject in the sense that the subject is a corner location and the comparables are not. Comparable 3 is also on a corner lot so no adjustment is made because this attribute is considered to be the same as the subject. The appraiser judges that such a difference is worth $1,950 in additional market value for the subject, and hence increases the prices of the *comparables* by $1,950. On the other hand, we note that comparable 2 has a two-car garage whereas the subject has only a one-car garage. In this case, the price of the comparable 2 is adjusted *down* by the difference in the value of a two-car versus a one-car garage ($4,000). Again, the idea is to adjust the *comparables* until all positive and negative characteristics are priced and added to or subtracted from the comparables, leaving a residual value (after adjustments) that should be approximately equal in price to the bundle of characteristics contained in the subject property. The residual values of all comparables, after adjustments, should approach the value of the subject, which is unknown.

How does the appraiser estimate the value of these characteristics? Estimating is done on the basis of experience, judgment, and knowledge of how individual buyers and sellers tend to *price* these attributes in various neighborhoods, given the site and other property characteristics. In other words, the appraiser must be able to *identify* and *defend* the estimated increase or decrease in the total price of a property, given the addition or removal of one or more characteristics (garage, bedroom, bath, etc.). This may seem to be a difficult task; however, in many housing markets hundreds of properties are sold each week and the appraiser generally has access to this data. A process of comparison and continuous updating of information makes the estimation possible. It should be stressed that under the sales comparison approach to value, adjustments are *not* based on the *cost* of constructing improvements. This is because the *market* may not value the addition the same way that an individual may. For example, the cost of adding a swimming pool to a property in an area of small, older, lower-priced homes may not be recovered in the market price when the property is sold, even though the current owner may believe that the value of this addition is at least equal to its cost. In this case, the addition to *market value may not be equal to the cost of constructing the pool* because the appraiser may judge that buyers composing the market for the property are not willing to pay as much for such an improvement as the current owner. Hence, the swimming pool may be referred to as an **overimprovement** to the property, and its full cost may not be reflected in the sale price.[6]

To obtain the final estimate of value under the sales comparison approach, the appraiser gives a *qualitative* weight to the residual price for each comparable. The weight assigned to each price depends on how many adjustments were made to each comparable. If many adjustments were made to a comparable, it would be given less weight, and vice versa. The appraiser then assesses the final estimates for each comparable in relation to the qualitative weights (see the comments at the bottom of Panel B, Exhibit 7–6) given to each, and arrives at a final estimate of value.

A common concern of appraisers when using the sales comparison approach to value is the possibility that a comparable sale price may contain financing benefits paid for by the seller of a property. This situation occurs when the seller of a comparable is attempting to help the buyer qualify for a loan and has paid points or discount fees for the buyer, or has taken back a second mortgage at a below-market rate of interest, which usually reduces the borrower's-buyer's monthly payments and cost of financing the property.[7] Sellers often recover such financing costs by charging a higher price for the property. If this property is used later by an appraiser as a comparable to estimate the value of another property, the use of its price may be inappropriate. This is a difficult situation for appraisers because unless they know the conditions of a property's sale, it will not always be clear whether the seller of a property has paid some of the buyer's financing costs. During times when interest rates are rising and buyers find it difficult to qualify, seller-paid financing is common. During these times, appraisers usually verify that a comparable transaction does not include seller financing by speaking directly with one of the parties to the transaction or the settlement agent before using the comparable in the appraisal process. If seller financing has been used in the transaction, the appraiser must reflect this in his estimate of value by estimating the cost of the seller financing and subtracting this amount from the comparable value.[8] In the example shown in our exhibit, we see that no seller financing was present in any of the comparable sales. Based on the various adjustments to comparables and the appraiser's weighting of these estimates, a value of $76,850 is assigned to the property being appraised under the sales comparison approach.

[6] Overimprovements occur when individuals make improvements that they may prefer and/or believe will add value to the property. However, buyers in the market may not agree and will not pay for the full cost of the improvement. Similarly, a homeowner can also make an underimprovement, for example, if too small a house is built on a large site. In this case, individuals may not be willing to pay as much for the property as they would have if the relationship between the site and the improvement had been in conformity with other properties in the market area. Many textbooks are available on appraising if you want to pursue the topic (see the Appraisal Institute for sources).

[7] This is sometimes referred to as "creative" financing in residential transactions. This problem is more prevalent in periods of high interest rates, when buyers have a difficult time qualifying for a loan. In these situations, sellers may finance all or part of the purchase at below-market rates of interest or contribute in some way to the buyer's cost of financing.

[8] This will be analyzed in detail in the next chapter.

The sales comparison approach gives the most reliable indication of value when there are a number of current sales of highly comparable properties and information about the circumstances surrounding the transaction is easy to obtain. When these conditions are in effect, appraisers prefer the sales comparison approach.

The Cost Approach

When using the cost approach, the appraiser establishes a value for the land on which the improvement is located, and then determines the cost of reproducing the improvement and adds the two. After adding the cost of the improvement and land value, the appraiser deducts an amount for any depreciation (if appropriate) that improvements have suffered since they were constructed. If the improvement has just been completed, the latter adjustment is usually unnecessary. This procedure is illustrated at the top of Exhibit 7–6, Panel B.

In arriving at the estimate of land value, a procedure similar to that followed in the sales comparison approach just described is used. Comparable sites that have been recently sold are selected, and adjustments are made for differences in location, size, shape, and topography. In estimating the improvement cost, the appraiser will usually consult cost manuals for material, labor, and profit (overhead) as well as verify with local construction companies the costs associated with constructing improvements with specific physical and qualitative dimensions. Based on these sources, estimates of construction costs per square foot are made for living space, basements, garages, and second floors. Individual estimates are then made for fixtures (kitchen, bath, etc.), landscaping, and additional improvements (pool, porches, etc.).

In the event the improvement is not newly constructed, there are three types of depreciation that the appraiser will deduct from the cost estimate just described. The first is depreciation in the property's value resulting from normal wear and is referred to as physical depreciation. Examples of physical depreciation would include curable items, such as worn carpeting or walls needing paint. Incurable items, which would include items such as foundation settling, may detract from a property's appearance but do not necessarily affect the usefulness of the structure. The second is depreciation resulting from internal property characteristics that make the property less livable or marketable than it was when first constructed. This is referred to as functional obsolescence. Examples of incurable functional obsolescence may include excessive amounts of hallway space. Curable obsolescence would include replacement of lighting fixtures. The third type of depreciation the appraiser will consider is called external obsolescence. It is caused by characteristics external to the property, such as changing land uses in a neighborhood, that will cause a structure to become obsolete before the actual building would wear out. Examples of external factors that would cause economic depreciation to occur include pollution, shifting land uses, or changing legal restrictions on land use.

The older a property becomes, the more difficult it is for the appraiser to estimate the amount of depreciation that should be used in the appraisal process. In the example shown in Exhibit 7–6, Panel B, we see that the appraiser has estimated that for the subject property (which is 10 years old), physical depreciation amounts to $13,500, economic depreciation is $7,500, and no functional obsolescence was apparent. Based on the cost approach to value, we see that the appraiser assigns a value of $77,431 to the subject property.

The cost approach to value usually provides the most reliable estimate of value when comparable properties are newly constructed and require very few adjustments for depreciation. Appraisers also consider the cost approach when determining value if only a few transactions involving comparable properties exist and the sales comparison approach to value is difficult to use.

The Income Approach

A third appraisal method establishes market value of property by determining how much an investor is willing to pay for the income stream that a property produces. Using this method, the appraiser attempts to establish the relationship between a property's sale price and the monthly income stream it would produce if rented. The appraiser typically uses rents and prices from recent sales of rental properties that are similar to the subject property and determines the ratio of sale price to monthly rental income. This ratio is referred to as the **gross rent multiplier.** The value of the subject property would then be estimated by judging what the subject property should rent for (again by looking at comparable rental units and adjusting for dissimilarities), and then multiplying this estimate by the ratio established from comparable sales.

In our example we see in the lower portion of Panel B in Exhibit 7–6 that the appraiser has estimated that, if rented, the subject would bring $650 per month. Given that comparable properties have recently sold for 116 times their monthly rents, it is reasonable that the same relationship would hold for the subject also. Hence a value of $75,400, or $650 × 116, is arrived at by using the income approach.

Typically the income approach is difficult to use because sales of very comparable single-family rental properties are rare in an area. Consequently, appraisers tend to rely on the sales comparison and *cost* approaches when establishing value. However, it should be stressed that for some properties, such as condominiums, where many units are frequently rented, the income approach may provide a reliable estimate of value.

Final Estimate of Value

The appraiser must reconcile the different estimates of value provided by the sales comparison, income, and cost approaches to value when making a final estimate of value. This is accomplished by using a qualitative weighting method, in much the same way as in the sales comparison approach. The appraiser assigns subjective weights to each of the three values based on the reliability of the data and the number of adjustments that had to be made in each technique. More weight would be given to the method requiring fewer adjustments where data are verifiable, current, and complete. In our example, we see that the final estimate of value is $77,000, which, as the appraiser points out, is closest to the sales comparison and cost approaches.

Property Appraisal and Actual Sale Price

In our example, the sale price of a property agreed on between a buyer and seller does not exactly correspond to the appraised value. For example, a buyer and a seller agreed on a price of $76,700 for the property and the appraised value was $77,000. When considering the value of a property when making loans, lenders will generally use $76,700, or the lower of sale price or appraised value, as the value on which the loan will be based, unless there is convincing evidence to change it.

Property Values over Time

A cardinal rule followed by lenders is that the value of a mortgaged property should never fall below the outstanding loan balance at any time during the life of the mortgage. In other words, the lender wants to be assured that the market value of the property will always be higher than the loan balance in the event of default by the borrower.

An additional consideration for the lender when considering the relationship of the mortgage balance and property value over time will be the potential effect of any *increases* in the mortgage balance relative to property value. This may present problems in the case of mortgage programs in which loan balance may, or will, increase after the time of loan origination. Recall the discussion in Chapter 4 of the effects of negative amortization in graduated payment mortgage programs and of adjustable rate mortgage programs in Chapter 5.

Investing in "Distressed Properties"

The term *distressed* is used to describe various events or circumstances that usually result in the sale of properties that otherwise might not occur. **Distressed properties** may present opportunities for investors to acquire properties at below current market prices. *However, these discounts usually exist for a reason; otherwise, owners would simply sell their properties at current market prices as the properties become distressed.* As we will discuss, there are many reasons why properties become distressed and why owners may be willing to sell them for a discount. In such instances, investors usually acquire properties and provide an infusion of cash and hope to eliminate problems that may range from structural damage to legal issues affecting the title to properties. By remedying these problems, investors expect that the property value will increase enough to provide them with a satisfactory investment return.

Some of the personal financial and/or legal situations affecting the owner that may explain why properties become distressed are listed below. One or more of these factors may be occurring simultaneously:

- Borrower inability to make mortgage payments.
- Market value of the property below the mortgage balance.
- Delinquent property taxes/property tax liens.
- Internal Revenue Service tax liens.
- Civil judgments/bankruptcy/divorce.
- Mechanics and/or construction loan liens.
- Personal debts.
- Estate settlements.

One very common reason why a distressed property becomes available is the borrower's inability to make mortgage payments. In this case, the borrower-owner of the property may not yet be formally in default, as the lender may be providing the borrower with a grace period on the loan, hoping that foreclosure proceedings can be averted.[9] However, if the borrower cannot "cure" the problem, it is possible that the lender may acquire title to the property directly from the owner (usually referred to as "deed in lieu of foreclosure"). By using this process, both parties may save time and foreclosure costs and avert an auction. However, if the lender and borrower cannot agree on a deed transfer, the lender may have to foreclose. In these cases, the property may have to be sold at auction.

Another reason for default occurs in cases where property values fall below the outstanding loan balance. When this happens, properties are said to be "underwater" or "upside down." Situations like this can come about because owners may have overpaid for a property or overimproved a property relative to other comparable properties. Should property owners have difficulty making monthly loan payments on such an "underpriced" property, they may default.

Deterioration in local economic conditions, such as unemployment because of layoffs, plant closings, and the like, may lead to an increase in the number of distressed properties available for sale. Increases in unemployment may reduce household incomes and negatively affect the demand for housing. Such a market downturn may cause an extraordinary number of properties to become distressed and available for purchase.

[9] If the borrower's situation is believed to be temporary, a lender may also be willing to consider restructuring the terms of the loan. Such a loan restructuring is referred to as a workout.

There are also a number of events, usually unanticipated by homeowners, that may result in a distressed property situation. These events may not necessarily be related to the condition of the property and could include liens because of unpaid income taxes or property taxes, judgments because of civil actions stemming from lawsuits or business failures, bankruptcy, divorce, default on personal loans and/or business loans, or the need to settle an estate. Property owners may be seeking a financial solution to these unrelated financial or legal problems and may be considering the sale of properties to raise funds.

In addition to the causes listed above, it should be stressed that real estate is not like financial assets such as stocks and bonds, many of which have very active and liquid markets where they can be traded. Real estate requires a considerably longer period of time to buy and sell. Trading residential properties with the attendant requirements to finance and close may require at least 60 to 90 days under normal circumstances. In cases involving distressed properties, it may take even longer. Furthermore, in cases where the current owner may have overpaid for a property, because of aggressive lending practices or poor estimates of price appreciation, buyers of distressed properties may have to carry properties until "repricing" occurs in a market environment that is changing. In these cases, investors are providing financing and taking "repricing" risk until the market stabilizes.

Financial Framework for Analyzing Distressed Properties

When analyzing an investment in distressed properties, investors usually consider a financial framework as shown in Exhibit 7–7. Note that items listed in Exhibit 7–7 are classified into three phases: (A) acquisition, (B) holding period, and (C) disposition. For the investment to be profitable (D), net cash inflow from the sale phase (C) must exceed costs expended in phases (A) and (B). When the exhibit is reviewed, a number of factors must be analyzed. Perhaps the most important considerations have to do with thinking about the following general questions: (1) Why does the so-called distressed property situation exist? (2) Why can't the current property owners remedy the things causing the problem and sell or rent the property themselves? (3) What services and investment will an investor have to make to restore the property value and justify its acquisition?

Acquisition Phase

Sources of Information for Identifying Distressed Properties

Banks and lenders maintain *REO* (real estate owned) *lists* that are usually made available upon request. These lists contain information on properties that lenders have acquired by deed in lieu of foreclosure or through foreclosure and auction. Because lenders are not in the

EXHIBIT 7–7
Summary of Financial Considerations When Investing in "Distressed Properties"

Acquisition Phase

- Acquisition costs:
  - Purchase price
  - Market and legal research costs
  - Inspection costs
  - Elimination of liens
  - Other
- A. Total acquisition cost

Holding Period Phase

- Interim costs:
  - Renovation costs
  - Insurance, property taxes, etc.
  - Interest on investor financing
  - Other
- B. Total costs during holding period

Disposition Phase

- Expected sale price
- Less: Selling expenses
- C. Net cash from sale

D. *Profitability*

C − (A + B)

business of investing and managing real estate, they are generally interested in selling such properties as soon as possible. REO lists also are maintained by the FHA, VA, and HUD. Properties are usually acquired by these agencies when a foreclosure occurs in conjunction with one of the FHA insurance, VA guarantee, and/or HUD affordable housing programs. These properties are usually advertised for sale or they may be auctioned to the public.

Many *individual* property owners advertise their desire to sell properties because of financial difficulty. One reason why this is done is so that they may try and avoid default and preserve their credit standing. The latter may be important to these individuals at some future time, if they re-enter the market to buy a property. At that time, they may have to apply for mortgage financing and will have to supply lenders with a credit history. Other sources of information include public announcements, by county property tax authorities, of properties that are being sold for delinquent taxes. Other auctions are announced by the Internal Revenue Service, which obtains court orders to auction properties that have been seized to satisfy tax liens.

Legal Research

A search of a property's title history is perhaps one of the most important activities that will require an expenditure by the investor. It often must occur prior to the acquisition of a property. This is very important because if the investor plans to eventually sell a distressed property, the next owner may require a general warranty deed to obtain title insurance and financing. Therefore, any legal issues must be known by investors *prior* to acquisition in order to estimate the cost of extinguishing liens and other factors affecting title. It should be pointed out that in some situations, when purchasing distressed properties, investors do not always receive a general warranty deed. For example, if an investor is purchasing a foreclosed property from a lender, the lender may be willing to provide the investor with only a "bargain and sale deed." This means that the lender will provide the investor with a title "as is." It is then up to the investor to decide if the title record is satisfactory. If the title record is not satisfactory, the investor may have to expend time and money to clear the title. In some other cases, lenders may be willing to give a "special warranty deed." This means that the lender will warrant title against liens and encumbrances that occurred during the period when the lender held title. No warranty is made by the lender regarding any liens or title imperfections *prior* to that time. In summary, unless the lender provides the investor with a general warranty deed, the investor may have to expand funds and negotiate with all lienholders and obtain releases, thereby clearing the title in order to sell the property at a later date.

The Auction Process

The auction process is important to understand (1) because of possible delays between the time that foreclosure and sale occur and (2) because other bidders are likely to be present at auction. Because of possible delays, investors must make a judgment as to if, or when, the property will actually be sold before expending funds on extensive legal or market research. It is important to note that each state has its own auction process that investors should understand. Generally, the auction process in the United States can be described under three categories. For example, in states following the *lien theory* of mortgages, foreclosures generally require a civil action (lawsuit) against the borrower-owner who is in default. A court hearing is held and a judicial declaration must be made terminating the property owner's equitable rights. This is followed by an order directing the sheriff to conduct an auction. In some cases, as a part of the civil action, delays may be requested by the borrower for many reasons. This may prolong the time from foreclosure to actual sale.

In states favoring the so-called *title theory* of mortgages, title is usually vested in the lender when the mortgage loan is made and reconveyed to the borrower when the loan is repaid. In addition to having title, the lender is empowered to take certain steps in the event that the borrower defaults. These steps generally include providing the borrower notice of default and acceleration on the note, and that the sale of the property will occur to satisfy the debt. However, during this process, the borrower may bring an action to enjoin the lender from proceeding to sell the property. Actions taken by the borrower to prohibit and/or delay sale obviously affect the likelihood of a timely acquisition by investors. In some states, the so-called *modified lien theory* of mortgages is followed. Under this system, when a loan is made, title is invested in an independent third party (trustee). The trustee receives a deed of trust containing instructions to be followed if the lender provides notice to the trustee that a mortgagor is in default. In this event, the trustee usually notifies the borrower that the deficiency must be cured by a certain date or the trustee will proceed to auction the property. This process is different from the procedures described above in that it does not require a civil action or a court hearing. In order to delay this process, borrowers may take legal action and request that the court instruct the trustee to delay the property sale.

In summary, under all three systems, there may be opportunities for borrowers to bring legal action to delay the foreclosure-and-sale process. These range from claims that the lender and/or trustee did not give the borrower proper notice of default, challenges regarding contractual provisions in the note and/or the mortgage agreement, delays because of other actions pending against the borrower, bankruptcies, and so forth. In short, if the sale of the property at auction is delayed, the investor (1) may expend time and money on title research, (2) may have to wait even longer until the auction actually occurs, and (3) may not be a successful bidder when the auction occurs. These examples represent some of the cost and risks associated with the business of investing in distressed properties.

Lenders at Auctions

In cases when properties are sold at auction, lenders holding notes and mortgages will bid for properties. Lenders are usually allowed to bid an amount at least equal to the mortgage balance owed them without providing additional cash. If the amount owed to the lender is close to the current market value of a property, the lender may be the successful bidder and will add the property to its REO list. But if the market value of the property is greater than the loan balance, it may be possible that an investor may outbid the lender. In the latter event, the lender will be repaid from auction proceeds, the lien will be extinguished, and the new investor will receive title. The new owner hopes to realize the difference between the market value and the mortgage amount outstanding.

In cases where the current property value is less than the amount owed, the lender may bid an amount equal to the property value and sue the borrower for the deficiency. In this case, the property becomes a part of the lender's REO list and the lender will try to sell the property for as much as possible. In summary, as a part of the acquisition phase, investors must do a considerable amount of legal and market research. They must also decide whether or not there will be delays before an auction actually occurs and whether or not they will be successful bidders. Otherwise, they may expend a considerable amount of time and money and not make a successful acquisition of the property.

Other Issues—Equitable Rights

Prior to bidding for properties at auction, investors must also identify the extent to which previous owners may have any equitable rights *after* an auction is completed. For example, in some states, statutory provisions are made for "equitable rights of redemption." This generally means that even after auction occurs and a new investor acquires title to a property, it may be possible for the previous owner to *reacquire title*. Generally, this may be done if a previous owner pays all deficiencies plus any interest and penalties to the previous lender and the investor who obtained a property at auction.

In some other cases, courts of equity may award borrowers in default such redemption rights. Usually, such awards will be made based on the court's analysis of the extent to which a borrower has accumulated equity in a property prior to default (e.g., borrower defaults in the 29th year and 11th month of a 30-year mortgage). Obviously, investors interested in distressed properties in these situations must consider the likelihood that borrowers will be able to cure past deficiencies and reacquire title to such properties.

Buying at Auctions Conducted by Public Entities

When buying properties at auctions conducted by public agencies, investors should determine the nature of the title that they may receive if they make a successful bid. In some states, for example, if investors obtain title at an auction resulting from delinquent property taxes, the investor may receive from the county what is referred to as a "tax deed." These deeds may provide that if the previous property owner in arrears can cure the past-due taxes within a prescribed time period and pay the holder of the tax deed an additional amount of interest and/or penalties, they may reacquire title to the property. Even if the previous owner fails to cure the deficiency, the county tax authority may not provide the new investor with a general warranty deed. It may be the responsibility of the holder of the tax deed to institute appropriate legal action in the state where the property is located to assure possession of legal and marketable title.

To reiterate, the quality of title is usually *critical* to the success of investing in a distressed property. Typically, in order to successfully sell the property at a later time, the investor generally must eventually have a marketable title. That is, the investor must be able to convey a deed of sufficient quality so the next purchaser of the property is able to obtain mortgage financing from conventional financing sources. Since lenders usually insist that the borrower acquire title insurance and that the title record be free of liens, investors must *decide* if this requirement can be met during the acquisition phase, or *prior* to bidding at auction.

Market Research/Costs

Expenditures on market research must also be made by investors prior to making an acquisition. The goal of the research is to determine the value of comparable properties that are likely to compete with the distressed property when it is ready for sale. This must also be done to establish the extent to which the distressed property must be improved or renovated in order to compete against other properties for sale and to set a sale price upon disposition. In cases, where the value of a property has fallen below its original purchase price, investors must estimate whether prices are likely to fall further, or if and when prices are likely to recover. This research is also important because it will help to establish the offer that an investor must make at auction or when purchasing properties from individuals or lenders.

Inspection Costs

In addition to legal and market research, property inspections should be made at the beginning of the acquisition phase when developing a bid for a property. Items that are usually inspected include:

- Land/building.
- Foundation.
- Drainage.
- Building quality and building code compliance.
- Environmental issues: lead paint, asbestos, and the like.

If problems are discovered, investors must estimate any outlays that must be made to remedy problems. These costs must be factored in during the acquisition phase and will affect the investment analysis made by the investor.

Holding Period Phase

Depending on what is required to achieve their investment objective, investors generally make outlays for various items during the period of ownership:

- Renovation costs.
- Interest or other financial carrying costs.
- Property taxes and insurance.

In many cases, investors will choose to finance their investment. Typical financing sources include:

- Assumption of outstanding mortgage debt.
- Personal loan or credit lines.
- Personal equity/other equity sources.
- First or second mortgages on other real estate owned.
- Home equity credit line on other real estate owned.

In some cases, the existing lender who has acquired a distressed property at auction or through a deed in lieu of foreclosure may be willing to finance the sale of a property to an investor. This may occur if the lender wants to dispose of a property and/or if the lender believes that it may avert a loss by allowing an investor to renovate and market a property.

As noted above, investors also may borrow by using their personal credit or by using in other real estate that they may own as security for a loan. Such loans may be obtained by refinancing properties that they may own or by obtaining loans secured by second liens. In some cases, if investors plan on continuously bidding for a number of properties, lenders may be willing to provide credit lines to investors to acquire properties and to finance necessary improvements. See Exhibit 7–8 for an example of an investment analysis of a foreclosed property.

Disposition Phase—Exit Strategies

The obvious strategy that can be used to complete an investment in distressed properties would be to sell the property upon completion of the holding period phase. However, if a sale cannot be achieved because of a change in market conditions or for other reasons, an investor could consider converting a distressed property into a rental property to earn income or, perhaps, using the property as a personal residence.

EXHIBIT 7–8
Example: Investment Analysis of a Foreclosed Property

ABC Bank has title to a 3,000-square-foot, three-bedroom, two-bath home situated on one-quarter acre of land. The bank acquired the property at auction for the loan balance owed by a previous owner and has added this property to its REO list. It has indicated that the asking price for the property is $200,000 and that it can convey a general warranty deed to the purchaser. GMI Sharpe Investors is considering the purchase of this property. An estimate of costs associated with the acquisition and expenses of owning the property for a period of one year is as follows:

Phase A. Acquisition fees:	
Legal counsel/research	$ 2,000
Inspection fee/report	500
Payoff of existing property tax lien	8,000
Total	$10,500
Phase B. Renovation costs:	
Carpet	$ 6,000
Dry wall repair/paint	1,000
Counter tops/cabinets	3,000
Utilities during renovation	200
Roof repair	8,000
Plumbing/electric	3,000
Property taxes (1 yr.) and insurance	4,000
Interest ($200,000 personal loan @ 7%)	14,000
Total	$39,200
Phase C. Sale phase:	
Broker commission (est)	$ 6,000
Total	$ 6,000

Question

Assuming that GMI Sharpe acquires the property for $200,000, how much must the *property sell for* in order for Sharpe to achieve a 20% return (annual rate, compounded monthly) on its investment during this one-year period?

Cash Flow Analysis

Phase A Acquisition		Phase B Average Monthly Outflows	Phase C EOY Sale	
Purchase Price	$ 200,000	$3,267	Sale Price: TBD	
Plus Acquisition fees	10,500			
Less: Loan	200,000		Less: Selling expenses =	$ 6,000
Equity	$ 10,500	$3,267	Repayment of loan =	$200,000

Present value analysis:

$PV = -10{,}500$ $\quad i = 20\%$

$PMT = -3{,}267$ $\quad FV = ?$ (Net cash flow needed in year of sale)

$n = 12$ months

Solution/Interpretation

A sale price at the end of year 1 must be great enough to repay the $200,000 loan plus $6,000 in selling fees and have enough cash flow remaining to make the investment worthwhile. Solving for *FV* produces $55,808, which is the *net* cash flow after the loan repayment and selling fees ($206,000) that must be realized at the *EOY1* in order to achieve a 20% return.

This means that GMI Sharpe must be able to sell the property for at least $261,808 ($206,000 + $55,808) in order to repay the loan; pay all costs of acquisition, holding, renovation, and sale; and earn a 20% *IRR* (annual rate compounded monthly). The investor must conduct careful market research to determine whether any comparable properties have sold in this price range or when, if ever, properties are likely to sell in this price range.

EXHIBIT 7–8 (Continued)

Pre-foreclosure Investments

In some situations, unanticipated events that affect the property owner but that are not directly related to the property or market conditions may result in properties becoming distressed. As indicated earlier, there are many events that may require a homeowner to obtain funds to repay business creditors.* In turn, this may cause a homeowner to sell a property to raise funds to satisfy debts. In some cases, it may be possible for an investor to contract to purchase a property whereby the seller delivers title on a future date and the investor immediately conveys title to a new buyer. In the meantime, the seller retains title and keeps existing loans alive. In the interim, the investor implements a necessary strategy to sell the property and acts as a middleman, taking title only briefly immediately before the property is sold. For example, the owner of a distressed property and an *investor* may agree on a specific selling price (or "strike price") and enter into an *option contract* to provide the investor title on or before a future date. This option may be exercised at the *investor's* option anytime between the date of the contract and the expiration date. The seller agrees not to abandon the property and also agrees not to enter into any other contracts that would encumber title to the property. The investor hopes to find a buyer before the expiration date of the option *and* simultaneously take title and sell the property and give title to a new buyer immediately. The funds received by the investor from the new buyer at closing are used to purchase the property from the seller who agrees to repay the outstanding debt. Title is then transferred from the previous owner to the new owner with the investor obtaining title only briefly at the closing when transferring title to the new owner.

*In some states, the debtor's homestead may be protected from bankruptcy judgments. However, such homesteads are not usually protected if the borrower defaults on a mortgage loan secured by the homestead while in bankruptcy.

Other Approaches to Investing in Distressed Properties — Concept Box 7.2

A. OPTION CONTRACT WITH SIMULTANEOUS TITLE CLOSING

Typical terms and conditions:

1. Investor contracts with seller for seller to deliver a deed at the option of [illegible] time up to one year from the contract date.
2. Investor does research on real estate values and must be convinced that the [illegible] property can be resold at favorable price. Investor determines the extent of [illegible] Investor may have to provide funds to clear title such as paying past-due property taxes prior to sale.
3. Investor agrees to make monthly mortgage payments for seller during the option period. Investor usually obtains interim financing with a personal line of credit or home equity loan.
4. Seller agrees not to abandon the property or to execute any contracts further encumbering the property in any way during the contract period.
5. When a new purchaser is identified by the investor, the investor exercises option to buy the property. Seller then sells the property and delivers title to the investor at the contract (strike price). Seller pays off mortgage debt with funds received from the investor. Investor simultaneously sells property and transfers title to third party.

Summary—Investor does not take title until a new buyer is found. This usually saves the investor closing costs and financing fees. Risks—no buyer is found during the option contract period. Unless the option contract is extended, investor loses all cash flows expended on research, monthly payments, etc. Seller benefits in that foreclosure is avoided, thereby preserving credit. Assuming that the market price that the investor receives from the new owner exceeds the option price, the investor would keep any difference between the final sale price and option price as a return on investment. In the event that the market value does not exceed the option price, the investor may elect not to exercise the option. However, as long as the market value exceeds the strike price on the expiration date, the investor may elect to exercise the option in order to minimize losses. Another reason for this option approach, as opposed to an outright purchase of the property by the investor, is to avoid transactions costs that may have to be paid twice during a short ownership period. Recall that the investor plans to have the property sold within six months. Therefore, taking title and incurring various closing costs during a short ownership period may significantly reduce the investor's returns and make the required sale price higher and could make the transaction not feasible. The risk to the investor is the potential loss of all cash outlays during the acquisition and holding period should the property value upon sale not increase enough to recover these costs and achieve the desired return. A related question is why does the homeowner need the investor? In many cases, homeowners may not have sufficient cash to make monthly payments, pay property taxes in arrears, clear up title problems, etc. Furthermore, this homeowner remains in the property for six months and does not have to make payments on the mortgage, property taxes, or insurance. Finally, this homeowner many not want to default on the mortgage loan, thereby avoiding future bad credit issues. Additionally, other issues relating to employment, marital status, possible business failure, etc., may have higher priority and preclude the homeowner from investing the time and effort needed to dispose of the real estate. There is another risk that must be considered by the investor in the event that the market value of the property exceeds the option price. In this case, it is imperative that the investor execute a very-well-written option contract in order to avert any motivation by the seller to default on the option contract with the investor and attempt to sell the property independently.

B. CONTRACT FOR FUTURE DEED

In some cases an investor may purchase a property; however, in order to sell the property, the investor and a *buyer* may have to enter into a contract for a future deed. This situation develops when a buyer would like to purchase the property, but cannot do so because of insufficient credit and has difficulty in obtaining financing. The investor may be willing to provide financing, but does not want to convey title as yet in order to avoid legal and other costs should the buyer default on the loan. Both parties agree on a specific selling price ("strike price") and enter into an *option contract* whereby the investor agrees to deliver title to the new owner at a future date. This option may be exercised at the buyer's option anytime between the date of the contract and the expiration date. The buyer agrees not to abandon the property and also agrees not to enter into any other contracts involving the property. The buyer also must make monthly rent payments some, or none, of which may be credited toward the selling price.

Typical term/conditions:

1. Investor purchases property and takes title.
2. Investor enters into a contract with a potential buyer to purchase the property at a specified price by a specific date. Investor agrees to deliver and close title if terms and conditions of contract are met.
3. Investor obtains financing and may pay property taxes and hazard insurance to avoid liens and to protect title to property during the contract period.

4. Potential buyer makes monthly payments (rent) to investor. Buyer attempts to accum late additional equity and or repair any credit problems.
5. As a buyer eventually qualifies for financing and executes purchase option, the invest delivers title and receives strike price from buyer.*

*The effect of federal income taxes is not included in this analysis.

Conclusion

Readers should now have a general understanding of the determinants of house prices and apprai procedures used for residential mortgage lending. We have provided techniques for determining t appreciation rates in house prices and on equity, as well as federal income tax treatment for hom owners and comparisons with the cost of renting. We have also reviewed the three approaches us by appraisers to estimate the market value of residential properties. Various issues involving housi bubbles and investing in distressed properties have been discussed. Lenders and investors should familiar with these concepts and with the assumptions made by each and effects on value.

Key Terms

base industries, *188*
capitalization effect, *191*
capital gains exclusion, *183*
comparable properties, *193*
cost approach, *193*
distressed properties, *200*
drivers of economic growth, *188*
economic base, *189*
expected appreciation rate on home equity (EAHE), *183*
gross rent multiplier, *199*
loan-to-value ratio, *183*
location quotient, *189*
market value, *192*
optimal size of cities, *191*
overimprovement, *197*
public goods, *190*
sales comparison, *193*
submarket, *192*

Useful Web Sites

www.nahb.org—National Association of Home Builders.

www.realtor.com—National Association of Realtors.

www.ofheo.gov/HPI.asp—Office of Federal Housing Enterprise Oversight House Price Index

www.freddiemac.com/finance/cmhpi—Freddie Mac's Conventional Mortgage Home Price Index (CMHPI)

www.bestplaces.net—Statistics, including crime rates, on places to live.

www.ers.usda.gov/Data/Unemployment/—U.S. Department of Agriculture. This link includes median household income and unemployment data on every county in the United States.

www.statetaxcentral.com/—Provides tax information for every state.

www.realestate.yahoo.com/realestate/homevalues—This site provides information fo home buying such as comparable sales, home valuation, and neighborhood demographics for an address the user enters.

www.owners.com (then Click on Mortgage)—This site provides information and articles on buying a home and financing.

http://www.fairmark.com/refrence/index.htm This website is good resource for finding related policies. It can help in doing real estate analysis from Tax saving perspecitve.

Questions

1. Why is the income approach to value often difficult to use on a single-family residential appraisal?
2. What are the differences between the cost and sales comparison approaches to appraising property?
3. What are the capital gains rules as applied to residential property owners?
4. List four important drivers of housing demand and price appreciation.
5. What are public goods? How may they be reflected in house prices?
6. When considering an investment in "distressed" properties, what are the two most important areas of research that should be undertaken?

Problems

1. You are considering an option to purchase or rent a single residential property. You can rent it for $2,000 per month and the owner would be responsible for maintenance, property insurance, and property taxes. Alternatively, you can purchase this property for $200,000 and finance it with an 80 percent mortgage loan at 6 percent interest that will fully amortize over a 30-year period. The loan can be prepaid at any time with no penalty.

   You have done research in the market area and found that (1) properties have historically appreciated at an annual rate of 3 percent per year, and rents on similar properties have also increased at 3 percent annually; (2) maintenance and insurance are currently $1,500.00 each per year and they have been increasing at a rate of 3 percent per year; (3) you are in a 26 percent marginal tax rate and plan to occupy the property as your principal residence for at least four years; and the capital gains exclusion would also apply when you sell the property; (4) selling costs would be 7 percent in the year of sale; (5) property taxes have generally been about 2 percent of property value each year.

   Based on this information you must decide:

   a. In order to earn a 10% *IRR* after taxes on your equity, should you buy the property or rent it for a four-year period of ownership?

   b. What if your expected period of ownership was to change to five years. Would owning or renting be better if you wanted to earn a 10% *IRR* after taxes?

   c. Approximately what level of rents would make you *indifferent* between owning and renting for a four-year period?

2. You are considering the purchase of a property today for $300,000. You plan to finance it with an 80 percent loan. The appreciation rate on the property value is expected to be 4 percent annually for the next three years.

   a. Approximate the expected annual average rate of appreciation on *home equity* for the *next 3 years*.

   b. What would be the annual appreciation rate on home equity for *each* of the next three years?

   c. What if you now think that a $300,000 purchase price may be somewhat high and that if you pay this price, the expected appreciation rates in your house price will be as follows: year 1 = 0%, year 2 = 2%, and year 3 = 3%. How will your answers to parts (*a*) and (*b*) change?

3. You are trying to estimate the value of a property that you are interested in buying. The subject property is located at 322 Rock Creek Road in a new suburb of a large metropolitan area. The property is like many others in the area, with three bedrooms, two baths, a living room, a den, a large kitchen, and a two-car garage. The residence has about 1,800 square feet of air-conditioned space and is of traditional design. The property is located on an interior lot with no potential flooding problems. The quality of construction appears to be about average for the market area.

   Comparable properties in the area have the following characteristics:

	Comparable I	Comparable II	Comparable III
Address	123 Clay St.	301 Cherry Lane	119 Avenue X
Sale price	$85,000	$79,000	$75,000
Time of sale	6 months ago	7 months ago	13 months ago
Design	Modern	Traditional	Traditional
Parking	2-car garage	2-car carport	1-car garage
Location	Corner lot	Interior lot	Interior lot
Drainage	Good	Below average	Good
Bedrooms	Four	Three	Two
Baths	Two	Two	Two
Construction	Average	Average	Below average

You have come to some conclusions concerning what you believe the different attributes of the comparable properties are likely to be worth in the market area. Appreciation in house values in the area has been very low over the past eight months, and you think that any properties that have sold within that period would probably not require any adjustments for the time of sale. However, one of the comparable properties sold over a year ago, and you think it will require a $1,500 upward adjustment. You also believe that properties in the area that are located near the creek sell for about $1,200 less than other properties in the area because of a slower rate of runoff after heavy rains. Properties on corner lots generally sell for a premium of about $1,000. Houses with the fashionable modern design usually bring about $1,000 more than those that have traditional design characteristics. Because three-bedroom homes are considered desirable by buyers in the area, an additional fourth bedroom will generally only add about $1,200 in value to a property. However, properties that contain only two bedrooms are rather difficult to sell, and often bring $2,000 less than their three-bedroom counterparts when they are sold. Most homes in the area have a two-car garage, but when properties have a one-car garage, they usually sell for about $800 less. A two-car open carport generally reduces the value of the property by a similar amount, or $800. The inferior construction quality exhibited by comparable III should reduce its value by about $1,500.

a. You plan to complete the sales comparison approach to value and assign an estimate of value to the subject property. Give specific reasons for your choice of value.

b. Assume that the value of the lot the subject property is constructed on is $13,000. Air-conditioned space in the dwelling would cost about $36.00 per square foot to reproduce, and the garage would cost approximately $3,700 to reproduce. Complete the cost approach to value, assuming that, because the property is new, no depreciation of the structure is required.

4. An investor is considering the acquisition of a "distressed property," which is on Northlake Bank's REO list. The property is available for $200,000 and the investor estimates that he can borrow $160,000 at 8 percent interest and that the property will require the following cash expenditures during the next year:

Inspection	$ 500
Title search	1,000
Renovation	13,000
Landscaping	800
Loan interest	12,800
Insurance	1,800
Property taxes	6,000
Selling expenses	8,000

a. The investor is wondering what such a property must sell for after one year in order to earn a 20 percent return (*IRR*) on equity? What other issues must he consider?

b. The lender now wonders that if the property does not sell, he may have to carry the property for one additional year. He believes that he could rent it and realize net cash flow before debt service of $1,200 per month. He would have to make an additional $12,800 in interest payments on his loan during that time, and then sell. What would the price have to be at the end of year 2 in order to earn a 20 percent *IRR* on equity?

5. You have an opportunity to acquire a property from First Capital Bank. The bank recently obtained the property from a borrower who defaulted on his loan. First Capital is offering the property for $200,000. If you buy the property, you believe that you will have to spend (1) $10,500 on various acquisition-related expenses and (2) an average of $2,000 per month during the next 12 months for repair costs, etc., in order to prepare it for sale. Because First Capital Bank would like to sell the property ASAP, it is willing to provide $180,000 in financing at 8 percent interest for 12 months payable monthly (interest only). Your market research indicates that after you repair the property, it may sell for about $225,000 at the end of one year. Furthermore, you will probably have to pay about $3,000 in fees and selling expenses in order to sell the property at that time.

   If you wanted to earn a 20 percent return compounded monthly, do you believe that this would be a good investment? If not, what counteroffer would you have to make First Capital in order to achieve the 20 percent return?

6. **Spreadsheet Problem.** Use the Ch7_Rent_vs_Own worksheet in the Excel workbook provided with the book. Determine the after-tax *IRR* for owning versus renting in each of the five years with the following changes in the original assumptions in the spreadsheet:

   a. The homeowner has a 15 percent marginal tax rate instead of 28 percent.

   b. Rents and property values will not increase over the five years.

   c. The loan amount is $105,000 instead of $120,000.

   d. The initial rent for year 1 is $15,000 instead of $12,000.

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Chapter 8

Underwriting and Financing Residential Properties

This chapter deals with the process of seeking long-term mortgage financing for owner-occupied residential properties. Here we focus on two aspects of this process: loan *underwriting* and *closing*. When discussing the underwriting process, we consider borrower and property characteristics and how loan terms are established. We also consider the size of the loan relative to property value, loan payments relative to borrower income, and default risk undertaken by lenders. We discuss the use of mortgage insurance or guarantees that may be necessary to grant a given loan request in cases where the total risk of lending to a specific borrower is too great for a given lender to undertake. Insurance may be provided by private insurers, or, depending on the property and borrower characteristics, insurance or guarantees may be available from various government agencies.

We look at the loan closing process in terms of the necessary accounting between the borrower, lender, seller, and other parties to a transaction in which transfer of title and a loan closing occur simultaneously, and we consider federal regulations that require certain practices from the lender regarding uniform disclosure of interest charges, closing statements, and collection of credit and other information about the borrower.

Underwriting Default Risk

The process of evaluating a borrower's loan request in terms of potential profitability and risk is referred to as **underwriting.** This function is usually performed by a loan officer at a financial institution, such as a savings and loan association, commercial bank, mutual savings bank, or mortgage banking company. The loan officer performs this analysis based on information contained in (1) the loan application submitted by the borrower and (2) an appraisal of the property. This analysis is made in the context of a lending policy, or guidelines, that a particular institution specifies. In some cases, lenders will require that borrowers obtain **default insurance.** The borrower purchases this insurance policy to protect the lender from potential losses should the borrower default on the loan. In such cases, the lender is not willing to bear the total risk of borrower default, or the loan may be sold to a third-party investor (recall the process of assignment of the note and mortgage discussed in Chapter 2). In the latter case, the lender must consider underwriting standards required by such investors; otherwise, the lender may lose the option of selling mortgages later. In deciding whether a loan application should be accepted or rejected, the loan officer follows some fundamental concepts in loan risk analysis.

Before beginning a detailed discussion of specific underwriting standards and policies, we first consider some basic relationships and terms used in mortgage underwriting. Two fundamental relationships that must be assessed by any lender when considering the risk of making a mortgage loan are the expected **payment-to-income ratio** and the **loan-to-value ratio.** The payment-to-income ratio is simply the monthly payment on the loan amount being applied for plus other housing expenses divided by the borrower's income. The loan-to-value ratio is the loan amount requested divided by the estimated property value.

The first ratio is important because the borrower will generally be personally liable on the note, and must be able to make payments either as scheduled (in the case of a *fixed rate mortgage*) or as market conditions change interest rates (in the case of *adjustable rate mortgages*). Clearly, the greater the ratio of mortgage payment to income for a given borrower, the greater is default risk. Hence, a higher risk premium must be earned by the lender. Similarly, because the property being acquired by the borrower also serves as security for the note, as the loan-to-value ratio increases, the likelihood of loss increases. This is because the property may not bring a sufficient price at a foreclosure sale to cover the outstanding loan balance, any past due payments, and foreclosure costs. Therefore, the major problems facing a lender when reviewing a loan request made by a borrower are (1) assessing the many variables that affect default risk, (2) determining whether a fixed interest rate or adjustable rate mortgage can be made, and (3) if the total risk on a particular loan request is too great, deciding whether the loan should be refused or made with default insurance or guarantees from third parties.

Classification of Mortgage Loans

In previous chapters, we discussed and classified mortgage loans mainly in terms of interest rate risk, that is, whether a loan was a fixed rate mortgage (FRM) or an adjustable rate mortgage (ARM). While those chapters also included basic discussion of default risk, specific methods and procedures for assessing borrower default risk are primary topics in this chapter.

Recall from the previous chapter that default risk was defined as a potential loss that could occur if the borrower failed to make payment on a loan. This failure could be caused by a borrower having insufficient income, or because the market value of the property fell below the outstanding mortgage balance, or both. There are several ways that default risk can be shared. Default risk may be fully assumed by the lender, shared by the lender and a third-party insurer, or fully assumed by a third-party insurer or guarantor. To facilitate discussion, we use the following classifications:

1. Conventional mortgages.
2. Insured conventional mortgages.
3. FHA insured mortgages.
4. VA guaranteed mortgage loans.

Conventional Mortgage Loans

Conventional mortgage loans are negotiated between a borrower and lender. From these negotiations, the loan-to-value ratio, interest rate (or ARM terms), and the payment-to-income ratio are established. The loan-to-value ratio establishes the borrower's down payment, or equity. Should the borrower default on the loan, both the lender and borrower may incur losses. Losses usually include any past due interest, costs of selling the property, and the extent to which the sale price is less than the mortgage balance. In the event of loss, the borrower absorbs such losses first to the extent of any equity. If losses exceed the amount of borrower equity, the lender will then incur a loss, which then becomes a claim against the borrower and (depending on state law) may be used to attach other assets owned by the borrower (recall the discussion of deficiency judgments in Chapter 2).

Typically, if the borrower desires a conventional loan, the maximum loan amount will be 80 percent of the value of the real estate being purchased. Location of the property—for example, in a platted subdivision with city utilities—is a key factor. Because the lender must look to the sale of the property for repayment of the mortgage loan should the borrower default, regulations governing the operation of most savings institutions generally require that for conventional loans, equity of at least 20 percent of value must be provided by the borrower. Therefore, such losses must exceed 20 percent of the original property value before the lender would suffer a loss. Much of the lending activity in the conventional loan market is affected by the Federal National Mortgage Association (FNMA) and the Federal Home Loan Mortgage Corporation (FHLMC). See Concept Box 8.1 for a brief discussion.

The Secondary Mortgage Market and Increasing Standardization in the Mortgage Lending Industry — Concept Box 8.1

The influence of FNMA and FHLMC (Fannie Mae and Freddie Mac) goes far beyond the standardization of documents (appraisal forms, etc.) noted in Chapter 7. As will be described in detail in later chapters dealing with mortgage-backed securities, these two government-sponsored enterprises (GSEs) dominate the secondary residential mortgage market in the United States.

These organizations (1) purchase mortgages from lenders, (2) create large mortgage pools (often in the billions of dollars), and (3) then using these pools as collateral, issue mortgage-backed securities, which are sold to investors such as pension funds, insurance companies, and overseas investors. In order to accomplish this securitization process cost-effectively and efficiently, FNMA and FHLMC have instituted many requirements that lenders must adhere to and that have resulted in considerable standardization in the mortgage lending process.

GSEs classify loans that they are willing to purchase as (1) *conforming* or (2) *nonconforming* mortgages. The conforming category specifies the loan amount (currently, $417,000) that Congress has authorized as the maximum mortgage loan that these GSEs may purchase from lenders and for which the U.S. Treasury will provide credit backing. These loans also must meet the underwriting standards of FNMA/FHLMC. FNMA and FHLMC dominate the conforming loan market because of their GSE status, which includes various guarantees by the U.S. Treasury. Because of these government guarantees, they can borrow at lower rates of interest than other entities and can buy conforming loans at lower yields than their competitors.

Nonconforming loans (sometimes referred to as "jumbo loans") are loans made in amounts *greater* than the loan maximums set for conforming loans. Because jumbo loans are made in larger amounts and are not backed with government guarantees, FNMA and FHLMC must compete for them with other lenders. Because of this competition, jumbo loans are usually made by many lenders at higher interest rates than those of conforming loans.

Insured Conventional Mortgage Loans

In many instances, borrowers do not have the necessary wealth to make a down payment of 20 percent of value when purchasing a property. However, if the income-earning ability of the borrower and the location of the property being acquired are satisfactory, lenders may be willing to grant a loan request in excess of 80 percent of value with a condition that the borrower purchase **mortgage insurance** against default risk. Many firms provide this insurance for a premium, which is paid by the borrower and is based on the amount of risk assumed by the mortgage insurer. A useful way of thinking about mortgage insurance is to view the borrower as negotiating for a larger loan from the lender, and then paying an insurer to assume the increase in default risk above that taken by the lender on a conventional loan. In other words, only the amount of the loan in *excess* of 80 percent of the property value at the time of loan origination is usually covered under the mortgage insurance policy. Therefore, if a mortgage is made for 95 percent of value and private mortgage insurance is purchased, the borrower would make an equity down payment of 5 percent of the property value and the mortgage lender would make a 95 percent loan. However, the lender would have 80 percent of the loan amount at risk and the mortgage insurer would insure any losses to the lender in an amount equal to 15 percent of the property value. The interest rate charged on this type of loan might be higher than the rate on an uninsured conventional loan because the amount of the loan is greater (95 percent versus 80 percent).

Mortgage insurers are private companies that operate by collecting premiums from borrowers based on the incremental risk being assumed as loan amounts rise above 80 percent. These premiums are pooled and the insurers maintain reserves that are used to pay claims to lenders should mortgage defaults occur. These companies can usually take this additional risk at a premium that would be lower than individual lenders would have to charge because they insure many different borrowers making mortgage loans nationally whereas individual lenders make loans to fewer individuals in fewer geographic regions. Consequently, mortgage insurers are able to diversify the additional default risk more effectively than a single lender can. A single lender could be more adversely affected should an economic decline occur in a particular region.

When an insured conventional mortgage is made, the maximum loan that a borrower is likely to obtain will be 95 percent of value although some lenders will go even higher. Because a greater potential for loss exists and much of the risk of loss is being assumed by the mortgage insurer, underwriting requirements that the lender uses to evaluate the borrower are likely to be heavily influenced by the insurer. Lenders must rigidly adhere to these standards when this type of loan is considered. Premiums will be based on the extent to which the loan-to-value ratio exceeds 80 percent for any given borrower.

FHA Insured Mortgage Loans

A mortgage loan can also be insured by the **Federal Housing Administration (FHA).** Unlike conventional insurance, which protects the lender against some portion of the potential loan loss, FHA mortgage insurance insures the lender *completely* against any default losses. It should be stressed that FHA does not make loans but provides insurance. Because FHA accepts the entire risk of borrower default, it maintains strict qualification procedures before the borrower and property will be accepted under its insurance program.

The FHA was created in 1934 with the passage of the Federal Housing Act.[1] The original intent of the FHA was to stabilize the housing industry after the Depression of the early 1930s. It has also had a long-standing policy objective to make housing affordable to lower- and middle-income families. This has been accomplished by allowing such families to purchase homes with lower down payments than would be required under conventional

[1] The National Housing Act of 1934, as amended.

lending standards. The FHA operates as an insurance program, collecting premiums and maintaining reserves for payment of lender claims. Because FHA mortgage loans are made with higher loan-to-value ratios than conventional uninsured loans and because the FHA assumes the entire risk of default, mortgage insurance premiums charged by FHA are usually higher than conventional premiums, reflecting the additional risk taken by FHA.

Why is there a need for both FHA and private mortgage insurance? Regulations place loan maximums on FHA insured mortgage loans which may not be sufficient for many borrowers who purchase higher-priced properties.[2] Hence, qualified borrowers will normally choose a conventional, privately insured loan when a larger loan is necessary to purchase higher-priced property with a low down payment. In general, borrowers with higher incomes, who desire to purchase higher-valued properties with low down payments, opt for private mortgage insurance because the loan amount can be greater than the maximum available under FHA at a lower insurance cost. FHA borrowers are likely to have lower incomes and purchase properties in lower price ranges, within the maximum loan limits set by FHA. Because of the borrowers' lower incomes, lenders may insist that the entire mortgage loan be insured; consequently, these borrowers will pay higher insurance premiums to FHA.

FHA extends insurance to buyers under a number of programs. The most common is Section 203b, which insures loans on one- to four-family detached residences. This program requires fixed interest rate financing with a term of between 15 and 30 years. Other FHA loan programs include Section 251, an ARM program; Section 234c, a condominium insurance program; and Section 245, a graduated payment mortgage insurance program.[3]

VA Guaranteed Mortgage Loans

Qualified veterans who desire to purchase a residential property and who meet certain length-of-service tests may obtain a mortgage loan guarantee from the **Department of Veterans Affairs (VA).** The VA provides **guarantees** that compensate lenders for losses on loans made to veterans (borrowers). The amount of the guarantee varies with the home loan amount and the veteran's remaining entitlement. The guarantee generally equals or exceeds 25 percent of the loan amount. This amount, in effect, represents what would otherwise be a down payment in conventional financing under the VA's GI loan program. As is the case with the FHA program, VA does not make mortgage loans. It does, however, make direct loans to the public in connection with the sale of repossessions. *Unlike the FHA program, the VA provides a loan guarantee, not default insurance.* The certificate of guarantee is provided at no charge to the lender. All losses incurred by VA under this program are paid by the U.S. government through its budget allocation to the Department of Veterans Affairs. In recent years, however, the program has not incurred any net losses due to the funding fees paid by veterans on each loan.

The amount of the loan that may be guaranteed is generally limited to the amount shown on the **Certificate of Reasonable Value (CRV)**, with the following exceptions:

1. For regular refinancing loans (cash-out), the loan is limited to 90 percent of the amount on the CRV.
2. Loans to refinance construction loans, installment land sale contracts, and loans assumed by veterans at interest rates higher than the proposed refinance rate are not subject to the 90 percent limit. However, these types of refinancing loans may not exceed

[2] For a discussion of FHA maximum insurable loan amounts, see *HUD Handbook 4000.2* and subsequent revisions. FHA maximum insurable loan amounts depend on the geographic region in which the loan is made. These amounts also change from time to time.

[3] For a detailed listing of FHA mortgage insurance programs, see *HUD Handbook 4000.2.*

the lesser of the VA reasonable value or the sum of the outstanding balance of the loan plus allowable closing costs and discounts. In construction loan cases, "balance of the loan" includes the balances of construction financing and lot lien(s), if any.

3. For graduated payment mortgage loans, a cash down payment is required.
4. For Energy Efficient Mortgages, the loan amount may be increased by the cost of the energy conservation improvements up to a maximum which varies according to regulation. When energy efficiency improvements are made in conjunction with a refinancing loan that is subject to the 90 percent of value limit, the maximum loan is 90 percent of the CRV, plus the cost of the energy efficiency improvements.
5. Any loan amount may be increased by the amount of the VA funding fee, and the loan may exceed the reasonable value of the property by this amount.

The maximum loan entitlement available to any veteran is $36,000. Veterans may use their VA home loan entitlement more than once. Essentially, qualified veterans receive an entitlement that never expires. The amount of entitlement available to a borrower at any given time depends on the current guarantee maximum, amounts of previously used entitlement, plus any amounts restored from previously used entitlement. For example, if the current maximum entitlement is $36,000 and a borrower purchases a property for $80,000, the VA will issue a certificate of guarantee for 40 percent, or $32,000, leaving $4,000 of entitlement for future use by the borrower. If after a time the borrower meets the legal requirements for restoration, the $32,000 of previously used entitlement would be added back to the remaining entitlement, making the full entitlement $36,000 once more.

If the borrower sells the property on assumption to another qualified veteran borrower with entitlement who agrees to substitute his entitlement for the entitlement used by the original borrower on the loan, the original borrower's entitlement would be restored.

Many other influences affect the amount of entitlement for which a borrower may qualify, for example, when both husband and wife are qualified veterans.[4]

The Underwriting Process

Regardless of the type of mortgage (conventional, conventional insured, FHA, or VA), much of the underwriting process is common to all types of mortgage loans. The underwriter begins by collecting the data for deciding whether credit should be extended. The goal of this process is to determine whether the loan-to-value ratio, the payment-to-income ratio, assets of the borrower, and borrower credit history are acceptable to the lender or the lender and insurer. Next we discuss (1) how borrower income is estimated and the relationship of that income to the proposed mortgage payments and other obligations of the borrower, and (2) how the value of the property is established through an appraisal.

Borrower Income

The underwriting process usually begins with the underwriter obtaining the data needed to decide about extending credit. An item of primary importance will be *borrower income*. To gather the necessary data regarding income, the borrower is requested to allow the lender to (1) verify place of employment, (2) verify wages (via W-2 forms, paycheck stubs, etc.),

[4] For a discussion of VA loan guarantee eligibility requirements, see Title 38, U.S. Code, Section 3701.

and (3) inquire as to whether employment is likely to continue into the future. Typically, where a borrower is employed on a full-time basis and obtains regular income from this employment, there is little problem in verifying income. In cases where a borrower's income is derived from more than a single source, the process of verifying the amount and the likelihood of that income continuing is more difficult.

Other possible income sources include these:

- Part-time employment.
- Working spouse.
- Rentals.
- Alimony or child support.
- Commissions.
- Self-employment.
- Bonuses.
- Dividends or interest.
- Retirement annuity.
- Social Security.
- Public assistance.

Generally, two tests must be met before any of these sources will be included in establishing borrower income in the underwriting process. First, the underwriter must judge that the income is likely to continue. This usually means that a source of income must have already occurred continuously for a sufficient time for the underwriter to judge whether that income will continue. Second, the income must be verifiable, usually by reviewing the borrower's federal income tax returns for at least two years. When the income is nontaxable, such as distributions from retirement annuities, canceled checks or verification of deposits may be used to verify the existence of the income.

In addition to deciding what sources of income should be included, difficulties also arise when determining how much income should be used in the underwriting process. For example, the amount of income from a particular source may vary from period to period. When income is variable in nature, such as the earnings from commission sales positions, rentals, or self-employment, a borrower's income will generally be averaged over a period of at least two years from amounts shown on tax returns. Any expenses incurred in earning that income will be deducted from the amount of income earned.

When two individuals are employed, the question arises of what constitutes income. The general rule applied by the lender takes a long-run viewpoint; that is, it asks whether both individuals will remain employed indefinitely, or at least until the income of one is sufficient to meet the monthly mortgage payments. This question often presents difficulty when the value of the property and the loan amount being requested are high in relation to the income of only one of the earners. Obviously, the lender will have to exercise judgment about the future stability of the joint incomes. Generally, if both parties have been employed for several consecutive years, future income stability is more likely. If the intent of one of the parties is to end employment after a given number of years and this individual is presently employed in a professional activity with employment stability, both incomes may be included for the time both expect to remain employed. An estimate may be made as to what the primary worker's total income will be at the time the other party ceases employment.

Although income forms much of the basis for risk analysis by the lender, recent federal regulations have limited the extent to which lenders may obtain information or make inferences concerning a loan applicant's background. Regulation B of the Board of Governors of the Federal Reserve System provides guidelines that lenders must comply with when gathering information about potential borrowers.[5]

Verification of Borrower Assets

Another step in the data collection process is the *verification of borrower assets.* Assets of the borrower must at least be sufficient to close the transaction. This means that borrower assets must be sufficient to pay closing costs and make a down payment. Moreover, lenders usually do not allow borrowed funds to be used as the borrower's down payment. Thus, how long a borrower's assets have been on deposit will be used as an important indicator of whether the borrower is planning to use borrowed funds to make a down payment. Gifts, on the other hand, are usually allowed for all funds necessary to close. A gift letter stating that no repayment is required, signed by both the borrower and gift donor, is usually required. The lender will usually document the transfer of funds from the donor's account to the borrower's account. Any assets that are not required to close the lending transaction will reflect favorably upon the creditworthiness of the borrower.

Other assets of the applicant also play an important role in rating the loan quality by the lender. The rating is improved if the applicant has demonstrated a consistent ability to save as evidenced by savings accounts or investments in other property, ownership of life insurance (cash value), purchase of securities, and the like, as well as the ability to carry the obligations associated with the acquisition of these assets. For example, an older applicant whose remaining life expectancy is less than the term of the mortgage being sought may be granted a loan with the desired maturity, even though it exceeds the years of life expectancy remaining, if adequate life insurance exists to pay off the mortgage loan in the event death occurs before the loan is repaid. In most cases, the lender will request that the applicant sign a request allowing other financial institutions, investment companies, and credit agencies to disclose to the lender the nature and amount of the applicant's assets. These could include stocks, bonds, savings accounts, and any recent activity in the accounts.

Assessment of Credit History

Typically, the underwriter will also make a judgment about the acceptability of the borrower's past payment history on other obligations. Credit reports from a central credit bureau, located in most cities, will give a history on a borrower's payment habits for up to 10 years. Such things as slow payment of past borrower obligations may reflect unfavorably upon the loan

[5] (*a*) The use of sex, marital status, race, religion, age, or national origin in a credit underwriting procedure is prohibited. (*b*) Creditors may not inquire into birth control practices or into childbearing capabilities or intentions, or assume, from her age, that an applicant or an applicant's spouse may drop out of the labor force due to childbearing and thus have an interruption of income. (*c*) A creditor may not discount part-time income but may examine the probable continuity of the applicant's job. (*d*) A creditor may ask and consider whether and to what extent an applicant's income is affected by obligations to make alimony or child support or maintenance payments. (*e*) A creditor may ask to what extent an applicant is relying on alimony or child support or maintenance payments to repay the debt being requested, but the applicant must first be informed that no such disclosure is necessary if the applicant does not rely on such income to obtain the credit. Where the applicant chooses to rely on alimony, a creditor shall consider such payments as income to the extent the payments are likely to be made consistently. (*f*) Applicants receiving public assistance payments cannot be denied access to credit. If these payments and security provided for the loan meet normal underwriting standards, credit must be extended. (*g*) An individual may apply for credit without obligating a spouse to repay the obligation, as long as underwriting standards of the lender are met. (*h*) A creditor shall not take into account the existence of a telephone listing in the name of an applicant when evaluating applications. A creditor may take into account the existence of a telephone in the applicant's home. (*i*) Upon the request of an applicant, creditor will be required to provide reasons for terminating or denying credit.

dit Scoring Mo... Concept B...

The evolution of credit scoring models has had a profound impact on all areas of lending, including mortgage lending. When underwriting mortgage loans, lenders usually require that a credit reports be obtain on borrowers. All credit reports contain *credit scores.* This credit score is a three-digit credit rating that represents an estimate of an individual's financial creditworthiness as determined by a statistical model. The credit score attempts to quantify the likelihood that a prospective borrower will fail to repay a loan during a specified period of time. Credit scores have an important influence on (1) loan approval and (2) the interest rate that will be quoted on a loan. As of 2006, based on industry practices, scores will become more standardized. In example, lenders will assign scores of A for 900 and over, B for scores in the range of 800–900, and so forth. Higher credit scores increase the probability that the loan will be approved and that it will be made at a lower interest rate than may be quoted to borrowers with lower credit scores. Scores below 500 (F) usually result in rejection of the loan application.

While the contents of credit-scoring models are private, it is generally believed that the major variables used in the models to determine the final credit score include the following (approximate weights are shown in parentheses):

A. Punctuality of past payments (35%).
B. Capacity used: the ratio of current debt (credit card balances, etc.) to total available credit card limits (30%).
C. Years of credit experience (15%).
D. Types of credit used (10%).
E. Recent searches for credit and/or the number of credit cards/accounts applied for recently (10%).

A. Punctual Payments A prompt payment history has a very positive effect on credit scores. Any payments reported more than 30 days late have a negative affect on credit scores. Any account placed in "collection status" (usually after it is 6 months past due) has a very negative effect on scores.

B. Capacity Used Large total outstanding loan balances as a percentage of total credit limits available on all credit cards used by a borrower will generally have a negative effect on the credit score. Many different credit cards also may adversely affect scores because of the potential to borrow large amounts in the future.

C. Length of Credit History Experience A lengthy experience with managing credit usually has a positive influence on the borrower's credit score. Individuals with less experience with credit will not score as well. This tends to favor older individuals with a long history of successful credit management.

D. Types of Credit Used Loans made with consumer finance companies or other entities that make loans to high-risk individuals at high interest rates have a negative effect on scores.

E. Searches/Inquiries The number of applications, credit cards issued, and inquiries to credit bureaus regarding the status of the borrower's credit tend to have a negative impact on credit scores. Frequent inquiries regarding borrower credit balances may also adversely affect scores.

applicant. Many examples of adverse credit experience will surely cause the loan application to be rejected. However, a brief interruption in an otherwise acceptable credit history caused by explainable events such as divorce or interruption in income will sometimes be overlooked by the underwriter if an explanation is provided—assuming that the borrower has recovered financially from the adverse circumstances that caused this problem. Even bankruptcy may not automatically cause a loan application to be rejected if there were extenuating circumstances and the borrower has had several years of acceptable history since the problem occurred. For developments in analysis and credit scoring see Concept Box 8.2.

Estimated Housing Expense

Determining the housing expense used to establish the payment-to-income ratio that a borrower is proposing to undertake is relatively straightforward. The following is a list of items that are likely to be included in the estimate of monthly housing expense:

- Principal and interest on the mortgage being applied for.
- Mortgage insurance (if any).
- Property taxes.
- Hazard insurance.
- Condominium or cooperative homeowners association dues (if applicable).

The underwriter will have to estimate many of these items because their exact amounts will not be known at the time of underwriting. Very often the lender may require that the borrower pay monthly, prorated installments toward mortgage insurance, hazard insurance, and property taxes, in addition to the mortgage payment. Judgment concerning the risk associated with making the mortgage loan will depend upon the total cost of home ownership relative to borrower income. If this total cost of home ownership is too high, then an applicant's loan application may be rejected. Specific examples of how these expenses are estimated and related to income will be discussed later in the chapter.

Other Obligations

In most cases, borrowers will have other obligations in addition to the mortgage loan being applied for. Obvious examples include auto loans, credit card accounts, other mortgage debts, or alimony and child support payments. The underwriter will request that the borrower disclose all debts at the time of application, and then verify these commitments by obtaining a credit report with the approval of the borrower. Courthouse records in the borrower's county of residence also may be checked to determine whether there are any judgments outstanding against the borrower for unpaid debts. Another item on the credit report of importance to the underwriter will be whether the borrower has ever filed for bankruptcy.

Compensating Factors

It is possible that the underwriter will find other favorable factors about the borrower that can offset certain unfavorable factors during the underwriting process. Typically, it is considered favorable for a borrower to have liquid assets that could be used to make her monthly mortgage payment should the borrower's income be interrupted. Another favorable factor is if the borrower is employed in a field where his skills are in high demand and the likelihood is that his income will increase over time. These factors may prove sufficient to allow a borrower to devote more income to housing expenses, even if the borrower's proposed housing expense ratio is higher than for other borrowers with similar incomes. Of course, making a substantial equity down payment as part of the purchase price is considered favorable as well. When any or all of the conditions exist, it is possible that underwriting policies may be relaxed to some degree.

After all of the factual data described above have been determined, the loan underwriter will consider whether or not the loan in question should be granted. The process of making this evaluation varies, depending upon the kind of loan the borrower is seeking. The following examples of the underwriting process in conventional, insured conventional, FHA, and VA loan transactions should help to illustrate this point. For a list of other important issues and strategies, see Concept Box 8.3.

Borrower/Strategies to Consider during the Loan Underwriting Period — Concept Box 8.3

- *Lock-in period and fee.* Most lenders will provide a firm interest quote usually for 30 days prior to closing. This "lock in" period is a commitment by the lender to make a loan at a specific rate of interest for a specified number of days, even though market interest rates may change prior to the actual loan closing. Some lenders may charge a fee to "lock this rate in." Lock-in periods may also be extended to 45 or 90 days, usually for a higher fee.
- *Prepayment penalty.* Borrowers may be able to negotiate a lower interest rate from lenders in exchange for a prepayment penalty. With such a penalty, the borrowers may repay their loan early (usually within a specified number of years) only if they sell their property. They may not repay loans early because they want to refinance. Prepayment penalty periods usually expire after a specified number of years. This penalty gives more assurance to lenders that most loans will not be repaid shortly after closing. This is particularly important to some lenders should interest rates decline.
- *Private mortgage insurance (PMI).* This is usually required for loans that are over 80 percent of value. However, borrowers who need loans in excess of 80 percent of value may consider a first lien for 80 percent, and then add a second lien for the additional amount needed. By keeping the first lien at or below 80 percent, borrowers may avoid PMI. However, interest rates on second liens are usually higher, and this higher rate must be compared to PMI premiums.
- *Option to eliminate PMI or FHA insurance after closing.* These requirements may be dropped when loan-to-value ratios reach 80 percent and 78 percent, respectively, thereby reducing monthly payments by the premium. Elimination of this insurance will usually require a new appraisal conducted by an appraiser who must be approved by the lender.
- *Buying down interest rates.* This option may be compared with making larger down payments. As larger down payments are made, interest rates quoted on a loan may not decline by as much as would be the case if the borrower buys down the rate from the lender.
- *Subprime loans.* When a deficiency is discovered (e.g., low credit score) during the underwriting phase of the loan application process, lenders may be willing to make a **subprime loan.** These loans are usually made at higher rates of interest than would otherwise be available and may also include prepayment penalties and significant penalties for late payments. Subprime borrowers may attempt to negotiate a provision in the loan that, if such a deficiency is cured (e.g., the borrower achieves a higher credit score) after closing, the interest rate will be reduced.
- *Power payment option.* This allows a borrower to miss up to 2 monthly payments in any year or up to 10 payments over the life of the loan. An up-front fee is charged for the option, plus a usage fee which is added to the loan balance each time the option is used. This feature can also be viewed as an insurance provision that may be used should a borrower become ill or unemployed and miss monthly payments.

The Underwriting Process Illustrated

This chapter section illustrates how each of the four types of mortgage loans described above is generally underwritten by lenders. As indicated earlier, one goal of underwriting is to establish whether the risk of borrower default is acceptable and whether the loan should be granted. We will consider each type of mortgage (conventional, insured conventional, FHA, and VA) separately. In this section, we look at how the maximum mortgage amount is established, how it is related to property value, and how that relationship varies with each type of mortgage. We also discuss (1) proposed housing expenses and other obligations relative to borrower income, (2) the criteria used to establish acceptable relationships between expenses and income, which will serve as the basis for the lending decision, and (3) the role of appraisals in establishing the loan-to-value ratio.

To facilitate the discussion, we use the sample borrower information in Exhibit 8–1 to illustrate the underwriting process for each category of mortgage loans. Details about the underwriting criteria will be sufficient to allow generalizations beyond the cases used in our discussion.

Underwriting Standards—Conventional and Insured Conventional Mortgages

Looking at the data shown in Exhibit 8–1, we see that in addition to the verification of income and outstanding debts, the lender has estimated both property taxes and hazard insurance (fire, storm, etc.), which are also used in estimating housing expenses. These expenses establish the monthly payment-to-income ratio for the borrower-applicants. Looking at Exhibit 8–2, we see some of the general underwriting standards that lenders will apply in making the decision to grant or deny the loan request. In other words, after assembling the facts necessary to establish monthly housing expenses and other obligations, the lender will compute the necessary ratios and compare them to the general standards used by the lenders and mortgage insurers. This will help determine whether the default risk is acceptable, given the prevailing rate of interest. Lenders and insurers establish these underwriting standards, or maximum allowable ratios, based on loss experience from previously underwritten loans. Interpret these ratios as a general guide, however, because there may be other assets or compensating factors to be considered as a part of the underwriting process.

Also note in Exhibit 8–2 that, in the case of ARMs, more stringent underwriting standards may have to be met in certain cases. This is because an increase in interest rates could result in either an increase in payments or an increase in the loan balance due to a payment cap and negative amortization. Lenders refer to cases where negative amortization is *expected* as *scheduled amortization* and usually take it into account when underwriting the ARM by requiring a *lower* loan-to-value ratio. If payments are likely to be adjusted because the composite rate (current ARM index plus margin) at the time of origination is higher than the initial interest rate, the underwriter will probably consider the scheduled payment increase when reviewing the payment-to-income ratio.[6] Note that conventional GPMs are usually underwritten on the basis of scheduled amortization, which is known at the time of

EXHIBIT 8–1
Sample Underwriting Illustration: Borrower and Property Characteristics

Name of borrower:	John and Jane J. Jones
Income:	$3,542 monthly from salaried employment of both spouses, $42,500 annually
Debts:	Installment obligation of $181 per month with 35 months remaining
	Credit card obligations, $50 per month with more than 12 months remaining
Sale price:	$76,700
Appraised value:	$77,000
Estimated property taxes:	$797 annually
Hazard insurance:	$552 annually
Desired mortgage:	FRM with a 30-year term, constant payment

[6] When the composite rate is higher than the initial rate at the time of origination, the latter rate is referred to as the *teaser rate*, because lenders may be using it as an incentive for borrowers to make ARMs. When the first payment adjustment occurs, payments will increase substantially if the composite rate is still considerably higher than the initial rate. This increase in ARM payments is referred to as *payment shock* in the lending industry.

EXHIBIT 8–2
General Industry Standards for Underwriting Conventional and Insured Conventional Loans

	Conventional		Insured Conventional	
	FRMs	ARMs	FRMs	ARMs
Maximum ratios allowed (%) :				
Loan-to-value	80%	80%	95%	90*–95%
Payment-to-income	28	25†–28	28	25†–28
Total obligations to income	36	33†–36	36	33†–36

*Conventional ARMs with loan-to-value ratios in excess of 90 percent are generally not available, although some lenders will loan in excess of 90 percent at a higher interest rate. Graduated payment mortgages (GPMs) are usually limited to 90 percent loan-to-value ratios because of scheduled negative amortization.

†Generally, the higher ratios are allowed; however, if the conventional ARM or GPM allows for the possibility of maximum increases in monthly payments beyond prescribed limits, the lower ratios must be met for the loan to be insured.

origination, and the loan-to-value ratio is usually restricted to 90 percent. Also, in the case of ARMs, initial maximum payment-to-income ratios may be lowered if the mortgage agreement provides for the possibility of monthly payments exceeding prescribed maximums. For example, if an ARM is made with a payment cap greater than 15 percent annually, or the interest rate cap exceeds 2 percent annually or 5 percent over the life of the mortgage, lower ratios will usually be required. This latter restriction also applies to GPMs.

When computing these ratios for the conventional and insured conventional cases, we take relevant information from Exhibit 8–1 and compute the necessary ratios shown in Exhibit 8–3. Note that in the two cases being considered, the insured conventional loan is larger (95 percent versus 80 percent) and is made at a higher interest rate. Also, the insured loan requires a monthly mortgage insurance premium, and the conventional loan does not. The ratios calculated and shown at the bottom of the exhibit indicate that the borrower would probably qualify for either a conventional loan or an insured conventional loan.

EXHIBIT 8–3
Computation of Borrower Qualification (conventional and insured conventional loan examples)

	Conventional	Insured Conventional
Loan amount requested	$61,360	$72,865
Terms	*FRM* 30 yr., 9.25%	FRM 30 yr., 9.5%
Loan-to-value ratio	80%	95%
Borrower income (A)	$ 3,542	[illegible]
Housing expenses:		
Principal and interest	$ 505	[illegible]
Property taxes	66	[illegible]
Hazard insurance	46	[illegible]
Mortgage insurance	—	31*
Housing expense (B)	61[illegible]	[illegible]
Add:		
Installment debt†	181	[illegible]
Credit cards	50	50
Total obligations (C)	$ 848	[illegible]
Housing expense ratio (B ÷ A)	17%	[illegible]
Total obligation ratio (C ÷ A)	24%	[illegible]

*Based on the second year's premium, or .35 percent of the loan balance outstanding at the end of the first [illegible] first year's premium is likely to be higher (0.8 percent) and is usually collected in advance as a part of [illegible] Monthly mortgage insurance premiums that lower the amount of money needed at closing [illegible] invoiced monthly instead of annually.

†Usually defined as an obligation with at least 11 remaining monthly payments. However, any obligation [illegible] underwriter requires a large monthly outlay relative to income may be included, even if the number of [illegible]

given that those ratios fall well below the maximum ratios allowed under the general underwriting standards shown in Exhibit 8–2. Whether the borrower will prefer the conventional or insured conventional loan depends on the amount available for a down payment (20 percent or 5 percent of appraised value) and whether the borrower wants to pay additional interest and insurance charges. The latter choice also depends on whether the borrower has sufficient funds to make either down payment requirement. If the borrower could afford to make either down payment, the borrower must decide whether the difference (15 percent) can be reinvested at a rate of interest in excess of the added interest and insurance charges. (A procedure that may be used to choose between loans that differ in amount and interest rates was presented in detail in Chapter 7.)

Underwriting Standards—FHA Insured Mortgages

If the borrower in our example is considering an FHA insured mortgage, a similar approach is used to underwriting, with some notable exceptions. To begin our general discussion of FHA underwriting, we point out that unlike the conventional underwriting process, which provides for loan amounts as a percentage of appraised value (80 percent, 95 percent, etc.), FHA has a specific procedure that is used to establish the *maximum insurable loan amount* for which they are willing to issue an insurance binder. This process is generally described in Exhibit 8–4.

Exhibit 8–4 shows that FHA provides for a closing cost allowance (to be discussed) in its definition of total acquisition cost, which is used as a basis for establishing the maximum loan amount.[7] To the extent the borrower pays closing costs that are equal to or greater than the FHA allowance, the acquisition cost increases. Note that FHA also gives the borrower the option to finance the up-front mortgage insurance premium. This additional amount financed is added to the maximum mortgage amount to arrive at the total amount financed, $76,326. Monthly payments are calculated on this latter amount. Also note that the maximum loan amount is computed on a graduated basis when the total acquisition is greater than $50,000. That is, calculate 97 percent of the first $25,000, which is equal to $24,250, and then 95 percent of the remainder, subject to a maximum loan-to-value ratio established under the Omnibus Budget Reconciliation Act of 1990, and an absolute maximum loan amount that FHA is willing to insure.[8] If the total acquisition cost is less than or equal to $50,000, then the maximum mortgage amount is 97 percent. These graduated rates and maximums are subject to change by FHA at any time, based on prevailing economic conditions.

It should be stressed that FHA has established its own standards for both of these qualifying ratios (see bottom of the exhibit), which it uses uniformly for FRM, GPM, and ARM loans. This practice of computing ratios based on current income at the time of loan originations is followed even though monthly payments with a GPM or ARM may change in future periods.

As in the case of conventional lending, the underwriter is likely to take into account other assets, the credit history, and offsetting factors when deciding to accept or reject a loan application. Because FHA requires tax adjustments in its underwriting process, the

[7] Examples of various closing costs to be discussed later in the chapter include origination fees, appraisal fees, credit report fees, and transfer taxes.

[8] The maximum loan-to-value limits under the Omnibus Budget Reconciliation Act of 1990 are 98.75 percent if the appraised value is $50,000 or less or 97.75 percent if that value is in excess of $50,000. These limits are subject to change at any time.

Web App

First-time homeowners often use FHA loans to finance their home. Go to **www.fha-home-loans.com/** and find out the *current* requirements to qualify for an FHA loan. They may differ slightly from that described in the book because the underwriting requirements frequently change. Summarize the types of loans that are currently available. What is the highest loan-to-value ratio that you could obtain?

EXHIBIT 8–4
Determination of Maximum Loan Amount and Borrower Qualification Ratios (FHA example)

SECTION I. Maximum Loan Amount Calculation		
First Calculation		
Lower of price or appraised value	$76,700	
Plus: Closing cost allowance[*]	1,350	
Acquisition cost	$78,050	
97 percent of the first $25,000		$24,250
95 percent of the remainder		50,397
Maximum loan amount under first calculation		$74,647
Second Calculation		
Lower of price or appraised value		$76,700
Times: Maximum loan-to-value ratio—Value > $50,000		97.75%
Maximum loan amount under second calculation		$74,974
Maximum loan amount[†]—lesser of the first or second calculation		$74,647
Plus: Financed mortgage insurance premium[‡] of 2.25%[‡]		1,679
Amount financed		$76,326
SECTION II. Computation of Qualifying Ratios		
Gross income (monthly) (A)		$ 3,542
Housing Expense		
Principal, interest, and up-front mortgage insurance premium ($76,326, 9.5%, 30 years)		$ 642
Property taxes		66
Hazard insurance		46
Annual mortgage insurance premium[‡]		[illegible]
Total housing expense (B)		$ 785
Other Obligations		
Installment debt[§]		$181
Credit cards		50
Total obligations (C)		$ 1,016

Qualifying Ratios (percent)	Applicant Ratios (percent)	FHA Maximum Ratios (percent)
Housing expense ratio B / A	22	29
Total obligations ratio C / A	29	41

[*] The FHA provides for a closing cost allowance in determining the loan amount. Limits on this amount vary by region.
[†] The maximum loan amount may not exceed limits set by FHA regulations. These limits vary by city and change over time.
[‡] The mortgage insurance premium is composed of two components, an up-front insurance premium, which may be financed or paid in cash, and an annual fee, which varies in terms of amount and term according to the loan-to-value ratio. See U.S. Department of Housing and Urban Development *Mortgagee Letter 94–14* and revisions for a complete discussion on mortgage insurance provisions.
[§] Usually debt with 10 installments remaining. However, the underwriter can increase or decrease the number of installments depending on the total number of obligations outstanding and the relationship to borrower income.

qualifying ratios used as standards in determining the adequacy of borrower income are higher than those used in the conventional cases. These ratios are also based on FHA's loss experience in the operation of its insurance fund. Our hypothetical borrower-applicants, then, would likely qualify for an FHA insured loan. FHA uses one additional underwriting test, however, which is discussed in the next section.

Underwriting Standards—VA Guaranteed Mortgages

The underwriting process followed by the Veterans Administration differs considerably in its approach to establishing the adequacy of borrower income in relation to the loan request. The VA procedure stresses the notion of **residual income,** which is a process whereby gross income is reduced by all monthly outlays for housing, expenses, taxes, all debt obligations, and recurring job-related expenses (see Exhibit 8–5). The difference, or residual income, is then examined to establish whether VA deems it adequate for supporting the borrower's family.

A few items are of particular importance. The mortgage loan amount is equal to the sale price, $76,700, plus a funding fee ranging from 0.5 to 3.0 percent of the loan request to help the borrower fund closing costs (to be discussed).[9] Because the loan request is equal to or less than the maximum loan amount, it would qualify for a guarantee.[10] In addition, because the VA is providing a *guarantee,* no monthly mortgage insurance premium is required of the borrower. Based on the borrower-applicant information in Exhibit 8–1, with a family size of two and no minor dependents, our hypothetical borrowers should qualify for a VA guaranteed loan. They would also meet the supplemental test as used as a secondary underwriting tool by the FHA.

[9] VA typically allows the funding fee (which is paid to VA) to be included in the veteran's loan amount. The funding fee charged depends on the amount of down payment paid by the borrower. If the down payment is 10 percent or greater, the funding fee is 1.25 percent. If the down payment is from 5 percent to 10 percent, the fee is 1.5 percent; anything less than 5 percent requires a fee of 2.0 percent. If the veteran has a service-related disability, the veteran is not required to pay any funding fee on the VA loan. If the funding fee was 2.0 percent, .02 times 76,700, or $1,534, is included in the loan amount of $76,700 + $1,534, or $78,234. Any closing costs in excess of $1,534 would be required of the borrower at closing. However, the VA also monitors what it considers to be excessive closing costs when considering whether to extend its guarantee.

[10] The down payment plus VA guarantee must always equal 25 percent of the lesser of purchase price or appraised value. For example, if the current maximum guarantee is $36,000, a loan of up to $144,000 can be made with no down payment. These amounts are subject to change at any time, depending on congressional action.

VA loans are also fully assumable. There are two types of assumptions: (1) nonqualifying assumptions, where the buyer may or may not be a veteran or qualify with VA before assuming the loan; (2) qualifying assumptions, where the buyer assumes the loan with VA approval. In the former case, if the loan closed prior to March 1, 1988, the loan may be assumed without qualification and the veteran who originated the loan remains personally liable on the note. In the latter case, loans closed after March 1, 1988, require the buyer to qualify for the assumption. The veteran has no liability because the buyer qualified with VA prior to assuming the loan.

When a VA mortgage loan is assumed, the buyer is not required to be a veteran and is not charged for the mortgage guarantee. If, however, the buyer is a veteran and the seller can induce him to substitute his guarantee for the guarantee used by the seller, then the seller's VA entitlement can be restored and used again. Also, in many instances, increases in VA guarantees provided for by Congress are retroactive. As a result, a veteran who used his maximum VA guarantee in one period may have an additional VA guarantee in a subsequent period.

EXHIBIT 8–5
Determination of Borrower Qualification (VA guaranteed loan example)

Residual income technique		
Gross income		$3,542
Less federal income taxes		602
State income taxes		106
Social Security taxes		266
All debts[*]		231
Maintenance		58
Utilities		134
Principal and interest payment[†]		657
Property taxes		66
Hazard insurance		46
Job-related, or child care expense		50
Residual income		$1,326
Minimum residual income for family of:[‡]	1	424
	2	710
	3	855
	4	964
	5	999
	6	1,079
	7	1,159

[*] Usually includes obligations with six monthly installments remaining; however, the underwriter may include any obligations considered material relative to the borrower's income.
[†] Based on a loan amount of $78,138 at 9.5 percent for 30 years (rounded).
[‡] Residual income figures are determined by region of the country and loan amount. The figures used in this exhibit are based on the Midwest region for loan amounts of $70,000 and above.

Underwriting and Loan Amounts—A Summary

It is useful at this point to summarize some pertinent data before moving on to the next topic, closing costs. Exhibit 8–6 provides a summary breakdown of some of the more important characteristics considered thus far. The first item to be noted is that although we begin with the same appraised value in all cases, the loan amount will vary by mortgage category. This variation is based on the fact that we have assumed that a loan-to-value ratio of 80 percent is to be used in the case of the conventional loan and a 95 percent loan is to be made in the insured conventional loan case with any additional closing costs to be paid by the borrower in both cases. In the FHA case, the loan amount is higher because of the higher loan-to-value ratio allowed by FHA (97 percent and 95 percent of portions of the loan request) *and* because a closing cost allowance may be financed under this program. In the case of the VA, the loan amount is 100 percent of the lower of price or appraised value, plus an allowance for closing costs. Also note that an additional term, *amount financed,* is used in the exhibit. This is the amount upon which the monthly interest and principal will be calculated. In three of the cases it is equal to the loan amount. In the FHA case, the amount financed includes the total insurance premium, or 2.25 percent of the loan balance (or an additional $1,679) that the lender is also financing and that must be repaid as a part of monthly principal and interest on the total loan amount.

Other items of importance in Exhibit 8–6 are the interest rates and notes regarding insurance costs. In our example, we have assumed that the interest rate on the conventional loan will be 9.25 percent, or lower than the rate charged in all other cases. This is because the amount of funds being loaned is lower than in all other cases. Another important item about interest rates in the exhibit is that all of these rates are competitively determined through negotiation between borrower and lender and will change over time. Do not infer from our example that there is a fixed spread between interest rates on conventional and

EXHIBIT 8–6
Summary of Underwriting Results

	Conventional	Insured Conventional	FHA Insured	VA Guaranteed
(a) Lower of price/ appraised value	$76,700	$76,700	$76,700	$76,700
(b) Loan amount	$61,360	$72,865	$74,647	$76,700
(c) Amount financed	$61,360	$72,865	$76,326	$78,138
(d) Interest rate	9.25%	9.5%	9.5%	9.5%
(e) Term	30 years	30 years	30 years	30 years
(f) Insurance fee	N.A.	*	†	N.A.

*0.8 percent of loan at closing, .35 percent per year, payable monthly.
†Two components: an up-front mortgage insurance premium that may either be financed or paid at closing and a monthly insurance premium that varies according to the loan term, loan-to-value ratio, and date of loan closing.

other loan types. These illustrations are used as *examples only*. Similarly, we assume the terms of the mortgages to be 30 years. While FHA and VA loans are available in 15- to 30-year terms, 30-year loans are used most frequently under these programs. Conventional mortgages, however, are frequently made from 15 to 30 years. Finally, keep in mind that in developing the estimates of housing expenses, total obligations, and other expenses used in underwriting, we have assumed the same estimates in many of our examples for similar expense categories (utilities, maintenance, debts, etc.). In reality these estimates may differ, depending on the specific regulations, policies, cost manuals, and guidelines that the various insurers and lenders involved in the underwriting process use.[11] While there are many other peculiarities associated with underwriting each type of loan, we have attempted to limit the administrative and regulatory detail and to focus on the major differences between underwriting approaches and regulations in order to help the reader understand the more important attributes of the process.

The Closing Process

When a property is being acquired, all interested parties gather, execute, and exchange the documents necessary both to *close the buyer's loan* and to *transfer title to the property* from the seller to the buyer. Generally, such closing are attended by (1) the buyer and seller (perhaps each with legal counsel), (2) any real estate brokers involved, and (3) the settlement agent. The settlement agent is usually a representative of a title insurance company, if such insurance is being purchased, or a representative of the lender, if no title insurance is purchased. The purpose of the closing, then, is (1) to make final settlement between the buyer and seller for costs, fees, and prorations associated with the real estate transaction prior to the transfer of title, and (2) to finalize the loan agreement between the buyer/borrower and the lender.

To summarize the disbursements, charges, and credits associated with the closing, a settlement of closing statement is prepared by the settlement agent. This statement summarizes the expenses and fees to be paid by the buyer and seller, and it shows the amount of funds that the buyer must pay and the amount of funds that the seller will receive at closing. The loan and title closing occur simultaneously because the new lender wants assurance that his lien is established (1) as soon as the seller's lender is repaid and that lien is

[11] FHA and VA closing cost estimates may vary regionally, or even locally, and are updated continuously. In some instances, an appraiser may even make specific estimates of utilities and maintenance items for a given property.

canceled and (2) when the buyer's title company provides title insurance, thereby providing assurance that there are no outstanding liens and/or imperfections in the title being transferred to the buyer. In this event, the new lender will have first lien on the property.

Fees and Expenses

Expenses associated with loan closings must be paid either by the buyer or by the seller, depending on negotiations between the buyer and seller and to some extent on custom in a particular lending area. There is no generally established practice in the area of expense settlement, and in many cases payment of any, or all, expenses is negotiated between buyer and seller. What follows is an identification of various expenses associated with real estate closings, followed by an illustration of a settlement statement.

Financing Costs

These charges are generally paid by the buyer/borrower to the lender and are made in connection with services performed by the lender when underwriting and approving the loan. What follows is an extensive list of possible charges that may be made by the lender.

1. Loan application fee. Charge made for processing the borrower's loan application.
2. Credit report fee. Charge made for compilation of the borrower's credit statement.
3. Loan origination fee. Charge which compensates the originator of a mortgage loan for handling paperwork, preparing mortgage documents, and dispensing funds to the borrower.
4. Lender's attorney's fees. For preparing loan documents—mortgage/note; also for examining title documents presented to the lender.
5. Property appraisal fee required by the lender. (In many cases, this fee is paid directly by the buyer outside of the closing.)
6. Fees for property survey and photos when required by the lender. (This fee may also be paid by the buyer/borrower directly to the surveying company outside of closing.)
7. Fees for preparation of loan amortization schedule by the lender from the borrower.
8. Loan discount points. Additional charge paid to the lender to increase the loan yield (per discussion in Chapter 4).
9. Prepaid interest. Interest charged from the date of closing until the date that interest begins accruing under the terms of the note. The latter date usually coincides with the day of the month that the borrower and lender prefer to make payments, which may be different from the day of the month that the closing occurs.

Prorations, Escrow Costs, and Payments to Third Parties

Property Taxes, Prorations, and Escrow Accounts

Because the dates on which property taxes are due to a particular governmental unit rarely coincide with the title closing date, a *portion* of the annual taxes that were paid by the seller on the due date must be refunded to the seller at closing. In other words, the buyer usually pays taxes only from the date that title to the property is transferred. For example, if a county collects taxes on January 1 of each year, and the loan closing date is April 1, the seller should pay taxes (January through March), because the seller owned the property for any part of the tax period. A proration of taxes is usually made at closing by refunding to the seller that portion of the taxes that the buyer will be responsible for. This usually runs from the closing date until the date when the next payment of property taxes is due. In this way the seller pays taxes up until the closing date.

Depending on the loan-to-value ratio in the transaction, the lender may require that an escrow account be established. An escrow account is a non-interest-bearing account into which are deposited prorated taxes from the seller and into which the borrower prepays a monthly share of property tax along with the monthly mortgage payment. These funds are accumulated until taxes are due; then a disbursement is made by the lender to pay the tax bill when due. In addition to these monthly payments, the lender may also require that two additional monthly payments be prepaid and escrowed at closing. This is done to ensure the lender of a "cushion," or reserve, in the event that the borrower falls behind in payments or is in default. This provision assures the lender that no tax liens will be attached to the property as a result of the borrower's failure to pay property tax, and is usually required in cases where the loan-to-value ratio exceeds 80 percent.[12]

Mortgage Insurance and Escrow Accounts

When mortgage default insurance is made a requirement of obtaining a loan, it will be paid in one of two ways. Either the full policy premium will be paid by the borrower at closing, or, if the borrower plans to make premium payments over time, the premium for the first year will be prepaid by the borrower at closing and then disbursed to the insurer. The premium for the second year is also determined at closing, and the borrower will be required to prepay an amount equal to two monthly premiums into escrow. Monthly premium payments are then prepaid into escrow each month after the closing. In this way, when the annual policy premium comes due each year after closing, the lender will always have a full year's premium for payment plus premiums for two additional months in escrow. The escrow or reserve may be needed should the borrower fall behind in mortgage payments and default becomes a possibility. The escrow insures that the default insurance policy will not lapse should the borrower be in danger of default. This is the objective of requiring a default insurance policy, and the lender wants to be certain that it does not lapse and coverage is not lost while the loan is about to go into default.[13]

Hazard Insurance and Escrow Accounts

Hazard insurance against property damage is required by the lender as a condition for making the loan, and the mortgage usually carries a provision to that effect. For loans made in excess of 80 percent of value, however, the lender usually requires that the premium for the first year be collected at closing, which is then disbursed to the insurer. An escrow account will also be established for pro rata payments made by the borrower toward the next annual premium due on the policy renewal date. In other words, like the collection of property taxes and mortgage insurance premiums, the lender collects monthly installments equal to 1/12 of the annual premium, along with the mortgage payment, and credits the insurance payment to the borrower's escrow account. When the policy renewal date arrives, the lender then disburses the 12 monthly payments accumulated to the property insurance company. In this way the lender is certain that the property is always insured against damage. This in turn insures the loan collateral. In addition to these requirements, the lender will also require that two months' premiums be prepaid at closing and escrowed. In this way the lender has a hazard insurance reserve with which to pay premiums should the borrower default.

[12] A lender may require that escrow accounts be established on any mortgage regardless of the loan-to-value ratio, but loans with loan-to-value ratios above 80 percent will always require escrow accounts; see Title 12 CFR, Section 54532(b)(6).

[13] Mortgage insurance may no longer be required by the lender (1) after the borrower pays the mortgage down to less than 80 percent of value or (2) if the property appreciates in value such that the outstanding loan to current value ratio falls below 80 percent. Assuming that it is allowed in the mortgage insurance policy, the borrower should request that monthly premiums no longer be required at that time.

Mortgage Cancellation Insurance and Escrow Accounts

Mortgage cancellation insurance is usually optional, depending on whether the borrower desires it. Essentially, it amounts to a declining term life insurance policy which is taken out at closing and runs for the term of the mortgage. Because the outstanding loan balance declines as monthly payments are made on a fully amortizing mortgage, the insurance coverage also declines with the loan balance. In the event of the borrower's death, the insurance coverage is equal to the outstanding loan balance. The mortgage loan is repaid with insurance proceeds. Premiums are usually paid monthly and are added to the monthly mortgage payment. The lender then disburses those payments to the life insurance company. Although mortgage cancellation insurance is usually bought at the borrower's option, if the borrower's age is a critical factor in the lender's loan analysis, purchase of such insurance may be necessary to obtain the loan.

Title Insurance, Lawyer's Title Opinion

Premiums are charged by the title insurance company to search, abstract, and examine title to a property and to issue an insurance policy that indemnifies the buyer against loss arising from claims against the property. Attorneys may perform a similar service for a fee and render an opinion as to the validity of the title held by the seller and whether it is merchantable. Normally *either* the full premium for the insurance policy or the fee for the title opinion is paid at closing. Depending on the policy of the lending institution and government regulations, either title insurance or an attorney's opinion is required as a condition for granting a loan.

Release Fees

Release fees are associated with canceling outstanding liens, such as the seller's mortgage lien, mechanics' liens, and so on, and for services rendered by third parties in negotiating and obtaining such releases.

Attorney's Fee

When incurred by the buyer or seller, legal fees may be paid directly by each party outside of the closing or may be included in the closing.

Pest Inspection Certificate

A pest inspection may be made at the insistence of the lender or buyer. In some states, such as Florida, an inspection is required before title is transferred. The inspection fee may be paid directly or included in the closing settlement.

Real Estate Commission

When a seller of a property engages the service of a real estate agent to sell a property, the seller usually pays the commission for such service at the closing.

Statutory Costs

Certain costs may be imposed by a local or state government agency and must be paid before deeds can be recorded. These costs include:

1. Recording fees. Fees paid for recording of the mortgage and note in the public records.
2. Transfer tax. A tax usually imposed by the county on all real estate transfers.

Requirements under the Real Estate Settlement and Procedures Act (RESPA)

RESPA is a law passed by Congress to provide a uniform set of procedures and documents for buyer/borrowers of residential real estate. It includes many provisions; however, [illegible] those directly associated with the closing are covered here. The essential aspects of RESPA fall into seven areas that are used here to facilitate discussion:

1. Consumer information.
2. Advance disclosure of settlement costs.
3. Title insurance placement.
4. Prohibition of kickbacks and referral fees.
5. Uniform settlement statement.
6. Advance inspection of uniform settlement statement.
7. Escrow deposits.

Consumer Information

Under provisions in RESPA, lenders are required to provide prospective borrowers with an information booklet containing information on real estate closings and RESPA when a loan application is made.

Advance Disclosure of Settlement Costs

At present, the lender is required to mail to the borrower within *three days after* the time of application a *good faith* estimate of certain closing costs for which information is available. The lender must provide information on the basis of actual costs known at that time,[14] or estimates based on past experience in the locality where the property is located.

The estimates provided by the lender generally cover costs in the following categories: (*a*) title search, (*b*) title examination and opinion, (*c*) title insurance, (*d*) attorney's fee, (*e*) preparation of documents, (*f*) property survey, (*g*) credit report, (*h*) appraisal, (*i*) pest inspection, (*j*) notary fees, (*k*) loan closing service fee, (*l*) recording fees and any transfer tax, (*m*) loan origination fees, (*n*) discount points, (*o*) mortgage insurance application fees, (*p*) assumption fees, (*q*) mortgage insurance premiums, (*r*) escrow fees (fees charged for setting up escrow accounts), and (*s*) prepaid mortgage interest.

In addition, it is suggested, but not required, that the lender disclose (*a*) hazard insurance premiums and (*b*) escrow deposits for mortgage insurance, hazard insurance, and property taxes, if these amounts are known at the time of the advance disclosure. In practice, it would be difficult for the lender to know these latter two amounts three days after the borrower has applied for a loan. Although these two items are not likely to be estimated by the lender at the time of the advance disclosure, they will be charged to the borrower at the time of closing.

The form of the advance disclosure may vary from lender to lender and still remain within the requirements of the act. Typically, the disclosure will be made in dollar amounts which will be estimates of the cost of settlement services which are to be performed. However, it is also acceptable for the lender to disclose *ranges* for settlement costs. For instance, a loan origination fee could be stated as ranging from $1,500 to $2,000 in the lending area where the settlement is to occur. However, the lender may not disclose a range if a *specific party* is required by the lender to provide a settlement service. In this case, a specific dollar amount is required. Also, the lender is under no requirement to redisclose if the estimates of settlement services provided to the borrower change prior to the time of closing.

Title Insurance Placement

Under RESPA, a seller may not require that a buyer use a specific title insurance company as a condition of sale. This regulation is aimed primarily at developers who may have

[14] See: Public Law 95-522 as amended. Under RESPA, the lender is only required to disclose exact amounts of settlement costs when the lender requires a specific third party to provide a settlement service. If the borrower is free to choose providers of services, the lender need only disclose a range of what an acceptable fee for the service might be. See the consumer information booklet on RESPA obtainable from the U.S. Department of Housing and Urban Development.

obtained a very favorable title insurance rate on undeveloped land, with the understanding that after development, buyers would be required to place the title insurance with the same company. This part of the act prohibits such requirements and ensures the freedom of the buyer to place title insurance with any title company.

Prohibition of Kickbacks and Referral Fees

Under RESPA, no person can give or receive a kickback or fee as a result of a referral. If any person refers a buyer-borrower to any specific party involved in the closing (lender, title company, attorney, real estate broker, appraiser, etc.) and receives a fee for the referral, receipt of such a fee violates the act. RESPA also prohibits fee splitting by parties associated with the closing unless fees are paid for services actually performed. This latter part of RESPA has probably caused more confusion than any other provision of the act because of the vagueness of the term "services actually performed." However, the intent was to prohibit any circumvention of payments that would have been normally called referral fees by simply splitting fees.

Uniform Settlement Statement

Under RESPA provisions, a uniform settlement statement must be used by the settlement agent at closing. The responsibility for preparation of this statement lies with the lender, and it must be delivered to the borrower and seller at closing. Other closing statements, such as a company form, can also be used for closing purposes, if desired, but the uniform settlement statement must be completed.

This statement is uniform in the sense that the same form must be used in all loan closings covered under RESPA. This form coupled with the information booklet received by the borrower when the loan application is made, which defines and illustrates costs on a line-by-line basis, should enable the borrower to make a better judgment concerning the reasonableness of the closing costs to be paid.

Advance Inspection of Uniform Settlement Statement

Not only must a uniform settlement statement be used at the closing, but the borrower has the right to inspect this statement one day prior to closing. At that time, information on the additional closing costs not required to be disclosed when the loan application is made must be disclosed to the borrower. These costs include hazard insurance premiums and any required escrow deposits, whatever their intended use is to be.

All of these costs must be disclosed to the extent that they are known to the lender on the day prior to closing. Also, the good faith estimates of other closing costs made when the loan application was completed by the borrower must be revised, if necessary, to reflect actual costs at that time. Both groups of costs must be entered on the uniform disclosure statement for inspection by the borrower.

Although the borrower has the right to advance disclosure, under RESPA [illegible] deemed to have *waived* the right of advance inspection unless a request [illegible] see the settlement statement on or before the business day prior to settlement. [illegible] been [illegible] the lender is under no obligation to prepare the advance [illegible]

Escrow Deposits

RESPA limits the amount that a creditor may require the borrower to pay as an initial deposit into the escrow account. The maximum that a lender may require from the borrower as an escrow deposit is one sixth of the annual amount to be paid on the borrower's behalf. For example, if the lender forwards premiums on the borrower's hazard insurance annually, then the maximum escrow deposit that the borrower can be required to make is one sixth (two monthly premiums) of the annual hazard insurance premium. Lenders are not allowed to earn or pay the borrower interest on the initial deposit or monthly payments made into the escrow account.

Settlement Costs Illustrated

To help the reader understand how settlement costs are allocated between buyer and seller, we present an example involving the acquisition of the property used in our base example. We demonstrate first how closing costs are determined for a *conventional loan*. The basic information for the closing transaction is shown in Exhibit 8–7. Essentially, these costs must be disclosed to the borrower on a settlement statement, shown in Exhibit 8–8.

As shown in Exhibit 8–8, closing costs are separated into four categories, the first three of which involve the buyer. These are the amounts to be paid to, or received from, the seller, lender, and third parties. The fourth category involves costs that must be paid by the seller to third parties. Most items have been previously explained; however, a few computational procedures deserve mention.

EXHIBIT 8–7
Information for RESPA Closing Statement

Buyer:	John and Jane J. Jones 482 Liberty Street Anytown, USA	
Seller:	Ralph and Pearl Brown 200 Heavenly Dr. Anytown, USA	
Lender:	ABC Savings and Loan Association Anytown, USA	
Settlement agent:	Land Title Company Anytown, USA	
Loan application date: March 1—conventional loan		
Advance disclosure date: March 3		
Borrower may request advance copy of actual settlement statement on March 24		
Actual settlement date (closing date): March 25		
I. Buyer and seller information:		
a. Purchase price		$76,700.00
b. Deposit		1,000.00
c. Real estate tax proration (taxes due January 1) $797 total. Taxes owed by seller: March 25–Dec. 31 or 282 days ÷ 365 * $797		615.76
II. Buyer-borrower and lender information:		
a. Amount of loan (9.25% interest, 30 years, conventional loan)		61,360.00
b. Prepaid interest March 25–31 (7 days) or (.0925 ÷ 365) times $61,360 times 7 =		108.85
c. Property tax (escrow) (2 months @ $66.42 per month)		132.84
d. Loan origination fee (1%)		614.00
e. Loan discount (1%)		614.00
f. Application fee		50.00
g. Appraisal		125.00
h. Credit report		45.00
i. Hazard insurance (escrow)		92.00
j. Pest inspection (Anytown Pest Co.)		20.00
k. Title insurance: Land Title Company		350.00
l. Land Title Company closing fee		75.00
III. Transaction between buyer-borrower and others:		
a. Recording fees		31.00
b. Hazard insurance (1 yr.)		552.00
c. Lender's title insurance—Land Title Company		100.00
IV. Transactions between seller and others:		
a. Release statement seller's mortgage		5.00
b. Payoff seller's mortgage (Anytown State Bank)		21,284.15
c. Real estate brokerage fee (6%) (Bobbie Broker)		4,602.00

EXHIBIT 8–8
Settlement Statement

I. Amount Due from Buyer:		**II. Amount Due to Seller:**	
(A) Purchase price	$76,700.00	Sale price	$76,700.00
Plus: Settlement Charges	2,909.69	Plus: County tax proration	615.76
County Tax Proration	615.76	Less: Payoff of existing loan	21,284.15
Less: Earnest Money	1,000.00	Settlement charges*	4,607.00
Mortgage Loan	61,360.00	Net amount due to seller	$51,424.61
Net amount due from buyer	$17,865.45		
Buyer's Share of Settlement Changes:		**Seller's Share of Settlement Charges:*	
Loan origination fee	$ 614.00	Broker commission	$ 4,602.00
Loan discount	614.00	Recording fee	5.00
Appraisal fee	125.00		
Credit report	45.00		
Mortgage insurance application fee	50.00		
Interest (7 days @ $15.55)	108.85		
Homeowners insurance	552.00		
2 months premium-escrow	92.00		
2 months property tax-escrow	132.84		
Title insurance (lender)	100.00		
Recording fee	31.00		
Closing fee	75.00		
Title insurance	350.00		
Pest inspection	20.00		
Total	$ 2,909.60	**Total**	$ 4,607.00

In section I of Exhibit 8–8, note that a property tax adjustment is made for the 83 days that the property has been owned by the seller since the last property tax payment was made. A refund for part of this tax is $615.76 payable to the seller at closing. An additional $132.84, representing two months of prepaid property taxes, will also be collected and escrowed by the lender. Prepaid interest for seven days will be collected by the lender, as monthly payments are scheduled to commence on May 1 (Section II). Interest included in the first, regular payment on May 1 spans the period of April 1–30; hence, interest for March 25–31 (inclusive) must be paid at closing. The reader should also note that two monthly installments for hazard insurance are to be prepaid by the buyer and escrowed by the lender. Finally, the lender is also requiring evidence of a binder and one full year's hazard insurance be prepaid at closing to the insurance carrier. The amounts shown in Exhibit 8–7 are summarized on the uniform settlement statement in Exhibit 8–8. As previously indicated, this statement must be used by lenders to disclose closing costs in most residential transactions.

Federal Truth-in-Lending (FTL) Requirements

In addition to disclosure requirements affecting settlement costs under RESPA, disclosure requirements under the federal Truth-in-Lending Act, which deals with the cost of mortgage credit, have been a requirement affecting lenders since 1968.[15] The intent of FTL legislation is to require that lenders disclose to borrowers financial information contained

[15] USC 1601; Stat. 146; Pub. L. 90-321 (May 29, 1968) as amended.

in loan agreements in a uniform manner. This is required so that borrowers can compare the cost of different loan agreements. It should be stressed that FTL legislation does not attempt to regulate the cost of mortgage credit, but it mandates uniform disclosure of the cost of credit. Truth-in-lending legislation generally requires that lenders disclose financial information contained in mortgage loan agreements to individuals purchasing one- to four-family residences. Commercial real estate transactions are generally excluded. The FTL disclosures must be made by lenders *three days after* application for a mortgage is made by the borrower. Recall that this time requirement is the same as the RESPA disclosure for closing costs. However, unlike the RESPA disclosure, which are estimates, the FTL disclosure, particularly the annual percentage rate (APR), must be accurate to one eighth of a percent. This means that the APR may be rounded (up or down) to the nearest one eighth of a percent. As a result, market interest rates and, hence, the APR may change from the time of application until the loan is closed. If this happens, the lender must make additional disclosures prior to the date of loan closing.

Truth-in-Lending Sample Disclosure

Exhibit 8–9 contains a description of disclosures that must be made under FTL regulations. Referring to Exhibit 8–9 will aid the reader in establishing what financing costs are included under each disclosure item.

Establishing the APR under Federal Truth-in-Lending Requirements

The APR is the most important required disclosure under FTL, because not only must it be disclosed to loan applicants, but it must also be used when the lender advertises specific loan programs. Accuracy of calculation is also important because in the case of fixed rate, constant payment mortgages, the stated APR may vary from the true APR by only one eighth of a percent. The calculation performed to determine the APR is essentially the same as the internal-rate-of-return calculation developed in previous chapters.

The information provided in Exhibit 8–10 makes determining the APR for a conventional mortgage fairly straightforward. The APR is found by taking the amount financed from the exhibit, shown as item (*f*), then setting this amount equal to the borrower's monthly payment, shown as item (*b*), and solving for the interest rate that makes the present value of the monthly payments equal to the amount financed. This is done as follows:

Calculator Solution:

$PV = -\$60{,}023$	$FV = 0$
$PMT = \$504.79$	solve for (i):
$n = 360$	$(i) = 9.50\%$

Determining the APR on the conventional insured mortgage is more difficult. This is because of multiple, uneven payments that occur as annual premiums for mortgage insurance change at the end of each year. Exhibit 8–11 illustrates the payment pattern on a conventional insured mortgage, where the annual mortgage insurance premium is based as a percentage of the outstanding loan balance each year. To find the APR, 30 groups of 12 monthly payments listed in the exhibit must be discounted until the present value equals the amount financed. The procedure for discounting grouped cash flows has been presented in an earlier chapter, and the student should refer again to that material. The APR on the mortgage used in the example and the payment pattern shown in Exhibit 8–11 is 10.19 percent (calculation not shown).

EXHIBIT 8–9 **FTL Disclosure Requirements (numerical disclosures, FRM)**

Disclosure Item	Description
Annual percentage rate	The effective cost of credit to the borrower on an annual basis as determined by an actuarial method prescribed in the act.
Finance charges	The sum of (1) all interest paid over the term of the loan including discount points, (2) loan application fees,* (3) *required* mortgage insurance or guarantee, credit life, or disability, and hazard insurance, (4) loan origination fees, (5) discount points, (6) escrow charges made for establishing an escrow account, (7) prepaid mortgage interest, (8) assumption fees, (9) fees for the preparation of an amortization schedule, when *paid for by the borrower.*
Amount financed	The mortgage amount less any of the finance charges described above that are paid at closing.
Total of payments	The borrower's total monthly payment over the loan term, including interest and principal reduction and fees for required mortgage insurance or credit life insurance, but typically excluding charges for property taxes and hazard insurance.
Amount of payments	The dollar amount of borrower monthly payments. When the monthly payment varies due to the cost of mortgage insurance, typically the highest and lowest payment amounts will be disclosed. When payment increases are known, as would be the case on a *GPM*, all payment amounts must be disclosed to the borrower.
Number of payments	For a constant payment, fixed rate mortgage, the term of the mortgage times 12. For a *GPM*, the number of times a borrower must make a payment must be disclosed.
Security interest	The lender must describe the nature of any interest that will be acquired in the borrower's property should the loan be granted. Typically, the lender must describe any assets which he places a lien against.
Assumption policy	The lender must inform the borrower whether the mortgage is assumable by a subsequent purchaser of the property and whether the loan terms might change at the time of assumption.
Variable rate	If the interest rate on the mortgage is not fixed, the lender must disclose this fact.
Filing fees	The lender must disclose any statutory fees for filing liens against loan assets.
Late charge	The lender must disclose the existence and amount of any late payment fees.
Payment due date	The date after which the lender will charge late fees.
Prepayment policy	Whether or not a penalty will have to be paid should the borrower repay the loan before the term has expired. The amount of any penalty need not be disclosed.
Hazard insurance	The lender must disclose whether insurance is required.
Mortgage insurance	Premium amount of any such insurance if the lender either requires or offers it for sale to borrowers.

*When an application fee is charged to all applicants, rather than just to applicants who receive loan approval, this fee need not be included in the finance charge.
†Credit life or disability insurance need not be disclosed with the finance charge unless it is required by the lender. Hazard insurance is included in the finance [illegible] when the lender requires that a specific insurer be used.

ARMs and Truth-in-Lending Disclosure

In addition to the required disclosure for a FRM outlined in Exhibit 8–9, slightly more disclosure is required when a borrower applies for an ARM. Additional items that must be disclosed are listed in Exhibit 8–12. The intent of the additional disclosure on ARMs is to illustrate to the borrower the effect of one increase in the composite rate (the index plus the margin) on monthly payments and the loan balance. However, determining the APR as

EXHIBIT 8–10
Federal Truth-in-Lending Disclosure Requirements (*FRM* transactions)

	Conventional	Conventional Insured
(*a*) Prepaid finance charges		
Loan origination fee	$ 614	$ 729
Discount fee	614	729
Prepaid interest	109	133
Prepaid mortgage insurance	-0-	583
Prepaid finance charge	$ 1,337	$ 2,174
(*b*) Payment amount		
Constant	$ 504.79	N/A
Highest		$ 633.94
Lowest		$ 612.69
(*c*) Number of payments	360	360
(*d*) Total of payments (*c* times *b*)	$181,724	$223,919
(*e*) Total finance charge*	121,701	153,228
(*f*) Amount financed		
(1) *First method:*		
Original loan balance	61,360	72,865
Less:		
Prepaid finance charge	(1,337)	(2,174)
Amount financed	$ 60,023	$ 70,691
(2) *Second method:*		
Total payments	$181,724	$223,919
Less:		
Total finance charge	$121,701	153,228
Amount financed	$ 60,023	$ 70,691
(*g*) APR	9.5%	10.19%

*This amount includes all interest and mortgage premiums, as well as all prepaid finance charges.
†Based on amount financed.

more difficult on an ARM. The difficulty arises because, as discussed in the previous chapter, future interest rates on ARMs are *unknown*.

Because the future pattern of interest rates is unknown, the method required when determining the APR on an ARM requires that the margin plus index *at the time of origination* be used as the assumed interest rate over the remaining term of the loan. An example should help clarify this point. We make the following assumptions:

Conventional ARM.
$60,000 loan amount.
2 percent annual interest rate cap.
5 percent over the life of the mortgage cap.
5 percent initial rate.
7 percent index at origination.
2 percent margin.
30-year term.
$1,200 prepaid finance charge.
$59,498.76 balance at the end of year 1.
Negative amortization is allowed.

EXHIBIT 8–11
Mortgage Insurance Premiums (conventional mortgage)

Year	Mortgage Balance Beginning of Year	Annual Mortgage Insurance Premium	Monthly Mortgage Insurance Payment	Borrower Monthly Mortgage Payment	Current Mortgage Balance as a Percentage of the Original Mortgage Balance
Closing	$72,865.19	$582.92	$21.25	$633.94	100.00%
1	72,865.19	255.03	21.12	633.81	100.00
2	72,415.87	253.46	20.98	633.67	99.38
3	71,921.96	251.73	20.82	633.51	98.71
4	71,379.03	249.83	20.64	633.33	97.96
5	70,782.22	247.74	20.45	633.14	97.14
6	70,126.17	245.44	20.24	632.93	96.24
7	69,405.01	242.92	20.01	632.70	95.25
8	68,612.28	240.14	19.76	632.45	94.16
9	67,740.87	237.09	19.48	632.17	92.97
10	66,782.98	233.74	19.17	631.86	91.65
11	65,730.02	230.06	18.83	631.52	90.21
12	64,572.55	226.00	18.46	631.15	88.62
13	63,300.21	221.55	18.05	630.74	86.87
14	61,901.59	216.66	17.61	630.30	84.95
15	60,364.17	211.27	17.11	629.80	82.84
16	58,674.15	205.36	0.00	612.69	80.52
17	56,816.41	0.00	0.00	612.69	77.97
18	54,774.29	0.00	0.00	612.69	75.17
19	52,529.50	0.00	0.00	612.69	72.09
20	50,061.91	0.00	0.00	612.69	68.70
21	47,349.43	0.00	0.00	612.69	64.98
22	44,367.73	0.00	0.00	612.69	60.89
23	41,090.11	0.00	0.00	612.69	56.39
24	37,487.19	0.00	0.00	612.69	51.45
25	33,526.70	0.00	0.00	612.69	46.01
26	29,173.13	0.00	0.00	612.69	40.04
27	24,387.48	0.00	0.00	612.69	33.47
28	19,126.87	0.00	0.00	612.69	26.25
29	13,344.15	0.00	0.00	612.69	18.31
30	6,987.52	0.00	0.00	612.69	9.59
31	0.00	0.00	0.00	-0-	0.00

EXHIBIT 8–12
Federal Truth-in-Lending Additional Required Disclosures for ARMs

- Index.
- Margin.
- Composite rate at the time of origination.
- Adjustment period.
- Payment caps at each adjustment period (if any).
- Payment caps over the term of the loan (if any).
- Interest rate caps over the life of the loan (if any).
- Interest rate caps at each adjustment period (if any).
- Whether composite rate increases will affect payment amounts, the loan balance, or both
- An example of the effect that an increase in the composite rate would have on payment amounts or the loan balance or both (depending upon payment and rate caps, as well as any limits on negative amortization the loan may feature).

The following illustrates the calculation of an APR on the ARM loan described above:

(A) Payment year 1:

Calculator Solutions:

$PV = -\$60{,}000$	$i = 8\%$
$n = 360$	Solve for payment (PMT):
$FV = 0$	$PMT = \$440.28$

(B) Payments year 2 through 30:

$PV = -\$59{,}498.76$ (balance)	$i = 8\%$
$n = 348$	Solve for new payment (PMT):
$FV = 0$	$PMT = \$482.06$

Solving for the APR:

Calculator Solution:

PV = −$58,800 (60,000 less points)

$CF_j = \$440.28$

$n_j = 12$

$CF_j = \$482.06$

$n_j = 348$

FV = 0

Solve for interest rate (i):

i = 9.12%

Using tables:

$58,800 = $440.28 (*MPVIFA*, ?%, 12 mos.) +
$482.06 (*MPVIFA*, ?%, 348 mos.) (*MPVIFA*, ?%, 12 mos.)

i = 9.12%

Recall that disclosure of the APR on a fixed rate mortgage must be accurate to one eighth of a percent; however, on an ARM, the APR may vary as much as one fourth of a percent from the actual APR.

It should be stressed that this method of computing the APR on an ARM will almost certainly *not* reflect the true cost of funds to the borrower. Clearly, a decrease or increase in the index over the loan term would cause the stated APR to be incorrect. Moreover, the lender is not required to redisclose the APR at closing. As a result, the borrower should be aware that using the APR for an ARM for comparison with FRMs or ARMs with substantially different terms is not advisable. Indeed, the usefulness of an APR for an ARM is quite limited since it assumes that the composite rate (9 percent) in existence at the time that the loan is originated will be the same at the end of the first adjustment interval and for every succeeding period for the term of the loan.

Key Terms

Certificate of Reasonable Value (CRV), *217*
conventional mortgage loans, *214*
default insurance, *213*
Department of Veterans Affairs (VA), *217*
Federal Housing Administration (FHA), *216*
FHA insured mortgages, *216*
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loan-to-value ratio, *214*
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Useful Web Sites

www.hud.gov—U.S. Department of Housing and Urban Development. Includes the Federal Housing Administration (FHA), which is now part of HUD. See www.hud.gov/offices/hsg/hsgabout.cfm for discussion of FHA.

www.fha-home-loans.com/—Excellent site for information about FHA loans, including the current requirements to qualify.

www.mortgage professor.com—Excellent site for questions and answers on many aspects of mortgage lending.

www.freddiemac.com—Federal Home Loan Mortgage Corporation

www.va.gov—Veteran's Administration—see http://www.homeloans.va.gov/ for information on VA Guaranteed loans.

www.fanniemae.com—Federal National Mortgage Association.

www.riskgrades.com—RiskGrade™ Measure is an open and transparent benchmark to measure the risk of the world's financial assets.

Questions

1. What is the legislative intent of federal truth-in-lending disclosures, and what specific disclosures are required under the act?
2. When would the cost of credit life insurance be included in the finance charge and APR calculations for federal truth-in-lending disclosures?
3. What assumption about the future composite rate of interest on an adjustable rate mortgage is made when determining the APR for federal truth-in-lending disclosures?
4. List the closing cost items which require RESPA disclosure. What items may be excluded from disclosures under the act? What form can these disclosures take?
5. What types of fees and conditions are prohibited under RESPA?
6. For what items may a lender require escrow accounts from a borrower?

Problems

1. A loan with the following terms is being made:

   Fixed rate, constant payment.

   9% interest rate.

   $70,000 desired mortgage amount.

   $1,500 loan discount points paid by the buyer/borrower to the lender.

   25-year term, monthly payments.

   a. Calculate the APR for federal truth-in-lending purposes.

   b. Do you think that the APR calculated in (*a*) reflects the likely return that the lender will receive over the term of the loan? List specific reasons that the lender's actual return might be different than the APR.

2. You are a new loan officer with Alpha Mortgage, and the manager of the loan department has just presented a problem to you. He is unable to complete the APR calculation on an adjustable rate mortgage which a borrower applied for yesterday. The loan features initial payments based on a 10 percent rate of interest, while the current composite rate on the loan is [illegible] percent. No discount points have been paid by any party to the transaction, and any difference between borrower payments and the interest payment required at the composite rate will be accrued to the mortgage balance in the form of negative amortization. The mortgage amount desired by the borrower is $65,000 for a 30-year term, but a one-time mortgage insurance premium of $2,400 is being funded as a part of the loan amount, making the total loan balance $67,400. The borrower is paying $1,600 in prepaid finance charges at closing.

   a. Determine the APR, assuming that the ARM is made with a 2 percent annual and 5 percent over-the-life interest rate cap.

   b. In what way does the APR disclosure aid the borrower in understanding the terms of this specific loan agreement? What are some of the problems with the APR calculations on ARMs?

3. On August 20, Mr. and Mrs. Cleaver decided to buy a property from Mr. and Mrs. Ward for $105,000. On August 30, Mr. and Mrs. Cleaver obtained a loan commitment from OKAY National Bank for an $84,000 conventional loan at 10 percent for 30 years. The lender informs Mr. and Mrs. Cleaver that a $2,100 loan origination fee will be required to obtain the loan. The loan closing is to take place September 22. In addition, escrow accounts will be required for all prorated and prepaid property taxes and hazard insurance; however, no mortgage insurance is necessary. The buyer will also pay a full year's premium for hazard insurance to Rock of Gibraltar Insurance Company. A breakdown of expected settlement costs, provided by OKAY National Bank when Mr. and Mrs. Cleaver inspect the uniform settlement statement as required under RESPA on September 21, is as follows:

I. Transactions between buyer-borrower and third parties:	
a. Recording fees—mortgage	$ 30.00
b. Real estate transfer tax	225.00
c. Recording fees/document prep.	200.00
d. Hazard insurance—one-year policy—Rock of Gibraltar Ins. Co.	420.00
e. Peggy Prudent—attorney	150.00
f. Pest inspection	50.00
g. Title insurance fee (Landco Title Co.)	400.00
h. Landco Title Co.—closing fee	125.00
II. Transactions between seller and third parties:	
a. Release statement—seller's mortgage	5.00
b. Payoff—seller's mortgage (Home State Bank)	32,715.00
c. Real estate brokerage fee (6% Fast Deal Realty)	6,300.00
III. Buyer-borrower and lender information:	
a. Amount of loan	$ 84,000.00
b. Prepaid interest is owed from closing through September 31 which equals 9 days. Regular payments to begin on November 1. [.10 * 84,000) ÷ 365] · 9	207.12
c. Property tax escrow—2 months required	133.33
d. Hazard insurance escrow—2 months @ $35 required	70.00
e. Loan origination fee	2,100.00
IV. Buyer and seller information:	
a. Purchase price	$105,000.00
b. Deposit paid by Cleaver to Ward (paid in escrow to OKAY National Bank)	1,500.00
c. Real estate tax proration (taxes paid to county January 1. $800 per year) ((January 1–September 22 paid by seller) 264 days or (264/365 * $800)	$ 578.63

Required:

a. What are the amounts due from the borrower and due to the seller at closing?

b. What would be the disclosed annual percentage rate as required under the Truth-in-Lending Act?

Chapter 9

Introduction to Income-Producing Properties: Leases, Rents, and the Market for Space

In this chapter our focus is on income-producing properties. We begin by identifying the major property types and the economic forces that affect their value. We will consider supply and demand relationships, location analysis, and the competitive nature of the real estate business. We will then turn to a discussion of the importance of leases in defining the contractual relationship between the owner of the property and the tenant using the space. Leases impact the income potential and riskiness of income property investments.

Property Types

We begin with Exhibit 9–1, which outlines major classifications used to identify and group different types of real estate. The two major categories used to classify property are residential and nonresidential. Residential properties include *single family houses* and *multifamily properties* such as apartments. Condominiums and co-ops are also included as residential properties.

In general, residential properties are properties that provide residences for individuals or families. Although hotels and motels can also be thought of as providing residences for people, they are considered to be transient or temporary residences and thus are not categorized as residential property. In the discussion that follows, we use the same categories, which are logical from an economic perspective because factors that affect the supply and demand for hotels and motels are quite different from those that affect residential properties used as a residence.

EXHIBIT 9–1
Classification of Real Estate Uses

I. Residential

Single family
- Detached
- Cluster developments
- Zero lot line developments

II. Income Producing

A. *Multifamily*
- High rise
- Low rise
- Garden apartments

B. *Commercial*

1. Office
   - Major multitenant—CBD
   - Single or multitenant—suburban
   - Single-tenant—build to suit
   - Combination office/showroom
   - Professional: Medical, specialized use
2. *Retail*
   - Regional shopping centers/malls
   - Neighborhood centers
   - Community centers
   - Strip centers
   - Specialty centers
   - Discount centers
3. *Hotel/motel*
   - Business/convention
   - Full service
   - Tourist/resort:
     - Limited service
     - Extended stay
     - All suites

C. *Industrial/Warehouse*
- Heavy industrial
- Light industrial warehouse
- Office/warehouse
- Warehouse:
  - Distribution
  - Research and development (R&D)
  - Flex space

D. *Recreational*
- Country clubs
- Marinas/resorts
- Sports complexes

E. *Institutional (special purpose)*
- Hospital/convalescent
- Universities
- Government
- Other

III. Mixed Use Developments

Combinations of the above uses

Single family dwellings are usually thought of as individual, detached units developed in subdivision tracts. Other variants include cluster home developments, where owners share "green space" in outdoor areas, and "zero lot line" developments, which contain single family and detached units.

The second major category of residential housing is income producing and referred to as multifamily housing. It is usually differentiated by location (urban or suburban) and size of structure (high rise, low rise, or garden apartments). High-rise apartments are usually found near the central business district (CBD) of cities because land costs are greater than in suburban areas.

Nonresidential properties are typically broken down into five major subcategories: commercial, industrial, hotel/motel, recreational, and institutional. **Commercial real estate** includes both office buildings and retail space. As is the case for many of the categories, the same *building* can contain both office and retail space. In fact, the same building could contain residential as well as nonresidential uses of space. A combination of end uses in one property is usually referred to as a *mixed use development*. Thus, the categories being

discussed should be viewed more as a convenient way of categorizing the use of space for the purpose of analyzing supply and demand, and thus investment potential for that space.

Office buildings range from major multitenant buildings found in the central business districts of most large cities to single tenant buildings, often built with the needs of a specific tenant or tenants in mind. An example of the latter would be a medical office building near a hospital.

Retail properties vary from large regional shopping centers containing over a million square feet of space to small stores occupied by individual tenants found in almost every town. As indicated earlier, it is also common to find retail space combined with office space, particularly on the first floor of office buildings in major cities.

Hotels and motels vary considerably in size and facilities available. Motels and smaller hotels are used primarily as a place for business travelers and families to spend a night. These properties may have limited amenities and will often be located very close to a major highway. Hotels designed for tourists who plan to stay longer will usually provide dining facilities, a swimming pool, and other amenities. They will also typically be located near other attractions that tourists visit. Hotels at "destination resorts" provide the greatest amount of amenities. These resorts are away from major cities, where the guests usually stay for several days or even several weeks. Facilities at these resort hotels can be quite luxurious, with several dining rooms, swimming pools, nearby golf courses, and so forth. Hotels that cater to convention business may be either a popular destination resort or located near the center of a major city. People who go to conventions usually want a variety of choices for dining and want to be able to "combine business with pleasure."

Industrial and warehouse properties include property used for light or heavy manufacturing as well as associated warehouse space. This category includes special-purpose buildings designed specifically for industrial use that would be difficult to convert to another use, buildings used by wholesale distributors, and combinations of warehouse/showroom and office facilities. Older buildings that were initially used as office space often "filter down" to become warehouse or light industrial space.

Recreational real estate includes uses such as country clubs, marinas, sports complexes, and so on. These are very specialized uses, usually associated with retail space that complements the recreational activity (e.g., golf shops). Dining facilities and possibly hotel facilities may also be present.

Institutional real estate is a general category for property that is used by a special institution such as a government agency, a hospital, or a university. The physical structure could be similar to other properties; government office space, for example, would be similar to other offices, and could in fact be in the same building. However, space used by institutions such as universities and hospitals is usually designed for a specific purpose and not easily adaptable for other uses.

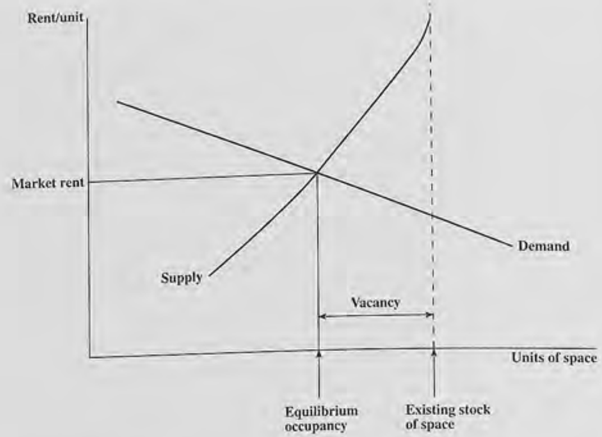
Supply and Demand Analysis

In an earlier chapter, we discussed the importance of economic base analysis in assessing potential real estate investment. Market rents for properties depend on the economic base, as well as on the supply and demand for space by tenants. In this section, we look more closely at market forces that affect both the supply and demand for space and how these factors affect real estate investments.

Equilibrium Market Rental Rate

At any point in time, a fixed stock of space exists in the market in previously constructed buildings. Some of this space will be leased. The remaining space constitutes vacancies, or supply of space available for lease. The price at which an owner can lease the space depends

EXHIBIT 9–2
Rental Market Equilibrium



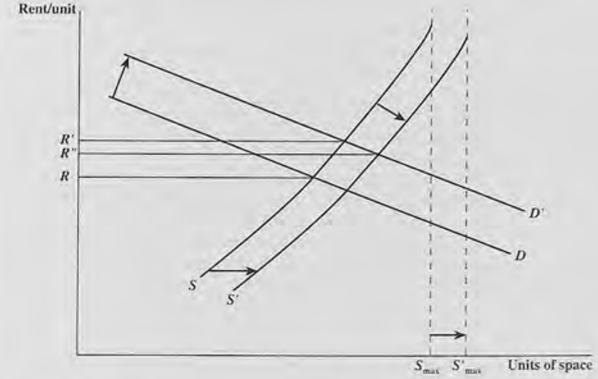
on the market rental rate on comparable properties. The amount of existing space that building owners are willing to lease at different rental rates is expressed by a supply curve as illustrated in Exhibit 9–2. As the market rental rate rises, more space is supplied by building owners. The maximum amount of space that can be leased at any given point in time is limited, however, to the existing stock of space.

At lower market rental rates, some of the existing space may not be made available for lease. This space may be deliberately held vacant by owners in anticipation of higher market rents in the future. Alternatively, they may prefer to convert the space to a different use rather than rent it under the existing use at the current market rate for that use. A certain amount of space will also always be vacant because of tenants moving and the time it takes for newly constructed space to be offered for lease. This stock of space will change over time due to construction of new buildings and demolition of existing buildings.

Exhibit 9–2 also shows the *demand* for space from users. As the rental rate falls, firms are more willing to use additional space in their operations rather than other factor inputs such as labor and capital. As shown in the exhibit, the intersection of the supply and demand curves determines the equilibrium market rental rate as well as the amount of space that is leased. The total space that is leased at a given point in time includes space that was leased in previous periods. The difference between the existing stock of space and the total amount leased at the market rate represents vacant space. This is a normal, or equilibrium, market vacancy rate.

The supply curve illustrated in Exhibit 9–2 depicts a short-run equilibrium for a period of time during which the total supply of existing space is fixed and does not increase due to new construction or decrease due to demolition. That is, the supply of space includes existing space that was constructed in the past based on an analysis of the rental market at that point in time. Changes in the market for space after an additional building is constructed can result in a change in the market rental rate. For example, suppose the demand for office space increases because new firms are locating in the area and office employment is increasing. This is indicated by a shift in the demand curve from D to D' in Exhibit 9–3. Based on the supply curve for existing space offered for lease, the market rent would rise

EXHIBIT 9–3
Increase in Demand and Supply



from R to R'. The increase in demand is likely to result in an increase in the construction of new space, however, because the profitability of developing new space increases at the higher market rents and lower market vacancy rate. The amount of new space that is actually developed depends on the profitability of developing new space as well as the supply of land for development. As new space is developed and the stock of space increases, the maximum amount of space that can be offered for lease increases from S_{max} to S'_{max} and shifts the entire supply curve from S to S' as shown in Exhibit 9–3. Based on the new supply curve (after new space is constructed) equilibrium rents decrease from R' to R''. In other words, the rental rate does not rise as much as it would have in the absence of new construction. Depending on the quantity of space added by the new construction, it is possible that rental rates could fall below the level they were at before demand increased if more space is developed than was needed to meet the increase in demand.

This analysis considered an increase in the demand for space, which was followed by an increase in the supply of space. A *decrease* in the demand for space causes an opposite movement in the demand curve and a reduction in the equilibrium market rental rate. This results in an increase in the vacancy rate. Because the stock of space already exists, the higher vacancy rate may persist until the demand for space increases. Some decrease in the existing stock may occur due to depreciation and demolition of older buildings, but this occurs over a long period of time.

Implications for Risk

In general, market rent depends on changes in the demand for space as well as expected changes in the supply of space as we discussed. Expected and unexpected changes in market rental rates over the entire economic life of a property affect the return and risk associated with investing in that property. Changes in the demand for space can result from a number of factors that affect the economic base of the area where the property is located. Changes in the supply of space can result from developers reacting to anticipated increases in the demand for space or a belief that they can attract a sufficient number of tenants from existing buildings to make their building profitable. The investor must evaluate how changes in the market rental rate due to changes in supply and demand can affect the income potential of a possible investment as well as the volatility in income. Even if the investment is an existing building that has already been leased, the income can be affected when the existing leases expire and are renewed at the market rent at that time. As we will see later in this chapter, *leases* can be structured to shift some of the risk from the owner/lessor to the user/lessee.

Local Market Studies of Supply and Demand

While it is useful to think of supply and demand relationships in the abstract, when real estate investments are made, a market analysis must usually be undertaken to determine the level of vacancies, rents, the amount of new construction under way, and when the property will be ready for occupancy. This is important because, as we will see later in this chapter, a forecast of rents, vacancies, and expenses must be made when a property is under consideration for investment. Exhibit 9–4 contains a summary of many of the variables that must be considered when undertaking a market study. All of these relationships are generally dependent on, or derived from, the types of employment generated by the economic base of the area and the levels of supporting employment discussed in the previous section. However, in order to consider the demand for space by type of property, more detail is necessary. When considering investments in apartment and retail properties, in addition to forecasting the number of new employees, investors need information on the quality of job creation indicated by the salaries and wages that will be earned by individuals in the area, as well as their ages, sizes of households, and other related information. This information will provide a

EXHIBIT 9–4
Determinants of Supply and Demand—Major Property Types

Demand Influences:

Apartments:
Number of households, age of persons in households, size of household incomes, interest rates, home ownership, affordability, apartment rents, housing prices.

Office Space:
Categories of employment with very high proportions of office use include service and professional employment including attorneys, accountants, engineers, insurance, real estate brokerages and related activity, banking, financial services, consultants, medical–dental, pharmaceutical, etc.

Warehouse Space:
Categories of employment with high concentrations in warehouse use: wholesaling, trucking, distribution, assembly, manufacturing, sales/service, etc.

Retail Space:
Demand indications include household incomes, age, gender, population, size and tastes/preferences.

Supply Influences:
Vacancy rates, interest rates and financing availability, age and combination of existing supply stock, construction costs, land costs

Property Type		*Typical Construction Periods*
Apartments	Suburban garden walkup	6–18 months
	Urban mid, high-rise	18–24 months
Office Buildings	Suburban low-rise	18–24 months
	CBD mid, high-rise	24–48 months
Retail	Strip/stand-alone	6–12 months
	Neighborhood/community	12–24 months
	Enclosed malls	36–48 months
Warehouse	Suburban, single level	9–12+ months

better understanding regarding the *type* of apartments and retail merchandise desired, which will, in turn, indicate which submarkets are likely to benefit from economic growth.

Similarly, when considering investments in warehouses and office properties, a deeper understanding of the nature and kinds of employment produced by growth in the economic base will help in investment analysis. For example, when one considers employment growth in New York City, it is likely that much of the employment will be occurring in offices. On the other hand, if considering Detroit, a higher percentage of employment growth is likely to occur in industrial and warehouse properties. Exhibit 9–4 provides the reader with some idea of the variables that influence the demand for various property types.

For the supply side of each market, developers of each property type also carefully consider each of the same variables in Exhibit 9–4. However, they must also weigh the costs of financing and the economic benefits of acquiring land and undertaking development in other locations. The exhibit provides some idea as to the time required to develop various property types. Based on this information, it should be fairly clear that the supply of space available in any market tends to be fixed in the short run and unlike many other goods and services, requires lead time to adjust to increases in demand. Furthermore, trying to establish the quantity of space that can be produced effectively relative to the size of a submarket is also important when completing an investment study.

Location and User-Tenants

After briefly examining a method for identifying the economic drivers affecting cities and regions, we now turn to a conceptual framework for determining how locations *within* a city are evaluated by businesses. It goes without saying that location is an important attribute in real estate. Successful real estate investors and developers must also realize that location as viewed by *user-tenants* is also important to recognize. We mean that successful real estate investors and developers should understand the *business operations* of potential *tenant-users and how certain locations will appeal to those users.* Recall that many users of real estate are business firms that operate to make a profit. Consequently, most real estate decisions made by these users are considered in terms of how leasing space in alternative locations will generate more profit by (1) increasing sales revenue or (2) reducing the cost of operations, or (3) some combination of both. A very basic illustration of the relationship between user profits and locations is shown in Exhibit 9–5.

As Exhibit 9–5 shows, if we evaluate three locations in Big City, it is clear that User A will realize more profit in location (1) because revenues are greater and its operating expenses are invariant to location. User A can afford to pay more rent per square foot in location (1) and potentially earn a greater profit than it would in locations (2) and (3). User B, on the other hand, will be best off in location (3) because its *revenues* are invariant to location, and its expenses will be lowest in that location. Location (2) appears to be suboptimal for both Users A and B and may also be appealing to businesses that are different from Users A and B.

Because profitability will vary by location, the above analysis also implies that User A and other users either who are in competition with User A or who operate businesses in which location significantly affects *sales revenue* (examples could be retailers, restaurants, or certain service providers) will tend to cluster near location (1) as they anticipate earning higher profits there. These firms will compete with one another by bidding for space in that location. The location will take on the characteristics of a *submarket* containing these tenant-users selling goods and services to consumers who are sensitive to the location.

On the other hand, User B, whose *expenses* are very sensitive to location, will choose location (3) because it will tend to lower costs and thus produce higher profits. Competitors of User B and firms that are not necessarily in the same business as User B but that have *similar operating cost structures* will compete for space in and around location (3). Examples

EXHIBIT 9–5
Relationship between User Revenue, Expenses, and Profits per Square Foot by Location

	Locations in Big City, USA		
	(1)	(2)	(3)
User A:			
Revenue	$120	$100	$ 90
Less: Expenses	80	80	80
Profit	$ 40	$ 20	$ 10
User B:			
Revenue	$100	$100	$100
Less: Expenses	90	80	70
Profit	$ 10	$ 20	$ 30

of user-tenants in this location might include wholesale distributors occupying large warehouses. Such distributors may charge the same price for products to all customers in a region; however, their delivery expenses will vary by location. Therefore, they will tend to choose a location in an area that will minimize delivery expenses.

This process of profit analysis and competition by many different firms for space in locations that tend to maximize profits produces certain general land-use results in real estate markets:

1. The process of firms competing for space will result in the highest rents possible for the most profitable locations and, ultimately, the highest land value and best development for a site (e.g., office, retail, warehouse, apartment, or hotel).
2. Locations will tend to be dominated by clusters of users with revenue or operating expense structures that relate in similar ways to a given location.
3. Locations with the greatest appeal to users will tend to produce higher rents and also to exhibit highest spatial *densities*. Developers will attempt to build multistory projects or cluster buildings on very desirable sites so that they may earn the highest rents per square foot. This process will tend to attract tenants whose operations can be conducted in relatively small amounts of space or in multistory structures while still enabling them to earn higher revenues and profits.
4. Some locations are competed for by firms that are most cost-sensitive. These firms tend to require large amounts of land and large facilities on which to conduct larger scales of operations at lower rents per square foot.

When viewing location in this way, we can begin to understand how and why land-use patterns and submarkets develop within urban areas. It should also help us understand why retail and high-rise office developments occur in some areas while warehouses requiring large quantities of land on single levels occur in others. Of course, these patterns of land use are also affected by zoning and historic land-use patterns in urban markets. However, even the latter influences are subject to periodic changes.

In summary, a key concept to understand is that for most business users, real estate is considered to be an *operating input* that is used with labor to produce output. In other words, business firms in their operations combine labor and materials *with* real estate at a location to produce goods and services. For example, law, accounting, and advertising firms produce services for clients, and employees and real estate are major *inputs* in the *production* of their client services that are sold from a specific location. Retailers may combine large quantities of merchandise and salespersons on land and in buildings to produce a merchandise/service mix that appeals to customers. Further, the distribution of their goods and merchandise may require a large quantity of land and warehouse buildings with relatively few employees to break down, re-sort, and deliver merchandise to customers. The point of these examples is that because business users view real estate as an input that affects operating expenses and/or revenues, the relationships between land and building space requirements, rent, the number of employees, and revenues should be viewed in the context of various locations. These resources tend to be combined by businesses so that they maximize profit. Land-use patterns follow this pattern of business location decision making.

The Business of Real Estate

Contrary to popular belief, the vast majority of real estate used by business firms is *leased* and not owned. This is true in spite of the vast number of buildings with signs that carry a name of a major corporation on the exterior.[1] Why is this the case? There are many important reasons:

1. Most tenants find *leasing to be more cost-effective than owning*. This is particularly true when their space requirements are less than the quantity of space they would have to purchase in order to satisfy their needs in a desired location. For example, assume that a user needs 20,000 square feet of space to operate profitably, and it must have such space in a specific location. However, only buildings with a minimum size of 100,000 square feet are available for purchase in that location. In this case, the user will usually opt to *lease* the 20,000 square feet of space as opposed to purchasing a 100,000-square-foot building. Leasing will usually be preferred because purchasing would include the responsibility for leasing the remaining 80,000 square feet of excess space to other users. Purchasing would generally not be optimal because:
   a. Owning would require a large commitment of capital to purchase the 100,000-square-foot facility. Such capital could be used in other business activities.
   b. A purchase would "put the user in the real estate business." That is, the user would have to take the risk of owning and also have the real estate business "know how" to lease, collect rents, maintain, and insure the additional 80,000 square feet of space that it does not use.
2. Even if a tenant could occupy the entire 100,000 square feet in a building, it might still choose to lease because:
   a. Owning would *reduce* operating flexibility. For example, if the firm would decide to leave a metropolitan area and/or consolidate or expand in a different location in the same metro area, it might have to sell the entire property. This could take a considerable amount of time and tie up personnel and capital. If it had leased the property, it could move upon the lease expiration date or even negotiate a release from the owner/lessor.
   b. If it owns the property, the firm must operate, maintain, and repair the facility. These activities may result in the loss of focus on its core business activities. For example, a technology consulting firm may be better off focusing all of its effort on consulting with clients and not have the worry of owning, operating, leasing, and managing the building that it occupies. Operating and managing properties is usually done more cost-effectively by firms that specialize in real estate operations.

[1] These signs usually identify major corporate tenants in a building, who are granted the right to erect a sign by the property owner in its lease agreement.

c. If the firm decided to *size down* from using 100,000 square feet, as the owner of the building it would have to engage a broker to find an additional user or buyer for the excess space. Furthermore, it might have to renovate the space to suit the requirements of the new tenant. Again, this would mean undertaking unrelated real estate business activities.

In summary, the primary point is that history is replete with evidence of corporations that ventured away from their core businesses and engaged in real estate investment and development. Results have been mixed at best. The real estate industry includes economic functions that are *specialized in nature* and are separate and distinct from the operations of the many different business activities conducted by tenant-users. These noncore real estate business activities include the risks of (1) selecting the "right tract" of land and developing the "right amount" of space; (2) leasing that space to many different tenants; (3) hiring personnel, collecting rents, and maintaining the facility; (4) finding financing for the investment or development; (5) doing continuous research about real estate markets in order to decide when to sell, raise or lower rents, renovate, and so on. These are a few examples of many of the functions requiring special skills that can be performed most cost-effectively by real estate firms that specialize in these activities. Business firm–users are best left to focus on their primary activities (e.g., lawyers, accountants, and advertising companies serving clients, and retailers serving their customers). These users will generally not be as effective in real estate development, investment, leasing, and so on, as those firms that specialize in these activities.

One general exception to the above observations may occur if a single tenant-user requires its own facilities for its corporate headquarters or must have unique features such as high-tech labs, specialized computer installations, security, or other features that are unique. In these very special cases, ownership may be preferred to leasing. It has been estimated that over 80 percent of all office buildings and retail properties is *leased* to tenants. This number is slightly lower for industrial/warehouse properties, of which 37 percent is estimated to be occupied by owners and 63 percent is leased to user-tenants. In summary, the reader should be aware that the real estate business is an activity that involves many firms that specialize in providing services to users. It is generally more cost-effective for users to lease their space requirements rather than attempting to provide them themselves.

The "Market" for Income-Producing Real Estate

Given the preceding discussion about (1) the general relationships between users seeking a location to maximize profits, (2) the general desirability of users to lease rather than own the space they need in their operations, and (3) the real estate business/industry performing the functions and risks associated with developing, owning, leasing, and maintaining land and buildings more cost-effectively than tenant-users, it is clear that an enormous market for real estate services has emerged.

When we approach the subject of making real estate investments, we must understand how this competitive market operates and the nature of the negotiations between owners of real estate and tenant-users. It is also important to understand how owner-investors in real estate must differentiate between expenses associated with operating buildings and expenses that are related to the business operations of a tenant. Property expenses are usually allocated by owners to users, and property owners do not pay expenses associated with the operations of tenants.

It can be best summarized to say that in this market for real estate services, tenants are searching for locations that provide the highest profit (through either greater revenues or lower costs), and real estate investor-owners stand ready to take the risks of developing

and/or leasing and operating real estate for tenant-users. Real estate owners engage in providing these services in exchange for rent. However, as will be seen below, the term *rent* is a very general term and, though important, is not adequate to explain how expenses are allocated between owners and renters. In order to estimate total occupancy costs for tenants and profits for owners, there are many other areas of negotiation between real estate owners and business-users of real estate or tenants in addition to rent. These may include additional rights and responsibilities of both parties that are usually contained in *leases*. Lease contents are important because they affect how much income may be produced from an investment property, the legal responsibilities, and any future options negotiated between owners and tenants that may ultimately affect the value of an investment.

Income Potential—Real Estate Assets

In this section we consider four major property types, that is, apartment, office, and retail buildings and industrial/warehouses. Our goal is to familiarize the reader with the operating and lease characteristics for each and how forecasts of cash flow may be developed.

The term **market rent** refers to the price that must be paid by a potential tenant to use a particular type of space under then current market conditions. The rent depends on many factors, including (1) the outlook for the national economy, (2) the economic base of the area in which the property is located, (3) the demand for the type of space provided by the property in the location being analyzed, and (4) the supply of similar competitive space.

For example, the market rent on office buildings depends on the number of firms doing business in the area as well as the likelihood of new firms locating in the area, the number of employees these firms currently employ and are expected to employ in the near future, and the amount of space that the firm needs for its employees to do their job. These factors can be very difficult to estimate as they depend upon many uncertain and complex factors. The number of employees and amount of space per employee that is needed by a particular type of firm may be quite different in the future than it was in the past, due to changes in the way the firm does business, especially with advances in technology.

Similarly, the market rent on apartments depends on the demographic makeup of the population and median income of families in the area in which the property is located, the cost and availability of homes or condominiums to purchase as an alternative to renting an apartment, and other factors. Market rents for retail space also depend on the demographic makeup of the population and the median income of families as well as the percentage of income they typically spend on various goods and services from retail establishments in a particular area. Real estate investors must also be very concerned with the creditworthiness of tenants. As a part of the leasing process, credit reports, bank references, and references from suppliers and customers are also important.

Real estate is a durable asset that has a relatively long economic life. The market rent at a given point in time is the price that users must pay for the use of a particular type of space, for example, the rent per square foot of leasable area in a building. Market rents can change many times over the economic life of the building because of changes in the demand for space from potential users and/or changes in the supply of space as additions or subtractions are made to the stock of available space. These changes are one source of volatility that will affect the rental income from properties over time. The value of a particular property at any point in time depends on the present value of the rental income expected from the building over its remaining economic life. Thus, real estate investors must consider how changes in the supply and demand for space might affect market rental rates over the economic life of the property.

Vacancy

As indicated previously, all space available in a building may not be leased at a particular time. This is because tenants leave after their lease has expired (or walk away from their lease before it expires!), or it could be that the space has never been rented, especially if it is in a newly constructed building. To project income for a property, it is therefore necessary to project how much of the space will be occupied by tenants during the anticipated holding period for the project. There should always be some allowance for vacant space, even in markets where leasing activity is strong, because as tenant turnover occurs it takes time to make space ready and to re-lease space to new tenants. Hence, there will always be some loss in rents, even in buildings occupied by a few larger tenants.

It is more difficult to project vacancy for newly constructed properties. While some leases may be signed before a project is completed, it is possible that less than full occupancy will be achieved immediately after construction is completed. In these cases, projections must be made as to how long it will take for remaining space to be "absorbed" by the market. That is, how long will it take for occupancy to reach a normal level? Obviously the longer it takes for space to be rented, the less income the investor will receive during the initial years of the project. Because this affects cash flows in the early years of the holding period, it will also have a significant impact on the investment value of a property.

At this point it is useful to make a few additional observations. First, when dealing with an acquisition of a property and developing a pro forma statement that will be used in an investment analysis, it is important to stress that such a forecast should contain a summary of *cash flow only*. The focus on cash flow is stressed and should be differentiated from statements that stress accounting income determined in accordance with generally accepted accounting principles (GAAP). While the latter may be important when producing annual reports, taxes, and so on, it should not be used in making an analysis for acquisitions of properties. Second, the term *net operating income* (*NOI*) was discussed in the previous chapter and is used extensively in the real estate investment business. Unless stated otherwise, NOI and cash flow from operations are used interchangeably. In this chapter, we also focus on *cash flow*, that is, a summary of all cash inflows and outflows. We make this distinction because when undertaking an investment analysis, we will usually have access to detailed rent and expense information from the seller of the property or his agent. We will usually make an inspection of the property and estimate the extent of needed outlays for tenant improvements that may be necessary as leases mature and the property is made ready for new tenants, or outlays for major repairs after the property is inspected. As a result, we will be in a better position to make annual estimates of cash outflows for such items than to make average estimates for these expenses. In Exhibit 9–6 we list data sources that may be used to help compile appropriate benchmarks for operating expenses and other data that may be relevant when developing financial projections for various properties. In summary, when analyzing financial statements, the reader should pay particular attention to how treatments of outlays for tenant improvements, repairs, and replacements are included in statements of cash flows. In this chapter, rather than using an average outlay for such items, we will make an estimate of cash outflows for the year in which the outlay is expected to occur.

Web App

There are many online sites such as **www.reis.com** that offer summaries and outlooks on both national and regional rental markets. Find reports on the current state of either the apartment, office, warehouse, and retail properties for the city or region where you live or are interested in living. What is the outlook for this type of property in that area? What is happening to rents and vacancy rates?

EXHIBIT 9–6
Useful Data Sources for Income Property Research

Type of Property	Source
Apartment, condominium, cooperative	*Income and Expense Analysis: Apartments, Condominiums and Cooperatives* (Chicago: Institute of Real Estate Management, annually)
Office buildings	*Office Building Experience Exchange Report* (Washington, DC: Building Owners and Managers Association International, annually)
Shopping centers	*The Dollars and Cents of Shopping Centers* (Washington, DC: Urban Land Institute)
Industrial parks	*Site Selection Handbook* (Atlanta: Conway Publications, Inc.)

Underwriting Leases

Typically, income properties are leased to tenants for a specified period of time. The lease document assigns rights, duties, and responsibilities between the **lessor** (owner) and **lessee** (tenant) for the duration of the lease. The terms of the **lease** include legal considerations that are designed to protect the interests of both the lessor and the lessee and specify how rents and expenses are to be paid.

When negotiating for the use of space, the property owner will evaluate the financial capacity of the tenant. This investigation is extremely important because the lease is a contractual agreement that creates an asset for the property owner and a liability for the tenant. Leases may require significant rent payments for very long periods of time; therefore, the ability of the tenant to pay currently and in future periods is very important. Furthermore, to properly assess risk, the property owner must understand the nature of the tenant's business, its competitive position in the industry, and the health of the industry itself. Typically, when evaluating a tenant and a lease proposal, the owner considers the following information:

- Financial statements/income statement–balance sheet.
- Credit ratings.
- Any analyst reports on the firm/industry.
- Bank relationships.
- Existing obligations (debt, other leases).

Underwriting leases is a very important component of risk assessment, which [illegible] cash flow produced by a property and hence its value. Furthermore, if a tenant defaults on a lease because of a business failure and petitions a court for bankruptcy protection, the tenant may be allowed to continue to occupy the space and pay little or no rent [illegible].[7]

General Contents of Leases

As discussed earlier, the contents of the lease includes the term "lessor," which usually refers to the owner of the property. Thus, we tend to use *lessor* and *owner* interchangeably. Similarly, the "lessee" is typically the tenant who occupies and uses the space and pays

[7] It should also be pointed out that from a *tenant's* point of view, the financial health of the *property owner* is very important. Should a tenant lease space and the property owner [illegible] difficulty and enters bankruptcy, the ownership of the property may change and the operation/management may affect the quality of service to the tenant.

rent. Hence, the terms *lessee* and *user-tenant* are used interchangeably. While many terms may be included in lease agreements, elements that are commonly included in many leases are shown below:

1. Parties to the lease, namely, lessor and lessee. The date of the lease agreement, occupancy date, identification of area to be leased, and the length of the lease term.
2. The base or minimum rent and any methods that will be used to calculate future rent. Description of any concessions and other inducements to be provided to the tenant by the landlord.
3. Deposits and any indemnities and guarantees from third parties or co-signers.
4. Condition of the leased premises to be provided to the occupant on the move-in date, including any tenant improvements.
5. Allowable uses of the property, restrictions on occupancy, and prohibitions regarding future changes in the use of the property.
6. Any restrictions on assignment or subletting of any of the leased space by the tenant.
7. The use of common areas and facilities, such as lobbies, rest rooms, and parking lots.
8. Responsibility for maintenance and repair of the tenant's space and of the general premises.
9. Any restrictions on alteration or improvements to the property by the tenant.
10. Construction of any expansion in the future by the owner and provisions for affected tenants.
11. Eminent domain and any consideration to be given to the tenant should it affect the space rented, business operation, the availability of parking, and so forth.
12. The responsibility for payment of specific expenses by the lessee and/or the lessor.
13. The extent to which the owner and/or the tenant must provide for fire and casualty insurance.
14. Any lease renewal options.
15. Estoppels

Depending on the amount of space, length of the term, and financial implications for both owners and tenants, leases may range from very complex to relatively simple agreements. For large corporate users who may be leasing large amounts of space and who plan to move many employees and equipment to the space being leased, many conditions may be negotiated in lease agreements. On the other hand, leases may be relatively straightforward, as may be the case for apartment leases. While we do not exhaust all possible features that may be included in leases, Concept Box 9.1 provides the reader with more detail on the general contents of leases listed above. This additional detail gives some idea as to the range and the variety of items that may be included in leases that affect the future cash flows from rents, payment of expenses, options, and other factors affecting risk and return on investment. When evaluating a property for investment, the analyst must carefully review each lease. Indeed, some consider the major determinant of property value to be the present values of cash flows from all leases in effect when a property is acquired. This is so because leases with onerous or overly restrictive terms can have a major affect on property values.

Leases and Rental Income

The initial rent that must be paid under the lease contract is usually a specified dollar amount, which we refer to as the **minimum rent**, or **base rent**. However, the base amount may change for a number of reasons during the term of the lease, depending on the methods agreed to by owners and tenants that may be used to calculate rent at various times.

Detailed Discussion of General Lease Terms — Concept Box 9.1

The goal of this concept box is to expand the discussion of leases and how various clauses and options listed above may affect the risk and/or cash flow to the investor. While the following list is not exhaustive, the reader should be aware that like any contract being negotiated, many features may be added to leases to meet the needs of both the owner and tenants.

1. *Parties to the lease.* If a corporation is a party to the lease, assurance that the person signing the lease is a corporate officer with the proper responsibility is important. The nature of the corporate entity and its relationship to a parent corporation or other entities should be investigated. Failure to do so may present delays in receipts and payments of cash flows if rents become delinquent or the lease is terminated and bankruptcy occurs. *Occupancy dates* may be important in leases on newly constructed property which the owner may not have finished by the move-in date. In these situations, *tenants* may want the option to terminate the lease. Similarly with retail leases, should the tenant delay occupancy for an unreasonably long period of time, the property *owner* may want to terminate the lease, particularly if the retail sales of other tenants appear to be adversely affected by the vacant space.
2. *Rents.* As will be explained in the chapter, there are many ways to determine rents, ranging from rents that are flat, stepped-up, indexed, and so forth. *Concessions* also may be included that effectively lower rents. For example, the owner may provide a **free rent** period during which no rent is paid. These concessions or discounts tend to be used (1) when vacancy rates are high because the market is oversupplied with rentable space or (2) when demand for space is weak because of slow economic growth. In addition to free rent, other concessions may include a move-in allowances, buyouts of existing leases, designated free parking, and the like.
3. *Other guarantees.* Depending on the outcome of the underwriting, if the risk of default is considered to be a possibility, a prospective tenant may be required to find a third party to indemnify the lease payments (a co-signer) or obtain a letter of credit (LOC) for a fee from a bank. In a LOC, the bank guarantees that any rents in arrears will be paid to the property owner. Provisions for reductions in the amount of the LOC based on timely rent payments by the tenant may be included in the lease in order to reduce annual LOC fees paid by the tenant.
4. *The condition of the space* on the move in may be "as is," or the lease may require it to be "finished out" or renovated before the move-in date. In such cases, the lease may call for *tenant improvements* (TIs), which could include bookcases, doors, lighting, carpets, wall coverings, and so on. The extent of TIs is negotiated and expressed as dollars per square foot of usable space that the owner will budget for a tenant. Any cost in excess of the agreed budget amount must be paid by the tenant. The dollar amount and the description of TIs that the owner will provide are described in a work letter which is prepared by the property owner. Also, the disposition of any of these improvements upon expiration of the lease is usually specified.
5. *Allowable uses* and prohibited uses are enumerated in all leases. These provisions usually prohibit tenants from making major changes in their use of the leased space. For example, a tenant could be prohibited from adding a retail business in space that has been leased in an office building.
6. *Subletting.* In the event that a tenant needs less space than originally leased, leases may allow the tenant to *sublet* to third parties with approval of the property owner. The owner generally agrees not to unreasonably withhold approval even though the lessee may be "in competition" with the property owner, who may also be trying to lease vacant space in a building. Even if subletting is allowed, most owners will require that the original lessee remain liable for rents on any sublet space for the remaining lease term.
7. *Business conduct.* All tenants are usually required to "obey the rules" regarding the use of common areas as indicated in the lease. In retail leases, this could mean a prohibition relating to the use of the mall way (common area) for special sales, promotions, signing, and so on.

Detailed Discussion of General Lease Terms

Concept Box 9.1 (Continued)

8. *Services to be provided.* In most office leases, the property owner will agree to provide services such as cleaning, maintenance, and repairs. In the case of retail and warehouse properties, more discretion is given to the tenant regarding maintenance and alteration of space to conform to the operating needs of the tenant. However, the property owner usually retains the right to approve (1) alterations and (2) the selection of architects, contractors, materials, and the like.
9. If the property owner wants to expand and construct new rental space, many leases contain *"non-disturbance" clauses,* which require the owner not to interfere with the tenant's business operations during an expansion or as any existing space is being renovated. When negotiating leases, tenants may require temporary relocation to other space, or the creation of special accommodations (e.g., private entries, exits) during construction.
10. Should the state or other government entity use *eminent domain* to condemn all or part of the owner's property (to acquire right-of-way, etc.), the lease may provide that the tenant receive a reduction in rent or other consideration should parking or other factors affecting the tenant's business occur. Similarly, leases usually include provisions that address events, such as a fire or other occurrences, that result in the loss of business or damage to the tenant's space.
11. Leases vary considerably regarding *responsibility for expenses.* In some cases, the property owner agrees to provide and pay for some or all of the operating expenses. In other cases, property owners do not wish to take responsibility for many of those expenses because (1) they may be directly related to the tenant's business and should be paid by the tenant and (2) there is a risk that such expenses may suddenly rise. Consequently, many property owners prefer to either "pass through" or recover certain expenses from tenants (to be discussed).
12. Many leases require the building owner to provide comprehensive insurance in common areas of the property (lobby, parking, etc.). Tenants must also provide evidence of insurance covering the tenant's space.
13. As the lease expiration date approaches, tenants must give a *termination notice* to the owner as to whether the lease will be renewed or terminated. This is an important decision for both the tenant and the property owner. For the tenant, if the lease is not renewed, considerable cost to move the business and employees may be incurred. For the property owner, the risks with nonrenewal of finding a new tenant to occupy the vacated space, of negotiating the rent, and of paying "make-ready" expenses and leasing commissions may be incurred. The renewal option is likewise complicated because in addition to the usual factors, it usually involves re-negotiation of a new rent for the next lease term. In order to reduce the uncertainty regarding the rent negotiation, many office, retail, and warehouse leases specify that a market survey of comparable properties will be conducted by at least two brokerage or research firms (one selected by each party). The survey will be made up to one year before and not less than three months before the lease expiration date. The results of the survey will serve as the basis to negotiate the new rent. While the final rent determination must still be negotiated, this process helps to provide current information on leases being made and renewed in the marketplace at the time the renewal option is being considered. These provisions normally do not apply to apartments, where information on rents is more readily determined and tenant mobility in properties is very common and leases are being continuously renewed on comparable units.
14. *Estoppel certificates.* This provision allows a questionnaire to be sent to existing tenants seeking verification of (1) rents/expenses that the tenant is obligated to pay under lease terms, (2) any past-due amounts, and (3) any rents being withheld by the tenant because of disagreements with the owner. This clause is important because a potential buyer wants verification (1) that all rents and recoveries are, in fact, being collected from tenants and (2) that there are no disputes, lawsuits, and the like, between the current owner and tenants.

1. *Flat rent leases.* In some cases, rents may remain the same (or flat) for the term of the lease. This is commonly the case for apartment leases. Flat rents may also apply to other leases with relatively short terms, or when tenant/user turnover occurs frequently.
2. *Step-up leases.* Some leases include step-up clauses. These provide that rent will increase at the end of specified time intervals and in *specific amounts* during the term of the lease. Example: base rent will be $20 per square foot and will increase by $1 per square foot on the anniversary date of the lease for each of the next five years. Step-ups are used commonly in office, retail, and warehouse leases.
3. *Indexed leases.* Another way of adjusting rents is to use a specified index as a basis for the adjustment. This approach may be used in lieu of, or combined with, step-up provisions. The consumer price index (CPI) is a commonly used index when this approach is used. That is, the base rental rate is adjusted periodically in accordance with changes in the CPI. Other indexes can be used. For example, in New York City it is common to use *Porter's wage index* to adjust rents for office properties. Using price indexes like the CPI to adjust rents differs from step-up leases because the change in rents is not known until the date of the **CPI adjustment**. Furthermore, index adjustments shift the risk of unexpected changes in the rate of inflation to the tenant. As a result, tenants may negotiate "caps," or upper limits, on the index. In return for using indexed adjustments in the lease, tenants may negotiate a lower base rent than would otherwise be the case if either flat or step-up provisions were used. Indexed leases are used in office, retail, and warehouse leases.
4. *Rents adjusted based on performance.* In some retail leases, rents also may be fully or partially determined by an indicator of retail sales performance. For example, some leases in shopping centers may include a provision for rents to be partially based on the tenant's sales volume. This is referred to as a **percentage rent** lease. In such cases, a flat, stepped-up, or indexed base rent is negotiated. Then an additional clause specifies that if the tenant's sales volume exceeds a certain amount (usually referred to as the "breakpoint"), additional rent will be paid based on some percentage of the tenant's sales over the negotiated breakpoint. The dollar amount by which the total rent exceeds the base rent is referred to as **overage rent**.

Leases and Responsibility for Expenses (Recoveries)

Owners of income-producing properties incur many operating expenses. These expenses are usually incurred as the owner operates and maintains the property and facilities used by all tenants. In general, owners avoid taking responsibility for expenses that are specifically related to a tenant's business. Tenants usually pay those expenses directly. With respect to expenses related to the areas of the property used by all tenants (usually referred to as common areas), many owners prefer to recover those expenses by prorating them among all tenants. In leases involving small amounts of space, owners usually [illegible] these common-area expenses and attempt to recover them in the base rent. However, [illegible] larger amounts of space may agree to pay a lower base rent and to [illegible] responsibility for payment of these expenses with the owner. The owner will usually collect such amounts, called **recoveries**, by billing tenants for a pro rata share of those expenses designated in the lease as recoverable.[3]

[3] The lease agreement will identify which of the expenses from this list are recoverable from the tenant and how the tenant's share of recoverable expense is to be calculated.

Typical Operating Expenses for Income Properties

Cleaning	Water/sewer
Repairs	Security
Maintenance	Management
Landscaping	Real estate taxes
Electricity	Insurance

There are many ways of calculating and recovering expenses. Some leases are identified by the way the payment for expenses is negotiated between the property owner and the tenant. Although many combinations of rent and of operating expense recoveries are possible, a few of the more common patterns are described as follows:

1. *Gross (full service) leases.* Tenant pays rent only and property owner provides all services and pays for all operating expenses.
2. *Modified (full service) leases.* Tenant pays rent and pays for individual, specified expenses identified in the lease such as electricity and the like. This is used when some tenants, because of the nature of their business, may incur higher expenses than others in the building. Such expenses are usually linked to the tenant by submetering or other methods.
3. *Leases with expense recoveries in excess of an expense stop.* Tenant pays rent plus a pro rata share of certain operating expenses incurred by the property owner. These expenses are identified "recoverable" in the lease. Recoveries from tenants may include a pro rata share of all recoverable expenses in excess of an **expense stop**. This "stop" is usually calculated as the total operating expenses *per square foot of* **rentable area** in the building that is incurred by the property owner during a specified *base year*.[4] The tenant agrees to pay only for operating expenses per square foot *in excess* of this stop. For example, if the building owner incurs total operating expenses per rentable square foot of $7 during the base period, and expenses subsequently increase to $8 per square foot during the next period, the tenant would pay only expenses in excess of the $7 stop, or $1 per square foot. The owner would be responsible for the base level of expenses, or $7. The $7 stop usually remains the same during the term of the lease.[5] However, future stop levels may also be negotiated in the lease.
4. *Pass-through leases.* These leases are usually made when a few tenants lease very large amounts of space in a property, or perhaps a lease is made with a single tenant who leases all of the space in a building. **Expense pass-through** leases tend to require tenants to pay a greater share of expenses. When fewer tenants lease large amounts of space, operating expenses tend to be identified and linked more directly to those tenants. Therefore, those tenants usually pay all such expenses. When such leases are made, base rents tend to be lower than would be the case for full-service and modified-full-service leases. Examples of pass-throughs include:
   a. *Net leases.* In addition to rent, the owner passes through *all* operating expenses (usually not subject to an expense stop) to the tenant(s).
   b. *Net, net leases.* Owner passes through all operating expenses, plus all property taxes and insurance costs to the tenant(s).
   c. *Net, net, net leases.* In addition to operating expenses, taxes, and insurance, the tenant pays for maintenance, repairs, and building alterations. Any alterations and modifications to the lease space are usually subject to the approval of the property owner. These leases are commonly found in leases of warehouse/industrial properties; tenants in these properties usually require large amounts of space and the flexibility to modify and move fixtures and reconfigure their space to operate their business effectively.
5. *Combinations.* While the above descriptions may be helpful to the reader when categorizing leases, it should be kept in mind that many leases are negotiated to include provisions that are specific to the needs of owners and tenants. Consequently, many combinations of the above provisions may be negotiated in a lease to achieve the specific needs of both parties.

[4] The owner and tenant will usually negotiate whether the base year is defined to be the current year, the year before, or the year after the lease is signed. This may be important during periods when operating expenses have been increasing. Determining rentable area is discussed later in the chapter.

[5] One complication arises when establishing stops and operating expenses on a new or renovated building that is not fully occupied. In such cases, certain expenses may be fixed, or invariant to occupancy. In these cases, tenants may insist that recoveries be calculated to reflect normal occupancy (say 95 percent). When actual space occupied is lower than normal occupancy, the amount per square foot in recoveries that tenants may pay usually increases.

Comparing Leases: Effective Rent

From the above discussion we know that a number of provisions affect rents and expenses as well as options that may be included in a lease. These provisions, in combination, determine the expected series of rental payments and the degree of risk that is borne by the owner/lessor versus the tenant/lessee over the term of the lease. Because of the large number of possible combinations of lease terms, cash flows may vary considerably from lease to lease, making it difficult to establish what the lease cost is, as well as making comparisons between leases difficult. Therefore, it is useful to calculate a single measure or **effective rent** that can be used for comparison of leasing alternatives. To calculate the effective rent we will use the following procedure:

1. Calculate the present value of the expected net rental stream. The net rental stream is the amount received after considering expenses that the owner must pay. Note that the focus here is on income to the *owner* of the building.
2. Calculate an equivalent level annuity over the term of the lease. An equivalent level annuity has the same present value as the original cash flow stream.

To illustrate, we will calculate the effective rent that would be collected by the lessor for different lease structures. Because the responsibility for payment of operating expenses can vary considerably for different lease structures, the effective rent will be calculated net of any operating expenses that must be paid by the lessor. That is, any operating expenses that must be paid by the lessor will be subtracted from the rental income. A similar procedure would be used to calculate the effective rent paid by the lessee. In this case the amount of operating expenses that the lessee is responsible for paying would be *added* to the rent each year.

The effective rent will be calculated for the following six alternatives for a five-year lease on 1,000 square feet of rentable space:

1. *Net lease with steps.* Rent will be $10 per rentable square foot the first year and will increase by $1 per square foot each year until the end of the lease. All operating expenses will be paid by the tenant.
2. *Net lease with one year of free rent.* No rental payment will be required during the first year. Rent the second year will be $14.50 per rentable square foot and increase by $1 per square foot each year. All operating expenses will be paid by the tenant.

3. *Net lease with CPI adjustments.* The rent will be \$11 per square foot the first year. After the first year, the rent will be increased by the amount of any increase in the CPI, in other words, a 100 percent CPI adjustment. The CPI is expected to be 2 percent during the second year, 3 percent the third year, 4 percent the fourth year, and 5 percent the fifth year.
4. *Gross lease.* Rent will be \$17.50 per rentable square foot each year with the lessor responsible for payment of all operating expenses. Expenses are estimated to be \$4 during the first year and increase by 50 cents per year thereafter.
5. *Gross lease with expense stop.* Rent will be \$15.50 per rentable square foot the first year with the lessor responsible for payment of expenses up to an expense stop of \$4 per square foot. Expenses are estimated to be \$4 during the first year and increase by 50 cents per year thereafter.
6. *Gross lease with expense stop and CPI adjustment.* Rent will be \$14.50 per rentable square foot the first year and increase by the full amount of any change in the CPI after the first year with an expense stop at \$4 per square foot. The CPI and operating expenses are assumed to change by the same amount as outlined above.

Based on the above assumptions, the effective rent can be calculated using the information in Exhibit 9–7. For each lease alternative, the average rent, present value of the rental stream, and the effective rent is shown in the exhibit. A 10 percent discount rate is used to calculate the present value and convert the present value into an effective rent. This rate should reflect the riskiness of the rental stream, as discussed below. The effective rent varies for each alternative. This is expected because the risk differs for each alternative.

To illustrate calculation of the effective rent, the following calculations can be made for the first lease alternative:

Step 1. Find the present value of the net rental income assuming a discount rate of 10 percent is appropriate.

$$PV = \frac{\$10.00}{1.10} + \frac{\$11.00}{(1.10)^2} + \frac{\$12.00}{(1.10)^3} + \frac{\$13.00}{(1.10)^4} + \frac{\$14.00}{(1.10)^5}$$

$$= \$44.77$$

Step 2. Calculate the equivalent level annuity with the same present value.

Calculation solution:	
$PV = -\$44.77$	$FV = 0$
$i = 10\%$	Solve for (PMT)
$n = 5$	$PMT = \$11.81$

Note that with this type of lease, the tenant bears the risk of any unexpected change in operating expenses. Although the lease includes a step-up, higher-than-anticipated inflation could erode the real value of the rental income.

The same procedure can be used to calculate the effective rent for the remaining five alternatives. The second lease alternative is similar to the first but has a free rent period. The rent must obviously be higher in years 2 through 4 to result in an effective rent similar to the first alternative. Because the calculation of effective rent considers the effect of the free rent period on the present value of the rental stream, we might expect the effective rent to be the same as the first alternative. Default risk might be considered slightly higher,

EXHIBIT 9–7
Comparison of Effective Rents

1. Net Lease with Steps					
Year	**1**	**2**	**3**	**4**	**5**
Net rent	\$10.00	\$11.00	\$12.00	\$13.00	\$14.00
Average rent		12.00			
Present value		44.77			
Effective rent		11.81			
2. Net Lease with Free Rent					
Year	**1**	**2**	**3**	**4**	**5**
Net rent		\$14.50	\$15.50	\$16.50	\$17.50
Average rent		12.80			
Present value		45.76			
Effective rent		12.07			
3. Net Lease with 100% CPI Adjustment					
Year	**1**	**2**	**3**	**4**	**5**
Expected CPI	NA	2.00%	3.00%	4.00%	5.00%
Net rent	\$11.00	\$11.22	\$11.56	\$12.02	\$12.62
Average rent		\$11.68			
Present value		44.00			
Effective rent		11.61			
4. Gross Lease					
Year	**1**	**2**	**3**	**4**	**5**
Gross rent	\$17.50	\$17.50	\$17.50	\$17.50	\$17.50
Less expenses	4.00	4.50	5.00	5.50	6.00
Net rent	13.50	13.00	12.50	12.00	11.50
Average rent		\$12.50			
Present value		47.74			
Effective rent		12.59			
5. Gross Lease with Expense Stop at \$4.00					
Year	**1**	**2**	**3**	**4**	**5**
Gross rent	\$15.50	\$15.50	\$15.50	\$15.50	\$15.50
Less expenses	4.00	4.50	5.00	5.50	[illegible]
Plus reimbursement	0.00	0.50	1.00	1.50	2.00
Net rent	11.50	11.50	11.50	11.50	11.50
Average rent		\$11.50			
Present value		43.59			
Effective rent		11.50			
6. Gross Lease with Expense Stop at \$4.00 and CPI Adjustment					
Year	**1**	**2**	**3**	**4**	**5**
Expected CPI	NA	2.00%	3.00%	4.00%	5.00%
Gross rent	\$14.50	\$14.79	\$15.23	\$15.84	\$16.64
Less expenses	4.00	4.50	5.00	5.50	6.00
Plus reimbursement	0.00	0.50	1.00	1.50	2.00
Net rent	10.50	10.79	11.23	11.84	[illegible]
Average rent		\$11.40			
Present value		42.84			
Effective rent		11.30			

however, because if the tenant defaults after the first year, the lessor will have received no income from the lease. Thus, a slightly higher effective rent is reasonable.

Some tenants take advantage of free rent periods by defaulting on the lease at the end of the free rent period and moving to another building that also offers free rent. One way of avoiding this problem is to have the free rent period be at the end of the lease. Building owners prefer to have the rent highest at the end of the lease term, however, when they are more likely to sell the property.

The third alternative includes a CPI adjustment rather than fixed step-ups. Because the risk of unexpected inflation is shifted to the lessee, we might expect the effective rent (based on the expected change in the CPI) to be lower than the first two alternatives because the lessee bears more risk of unanticipated inflation. In this case the effective rent is $11.61 per square foot.

The fourth alternative is a gross lease. This is much riskier for the lessor (less risky for the lessee) than any of the net leases. The lessor bears the risk if operating expenses differ from what was expected. Thus, we would expect the effective rent to be higher. In this case the effective rent is $12.59.

The fifth alternative also is a gross lease but includes an expense stop (but no CPI adjustment). This shifts the risk of increases in expenses to the tenant while allowing the lessor to retain the benefit of any decrease in expenses. Thus, it is less risky for the lessor than the net lease and has a lower effective rent of $11.50 per square foot.

The final alternative is a gross lease that combines a CPI adjustment with an expense stop. This shifts the risk of any increase in expenses to the tenant while retaining the benefit of any decrease in expenses and shifts the risk of any unexpected increase in expenses to the tenant. Thus, we would expect the effective rent to be the lowest for this alternative.

From the preceding examples, it should be clear that the effective rent is only a measure of the expected return to the lessor (cost to the lessee). Effective rents cannot be compared without considering differences in risk. The effective rent is useful, however, when it is desirable to compare the expected returns from different lease alternatives in a single measure.

Developing Statements of Cash Flow

What follows is a general discussion of the *link* between lease provisions and how investors in income-producing real estate develop statements of cash flow. These statements are very important as they serve as a basis for estimating real estate values and performing an investment analysis. These statements reflect (1) lease terms, (2) market supply and demand conditions affecting rents, (3) the tenant's credit risk, and (4) how responsibility for certain expenses associated with operating a property will be divided between the property owners and tenants. As has been described, lease terms vary considerably for apartments, office buildings, retail properties, and warehouses. Differences in lease terms must be translated and models must be developed into statements of cash flow in order to assess investment risk and return for investment opportunities.

It is useful to think of net cash flow realized from an investment in an income property as a combination of the relationships shown in Exhibit 9–8. *Rental income* for a property is calculated based on rents specified in each lease made with individual tenants. As we have discussed, rents specified in leases may be flat, stepped up, indexed, or based on some level of business performance. Furthermore, because existing leases have been made in previous periods and for different maturity periods, some leases may be due to expire, or "rollover," after a property is acquired. Therefore, rentable income in any year is a reflection of leases executed in previous years as well as leases being executed currently. As Exhibit 9–8 shows, in addition to rent, many properties produce income from other services provided (such as laundry facilities in apartments, cell towers atop office buildings, etc.).

EXHIBIT 9–8
General Approach for Developing Pro Forma Statements of Cash Flow for Income-Producing Properties

Rental Income
Add: Other Income
Add: Recoveries
Less: Vacancy and Collection Losses
Less: Concessions
Effective Gross Income
Less: Operating Expenses
Cash Flow from Operations (a.k.a. NOI)*
Less: Lease Commissions
Less: Recurring Capital Outlays
Less: Nonrecurring Capital Outlays
Net Cash Flow

*The reader should be aware that in real estate investment analysis, cash flow is the relevant focus. Even though the term *net operating income* (NOI) will be used in the coming chapters, it is calculated as cash flow and not income as determined by generally accepted accounting principles (GAAP). The term *NOI* is used interchangeably with cash flow from operations.

The statement shown in Exhibit 9–8 also shows that expense recoveries are usually *added* to rent and other income to produce gross cash inflow for the property. As we have explained, depending on the lease terms, some operating expenses may be *recovered from tenants*. Depending on the types of leases negotiated, such as full-service leases, modified-full-service leases, net leases, and so on, some tenants may pay a pro rata share of operating expenses while other tenants may pay a higher base rent but do not make any contribution to operating expenses. Expense recoveries also must be determined on a lease-by-lease basis.

After other sources of income and expense recoveries are determined, cash inflow is then reduced by loss of rents because of vacancies and nonpayment of rents (because of tenant bankruptcy, etc.). In addition to these reductions, property owners may have provided tenants with **concessions**, such as a move-in allowances or rent reductions for a specified period of time. These are inducements for new tenants to lease space or to keep old tenants who are renewing leases. After these allowances are deducted, the resultant *effective gross income* is the amount of cash flow available to the owner to pay operating expenses.

From effective gross income, the owner pays *operating expenses*. The net result is *cash flow from operations*, frequently referred to as *net operating income (NOI)*. This concept represents the net cash inflow from operating the property over a normal operating cycle (usually one year). *NOI is a very important concept in real estate investment analysis.*

Three additional cash flow categories for outlays must be taken into account for items that are *recurring* but are not "operating" in nature. The *first category* includes lease commissions that must be paid to brokers who find tenants to lease space in properties. These fees are usually paid by owners of office, retail, and warehouse properties. For apartments, this usually includes fees paid to apartment locator firms that find apartments for tenants based on location, size, and rent preferences. The *second* category includes recurring outlays made for replacement of items that have a service life lasting less than three years (or a normal operating cycle). Such items may include carpet replacement, paint, light fixtures, and the like. The *third* classification, called nonrecurring outlays, includes capital expenditures for items that are necessary for maintaining the physical condition of the property over longer periods of time. These items would include replacement of roofs, parking areas, and so on.

As we explained, the pro forma statement of cash flow shown in Exhibit 9–8 is very basic. As each major property type is considered in this chapter, pro forma statements of cash flow may be affected because of certain lease provisions that are important to each property type. We should also note that our explanation in this chapter is limited to pro forma statements *for only a one-year period.* As will be seen in later chapters, when doing an investment analysis, pro forma statements must be developed annually for longer periods of time. We now turn to an examination of how leases may vary for office, retail, industrial/warehouse, and multifamily properties.

Leases: Office Properties

Rent Premiums and Discounts for Office Space

Office space tends to be leased for three to seven year terms with tenants often having the option to renew leases for additional terms. Rents vary by location within office properties, and owners may charge *premium rents* for space with the following features and locations:

- Ground floor, transfer points, and space contiguous to elevator banks.
- Higher floors with unobstructed views.
- Building corners.

Rent discounts may apply to office space in the following locations:

- Middle floors and locations not adjacent to the elevator bank.
- Offices with obstructed or undesirable views.
- Noncontiguous space occupied by one tenant (e.g., space on the second floor and space on the sixth floor).

See Concept Box 9.2 for a listing of the typical provisions of office property leases.

Determining Lease Revenue

In order to determine revenue, the base rent per square foot of *rentable area* must be multiplied by the quantity leased to tenants. While this may seem to be a straightforward calculation, it is not always as easy as it seems. This is particularly true in buildings where multiple tenants use and share common space. We will provide a hypothetical example using an office building to give the reader some idea of how rentable space is determined. However, depending on the city in which a building is located, local practices may affect how these calculations will be done.

Rentable Area in a Building

It is useful to think about the rentable area in a building as the total area that could be rented to a *single tenant-user*. This would usually equal the total area on all floors and the lobby, less the nonrentable area which usually includes the thickness of exterior walls, any columns or protrusions through the floors such as elevator shafts or structural supports, mechanical equipment closets, basements, and so on, needed by the owner to maintain or operate the building. It would *include* areas such as elevator landings, lobbies, or reception areas, restrooms, or any areas that could be used by a tenant and their visitors/clients (these latter areas are also referred to as common areas). To illustrate, if we assume that a building contains 250,000 square feet of gross building area and of that area, 200,000 square feet *could be rented and occupied by one tenant*, and base rents are $20 per square foot, then total rent would equal $20 times the rentable area of 200,000 feet or $4,000,000 per year. Tenants would make payments based on this amount prorated monthly by dividing by 12.

Multiple Tenants—Rental Area per Floor

In cases where many tenants share a building, each tenant will occupy its **usable** area on a floor. For example, if four tenants share one floor equally and that floor has a total of 20,000 square feet that is partitioned off into equal interior office spaces of 4,500 square feet each, then the total usable space on the floor is 18,000 square feet. However, there

Lease and Selected Operating Characteristics—Office Properties — Concept Box 9.2

Because of the cost and importance of space that firms use in their operations, many options and other features are considered by owners and tenants when negotiating leases. In addition to the basic provisions discussed earlier (see Concept Box 9.1), what follows is a sample of some features found frequently in office leases:

- *Tenant right of first refusal.* According to the **right of first resusal**, tenants may have the right to rent contiguous space and/or any space in the building when it becomes available.
- *Tenant right to "put back" space to property owner.* Tenant may have the right to decrease space rented in the event that tenant desires to reduce space needs.
- *Sale or merger* by a landlord shall give tenant the option to terminate the lease.
- *Access-egress.* Material modification in access/egress or parking on the site by the owner requires approval of tenant.
- *Purchase option.* The tenant has the first right to purchase the property should the property owner desire to sell at some future date.
- *Signage.* The purpose of a **signage clause** is to grant one or more tenants the right to display a name inside and/or outside of the building. (For tenants that lease very large amounts of space, sometimes referred to as **anchor tenants**, signage may be offered as an inducement to lease space.) The size and designs of the signs are carefully controlled by the landlord, particularly when given exclusively to one tenant. Note: Other potential tenants may avoid leasing space in office building featuring a competitor's name. There may be "prestige" issues involved, depending on the tenant mix in the building.
- *New lease approval.* Anchor tenants may want the right to approve any major lease agreements being negotiated by the property owner with new tenants so as to protect their image/identification with the building.
- *Overloading—use of space.* Tenant must keep the current and future number of employees per square foot at an agreed level (e.g., 250 square feet of rentable space per employee).
- *Parking.* Property owner must reserve and/or keep a specified minimum number of spaces relative to rentable square feet currently in the building and relative to leasable space to be constructed in the future.

would be 20,000 square feet of usable *area* if only one tenant leased the entire floor. Therefore, when multiple tenants share a floor, the difference in the total possible usable area on a floor (or space that would be used if only one tenant occupied that floor) and usable area occupied by multiple tenants is a common area of 2,000 square feet to be used by all four tenants and their clients/visitors. In this instance, the owner will prorate the 2,000 square feet of common area among the four tenant users to determine the rentable area for each tenant by using a **load factor** which is calculated as follows.

$$\text{Load factor per floor} = \frac{\text{Rentable area per floor}}{\text{Usable area per floor}}$$

$$1.111 = \frac{20,000}{18,000}$$

Therefore, for a tenant with usable area of 4,500 square feet, rentable area for the tenant would be calculated as $4,500 \times 1.111 = 5,000$ square feet. The tenant would pay rent based on its rentable area of 5,000 square feet.

In many cases, the load factor per floor may be further adjusted for additional areas in the building. For example, a large office building may contain an "oversized" and elaborate lobby and may have other common areas (rooftop observations, etc.). In our example, if we assume that the 200,000 rentable square feet is distributed evenly over 10 floors (square building), and the first floor is a lobby and common area containing 20,000 square feet, then an owner *may attempt* to prorate this lobby common area among all tenants in the building. One way that this might be done is to take the ratio of the other common area (lobby) of 20,000 square feet ÷ 200,000 square feet total rentable area which is 10 percent. The load factor for a floor (1.111) may then be increased by another 10 percent or 1.111 × 1.10 = 1.222 (total load factor). Our tenant's rentable area would then be calculated as: (Usable area) (Total load factor) or 4,500 × 1.222 or 5,500 square feet. Assuming $20 per square foot base rents, total rental revenue to the owner from this tenant would be:

$$\$20 \times (4{,}500 \times 1.222) = \text{Rent per year}$$

$$20 \times 5{,}500 = \$110{,}000$$

Therefore, when tenants shop for office space in a multitenanted office building, they will not only be interested in the base rent per square foot. They will also be interested in how the *rentable area* is determined, including the *load factors* that will be applied to the usable area they occupy to determine total rentable area. Rentable area is the quantity against which the base rent will be multiplied to determine rent payments. In many cases, when tenants compare buildings for possible occupancy, they compare load factors as "efficiency measures." High load factors generally indicate a large number of common areas and therefore *lower* "building efficiency." However, if an image-conscious tenant desires a spacious area in which to receive its clients and large common areas, this qualitative consideration may offset low efficiency.

Leases: Industrial and Warehouse Properties

Many of the same features in office leases apply to industrial properties and warehouses. Indeed, many buildings include a combination of office space and warehouse space. However, there are a few areas where these properties differ.

Leases for warehouse property tend to be highly individualized due to the special-purpose nature of the buildings. Tenants generally prefer longer-term leases ranging from 10 to 20 years. Long-term leases are preferred because many large warehouse uses require equipment with high installation costs that cannot be moved easily or on short notice. Leases tend to be pass-through or (1) *net*, (2) *net, net*, or (3) *net, net, net leases*. Rent premiums for industrial/warehouse properties might be added for properties with the following features:

- Located near entrances to industrial parks.
- Located near freeways, interstate highways, or rail access.

Rent discounts for industrial/warehouse properties might be added for properties with the following features:

- Poor ingress/egress.
- Poor traffic circulation on the site.

When industrial and warehouse buildings are located in a large, campuslike development, CAM charges may be included in leases. This occurs because of the expenses associated with maintenance, landscaping, upkeep, security, and the like, that may have to be done on common areas in the entire development for the benefit of all tenants and do not apply to any specific building. Because all tenants in all buildings benefit from these services, the owner may recover these expenses with a CAM (common area maintenance) charge.

Leases: Retail Properties

It is safe to say that retail properties derive much of their value from the landlord's ability to lease to a mix of tenants that attract shoppers. One key indicator of the success of a retail property is *sales per square foot of rentable space and customer traffic counts*. These factors are very important to retail property owners when trying to lease space to prospective tenants.

Retail properties are subject to many changing trends, new concepts in retailing, fashions, and the like. In addition to rents and expenses, retail leases contain many provisions that affect how tenants may, and may not, operate their businesses. This is because most retailers will be operating business adjacent, or in proximity, to other retailers. Furthermore, some tenants may have the right to approve leases being negotiated with competing retailers. Retail leases with some tenants may also exclude certain other tenants that may be deemed as incompatible or that may detract or interfere with the operations of existing retailers.

Cash flow from retail leases may vary greatly. In addition to the flat, stepped-up, and/or indexed base rents, landlords and tenants may negotiate some of the rent based on a tenant's sales volume. Furthermore, retail leases usually incorporate recoveries of certain operating expenses. One very important item regarding retail properties is the recovery of expenses related to maintaining common areas, which tend to be *very significant* for most retail properties. Although much of our discussion applies to shopping malls, many of the concepts described here also apply to other types of retail properties.

The Retail Leasing Environment

Anchor Tenants versus In-line Tenants

When an investment in large retail properties is considered, understanding the nature of the business and importance of various tenants is important. A common distinction is made between "*anchor*" *tenants* and "*in-line*" tenants. Anchor tenants usually include very large department stores or other retailers that achieve very high sales volumes and generate a considerable amount of customer traffic. In many cases, because they lease a very large amount of space, anchors receive large rent discounts and demand many special lease features. In-line tenants, on the other hand, tend to be smaller retailers that hope to generate retail sales as a result of participating in the high shopping traffic, part of which is produced by the anchor tenants. By combining primary, complimentary, and cross-shopping activity between anchor and in-line tenants, the property owner hopes to create a retail environment that tends to produce high total retail sales for all tenants per square foot of rentable space.

Rents

Another very important distinction between anchor and in-line tenants is the determination of rent. In general, when negotiating with property owners, anchor tenants can usually bargain more effectively than in-line tenants. In many cases, *anchor tenants will pay very low rents or no rent at all*. In fact, if a particular anchor tenant is highly desirable, the property owner may be willing to lease space at very favorable rents *and* provide other incentives such as contributing funds to finish out the space being leased by the anchor. In some cases, property owners may sell a portion of the property to an anchor tenant, thereby allowing the tenant to build, finish, operate, and control the retail space in accordance with the floor plan and décor that the anchor believes to be most desirable and successful. In the latter case, instead of creating a long-term lease, the landlord usually enters a long-term operating agreement with the anchor tenant.

In contrast to low rents paid on very-long-term leases made with anchor tenants, rents for in-line tenants tend to be driven by current market conditions. Rent typically consists of a *base rent* per square foot of rentable space for relatively short terms—say, five years (with renewal options). Furthermore, as is the case for many commercial properties, this base rate could be flat for the lease term, subject to specific, periodic step-ups, or indexed to the CPI. Leases are usually reviewed by the owner and tenant prior to the expiration date and renegotiated.

For some in-line tenants, an additional component of retail leases combines base rent with a so-called *percentage rent lease*. The rationale for this usually occurs when, in spite of high traffic counts and sales volumes, in-line tenants believe that the base rents being asked by the property owner are relatively high. In these cases, tenants may prefer to negotiate a lower base rent and agree to pay additional rents (referred to as overage rents) if their business in the retail property is successful. The additional rent is based on a percentage of the retail sales above some breakpoint level. Tenants may believe that this rent arrangement is consistent with the landlord's claims relative to sales per square foot and customer traffic count: if the retail environment is as good as the owner claims, then the owner should bear part of the tenant's business risk as a portion of the total rent determination.

A basic example of a percentage lease is as follows. Assume that for 1,000 square feet of rentable retail space, a property owner is asking (1) a flat base rent of $38 per square foot (psf). Instead of the $38 psf rent, the landlord may offer (2) a *lower base rent* of $35 psf, plus *overage rent* equal to 8 percent of all gross sales revenue produced in excess of a breakpoint sales volume. Breakpoint sales levels and percentage rent factors are negotiated and vary by the type of retail tenant. For example, jewelry stores may have a relatively low breakpoint sales level and a high percentage rent factor, while a party goods store would have a relatively high breakpoint sales volume and low percentage rent factor. In our example, if the tenant produces gross sales of $1,000,000 and the breakpoint sales level is negotiated to be $900,000, then base rents plus *overage rents* would be as follows:

Base rent:		Total	Per Square Foot (psf)
$35 psf * 1,000 sq. ft.	=	$35,000	$35
Add overage rents:			
($1,000,000 − $900,000).08	=	8,000	8
Total base rent plus overage rents		$43,000	$43
Rent due beginning of each month	=	($43 * 1,000 sq.ft.) ÷ 12 = $3,583.33	

On the other hand, if sales volume for the in-line tenant in our example turned out to be less than the breakpoint sales volume of $900,000, base rents would remain $35 per square foot. Percentage leases also must specify what will be included in gross sales when determining breakpoint sales and overage rents. Returned merchandise, sales to employees, gift certificates, Internet sales, and sales taxes must all be clarified. Furthermore, documentation may be required of tenants and usually includes sales reports, financial statements based on tenant record retention, and sales tax receipts. The landlord also usually reserves audit rights.

CAM Charges—Recoveries

As indicated above, another very important component of retail leases is an expense recovery for common area maintenance (CAM). Most retail properties include a very large amount of common area space that is used for mall walkways, parking, and nonshopping spaces that are used by all customers who visit the property. This space must be lighted, operated, maintained, and repaired, and security must be provided by the owner. Also, if it is an enclosed mall, it is usually heated and cooled. When rents on retail leases are negotiated, *additional* common area maintenance (CAM) charges based

on specific expenses identified in the lease are usually negotiated. With regard to CAM charges, it should be pointed out that in many situations anchor tenants do not pay the same pro rata amount for these expenses as in-line tenants pay. CAM charges are usually charged to *in-line tenants* as follows:

CAM charges per square foot of rentable in-line space:

$$\frac{\text{(Total CAM expenses for the property} - \text{Contribution to CAM expenses paid by anchor tenants)}}{\text{(Total Rentable occupied by in-line tenants)}}$$

A general example of CAM charges might be as follows: (1) a retail mall contains 2 million square feet of space, of which 1.2 million is rentable area and 800,000 square feet is common area; (2) total CAM expenses are $5,000,000 for the year; (3) anchor tenants occupy 700,000 square feet of rentable area and in-line tenants occupy 500,000 square feet. The owner of the mall has negotiated with four anchor tenants that they will pay $2 per rentable foot for CAM charges on a combined total of 700,000 square feet. The CAM charges for in-line tenants will be:

$$\frac{\$5{,}000{,}000 - \$1{,}400{,}000}{500{,}000} = \$7.20 \text{ CAM charges per rentable square foot}$$

It should be clear that when negotiating CAM charges with anchor tenants, the property owner may be taking on considerable risk. In many cases property owners attempt to attract anchor tenants by providing very favorable leases, including relatively low rents and low CAM charges. In order to justify these favorable terms to anchor tenants, higher rents and CAM expenses may have to be negotiated with in-line tenants. Depending on the level of retail sales achieved, in-line tenants may not be able to afford rents and CAM charges and may vacate the property at their first opportunity. Or the property owners may have to reduce rents to in-line tenants and may not achieve their expected line of net operating income. In addition to CAM charges, retail property owners may pass through insurance and property taxes directly to all tenants based on the share of the rentable area that they occupy. In addition, all tenants will usually be required to belong to a retail merchants association and pay for various advertising and promotional costs. See Concept Box 9.3 for a discussion of retail property leases and operating characteristics.

Leases: Apartment Properties

Using the same general format shown in Exhibit 9–8, we consider a more detailed determination of cash flows for apartment investments. Investments in apartment properties are considerably different from office, retail, and warehouse investments for a number of reasons. Leases are made for relatively short periods of time, the turnover of units may be very significant, and many state and federal consumer protection laws may apply. Exhibit 9–9 shows a pro forma statement of cash flow for apartment properties.

It should be noted that the *gross potential rental income* is calculated based on full *occupancy* of the mix of one- and two-bedroom units at an *average current rent* of $888.65 per month, producing $2,465,649 for the coming year. The "*loss to lease*" term is somewhat unique to estimating cash flows for apartments. It reflects the fact that leases on a number of units have been made in previous periods and are different from rents being negotiated on new leases. The $61,036 loss to lease is determined by identifying the number of units with older leases made in prior periods. The difference in rents being collected on the older leases and rents that are currently being collected

Leases and Selected Operating Characteristics of Retail Properties

Concept Box 9.3

Because of the nature of retail properties and the interaction of many vastly different businesses ranging from high fashion to restaurants, many features are unique to leases on retail properties. What follows is a list of some of the more important features that may affect risk and return.

- *Lease termination* or *kick out clause.* Because sales per square foot and customer traffic are so important to the success of retail property investments, both retailers and owners may include a **kick out clause**, which specifies that the **tenant** must achieve a certain level of sales per square foot within a specific period of time (e.g., two years), otherwise either the property owner *or* the tenant may terminate the lease.
- *Co-tenancy clause.* The **co-tenancy clause** is a demand commonly made by tenants who require the continued presence of a certain anchor or other tenants as a condition of making a lease with the property owner. This occurs when a tenant has found that sales increase when certain co-tenants are present in retail malls. Furthermore, if any of these co-tenants terminate their leases, in-line tenants may: (1) require the property owner to find a comparable replacement within a specific time period, (2) renegotiate rent, or (3) terminate the lease.
- *Anchor tenant approval of major leases.* In retail situations, large anchor tenants are usually very concerned about the quality, image, and visibility of potential in-line tenants, and they may demand the right to approve all major leases (e.g., 5,000 sq. ft or more) being negotiated between property owners and (1) new in-line tenants and (2) other anchor tenants.
- *Signage.* A *signage clause* confers the right to display a name inside and/or outside of the building or in the mall ways. In the case of retail anchor tenants, unique signage may be offered as an inducement to lease space. Signage for in-line tenants will usually be specified as to size, color conformity, and so on.
- *Exclusivity, or "noncompete," clause.* A **noncompete clause** limits the ability of the property owner to lease space in the building to competitors of existing tenants. Some exclusive retail shops insist upon an exclusive-use provision prohibiting any similar shop from leasing space anywhere in, or in proximity to, the building in order to protect sales.
- *Nondilution, or radius, clause.* When an exclusivity clause is provided to tenants, the property owner may require a **radius clause**; that is, the tenants agree not to lease any additional space in the same market/trade area specifically defined (e.g., within a radius of five miles).
- *Excluded uses.* Many anchor tenants require that some uses be excluded within a specified number of feet from their leased space. These could include movie theaters, restaurants, health clubs, and so forth. The anchor tenant may believe that parking and/or access to their location may be adversely affected by these uses.
- *Operating times.* All tenants must generally operate during specified times each day and on holidays. This precludes problems that may affect customer traffic due to nonuniformity in times of operation of the many tenants in a retail property.

on new leases is determined and multiplied by the number of older leases/units. From this amount, rents on vacant units and rent losses from nonpayment are then subtracted, producing net rental income of $1,937,861. Other income from nonrent sources (such as laundry facilities, etc.) is shown to produce an additional $111,080, and recoveries from tenants for water and heat provided by the property owner are also included, resulting in total income from all sources of $2,248,941. Operating expenses are projected to be $999,380. After combining all items of income and expenses, *net*

EXHIBIT 9–9
Waterfall Court Apartments—Summary Description

Name of property:
Waterfall Court Apartments

Location:
Suburbia, USA

Improvement description:
A 232-unit garden apartment community located on a major north-south arterial road. The property is newly constructed and has a high level of amenities, including 100% direct-access garages. All buildings are two-story construction with 90% brick exteriors.

Age: Seven years old

Principal amenities:
Direct-access garages with automatic garage door openers. Washer/dryer connections (full-size) in some units, swimming pool, limited access gates, parking spaces (400/some covered).

Land area density:
15 acres/15.5 units per acre

Unit mix:
1 bedroom—1 bath 104 units
2 bedrooms—2 baths 128 units
Avg. 1,000 sq. ft. per unit
Average monthly rent:
$885.65 per unit/.88 per square foot

Gross Potential Rental Income (GPRI)	$2,465,649	
Less: Loss to Lease*	61,036	
Gross Rental Income	$2,404,613	
Less: Vacancy and Collection Loss	285,013	
Concessions and Adjustments	181,739	
Net Rental Income		1,937,861
Add:		
Other Income	111,080	
Recovery of expenses from tenants	200,000	311,080
Total Income		2,248,941
Less Operating Expenses		990,380
Net Operating Income (NOI)		1,257,706
Recurring Replacements	116,620	
Nonrecurring Replacements	129,475	246,095
Net Cash Flow**		1,012,466

* Loss to lease could be positive if current market rents have fallen relative to rents on older leases made prior to the present time.
** Before any debt service (if mortgage debt has been used) and any federal income taxes.

operating income is projected to be $1,257,706. After deductions for recurring and nonrecurring replacements, the investor/owner is forecasting a net cash flow of $1,012,466. Many other contents in apartment leases and other operating features affecting cash flows are detailed in Concept Box 9.4.

ease and Selected Operating Characteristics of Apartments

Concept B

1. *Leases.*
   a. Multiple occupants—all occupants are jointly and severely liable for rent. No subletting or substitution of tenants is allowed without approval of lessor. A fee may be charged for substitution of tenant on the lease.
   b. Lease termination—failure to pay rent, delay in taking occupancy, breach of lease agreement, breach of community rules. In some situations, the lessee may be able to terminate the lease and/or temporarily stop rent payments because of military duty or loss of employment.
2. *Collection losses* are usually due to nonpayment of rent, bankruptcy, abandonment of units, etc.
3. *Concessions and adjustments.* Fee rents, reduced rents for affordable housing requirements, discounts for corporate accounts, and so on.
4. *When leases expire* and the tenant does not give notice to vacate or renew, some states require that the lease automatically becomes "month to month," whereas other states may require that the lease be extended for a term equivalent to the original term of the lease. In some cases, if leases are not explicitly renewed, an additional "fee" may be added to the rent.
   a. *Fees* are usually charged for late rent payments and for NSF checks.
   b. *Deposits: security, damage, pets*—specified dollar amounts usually collected upon execution of the lease and the conditions under which all or part of amounts collected will be returned to the lessee (tenant).
   c. *Move out notice by tenants*—usually 30 days prior to move out date. Failure to provide notice results in an additional fee.
   d. *Additional income* may come from the following sources: lease cancellation fees, application fees, forfeited deposits, cable TV contract, laundry room, vending machines, garage rentals, clubroom rents, damage charges, property management, leasing, onsite maintenance fees, security personnel, group benefits
5. *Recoveries.* Heating/cooling, water and special services provided to tenant by property owner.
6. *Repairs.* Appliance, roof sprinklers, parking lot, equipment, glass, windows, key/lock, pool, HVAC, and all supplies. Turnover costs: all make-ready expenses (carpet and other cleaning, paint, countertop, tile/bath, etc.).

onclusion

The purpose of this chapter has been to familiarize the reader with lease provisions and operating characteristics generally representative of major property types. The illustrations have shown that regional economic conditions, market supply and demand, lease terms, tenant credit, investment risk, and the ability of property owners to pass through operating costs are all important considerations in income property analysis. Furthermore, the ability to modify and develop pro forma cash flow statements and to undertake a competitive market analysis serve as the foundations for analysis and for estimating an investment value for properties being sought for acquisition. These latter topics are the topic for chapters that follow.

Key Terms

anchor tenant, *269*
base rent, *258*
commercial real estate, *246*
co-tenancy clause, *274*
concessions, *267*
CPI adjustment, *261*
effective rent, *263*
expense pass-through, *262*
expense stop, *262*
free rent, *259*
industrial and warehouse properties, *247*
institutional real estate, *247*
kick out clause, *274*
lease, *257*
lessee, *257*
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radius clause, *274*
recoveries, *261*
recreational real estate, *247*
rentable area, *262*
right of first refusal, *269*
signage clause, *269*
tenant, *274*
usable area, *268*

Useful Web Sites

www.bls.gov/cpi—Consumer price index site sponsored by the U.S. Department of Labor Bureau of Labor Statistics. This site gives information on different indexes and rates as wells as news releases.

www.reis.com—Provides commercial real estate trends, analytics, market research, and news that support transactions by real estate professionals.

www.leasingprofessional.com/—Source of information about leases, including terminology, sample leases, and links to other sites.

www.GlobeSt.com—Provides current real estate news that is updated daily.

www.naea.co.uk/—This site is hosted by The National Association of Estate Agents (NAEA), which is the UK's leading professional body for estate agency personnel, representing the interests of approximately 10,000 members who practice across all aspects of property services both in the UK and overseas. These include residential and commercial sales and lettings, property management, business transfer and auctioneering.

www.realestate-tokyo.com—This website is good source for Residential and Commercial Real Estate properties in Tokyo. It also offers information on apartments and houses to rent in the Tokyo area, properties for sale, offices for rent, and in general about life in Japan and the real estate market.

http://www.ipdindex.co.uk—This website provides objective measurement and analysis of various properties. The company that runs this website does not invest in the market, and does not offer any direct investment advice, so it tends to be unbiased.

http://www.snl.com/dna/reit/—This website provides fundamental financial data on more than 230 REITs, REOCS and homebuilders. It gives detailed, descriptive property data, cost and performance data and property mapping. It also is a good source for analyst coverage, FFO estimates, proprietary AFFO and NAV consensus estimates.

Questions

1. How may the use of leases shift the risk of rising expenses from the lessor to the lessee?
2. What is the difference between base or face rents and effective rents?

Problems

1. A building owner is evaluating the following alternatives for leasing space in an office building for the next five years:

   Net lease with steps. Rent will be \$15 per square foot the first year and will increase by \$1.50 per square foot each year until the end of the lease. All operating expenses will be paid by the tenant.

   Net lease with CPI adjustments. The rent will be \$16 per square foot the first year. After the first year, the rent will be increased by the amount of any increase in the CPI. The CPI is expected to increase 3 percent per year.

   Gross lease. Rent will be \$30 per square foot each year with the lessor responsible for payment of all operating expenses. Expenses are estimated to be \$9 during the first year and increase by \$1 per year thereafter.

Gross lease with expense stop and CPI adjustment. Rent will be $22 the first year and increase by the full amount of any change in the CPI after the first year with an expense stop at $9 per square foot. The CPI and operating expenses are assumed to change by the same amount as outlined above.

a. Calculate the effective rent to the owner (after expenses) for each lease alternative using a 10 percent discount rate.

b. How would you rank the alternatives in terms of risk to the property owner?

c. Considering your answers to parts (*a*) and (*b*), how would you compare the four alternatives?

2. As CFO for Everything.Com, you are shopping for 5,000 square feet of *usable* office space for 25 of your employees in Center City, USA. A leasing broker shows you space in Apex Atrium, a 10-story multitenanted office building. This building contains 300,000 square feet of gross building area. A total of 45,000 square feet is interior space and is nonrentable. The nonrentable space consists of areas contained in the basement, elevator core, and other mechanical and structural components. An additional 30,000 square feet of common area is the lobby area usable by all tenants. The 5,000 square feet of usable area that you are looking for is on the seventh floor, contains 28,000 square feet of rentable area, and is leased by other tenants who occupy a combined total of 20,000 square feet of usable space. The leasing broker indicated that base rents will be $30 per square foot of *rentable area*.

   a. Calculate total rentable area in the building (excluding lobby).

   b. Calculate the load factor and common area on the seventh floor only.

   c. Calculate the rentable area, including the load factor for common areas on the seventh floor and the total rent per square foot that will be paid by Everything.Com for the coming year if it chooses to lease the space.

   d. Adjust (*b*) assuming that the owner adjusts the load factor for other common areas in the building.

   e. Calculate total rent per square foot, assuming that adjusted load factors are applied to usable area for both the common areas in the building lobby and on the seventh floor.

3. An owner of the Atrium Tower Office Building is currently negotiating a five-year lease with ACME Consolidated Corp. for 20,000 rentable square feet of space. ACME would like a base rent of $20 per square foot with step-ups of $1 per year beginning one year from now. Atrium would provide full service under the lease terms. The owner of Atrium Tower believes that the $20 lease is too low and is trying to negotiate $24 per square foot with the same step-ups. However, Atrium would provide ACME with a $50,000 move-in allowance and $100,000 in tenant improvements (TIs) if the lease at $24 psf is signed.

   a. Assuming that Atrium's owner believes that his required rate of return on investment should be 10 percent per year, is the $24 in rents per square foot combined with the move-in allowance and TIs justified?

   b. Acme informs Atrium that it has 1 year remaining on its existing 20,000-square-foot lease in an older building at $15 per square foot. ACME is willing to pay Atrium $23 per square foot with step ups on the new lease, but is demanding that Atrium "buy out" the old lease in lieu of the moving allowance and TIs. Should Atrium agree to the lease buyout or agree to the lease at $24 per square foot with the move-in allowance and TIs?

4. CAM charges for retail leases in a shopping mall must be calculated. The retail mall consists of a total area of 2.8 million square feet, of which 800,000 square feet has been leased to anchor tenants that have agreed to pay $2 per rentable square foot in CAM charges. In-line tenants occupy 1.3 million square feet, and the remainder is common area, which the landlord believes will require $8 per square foot to maintain and operate each year. If the owner is to cover total CAM charges, how much will in-line tenants have to pay per square foot?

5. A retail lease for 10,000 square feet of rentable space is being negotiated for a five-year term.

   Option A calls for a base rent of $25 per square foot for the coming year with step-ups of $1 per year each year thereafter. CAM charges are expected to be $3 for the coming year and are forecasted to increase by 6 percent at the end of each year thereafter.

   Option B calls for a lower base rent of $23 per square foot with the same step-ups and CAM charges, but the tenant must pay overage rents based on a percentage lease clause. The clause specifies that the tenant must pay 8 percent on gross sales over a breakpoint level of $900,000 per year. The owner believes that the tenant's gross sales will be $850,000 during the first year but should increase at a rate of 10 percent per year each year thereafter.

   a. If the property owner believes that 12 percent rate of return should be earned annually on this real estate investment, which option is best?

   b. What if sales are expected to increase by 20 percent per year?

6. You have been asked to develop a pro-forma statement of cash flow for the coming year for Autumn Leafs, a 200 unit suburban garden apartment community. This community has a mix of 40 studio, 80 one and 80 two-bedroom apartments with current rents of $550, $600 and $800 respectively. Leases with tenants are usually made for 12 month periods. Current rents are expected to remain fixed for the next six months. After that time, rents for each apartment type should increase by $10 per unit, and remain at those levels for the remainder of the year. Ten studios were leased 3 months ago for $500, 20 one bedroom units were leased 2 months ago for $580 and 10 two bedroom units were leased last month for $805. All other units have been leased recently at current rents. All of the previously leased units also are on 12 month leases. When those leases rollover, all are expected to be renewed at market rents upon rollover for an additional 12 months. Presently, 4 studios, 6 one and 6 two-bedroom units are vacant. This vacancy pattern should remain the same for the remainder of the year.

   Autumn Leafs anticipates that during the coming year, it will earn other income from laundry facilities, the awarding an exclusive cable TV contract, parking, plus fees from net deposits, late fees, etc. of $200,000. Autumn Leafs expects to pay total turnover and operating expenses of $400 per month, per occupied unit during the next year. However, it expects to recover some of these expenses for heating and central cooling that it provide to tenants in an amount totaling $100 per month, per occupied unit. During the next year, it is also anticipated that $100,000 will be required for recurring, make ready expenses (carpet, paint, drywall repair, etc.) and another $250,000 will be required for non-recurring items including countertops, parking lot repairs, etc. A total of $10,000 in fees will be paid to Apartment Locator Services, a company who provides marketing services and new tenant for Autumn.

   a. Prepare statement of operating cash flow (NOI) for the coming year.

   b. Add to (*a*) anticipated outlays for recurring and non-recurring and commissions. What will be net cash flow for the coming year?

www.mhhe.com/bf13e

7. **Spreadsheet Problem.** Refer to the effective rent example on page 265 in the book that is replicated in the Ch9 Eff.Rent tab in the Excel workbook.

   a. Suppose the CPI is expected to increase by 4 percent starting in year 2 and remain at 4 percent per year rather than the original pattern that is 2 percent in year 2, 3 percent in year 3, 4 percent in year 4, and 5 percent in year 5. What leases will be affected? What is the new effective rent on these leases?

   b. Supposed that in addition to the change in part (*a*), expenses increase by $1 per year instead of $.50. What leases will be effected? What is the new effective rent on these leases?

Chapter 10

Valuation of Income Properties: Appraisal and the Market for Capital

Introduction

The last chapter introduced property markets, discussed the supply and demand for space, leases, rents, and expense recoveries. It also introduced how concepts affecting users of real estate and locations interact to impact the value of income-producing property. Property value also depends on the cost and availability of capital for real estate investments. In this chapter, we will focus on various methods that can be used to estimate the market value of a property.

Valuation Fundamentals

Market value is a key consideration when financing or investing in income-producing properties. It is defined as follows:

> The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:
>
> 1. Buyer and seller are typically motivated;
> 2. Both parties are well-informed or well-advised, and acting in what they consider their best interests;
> 3. A reasonable time is allowed for exposure in the open market;
> 4. Payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and
> 5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

A property's market value is the basis for the lending decision because the property will be either the full or partial security for the loan. When making investment decisions, the investor will not normally want to pay more than the market value of the property. Similarly, the lender will not want to lend more than a proportion of the market value of the property because if the property must eventually be sold due to foreclosure of the loan, it would probably not sell for more than its market value. In the context of real estate finance, appraisal reports on properties are a part of the documentation required by lenders when considering whether to make mortgage loans. Because lenders and borrowers or investors use appraisals in decision making, they should be familiar with the generally accepted approaches to appraisal or valuation. There are many other instances when estimates of property values must be made after a property is acquired. These include valuations for insurance purposes, property tax assessments, investment performance reports for investors, and so on. These estimates may have to be made annually or even more frequently regardless of whether or not a property is sold. The purpose of this chapter is to explain the appraisal process and the three approaches ordinarily used in valuation.

Appraisal Process and Approaches to Valuation

An appraisal is an *estimate* of value. In making this estimate, appraisers use a systematic approach, referred to as the **appraisal process.** First, they ascertain the physical and legal identification of the property involved. Second, they identify the property rights to be appraised or valued. For example, the property rights being valued may involve fee simple ownership of the property or something other than fee simple such as a leased fee estate. Third, appraisers specify the purpose of the appraisal. Besides an estimate of market value for lending and investment decisions, appraisals are also made in situations involving condemnation of property, insurance losses, and property tax assessments. Fourth, appraisers specify the effective date of the estimate of value. Since market conditions change over time, the estimate must be related to a specific date. Fifth, appraisers must gather and analyze market data, and then sixth, apply appropriate techniques to derive the estimate of value. This process is the main concern of this chapter.

Appraisal Process

Physical and legal identification
⇩
Identify property rights to be valued
⇩
Specify the purpose of the appraisal
⇩
Specify effective date of value estimate
⇩
Gather and analyze market data
⇩
Apply techniques to estimate value

In the appraisal process, a considerable amount of market data must be collected and analyzed. Market data on rents, costs, vacancies, supply and demand factors, expenses, and any other data considered to be an important influence on property values must be collected, summarized, and interpreted by the analyst when making an estimate of value. It is not the intent of this book to cover how to conduct market studies and collect data for making appraisals. In real estate finance, it is more commonly the case that lenders, borrowers, and investors will use the appraisal report to make lending and investment decisions. However, the user must understand the approach used by the appraiser in estimating value. By understanding these approaches, the user will be in a better position to decide whether the appropriate market data have been used and whether appropriate techniques have been used to estimate the value.

The role of appraisals cannot be overemphasized because appraised values are used as a basis for lending and investing. Methods and procedures used in establishing values are thoroughly reviewed and evaluated by lenders to prevent overborrowing on properties and by investors to avoid overpaying for properties. Lenders want to be assured that both the initial property value and the pattern of property value over time exceed the outstanding loan balance for any given property over the term of the loan.

In income property appraisals, at least two of three approaches are normally used: the *sales comparison approach*, the *income capitalization approach*, and/or the *cost approach*. We review the essentials of each approach here to provide insight into the process followed by appraisers in establishing the market value of income property.

Sales Comparison Approach

The **sales comparison approach** to value is based on data provided from recent sales of properties *highly comparable* to the property being appraised. These sales must be "arm's-length" transactions, or sales between unrelated individuals. They should represent normal market transactions with no unusual circumstances, such as foreclosure, sales involving public entities, and so on. In short, when market value for a property is established, current transaction prices are important benchmarks to use because they indicate what investors have paid to acquire properties.

To the extent that there are differences in size, scale, location, age, and quality of construction between the project being valued and recent sales of comparable properties, adjustments must be made to compensate for such differences. Obviously, when this approach is used, the more differences that must be adjusted for, the more dissimilar are the properties being compared, and the less reliable the sales comparison approach. The *rationale for the sales comparison approach* lies in the principle that an informed investor would never pay more for a property than what other investors have recently paid for comparable properties. Selection of data on properties that are truly comparable along all important dimensions, and that require relatively minor adjustments because of differences in building characteristics or locational characteristics, is critical to the successful use of this approach.

In developing the sales comparison approach to valuation, the appraiser summarizes and uses sales transaction data on comparable properties from the market area analysis in the development of expected rents and value estimates for the property being appraised. Exhibit 10–1 illustrates an example of some of the data that could be used in the development of a sales comparison approach for a hypothetical small office building and three comparable properties.

Based on the data developed from the market area analysis shown in Exhibit 10–1, we see that the subject property being appraised is very comparable to three small office buildings that have recently sold. A careful analysis of the data reveals relatively minor deviations in gross square footage, location, front footage on major streets, construction type and quality, parking space, and age of structures. The procedure that may be used to estimate value via the sales comparison approach is to attempt to adjust for the deviations between

EXHIBIT 10–1
Market Area Analysis and Sales Data (sales comparison approach, hypothetical office building)

Item	Subject Property	Comparable Properties 1	2	3
Sale date	—	Recent	1 year ago	2 years ago
Price	—	$355,000	$375,000	$413,300
Gross annual rent	—	$58,000	$61,000	$69,000
Gross square feet	13,300	14,500	13,750	15,390
Price per square foot*	—	$24.48	$22.27	$26.86
Rent per square foot*	—	$4.00	$4.44	$4.48
Proximity to subject†	—	2 mi.	2.5 mi.	3.5 mi.
Frontage lineal feet	300	240	310	350
Number floors	2	2	2	2
Number elevators	1	1	1	1
Age	New	3 yrs.	4 yrs.	6 yrs.
Exterior	Brick	Brick	Stucco	Brick
Construction§	Average	Average	Average	Average
Landscaping§	Average	Average	Average	Average

*Gross square footage (rounded).
†In this example the subject property is considered to be at the best location, and locations further away are less desirable.
§Quality.

EXHIBIT 10–2
Adjustments from Comparables to Subject Property

	Comparable Properties 1	2	3
Sale price	$355,000	$375,000	$413,300
Square footage	14,500	13,750	15,390
Sale price per square foot	$ 24.48	$ 27.27	$ 26.86
Adjustments:			
Sale date	—	+4%	+7%
Square footage	−5%	−4%	−12%
Location	−7%	+12%	+15%
Frontage	+10%	−14%	−15%
Age of structure	+8%	−10%	−15%
Net difference	+20%	+8%	−1[illegible]%
Adjusted price	$426,000	$405,000	[illegible]
Adjusted price per square foot	$ 29.38	$ 29.45	$ [illegible]
Estimated price per square foot for subject	= $ 29.50		
Indicated market value $29.50 × 13,300 square feet	= $392,350		

the property being appraised and the comparables. This adjustment can usually be accomplished in one of two ways. The price per square foot paid for each comparable can be adjusted to determine the market value for the subject, or the relationship between gross rental income and sale prices on the comparable can be applied to the subject with appropriate adjustment. Exhibit 10–2 shows how the price-per-square-foot adjustment could be carried out.

Such adjustments on a square footage basis require adjustments for any major physical or locational deviations between the property being valued and the comparables recently sold. Adjustments on the square footage cost should be made *relative to* the property being valued; that is, the comparable data must be adjusted as though one wants to make the comparables identical to the subject property. Positive features that comparables possess relative to the subject property require negative adjustments, and negative features require positive adjustments. The appraiser makes all percentage adjustments based on knowledge of current market values and how various favorable and unfavorable attributes of comparable properties would affect the value of the subject. When adjusting for age differentials, front footage, or differences in the percentage of leasable square footage, the appraiser must be able to estimate the value of such attributes and how the addition or deletion of those attributes affects the value of properties. It should be stressed that the *cost* of these attributes should not always be added or subtracted to ascertain value. This is because buyers of properties establish what the value of each attribute of a property is and how each attribute interacts with others. Hence, the appraiser should be concerned with the effect that the addition or deletion of an attribute will have on total property value, holding all other attributes constant. In other words, the appraiser is concerned with the marginal change in value. This marginal change in value may not correspond to the cost of adding or deleting an attribute. *This is a subjective process and such adjustments should be justified with evidence based on recent experience with highly comparable properties; otherwise, serious errors can result.*

In the above example the price of each of the comparable properties was divided by the number of square feet of the building to adjust for differences in the size of the property. This adjustment was made under the assumption that the price for an office building is directly related to its size in square feet. In this case the price per square foot is considered a **unit of comparison.** Other examples of units of comparison are number of apartment units in an apartment building and number of cubic feet in a warehouse.

Income Approach

This approach to property valuation is based on the principle that the value of a property is related to its ability to produce cash flow. When attempting to estimate value using this approach, the analyst must take into account the many market influences that affect cash flows as well as extracting data from the sale of competitive properties deemed comparable to the property being evaluated. In this section, three techniques commonly are discussed. Two of the techniques, the gross income multiplier and direct capitalization methods, rely heavily on current market transactions involving the sale of comparable properties. These techniques resemble the sales comparison method discussed in the previous section in many ways. The focus of these techniques is to determine a market value that is consistent with prices being paid for comparable properties trading in the marketplace. However, rather than giving priority to adjusting for differences in value by adding and subtracting directly from the prices of comparable properties for physical and locational attributes, these two methods tend to focus first on the income-producing aspect of comparable properties relative to the prices at which they were sold. Adjustments are then made for physical and locational dissimilarities.

The third income capitalization technique discussed in this section is the discounted present value method. This method differs considerably from the gross income multiplier and direct capitalization techniques in that a forecast of future income production and expected investment return is used. The point of view utilized is more like that of an investor trying to value properties by using a technique that incorporates many of the same steps and information that he would use to make an investment decision. The following is a discussion of these three techniques.

Gross Income Multipliers

One technique used in conjunction with the income capitalization approach to valuation is to develop what are referred to as **gross income multipliers.** These are relationships between gross income and sale prices for all comparable properties that are applied to the subject property. This technique also requires that an estimate of the gross income be made for the subject property. The gross income multiplier (GIM) is defined as

$$GIM = \frac{\text{Sales price}}{\text{Gross income}}$$

or simply the ratio of sale price to gross income. Such multipliers are developed for the properties comparable to the office building being valued. In this case, gross income can be considered a unit of comparison. From the data developed in Exhibit 10–3, we can see that the *GIMs* range from 5.99 to 6.15, which means that the comparable properties sold for 5.99 to 6.15 *times* current gross income. If the subject property is comparable, it too should sell for roughly a price that bears the same relationship to its gross income.

In arriving at a value for the subject property, the appraiser must develop an estimate of gross income based on the market data on comparables shown in Exhibit 10–3. For the comparable properties the gross income should be annual income at the time the property is sold (i.e., what it will be during the first year for the purchaser). Similarly, gross income for the subject will be for the first year of operation after the date for which the property is being appraised.

Some appraisers use **potential gross income** (which assumes all the space is occupied) when developing *GIMs*. Others use **effective gross income,** which is based on occupied space (potential gross income less vacancies). The results should be similar if the appraiser is consistent for the comparable and subject properties. If there are significant differences in the vacancy rates among the comparable properties, then using effective gross income may be more appropriate. Of course, this may indicate that the properties are not really very comparable and may be in *different market segments.*

This method relies on gross income. Therefore, an additional assumption critical to the use of this method is that the operating expenses are about the same proportion of gross income for all properties. In many situations, particularly when smaller, older properties are being valued, information regarding operating expenses may not be available. If for some reason this assumption is not valid, then this technique should not be used.

Care should be taken here to ensure that significant changes in *lease agreements* are not expected to occur. For example, if a major increase in rent is expected on a comparable due to a lease expiration in the near future, this must be taken into account and adjusted for. In addition to comparability in physical attributes, location, and leases, it is also assumed that no material differences in operating expenses exist between comparables. If material differences do exist, this technique should not be relied on.

From the range of *GIMs* shown in Exhibit 10–3, the appraiser also must select an appropriate *GIM* for the subject property. This is done by observing the range of *GIMs* for the comparable properties, as shown in Exhibit 10–3. Rather than simply averaging the *GIMs* in the table, the appraiser would normally give more or less weight to a particular comparable when choosing a rate to apply to the subject property. For example, the appraiser [illegible]

EXHIBIT 10–3
Development of *GIM* (comparable properties)

	Subject Property	Comparable Properties		
		1	2	3
Sale price	?	$355,000	$375,000	$41[illegible]
Current gross income	$36,600	58,000	61,000	69,000
GIM	?	6.12×	6.15×	5.99×

believe that of the three comparable properties, the third one should be given the most weight because it was the most recent sale. Thus, the appraiser might believe the *GIM* should be closer to that for the second and third comparable properties. The experience and judgment of the appraiser are important parts of this process. Assuming that the appraiser chooses a *GIM* of 6 times as "appropriate" for the subject property, its indicated value would be \$59,185 times 6 or \$355,110.

Capitalization Rate

In cases where it is suspected that differences in operating expenses exist between comparables, the focus of the analysis should be shifted from gross income multipliers to *net operating income* (*NOI*). Additional financial information that may be used in this analysis is summarized in Exhibit 10–4. This information centers on aspects of the net operating income-producing capability of the subject property and the three properties selected as comparables from market transactions data.

As shown in Exhibit 10–4, the price, rent, and operating expense ratios have been obtained from brokers who were involved in the sale of the comparable properties. (Data were obtained with the permission of the buyer and seller of the comparable properties.) In each case, the **net operating income (*NOI*)** was obtained by subtracting operating expenses from rents reported on the comparables at the time of sale. The reader should note the definitions used to identify all items of rent, income, and expenses in Exhibit 10–4. After determining the *NOI*, it is then divided by the transaction price to obtain what is defined in the industry as the **capitalization rate** (sometimes referred to as the "cap rate" and designated as *R*) for the three comparable properties. Note that the cap rates, or *R*s, for the three comparables range from .084 to .099.

Given that the *NOI* for the subject property is \$36,600, we would like to determine its value using the following relationship:

$$\text{Value} = NOI \div R$$

By substituting \$36,600 for *NOI* for our subject property and dividing by an *estimate* of *R* which we obtain from the comparable sales data, we hope to estimate the value for the office building that we are analyzing. The question is which *R* should be selected from which comparable sale? Should we select an average of three *R*s, or put more weight on some of the comparables than others?

The best procedure to follow at this point is to choose an *R* based on a careful reexamination of the data in Exhibits 10–1 through 10–4 to determine the comparables that are *most* like the subject property. To complete this example, if the subject is more closely related to comparables (2) and (3), then an *R* ranging between .094 and .099 is probably warranted. Assuming that comparable (2) is most similar and .095 is chosen, then the value for our subject may be estimated as follows:

$$\text{Subject property value} = \$36{,}600 \div .095$$
$$= \$385{,}263$$

Further Interpretation—Application and Limitations

Essentially, this method uses income and expense data from current sales comparisons as market *benchmarks*. This only assures that if a price of \$385,263 is paid for the subject property, this price appears to be reasonable, or "in-line" with prices currently being paid for comparable properties. In this case, buyers of properties should not expect to pay less or sellers expect to receive more than this estimated market price. It should be stressed, however, that this approach to valuation *does not assure that this property will be a good investment if purchased.* It only assures the buyer that it is a competitive

EXHIBIT 10–4
Income, Expense, and Price Relationships

	Subject Property	Comparable Properties 1	Comparable Properties 2	Comparable Properties 3
Price	?	\$355,000	\$375,000	\$413,300
Effective gross income	\$60,000	58,000	61,000	69,000
% operating expense	39%	48%	42%	41%
NOI	36,600	30,160	35,380	40,710
NOI ÷ Price = (*R*)	?	.084	.094	.099

Definitions of Common Income and Expense Items

Rental Income at Full Occupancy. An estimate of revenues expected to be received from existing tenants based on lease terms plus any vacant space priced at market rents.
\+ **Other Income.** Examples may include revenues from parking, laundry and cable TV fees, application fees, net deposits, etc.
= **Potential Gross Income (PGI).** Total cash flow possible from all sources and activities relative to the property ownership.
− **Vacancy and Collection Losses.** Estimated rent losses from unoccupied space or due to unpaid rents and losses from other sources.
= **Effective Gross Income (EGI).** All sources of potential income less vacancy and collection losses.
− **Real Estate Taxes.** Based on assessed value by the county and/or other tax assessing entities.
− **Insurance.** Property owners usually provide for insurance on the premises (building, parking lots, etc.) for property damage and for personal injury.
− **Utilities.** Cost of electric, water, etc., that may be paid in full or part by property owners, depending on lease terms.
− **Repair and Maintenance.** Estimates of cash outlays for recurring items expected to be replaced within three years or less of economic use.
− **Administrative and General.** Allocations of costs for personnel and expenses from an off-site activity. That is, a real estate company with many properties under its ownership may allocate a percentage of certain costs (e.g., human resources, payroll, accounting) to the operating expenses of its individual properties.
− **Management and Leasing Expenses.** Supervisory on-site management employees who lease, collect rents, pay expenses, etc. These may be the employees of the property owner or include payment by the property owner for services outsourced to other companies who specialize in property management and leasing and earn fees and commissions.
− **Salaries.** On-site employees who maintain, "make ready," and repair the property.
= (*NOI*) **Net Operating Income.** An annual estimate of the net operating income resulting from the compilation of all of the above items.

market price and that if the method is applied correctly, the buyer is probably not overpaying or underpaying for the property relative to what other investors have paid for similar properties. The question of *whether or not it is a good investment will depend on the future growth in rents, income, and property values.* These aspects are not specifically considered as a part of this or the gross income *multiplier* technique and, therefore, no conclusions can be drawn as to the *investment potential* of this property. That must be determined by estimating the future course of the economic base in the market in which the property is located—the leases, rents, expenses, major repairs, and so on. We will consider these factors when we address *investment analysis* in the next chapter.

Capitalization Rate—A Note of Caution

The above discussion of direct capitalization that concerns the relationship between value and *NOI* and cap rates derived from comparable sales is an important one. However, it must be stressed that when direct capitalization is used, properties chosen as comparables must be *truly comparable* to, and/or competitive with, the property under consideration for investment. The term *comparability* means very similar in quality, of construction, size, age, functionality, location, and operating efficiency. It also means comparability in terms of lease maturities, lease options, rent escalators, and any other major lease attributes such as easements, title restrictions, and so on. While these attributes may be similar for many property investments, they may not be for many other investments. An example of the importance of the latter might be two office properties that have sold at the same time and that are locationally and functionally comparable. However, one office property may be leased by *four* tenants on a long-term lease basis with many lease options, and the other property may be leased to 30 small tenants with shorter-term average lease maturities and with many other different lease characteristics. It may be possible that the *NOI*s for the two properties were similar when they were sold. However, because of the differences in the *leases* and *attendant risk*, the prices for both, and therefore the cap rates, should be different. This also means that if an investor chooses to develop a cap rate (R) based on these two sales to use in pricing a property being considered for purchase, many adjustments will have to be made to reflect differences in the leases, in addition to any additional differences in physical, locational, and other attributes among the comparables. Making such adjustments is not always easy. As a result, assigning the "correct" cap rate is difficult and an incorrect one could result in a serious pricing error.

Another area of caution has to do with the treatment of capital outlays for any necessary replacement of building components that are nonrecurring or nonoperating in nature. Other items such as tenant improvements and commissions should also be accounted for. When making estimates of value based on the *NOI* obtained from the sales of comparable properties, the reader *must* determine whether or not, or how, outlays for tenant improvements and capital requirements were included in the data. *Industry practice varies on this issue.* Many appraisers estimate an *annual average outlay* for such items and adjust *NOI* downward by deducting such outlays much like an annual expense. In cases where properties are *highly comparable*, this practice may not materially affect the estimate of value as long as its treatment is consistent for all properties being used in the analysis. However, when properties used in this approach are somewhat dissimilar in that material differences in outlays of a nonrecurring nature are expected, then the reader must make adjustments for such items. If such adjustments are believed to be material and difficult to make, then this generally implies that the properties in question may really not be that comparable. Therefore, the results of this approach should be interpreted with caution.

When is it appropriate to use direct capitalization? Cap rates are important market benchmarks that are widely used in the real estate industry. However, it should be stressed again that estimating a property's value on a forecast of *NOI* for only one year and applying a cap rate generated from data collected on the sales of comparable properties can prove to be problematic.

Discounted Present Value Techniques

This final income capitalization technique is based on the principle that investors will pay no more for a property than the present value of all *future NOIs*. Finding the value for a property that is expected to produce income over a very long economic life requires many assumptions and in-depth knowledge of discounted cash flow techniques and *approximations* that make finding present values over long economic lives manageable. It is also necessary to understand the assumptions underlying present value mechanics when such

EXHIBIT 10–5
Ten Year *NOI* Forecast, Hypothetical Hills Apartments

Year	NOI	% Growth	Year	NOI	% Growth
1	$338,800	—	6	416,127	3
2	355,740	5	7	428,611	3
3	373,527	5	8	441,469	3
4	388,468	4	9	450,299	2
5	404,007	4	10	459,304	2

approximations are used. For these reasons, most professionals who value properties prefer to use direct capitalization or one of the sales comparison approaches when possible. However, this method is used by professionals when necessary. To illustrate this method we use an apartment example. Our forecast of *NOI* is made for a time period during which we can foresee any material change in market supply or demand conditions that could affect rents. In short, we want to forecast and analyze cash flow over a period for which we have knowledge regarding existing tenants, lease terms, and supply and demand market conditions.

Forecasting NOI

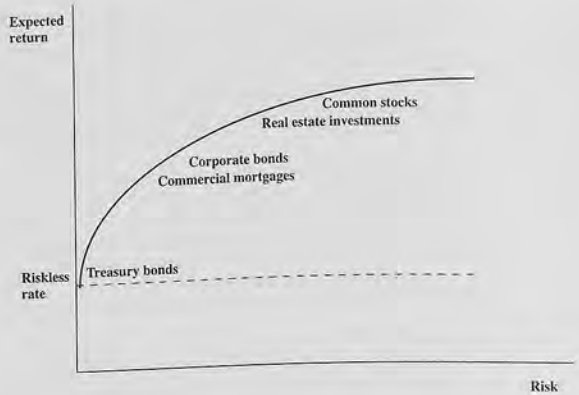
Based on our knowledge of market supply and demand, lease terms, as well as income and expenses, we have made a forecast for the Hypothetical Hills apartment complex. We believe that a forecast for a 10-year period is appropriate and this forecast is shown in Exhibit 10–5. We believe that because Hypothetical Hills is relatively new and unique in terms of both location and design, there are very few comparable properties that have been sold recently with which to compare it. Therefore, the sales comparison method described in the preceding section may not produce a reliable estimate of value. In our forecast, we believe that vacancy rates for Hypothetical Hills will remain below average relative to other apartment properties. Furthermore, the sales comparison method would probably not be useful because our estimate that cash flows are expected to grow at an *above-average* rate ranging from 5 percent to 3 percent for the first seven years is not characteristic of growth expected for other apartment investment opportunities. *NOI* will then stabilize at a long-term rate of about 2 percent in year 9 and thereafter. We also believe that this 2 percent growth rate will eventually become consistent with long-run supply and demand conditions and those for competing apartment projects. Based on our forecast of cash flows and knowledge of market conditions, we conclude that other apartment properties are not as comparable as would be desired in order to use the sales comparison method.

Selection of a Discount Rate (r)

After estimating *NOI* over an expected period of analysis in the preceding section, step 2 in the present value approach to income capitalization requires the selection of a **discount rate** or **required internal rate of return** (r) over the investment period. Conceptually, this discount rate should be thought of as a required return for a real estate investment based on its risk when compared with returns earned on competing investments and other capital market benchmarks. For example, if the period of analysis is 10 years for our prospective real estate investment, the discount rate selected should be greater than (1) the interest rate on a 10-year U.S. Treasury bond, (2) the interest rate on a 10-year commercial mortgage loan, and (3) the weighted average of corporate bond rates, or the borrowing rates for tenants in the property being evaluated.[1] A risk premium for real estate ownership also

[1] This is because when properties are leased, tenants are, in a sense, substituting lease obligations created by renting for loans that would be used if tenants chose to build and finance properties using bank debt. Therefore, in addition to credit risks, because real estate investors take the added risk associated with operating real estate, they should earn a return greater than the interest rate that tenants would otherwise pay on mortgage debt. If real estate investors could not earn more than this rate, real estate investors would be better off being lenders and making loans to tenants.

EXHIBIT 10–6
Risk and Return Trade-off by Type of Investment



its attendant risks related to operation and disposition should also be included to arrive at a reasonable discount rate. Exhibit 10–6 depicts the above discussion conceptually in terms of expected returns relative to the risk that may be expected on different asset classes. In the case of income-producing real estate, the diagram indicates that expected returns should be above expected returns for Treasury bonds, commercial mortgages, and corporate bonds, but below those expected returns on riskier common stocks. It should be stressed, however, that this conceptualization depicts the average returns for all income-producing real estate as a sector. Risk on individual properties may be higher or lower than risk relative to the "average" property; therefore, expected returns on individual properties may be greater or less than this average. In our example, after considering the risk on other competing properties, we have selected 12 percent as the internal rate of return that we should expect to earn if we invest in the Hypothetical Hills Apartments.

Thus far, we have completed three of the *four* steps that we need in order to estimate present value, that is:

1. A forecast of *NOI*.
2. Selection of a relevant period of analysis or the **holding period** for the investment.
3. Selection of a discount rate or required rate of return (r) for the period selected in (2).

In the fourth step, we must deal with the present value of expected *NOI beyond the 10-year period* of analysis. We will represent these cash flows with a **reversion value** (*REV*) or *resale price*. Returning to our estimate of cash flow in Exhibit 10–5, note that we have estimated that *NOI* will *stabilize* from year 8 and beyond at a rate of 2 percent per year. In our example, we assume that the property value or *REV* will be established at the end of year 9. As you will see, this will require a cash flow forecast beginning in year 10 and a long-term growth assumption from that point until the end of the economic life of the property. In making this estimate for *REV*, we make the following major assumptions:

1. The demand for apartments in this market region will tend to grow in a stable, long-term relationship with growth in the U.S. economy.
2. There will be no *major* or *structural* changes in the determinants of supply and/or demand for apartments from year 10 and thereafter.
3. If these assumptions cannot be made, a year-by-year forecast of *NOI* beyond year 10 must be made until a period of stability is expected to be reached.

Using Approximations to Estimate Reversion Values

At this point, the reader is probably wondering how the value for *REV* will be estimated at the end of year 9, particularly for an asset such as Hypothetical Hills, a new apartment community that is expected to have a long economic life, perhaps 50 years or more. The following are three techniques that are used frequently to do this.

(A) Developing Terminal Cap Rates Based on Expected Long-Term Cash Flows

Clearly, forecasting cash flows each year from year 10 through 50 would not be practical. One approach that could be used is to *approximate* the present value of cash flow for the remaining economic life of the asset by using a **terminal cap rate (R_T)**. This approach may be used only under very restrictive assumptions regarding the pattern of cash flow that is expected from the end of the holding period through the end of the useful life of the asset and its relationship to the required rate of return (r) that investors expect to earn on investment. These are:

Case 1: $R_T = (r - g)$ when average long-run growth (g) in *NOI* is expected to be *positive*.
Case 2: $R_T = (r)$ when long-run growth (g) in *NOI* is expected to be level or zero.
Case 3: $R_T = (r + g)$ when average long-run growth (g) in *NOI* is expected to be negative or decline.

Depending on the long-run scenario chosen for the remaining economic life *after* the holding period, an estimate for g must be selected in order to estimate *REV*. In our case, we have estimated that from year 10 until the end of the economic life, *NOI* will tend toward an average growth rate (g) of 2 percent per year. Based on this set of assumptions, the reversion value (*REV*) for Hypothetical Hills Apartments at the end of year 9, based on a 10-year projection period, can be approximated as follows:

$$REV_9 = (NOI_{10}) \div (r - g)$$

This means that the estimated resale price or reversion value REV_9 is equal to *NOI* in year 10, which is shown in Exhibit 10–5 as \$459,304 divided by r, which is the 12 percent discount rate or required rate of return that we have selected, minus the stabilized or long-term expected growth rate in cash flow, designated as g, or 2 percent. The relationship $(r - g)$ in period 9 is also referred to by industry practitioners as a *terminal* capitalization rate, designated as R_T.

$$REV_9 = NOI_{10} \div (R_T) \qquad \text{Note: } R_T = (r - g)$$

$$REV_9 = \$459{,}304 \div (.12 - .02) \qquad R_T = .10$$

$$REV_9 = \$459{,}304 \div .10, \text{ or}$$

$$REV_9 = \$4{,}593{,}040$$

Now that we have estimated the reversion value in year 9, or REV_9, which is the present value of expected cash flows from year 10 through the end of the expected economic life of the property, we can now estimate the present value for the property over its *entire economic life* beginning in year 1, as shown in Exhibit 10–7.

To summarize, the present value (*PV*) of estimated cash flows for this property can be illustrated as:

$$.370792PV = 1,853,962$$

$$PV = 5,000,000$$

Thus, the present value[2] would be \$5,000,000. In cases where we assume that growth in *NOI* and property value will be the same, this also implies that the capitalization rate will be constant over time; that is, at any point in time the ratio of income to value will be the same, 10 percent. In these examples, *NOI* during year 1 was \$500,000 and the value was estimated to be \$5 million, which results in a 10 percent current, or what real estate investors may refer to as the "going in," capitalization rate.

According to the same analysis, it should follow that if we know that the value of the property is \$5 million, then holding all else constant, the assumptions in this problem imply a resale price at the end of a five-year holding period of \$5,796,370, or \$5,000,000 $(1 + .03)^5$. As we have seen, this figure can be obtained either by discounting the *NOI* over the remaining economic life (year 6 forward) at a 13 percent rate or by compounding the initial value at a 3 percent rate over the five-year holding period.

Finally, the reader may have realized that in the example above we could have obtained the going-in capitalization rate of 10 percent by the same $r - g$ relationship discussed previously for the terminal capitalization rate. That is, $R = r - g$, or $R = 13\% - 3\% = 10\%$. The value would then be found by dividing the year 1 *NOI* by *R*, or \$500,000/.10 = \$5,000,000. This works in this example because it was assumed that *NOI* and value changed at the same compound rate (3 percent) each year. But the approach outlined here is more general and may be used when income and value are expected to grow at different rates.

Land Values: Highest and Best Use Analysis

In this section, we raise the question "What determines land values?" What causes land prices to move up and down? There is a framework underlying the process that should help us to better understand land markets and their relationship to supply, demand, vacancies, and rents. To illustrate, we consider an example of a new office building on a site that is expected to produce *NOI* of \$500,000 for the coming operating year. The improvements are expected to last 75 years and *NOI* is expected to *grow* each year by 3 percent and investors expect an *IRR* of 13 percent. We would value the property as:

$$PV = \frac{NOI_1}{r-g} \text{ or } \frac{NOI_1}{R}$$

$$PV = \frac{\$500,000}{.13 - .03} \text{ or } \frac{\$500,000}{.10}$$

$$PV = \$5,000,000$$

In our example, an office building on the site would produce \$500,000 in year 1 and grow at 3 percent (g) per year thereafter. Investors in similar office buildings are expecting 13 percent (r) on their investment and/or comparable office buildings are trading based on cap rates (R) of 10 percent, thereby producing a present value of \$5,000,000. Now assuming that a new building would cost \$4,000,000 to construct, the implied, or residual, land value would be \$5,000,000 − \$4,000,000 or \$1,000,000. The idea here is that the **residual land value** is the difference between total property value which is driven by rents and cash flows, and the cost of constructing an improvement on a given site.

[2] Note that .629208 (*PV*) results from 1.03^5 (*PV*) *PVIF*, 13%, 5 yrs., or 1.159274 (*PV*).542760.

Volatility in Land Prices

It may be useful to introduce at this point the causes of land price volatility. Many readers can probably relate to times when land prices in certain areas increase suddenly, and then subside and perhaps increase again. One observation may be that it is simply investor speculation causing such price fluctuations. While this may be the case from time to time, it is more likely that a fundamental change in a location has occurred, or is expected to occur, thereby changing one of the variables in our present value equation. To illustrate, we return to our office property example discussed earlier and two alternative scenarios for expected *NOI*.

Recall that expected *NOI* for our office property was \$500,000 and the land value was \$1,000,000. If we assume that because of unanticipated demand, our initial estimate of rents and hence, *NOI* increases by 10 percent to \$550,000, holding all else constant, total property value would rise to \$5,500,000. However, building construction costs would be unaffected in the short run and remain at \$4,000,000, thereby producing a land value of \$1,500,000. The latter value represents a 50 percent increase in land value given only a 10 percent increase in expected *NOI*. Conversely, if *NOI* was initially overestimated and declined to \$450,000, then the value would fall to \$4,500,000 and cause land value to drop 50 percent. Similarly, if in addition to the difference in initial *NOI* other changes in our present value equation were to occur (such as higher or lower growth rates, g), the resultant effect on land value could be more pronounced. These changes in expected *NOI* and/or expected values for r and/or g are the basic causes of volatility in land prices.

"Highest and Best Use" Analysis

One additional use of the land residual method of valuation is to establish the type of property improvement that should be developed on the land. In our example, we used an office project; however, would the land be better used for a retail, warehouse, or apartment project? The answer lies in determining what use will provide the ***highest total land value***. This analysis is also called the **highest and best use** of the land. For example, in Exhibit 10–8, we provide estimates of *NOI* for each property type that *could* be developed on the Albert tract currently for sale at a price of \$1,000,000. We assume that a market study has been conducted, that rents and expenses have been estimated, and that investors must have a rate of return consistent with the risk associated with the possible uses shown in Exhibit 10–8.

Results in Exhibit 10–8 indicate that a retail project would be the highest and best use of the Albert tract. Such a property would be expected to produce a total property value of \$7,500,000 and an implied land value of \$1,500,000. If the asking price for the land is \$1,000,000, then a developer can immediately realize value by developing a retail project (or by building the retail project for \$7,000,000 and selling for \$7,500,000). In summary, it

EXHIBIT 10–8 Highest and Best Use Analysis—Albert Tract

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Use	(a) Year 1 *NOI*	(b) $(r - g)$	(c) *R*	$(a \div c = d)$ Implied Property Value (*PV*)	(e) Bldg. Cost*	$(d) - (e)$ Implied Land Value (residual)
Office	\$500,000	.13 − .03	.10	\$5,000,000	\$4,000,000	\$1,000,000
Retail	600,000	.12 − .04	.08	7,500,000	\$6,000,000	1,500,000
Apartment	400,000	.12 − .03	.09	4,444,444	\$3,000,000	1,444,444
Warehouse	400,000	.10 − .02	.08	5,000,000	4,000,000	1,000,000

*Building costs include a profit to the developer.

is the *expected use* of the land and its future income that determine its value. As developers and investors envision what will bring the highest property value, competition for sites and prices paid based on expected site developments will ultimately determine land values. Land value is determined by its highest and best use.

Mortgage-Equity Capitalization

In our recent discussion, value was found by discounting the *NOI* and resale proceeds for the property. The discount rate chosen was called a "free and clear" discount rate; that is, it did not consider whether the property was to be financed, for example, or how much debt versus equity was used. In effect, we discounted the entire income available from the property as though the investor were paying cash for the entire purchase price. We did not consider the possibility of financing and how that income may be split among holders of debt (mortgage lenders) and equity investors. When financing is considered, the discount rate used to value a property subject to debt must be consistent with this assumption; that is, the discount rate must reflect rates of return expected on equity invested. As we will see in Chapter 13, it must reflect the *risk* associated with financial leverage. We now discuss how the value of a property can be estimated by explicitly taking into consideration the requirements of the mortgage lender and equity investor—hence the term **mortgage-equity capitalization.**

This method for estimating value is based on the concept that total value (V) must be equal to the present value of expected mortgage financing (M) and the present value of equity investment (E) made by investors. That is,

$$V = M + E$$

To illustrate, suppose the *NOI* for a small income property is expected to be $50,000 for the first year. Financing will be based on a 1.2 *DCR* (debt coverage ratio) applied to the first-year *NOI*, will have an 11 percent interest rate, and will be amortized over 20 years with monthly payments. We will see in Chapter 11 that financing for real estate income property is frequently based on a target first-year debt coverage ratio. The *NOI* will increase 3 percent per year after the first year. The investor expects to hold the property for five years. The resale price is estimated by applying an 11 percent terminal capitalization rate to the sixth year *NOI*. Investors require a 12 percent rate of return on equity (yield rate) for this type of property. Note that the discount rate of 12 percent and terminal capitalization rate of 11 percent imply an average annual compound growth in income after year 5 (for the remaining economic life of the property) of 1 percent per year. This is less than the 3 percent growth assumed for the first five years. As we have discussed, growth rates and capitalization rates can change over time.

We first determine the annual debt service (DS) as follows:

$$DS = NOI_1 \div DCR$$

$$DS = \$50{,}000 \div 1.20 = \$41{,}667$$

This equation results in a monthly mortgage payment of $41,667 ÷ 12 = $3,472.22. The amount of the mortgage can be found by discounting the monthly payments at the mortgage rate of 11 percent over the 20-year term. The amount of the mortgage can be thought of as the value of the mortgage (M) assuming that 11 percent is the current market rate for the mortgage.

We can now project the cash flows over a five-year holding period as follows:

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	Operating Years					
	Year					
	1	2	3	4	5	6
NOI	$50,000	$51,500	$53,045	$54,636	$ 56,275	$57,964
DS	41,667	41,667	41,667	41,667	41,667	N/A*
Cash flow	$ 8,333	$ 9,833	$11,378	$12,969	$ 14,608	
Resale:						
Resale in year 5					$526,945	
Less mortgage balance					305,495	
Cash flow					$221,450	
Total cash flow	$ 8,333	$ 9,833	$11,378	$12,969	$236,058	

*Shown only to estimate the resale price at the end of the five-year holding period.

The present value of the cash flows in this example at a 12 percent discount rate is $165,566. This represents the value of the equity investors' interest in the property (E). The total property value (PV) can now be found by summing the value of the mortgage (M) and the value of the equity (E). We have

$$PV = M + E$$

$$PV = \$336{,}394 + \$165{,}566$$

$$PV = \$501{,}960$$

The above value implies a going-in capitalization rate of about 10 percent ($50,000 ÷ $501,960). Note that this is less than the 11 percent rate used to estimate the resale price. As emphasized previously, the capitalization rate can change over time depending on assumptions about how income will change after the property is sold.

We can also calculate the first-year equity dividend rate based on the above equity value. (Recall that the equity dividend rate is equal to the first-year cash flow to the equity investor divided by initial equity investment.) The equity dividend rate is equal to $8,333 ÷ $165,566, or about 5 percent. Also, the loan-to-value ratio implied by the estimated value is $336,394 ÷ $501,960, or 67 percent.

We must emphasize that in the above formulation, proceeds to be realized by the equity investor are discounted at an investment yield rate (k), which is not the same "free and clear" rate (r) that was used for discounting *NOI*, because the equity that an investor is willing to invest in a project is equal to the discounted value of all cash returns to be realized on *equity* investment and not *total* investment. When attempting to estimate E, an estimate must be obtained for k, or the before-tax internal rate of return (*BTIRR*) investors expect to realize on their equity over the entire period of investment. In the previous cases, no leverage was assumed. Hence, the discount rate, r, reflects the required return on a total investment, or "all cash" basis, because the investor did not use any debt financing. For this reason we would also expect k to be greater than r because of the increased risk to the equity investor when financing is used.

As indicated previously, determining the mortgage interest rate and other mortgage terms and what percentage of value lenders would be willing to lend on a particular property is relatively straightforward. However, estimating the internal rate of return on equity (k) that investors expect to earn over an expected period of ownership is more complex. We do not normally know what cash flows were being estimated by an investor when a comparable property was purchased. Furthermore, k based on *historical data* may not be indicative of *future* trends. A few general guidelines, however, can be followed when estimating k.

1. We know that the risk premium should be *greater* for an equity investor than it would be for the mortgage lender. This equity position is riskier because the equity investor takes more risk than the mortgage lender since all debt-service (*DS*) requirements must be paid from *NOI* before the equity investor realizes any *BTCF* (before-tax cash flow). Also, because the property serves as security for the loan, the lender has first claim against proceeds from the sale of a property; that is, the mortgage balance must be paid from the proceeds from sales before any cash is received by the equity investor. Hence, the equity investor is in a residual position, or one in which the claims of the lender must be met before the equity investor receives any return.

2. We know that the rate of return required by an equity investor (k) should be higher than that for the entire property (r) because of the risk associated with financial leverage.

3. When the required investment yield on equity is estimated for a particular project, yields on other investments such as corporate bonds and stock can serve as a point of reference for estimation. Of course, adjustments must be made for differences in risk between the property being valued and any benchmark or average yields developed from other markets.

Reconciliation: Sales Comparison and Income Capitalization Approaches

Based on the preceding discussion, it is obvious that both the sales comparison and income capitalization approaches to valuation have positive and negative aspects in their respective applications. Therefore, it is probably a good policy to use both approaches to valuing properties when possible. This is because comparable market data are *always beneficial* in a valuation analysis. When the sales comparison method is used, cap rates reflect what investors are *currently paying* for comparable properties. Any property currently for sale should tend to sell for a price that is *similar* to prices paid for highly comparable properties that have recently sold. This will be true no matter what the present value method produces based on forecasts of cash flows, holding periods, discount rates, and reversion values. On the other hand, much of the time, properties that have sold recently are not always *truly comparable* to properties available for purchase. Consequently, the exclusive use of direct capitalization, even when adjusted for different property attributes, is not always well advised. For these reasons, a careful analysis using both the present value approach and sales comparisons can be helpful.

Exploring the Relationships between Changing Market Conditions, Cap Rates, and Property Values

Thus far, we have illustrated the *mechanics* or approaches to valuation by using case examples. Investors who are active in real estate valuation and investing must always try to interpret changing market conditions and the effect that these changes are having on cap rates and property values. In other words, as analysts track the sales of properties they may observe that cap rates ($NOI \div V$) from these transactions may be increasing or decreasing. What does this mean? What causes cap rates to rise and fall? In this section, we introduce certain changes in market conditions and try to interpret the effects of those changes on property values and cap rates.

Scenario 1. Effects of Changes in "Going In" Cap Rates in Response to Supply and Demand

To illustrate what effects short-run conditions of excess *supply and demand*, or real market forces, may have on cap rates both in the current time period as well as in future time periods, we consider scenarios relative to a base case. Exhibit 10–9 summarizes these cases. In

EXHIBIT 10–9 Scenario 1: Short-Run Relationships between Supply and Demand, Investor Returns, and "Going In" Cap Rates

Panel A: Market Scenario

		Year (1)	(2)	(3)	(4)	(5)	(6)
Base Case: Market in balance, g = 3%	*NOI*	$100,000	$103,000	$106,090	$109,273	$ 112,551	$115,927
	REV					1,288,082	
Case A: Excess supply	*NOI*	100,000	100,000	100,000	103,000	106,090	109,273
	REV					1,214,141	
Case B: Excess demand	*NOI*	100,000	105,000	110,250	115,762	119,235	122,812
	REV					1,364,578	

Panel B: Expected Result

			Commentary
Base Case:	*NOI*	$ 100,000	*Market supply/demand in balance.* Long-term growth in *NOI* = 3% and investor expected return (*n*) = 12%.
	PV @ 12%	$1,111,111	
	Cap rate (*R*)	.090	
Case A:	*NOI*	$ 100,000	Excess supply expected for three years. Rents remain flat, and then increase in long-term growth of 3% in year 4 and thereafter. Therefore, property values would be expected to *fall* and cap rates would be expected to *rise* relative to the base case.
	PV @ 12%	$1,054,776	
	Cap rate (*R*)	.095	
Case B:	*NOI*	$ 100,000	Excess demand causes *NOI* to rise at above normal growth (5%) for four years. Rents then revert to long-term growth (3%) beginning in year 5 and thereafter. Therefore, property values would be expected to *rise* and cap rates *fall* relative to the base case.
	PV @ 12%	$1,166,989	
	Cap rate (*R*)	.086	

the base case, we assume that market supply and demand *are currently in balance*, and that long-term growth in rents and *NOI* is expected to be 3 percent and that investors expect returns of r = 12 percent. The reader should recall our earlier discussion pointing out that when present value techniques are used in practice, *NOI* and cash flow may be different because of items such as capital expenditures and nonrecurring outlays. *To simplify the discussion and for purposes of illustration, we are assuming that NOI and cash flows in all examples that follow are equal.* Returning to our discussion, we show *NOI* to be $100,000 in year 1, which is expected to grow at 3 percent per year. At the end of year 5, we show *REV*, which is based on year 6 *NOI*, divided by $(r - g)$, or $115,927 ÷ (.12 − .03) = $1,288,082. Because of the short period of analysis in our example, we do not consider the possible influence of economic depreciation on the terminal cap rate. However, if the period of analysis were longer, or if the analyst believed that economic depreciation would occur, then it should be considered. Note that in Panel B, these base case assumptions produce a *present value* of $1,111,111, and a going-in cap rate (R) of .09. This is a result consistent with a condition of a market equilibrium, or when supply and demand are thought to be in balance. Furthermore, investors have no reason to believe that market imbalances are likely for the foreseeable future. They believe that future growth is expected to produce rent increases in *NOI* at the rate of 3 percent per year, and investors in properties such as the one illustrated expect to continue to earn a return of 12 percent. We now consider change in cap rates brought on by *unexpected changes* that bring on market conditions of excess supply and demand.

In case A, we show the effects of an unexpected change in short-run conditions relative to the base case. This is a condition of *oversupply* which we now expect to last three years and during which time rents are expected to be flat. Note that *NOI* remains at $100,000 for three years. Then demand increases and *NOI* resumes a long-run growth pattern of 3 percent per year beginning in year 4. This assumption, in turn, produces results shown in Panel B and case A. Note that under conditions of three years of excess supply (holding all else constant), *present value declines* to $1,054,776 and *cap rates (R) rise* to .095. Obviously *R* is now greater than .09 shown in the base case. *In short, conditions of excess supply produce rising cap rates.* Therefore, market conditions should show comparable property values falling because of higher market cap rates.

In case B, we show the effects of an unexpected short-run condition of *excess demand* that lasts for a period of four years, after which, supply adjusts and a long-term growth pattern at 3 percent per year is restored. Such a condition could be brought about by a sudden increase in employment in a market, thereby increasing demand relative to supply. Note in Panel B, case B, that present value increases to $1,166,989 and *cap rates fall* to .086 relative to results in the base case. Therefore, when demand exceeds supply of available rental space, this tends to reduce cap rates and to increase property values.

In summary, the goal of this exercise is to demonstrate the effects of changes in market conditions on property values and cap rates. In essence, *excess supply tends to drive PV down and cap rates up.* Investors are discounting lower rents and, therefore, future cash flows brought on by excess supply and are only willing to purchase properties at lower prices and higher cap rates. Conversely, *excess demand tends to drive PV higher and cap rates lower* as investors discount higher than normal cash flows, thereby producing higher property value and lower cap rates.

Scenario 2: Effects of Changes in Capital Market Conditions on "Going In" Cap Rates

In the previous section, we illustrated the effects of how *real* market influences, that is, the *supply* of new space available for occupancy and the *demand* for such space, affect both property values and capitalization rates. In this section, we illustrate the effects of changes in the market for capital or *financial markets*, primarily through changes in interest rates, on property values and capitalization rates relative to the same base case, contained in Exhibit 10–10. In case C, we show the effect of an unanticipated *increase* in long-term interest rates that also causes expected returns (r) to increase from 12 percent to 13 percent. Note that this increase is assumed to occur *holding all else constant.* This means that future rents, *NOI*, and so on, remain unaffected. The results of this increase in interest rates are shown in Panel B where present value declines to $1,000,000 relative to the base case of $1,111,111 and cap rates rise to .10 from .09 in the base case.[3]

In case D, we consider a decrease in interest rates and therefore required returns of 11 percent relative to the 12 percent used in the base case. Again, holding all else constant, property values *rise* ($1,250,000) relative to the base case ($1,111,111) because *NOI* remains the same while investors' expected returns fall to 11 percent. Also, cap rates fall from .09 in the base case to .08.

The conclusions to be drawn here are that, holding all else constant, *rising* interest rates generally result in higher required returns (r) and higher cap rates. This, in turn, results in lower property values than would otherwise be the case if interest rates had not changed. Conversely, when interest rates *decline,* required returns also decline and property values rise. This tends to produce *lower cap rates.*

[3] Of course, in reality, the *exact* effect on present value may be different than what we have depicted. The reader should view this exercise more in terms of *direction of impact,* not in terms of exact dollar magnitudes.

EXHIBIT 10–10 Scenario 2: Relationship between Changes in Interest Rates, Investor Returns, and "Going In" Cap Rates

Panel A: Market Scenario		Year (1)	(2)	(3)	(4)	(5)	(6)
Base Case:	*NOI*	$100,000	$103,000	$106,090	$109,273	$ 112,551	$115,927
	REV					1,288,082	
Case C: Interest Rates Rise, r = 13%	*NOI*	100,000	103,000	106,090	109,273	112,551	115,927
	REV					1,159,274	
Case D: Interest Rates Fall, r = 11%	*NOI*	100,000	103,000	106,090	109,273	112,551	115,927
	REV					1,449,093	

Panel B: Expected Result			Commentary
Base Case:	*NOI*	$ 100,000	Base case: Market supply/demand in balance. Long-term growth in *NOI* = 3% and investor expected return r = 12%.
	PV @ 12%	1,111,111	
	Cap rate (*R*)	.09	
Case C:	*NOI*	$ 100,000	Relative to the base case, property values *decline* because of a higher discount rate (13%) and cap rates *rise.*
	PV @ 13%	1,000,000	
	Cap rate (*R*)	.10	
Case D:	*NOI*	$ 100,000	Relative to the base case, property values *rise* because of lower discount rates (11%) and cap rates *fall.*
	PV @ 11%	1,250,000	
	Cap rate (*R*)	.08	

Scenario 3: Effects of Combined Changes in Capital Market Conditions and Spacial Market Influences on "Going In" Cap Rates

In Exhibit 10–11 we consider the effects of an unanticipated increase in *interest rates,* coupled with market conditions consisting of real market changes, including short-run excess supply and short-run excess demand. The base case shows that both real and financial market forces affecting supply and demand are currently producing a balanced market. However, in case E, because of an increase of 1 percent in long-term interest rates, investors now expect to earn 13 percent. When coupled with a market condition of excess supply, the combined results produce a major *decline in property values* and a significant *increase in cap rates.* Note that this combination of excess supply and rising interest rates produces the lowest present values when compared to all other scenarios. This is because investors demand greater returns on real estate investments in a market that is being oversupplied by developers. This produces flat rents and *NOI* that are discounted by a larger discount rate. Case F, which depicts a combination of rising demand and rising interest rates, tends to produce a slightly lower *PV* and higher cap rate than would be the case under case E because the condition of excess demand is producing both higher rents and *NOI*; however, these higher cash flows are being discounted at a higher discount rate because of rising interest rates.

Cases G and H shown in Exhibit 10–11 show the effects of falling interest rates under conditions of excess supply and demand, respectively. In these cases, the combination of excess demand and falling interest rates (case H) produces the greatest effect, in which there are dramatically lower cap rates relative to the base case and all other cases. Case G also produces a favorable result in terms of lower cap rates; however, the excess supply

EXHIBIT 10–11 Scenario 3: Relationship between Excess Supply/Demand Conditions, Interest Rates, Investor Returns, and "Going In" Cap Rates

Panel A: Market Scenario		Year (1)	(2)	(3)	(4)	(5)	(6)
Base Case:	*NOI*	$100,000	$103,000	$106,090	$109,273	$ 112,551	$115,927
	REV					1,288,082	
Case E: Oversupply and 13% return	*NOI*	100,000	100,000	100,000	103,000	106,090	109,273
	REV					1,092,727	
Case F: Excess demand and 13% return	*NOI*	100,000	105,000	110,250	115,762	119,235	122,812
	REV					1,228,120	
Case G: Oversupply and 11% return	*NOI*	100,000	100,000	100,000	103,000	106,090	109,273
	REV					1,365,909	
Case H: Excess demand and 11% return	*NOI*	100,000	105,000	110,250	115,762	119,235	122,812
	REV					1,535,150	

Panel B: Expected Result			Commentary
Base Case:	*NOI*	$ 100,000	Base case *G* = 3%, Expected return = 13%. Causes cap rate (*R*) to increase relative to Scenario A in Exhibit 10–8 and property values *decline*.
	PV	1,111,111	
	Cap rate	.09	
Case E:	*NOI*	100,000	Oversupply *and* rising interest rates cause property values to *decline* and cap rates (*R*) to *increase* relative to the base case.
	PV	949,957	
	Cap rate	.105	
Case F:	*NOI*	100,000	Although excess demand exists, when combined with rising interest rates, property values *rise* although by not as much as in the base case.
	PV	1,049,424	
	Cap rate	.095	
Case G:	*NOI*	100,000	Falling interest rates exert a *positive* effect on property values; however, this effect is offset to some extent by an oversupplied market. The result is *slightly higher* property values and *slightly lower* cap rates relative to the base case.
	PV	1,185,780	
	Cap rate	.084	
Case H:	*NOI*	100,000	Both falling interest rates and excess demand combine to produce the most *positive* effect on property values and dramatically *lower* cap rates relative to the base case.
	PV	1,313,977	
	Cap rate	.076	

condition produces a present value that is somewhat lower than that shown in case H because of lower rents.

A Closing Note on Cap Rates and Market Conditions

In the above scenarios we may summarize as follows:

Lower market cap rates (higher property values) tend to be brought about by

1. Unanticipated increases in the demand for real estate relative to supply.
2. Unanticipated decreases in interest rates.
3. Both (1) and (2).

Higher market cap rates (lower property values) tend to be brought about by:

1. Unanticipated increases in the supply for real estate relative to demand.
2. Unanticipated increases in interest rates.
3. Both (1) and (2).

There are obviously *many other factors* that contribute to increases and decreases in cap rates. These could include changes in the risk associated with a given property or could be due to changes in neighborhood characteristics and/or many other factors.

A Word of Caution—Simultaneous Effects of Real Market Forces and Interest Rates on Property Values

It should be stressed that the above illustrations were developed under strict assumptions regarding the timing and duration of conditions of excess supply and demand as well as the extent and duration of interest rate changes. These examples were developed to demonstrate the effects of changes in market conditions on property values and cap rates by using the benefit of numerical examples. In practice, projections of these relationships are difficult to make, as are the forecasts of the dollar magnitude of such changes on property values. There are many combinations of real market forces and interest rates that may be considered. Furthermore, we have not considered the possible *interaction* between changes in any one of these market forces on other market influences. For example, the effects of changes in interest rates may persist for a long period of time and affect the *long-term* growth in supply and demand and the pattern in *NOI* far beyond three years. Nonetheless, we believe that understanding these relationships is useful.

In practice, investors must know how to incorporate these relationships into forecasts. When valuing specific properties investors must consider:

1. Current market supply and demand conditions and how long such conditions will last.
2. The effects of such conditions on rents and *NOI*.
3. The future course of interest rates that may be affected by more global, non–real estate specific influences such as global economic growth and inflationary pressures.
4. The contents of leases that have been executed on the property being evaluated and whether conditions in (1), (2), and (3) will materially affect rents, expenses, and tenant default rates.

Valuation of a Leased Fee Estate

The previous examples in this chapter assumed that the properties being valued could be leased at current market rents. In these cases, it can be said that properties are valued as **fee simple estates.** However, in many situations when properties are being considered for purchase, there are existing leases in place that have below (or above) market rents. Such properties are purchased as **leased fee estates.** Similarly, when valuing properties and selecting comparable properties from recent sales, we find that many of these properties will also have existing leases. When such comparables are used, it is very important to investigate whether or not existing leases are present and the contents of such leases. Failure to investigate these cases can result in serious errors when estimating value.

For example, let us assume Property A has an existing net lease with payments for the next five years at $400,000 per year. At the end of the five-year period, the lease is scheduled to expire and rents could then be negotiated on a year-to-year basis at market rates.

Alternatively, Property B which is exactly comparable to A, can be expected to produce net rent of $500,000 per year with an escalation of 3 percent per year because it has no existing leases and market rents can be earned each year. Assuming this to be the case, we have:

	Cash Flow—Year 5					
PV	(1)	(2)	(3)	(4)	(5)	REV_5
Property A = $4,461,296	$400,000	$400,000	$400,000	$400,000	$400,000	$5,627,540
Property B = $4,908,366	500,000	515,000	530,450	546,364	562,754	5,627,540

We should also note that the reversion value at the end of year 5 (REV_5) is assumed to be the same in both cases because the lease on Property A will have expired and the rents can be adjusted up to market rates at the end of that year and every year thereafter, thereby making the reversion value the same as in case B from year 6 into the future. Therefore, from year 5 on, cash flows are assumed to be the same in both cases and will produce the same *REV* at that time. We assume that the same required return of 13 percent is to be earned on both properties. However, note that both the present value and "going in" cap rates for both sales are very different. After discounting, we show a value of $4.46 million for A versus $4.91 million for B, or a difference of about $450,000. Furthermore, the cap rates are .09 for Property A and .102 for Property B, respectively. One point to be made, then, is that if a property is under consideration for purchase (say, Property C) and it is highly comparable to both Properties A and B, but very little information is available on the existing leases for A and B, then using cap rates from either sale could produce very different estimates of value. Indeed, if the *NOI* for Property C was $450,00, then depending on which cap rate was chosen, the estimated value could range from ($450,000 ÷ .09), or $5,000,000, to ($450,000 ÷ .102), or $4,411,765. This would be a difference of $588,235. Therefore, it is important when selecting comparable properties for valuation purposes to be certain that, in addition to the physical and locational characteristics of the properties, the contents of *existing leases* on such comparables are also very similar to the lease contents of the property under consideration for purchase.

Cost Approach

The rationale for using the **cost approach** to valuing (appraising) properties is that any informed buyer of real estate would not pay more for a property than what it would cost to buy the land and build the structure. For a new property, the cost approach ordinarily involves determining the construction cost of building a given improvement, then adding the market value of the land. In the case of existing buildings, the appraiser first estimates the cost of replacing the building. This estimate is reduced by estimating any **physical deterioration, functional obsolescence,** or **external obsolescence** (discussed below) in arriving at the estimated value of the building. This approach is procedurally identical to the cost approach detailed in Chapter 6 for residential financing. In the case of income-producing property, however, structural design and equipment variations and locational influences make the cost estimation process much more complex. Consequently, the cost approach may at times be difficult to apply, particularly if the property is not new.

Many techniques can be used in conjunction with the cost approach to value. The technique chosen to estimate value will generally depend on (1) the age of the structure being valued, (2) whether the structure is highly specialized in design or function, and (3) the availability of data to be used for cost estimating. Generally if a project is in the proposal

EXHIBIT 10–12
Cost Breakdown—Hypothetical Office-Warehouse Complex (73,500 square feet: 8,000 office; 65,500 warehouse; 3 land acres; projected economic life, 50 years)

Component	Cost	PSF
	Hard Costs	
Excavation—back fill	$ 31,500	
Foundation	47,250	
Framing (steel)	160,500	
Corrugated steel exterior walls	267,750	
Brick facade (front)—glass	51,000	
Floor finishing, concrete	61,000	
Floor covering, offices	17,500	
Roof trusses, covering	115,040	
Interior finish, offices	57,400	
Lighting fixtures, electrical work	83,400	
Plumbing	114,500	
Heating-A/C	157,500	
Interior cranes, scales	139,060	
Loading docks, rail extension	96,000	
On-site parking, streets, gutters	176,000	
Subtotal	$1,575,000	$21.43
	Soft Costs	
Architect, attorney, accounting	$ 200,000	
Construction interest	125,000	
Builder profit	250,000	
Subtotal	575,000	
Land cost (by comparison)	350,000	
Value per cost approach	$2,500,000	$34.00

stage, cost data will be developed from plans and drawings by an appraiser or estimator. Cost estimation services are available for appraisers from the Marshall and Swift Company and the Boeckh Division of the American Appraisal Company.

If a project is in the proposal stage, specifications for material and equipment will have been set out in detail, usually making it possible to arrive at a relatively accurate cost estimate. Exhibit 10–12 contains a breakdown of hard and soft costs for a hypothetical office-warehouse complex in the proposal state of development. The cost breakdown shown in Exhibit 10–12 is based on categories that generally correspond to how various subcontractors would make bid estimates on improvements. This procedure is quite common for new, nontechnical construction.

In addition to the hard-cost categories shown in Exhibit 10–12 for our hypothetical office-warehouse complex, we see two additional categories. One represents a soft-cost category, which includes estimated outlays for services and intangible costs necessary when designing and developing a project. The other category represents land cost. Estimates of land value are made from comparisons with other recent land sales. The sales chosen to estimate value should be **comparable properties** to the land underlying the improvement being valued.

In cases where the project to be appraised includes an *existing* improvement, the detailed cost breakdown shown in Exhibit 10–12 is more difficult to use because the appraiser must estimate physical and economic depreciation on the component parts. Generally, when the cost approach to value is used for an existing improvement, the cost to replace the improvement is estimated and adjusted downward for depreciation caused by (1) physical

EXHIBIT 10–13
Estimates of Depreciation and Obsolescence on Improved Property

Replacement cost estimate	$1,750,000
1. Physical deterioration	
a. Repairable (curable)	
Interior finish	25,500
Floor covering	5,200
Lighting fixtures	17,000
Total	$ 47,700
b. Nonrepairable (incurable)	
15 years divided by 50 years (age to economic life)	30%
2. Functional obsolescence	
Layout design (inefficiency)	
Increasing operating cost (annually)	$ 15,600
3. External obsolescence	
Loss in rent per year*	4,000
Site value by comparison	$ 200,000

*Portion attributable to the building.

deterioration, (2) functional or structural obsolescence due to the availability of more efficient layout designs and technological changes that reduce operating costs, and (3) external obsolescence that may result from changes outside of the property such as excessive traffic, noise, or pollution. These three categories of depreciation are very difficult to determine and, in many cases, require the judgment of appraisers who specialize in such problems. Adjusting downward for depreciation is especially difficult for industrial properties, special-use facilities such as public buildings, and properties that are bought and sold infrequently.

To illustrate how adjustments must be made to reflect physical, functional, and economic depreciation, we consider a different property, a 15-year-old office-warehouse complex. The improvement, if constructed today and "costed out" at *current prices* using a procedure similar to that shown in Exhibit 10–12, would be $1,750,000. However, because the structure is 15 years old, certain adjustments must be made for necessary repairs, changes in design technology, and depreciation, as shown in Exhibit 10–13.

The essence of the cost approach for existing properties is first to price the improvement at its current **replacement cost.** Then that amount is reduced by any costs (1) that can be expended to upgrade the improvement or to cure obvious deterioration due mainly to needed maintenance or (2) that correspond to the economic loss associated with nonrepairable (or incurable) factors due to changes in design or layout efficiency that may make newer buildings less expensive to operate.

Hence, in our example, the appraiser estimates that a purchaser of the property would have to incur a cost of $47,700 simply to replace worn-out items, the result of deferred maintenance and replacement (curable physical deterioration). However, because the structure is 15 years old and the economic life was 50 years when the building was constructed, the appraiser estimates that structural nonrepairable or incurable depreciation due to wear and tear (incurable physical deterioration) would represent about 30 percent of current reproduction cost. This percentage was developed in the example by the ratio of age to economic life, or 15 divided by 50. This estimate assumes that the building will wear out evenly (at a rate of 2 percent per year—100 percent divided by 50 years) over its 50-year life. Because 15 years have passed, based on these assumptions, the building would be 30 percent depreciated. Estimates of physical depreciation are not always based on these simple assumptions. Many structures may wear out faster or slower over time. In such cases the appraiser should consider the **effective age** of the property rather than its actual age.

As for functional obsolescence in our example, the appraiser estimates that operating costs will be $15,600 higher on the existing structure when compared with a completely new building. The higher costs could be caused, for example, by the lack of suspended ceilings in an older structure, by posts and columns that might affect traffic and storage patterns, or by an older conveyor system designed into the initial structure. This $15,600 additional annual expense could represent added costs in manpower, machinery, and so on, due to functional inadequacies. This additional expense is treated as a discounted annuity because the increase in operating costs is expected to be $15,600 per year for the next 35 years. Assuming the buyer could earn 10 percent annually on other investments, the adjustment for functional obsolescence would reduce the total operating costs to a present value of $150,449. It is assumed that the owner could invest in a similar real estate venture or an investment of equal risk and earn 10 percent on total investment. This was discussed in more detail in our consideration of the income capitalization approach earlier in the chapter.

Finally, the appraiser estimates $4,000 per year for external obsolescence. This cost accounts for environmental changes, such as pollution, noise, neighborhood changes, and other *external* influences that result in lower rents (or higher expenses) when present. Estimates for these characteristics must be obtained from comparable sites where none of these external influences are present. Because the land value is being estimated separately from the building value, the effect of economic obsolescence on the land value will already be accounted for in the estimated land value. Thus, during the adjustment for the effect of locational obsolescence on the *building* value, the estimated rent loss should represent only that portion of the total rent loss (land and building) that applies to the building. For example, the appraiser might estimate that the rent for the entire property will be $5,000 per year less due to the locational obsolescence. However, if there were separate leases on the building and the land, the appraiser might expect that the building would rent for $4,000 less, whereas the land would rent for $1,000 less. This loss in building rent is capitalized and used to reduce the building value. In our example, we assume this rent loss to be $4,000 per year. As was the case with functional obsolescence, this loss in income will also be discounted at 10 percent. The discounted value of this loss is $38,577. In practice, this estimate is extremely difficult to make. The appraiser must often use considerable judgment as to what the total rent loss would be and how much would be allocated to the building.

Adjustments to the replacement cost estimate for the existing improvement in our example are shown in Exhibit 10–14. Note that any repairable or curable depreciation or obsolescence should be subtracted from the replacement cost estimate before any reduction is made for nonrepairable or incurable costs (30 percent in our example). In other words, even after adjusting for the curable items, productivity loss due to functional obsolescence and structural depreciation would still exist. The estimate for those incurable items must be made based on the assumption that all curable items are repaired.

In summary, the cost approach is most reliable where the structure is relatively new and depreciation does not present serious complications. However, when adjustments have to be made for depreciation and obsolescence, and when it is difficult to find comparable land sales, the cost approach is less desirable. This usually occurs where older, improved properties are being valued. However, where there are very few sales and market data are scarce, the cost approach to valuing older properties may be the only method available.

Valuation Case Study—Oakwood Apartments

Oakwood Apartments is a luxury apartment complex that is being appraised for the purpose of obtaining financing by an investor who has contracted to purchase the property. The bank has had its own staff appraisers estimate the value of the property but wants

EXHIBIT 10–14
Adjustment of Replacement Cost Estimate

Replacement costs at current prices	$1,750,000
Less: Repairable physical depreciation	47,700
Subtotal	$1,702,300
Nonrepairable (incurable) physical depreciation, 30%	510,690
Functional obsolescence (incurable):	
$15,600(*PVIFA*, 10%, 35 yrs.)	
$15,600(9.644159)	150,449
Economic-locational obsolescence:	
$4,000(*PVIFA*, 10%, 35 yrs.)	
$4,000(9.644159)	38,577
Add: Site value (by comparison)	200,000
Value per cost approach	$1,202,584
or (rounded)	$1,200,000

EXHIBIT 10–15
Property Information—Oakwood Court Apartments

Name of Property:
Oakwood Court Apartments
Location:
Suburbia, USA
Improvement Description:
A 95-unit luxury garden apartment community located on a major north-south arterial. The property is newly constructed and has a high level of amenities, including 100% direct-access garages. All buildings are of two-story construction with 90% brick exteriors.
Lender:
Bank of USA
Rent and Income Escalation = 3%

Principal Amenities:
Direct access garages with automatic garage door openers. Swimming pool and heated spa, fitness center, business center, jogging trail, limited-access gates, 200 parking spaces—some covered.
Land Area/Density:
4.75 acres
Unit Type:
95 two-bedroom units
1,100 square ft. with 2 bedrooms and 2 baths
Age:
3 years old
Average Current Monthly Rent:
$1,200.00 plus laundry income of $120 per unit per year

an independent appraiser to also provide an estimate using a "limited appraisal" that focuses on the income approach.

The bank has provided Exhibit 10–15, which summarizes information about the property. The appraiser has confirmed the expected rent per unit with the present owner, and she has also done an analysis of comparable apartment communities that is summarized in Exhibit 10–16.

Oakwood consists entirely of two-bedroom units. A competitive analysis indicates that Oakwood is very similar to comparables 1 and 2 even though they each have some one- and three-bedroom units. It appears that owners of apartment buildings with a greater proportion of two-bedroom units are able to get a higher average monthly rent per unit. Comparable 3 is more densely developed with one-bedroom apartments, and its parking ratios are lower than all others. It appears that the average rent for Oakwood is reasonable relative to the competition. In addition to rent, other cash flows may be realized from laundry facilities. Comparable 2 sold for $100,000 per unit, and comparable 1, which is most like Oakwood Apartments, sold for $110,000 per unit. Although the appraiser is not doing a formal sales comparison approach, she notes that a price of $110,000 per unit would suggest a value of Oakwood apartments of $110,000 × 95 = $10,450,000.

EXHIBIT 10–16
Oakwood Court Apartment: Comparables

		Comparables/Competitors		
	Oakwood	(1)	(2)	(3)
Units per acre:	20	20.0	21.0	25.0
Unit mix:				
1BR/1Bath	–0–	10%	10%	60%
2BR/2Bath	100%	85%	80%	40%
3BR/2Bath	–0–	5%	10%	–0–
Parking spaces/unit:	2.10	2.00	1.95	1.50
Age:	3 years	3 years	3 years	5 years
Condition/amenities:	Excellent	Excellent	Good	Good
Avg. monthly rent per unit:	$1,200	$1,150	$1,100	$950
Price per unit:	—	$110,000	$100,000	$90,000

The appraiser has determined that the number of units per acre (usually set by zoning) is currently the maximum allowable. This may be important if zoning laws have changed and now allow development of 20 or more units per acre. The average number of parking spaces (2.10) per unit, or 400 spaces, seems reasonable relative to the competition, and the appraiser has determined that the amenity package is appropriate relative to rental rates and to what the competition is currently offering in the way of exercise and recreation facilities, TV cable/satellite services, high-speed Internet connectivity, washer/dryer hookups, and so on.

On-site expenses will include salaries for on-site personnel who maintain and "make units ready" for tenants in the community. An operating risk that must be considered by apartment investors is the relatively short nature of lease maturities, the potential tenant turnover, and downtime due to vacancies. Experience in large metropolitan areas indicates that as many as 60 percent of apartments in a given property may turn over each year. In making cash flow projections, analysts must consider turnover-related losses in revenue because of vacancies, in conjunction with recurring repairs and maintenance expenses involved in making units ready for new tenants. For Oakwood Apartments they are included in repair and maintenance expense. A management fee for oversight of all leasing, rent collection, tenant relations, and so on, and office expenses for payroll, insurance, tax property, and other bookkeeping services necessary for operations have also been estimated. These items should be validated from payment records and/or the appropriate agency or vendors.

Vacancy is expected to be 5 percent of potential income, and credit loss due to tenants who default on their lease is expected to be an additional 1 percent of potential income.

The property is to be valued as of January 1, 2000. The property is to be valued using an 11 percent discount rate and assuming the property will be sold after five years. The resale price will be estimated by using a 9 percent terminal capitalization rate applied to year 6 *NOI*. The rate reflects lower growth expectations after year 5. Selling costs when the property is sold will be 5 percent of the sale price.

Rents are expected to be $1,250 when leases are renewed after one year and increase at the expected inflation rate of 3 percent per year thereafter. Additional revenue of $120 per unit is expected from the laundry machines that are included in a laundry area of the apartment complex. This income will also increase at 3 percent per year.

Contrary to most other property types, tenants occupying apartment properties usually sign leases with maturities of either 6 or 12 months. Furthermore, tenants usually pay for their own utilities, insurance, and so on, which usually relieves the investor of making payments for these items and recovering expenses from tenants. However, there are utility costs for common areas in the apartment community that must be paid by the owner.

Expenses next year are projected as follows:

Real estate taxes	$87,000
Office expenses (accounting administrative)	$20,000
Insurance	$150 per unit
Repairs and maintenance	$550 per unit
Advertising	$8,000
Utilities	$45,000
Miscellaneous expenses	$15,000

Real estate taxes are expected to increase by 2.5 percent per year and all other expenses are projected to increase at the inflation rate of 3 percent per year.

In addition to the above expenses a property management firm is paid 12 percent of effective gross income (rents less vacancy and credit loss) to find tenants, sign leases, handle tenant relations, and oversee repairs and maintenance.

Based on the assumptions above, cash flows for Oakwood Apartments are projected in Exhibit 10–17.

NOI is projected through year 6 since year 6 is used to estimate the resale price. Exhibit 10–18 shows the projected resale price by applying the 9 percent terminal capitalization rate to the year 6 *NOI* and subtracting the selling costs of 5 percent of the sale price.

Exhibit 10–19 shows the present value of the *NOI* over the five-year holding period plus the present value of the resale calculated above. Present values are based on an 11 percent discount rate. The total value is $10,548,557, or $10,549,000 (rounded). This is just slightly more than the replacement cost of $10,000,000 and about the same as the price that would be indicated by the price per unit from the comparable sales, which was $10,450,000.

Thus, based on the income approach, the appraiser will provide the bank with an estimated value for Oakwood Apartments of $10,549,000.[4]

[4] Rounding the number conveys the fact that a high degree of precision is not possible given the nature of the assumptions that must be made in the appraisal process.

10–17 Projection of Net Operating Income for Oakwood Apartments

eXcel www.mhhe.com/bf13e

	1	2	3	4	5	6
ent	$1,368,000	$0	$0	$0	$0	$0
ent from lease renewals	$0	$1,467,750	$1,511,783	$1,557,136	$1,603,850	$1,651,966
ncome	$11,400	$11,742	$12,094	$12,457	$12,831	$13,216
l gross income (PGI)	$1,379,400	$1,479,492	$1,523,877	$1,569,593	$1,616,681	$1,665,181
ancy	$68,400	$73,388	$75,589	$77,857	$80,193	$82,598
dit loss	$13,794	$14,795	$15,239	$15,696	$16,167	$16,652
gross income (EGI)	$1,297,206	$1,391,310	$1,433,049	$1,476,040	$1,520,322	$1,565,931
s:						
e taxes	$87,000	$89,175	$91,404	$93,689	$96,032	$98,433
penses	$20,000	$20,600	$21,218	$21,855	$22,510	$23,185
	$14,250	$14,678	$15,118	$15,571	$16,039	$16,520
maintenance	$52,250	$53,818	$55,432	$57,095	$58,808	$60,572
ng	$8,000	$8,240	$8,487	$8,742	$9,004	$9,274
nent	$155,665	$166,957	$171,966	$177,125	$182,439	$187,912
	$45,000	$46,350	$47,741	$49,173	$50,648	$52,167
eous expenses	$15,000	$15,450	$15,914	$16,391	$16,883	$17,389
enses	$397,165	$415,267	$427,279	$439,641	$452,361	$465,452
ating income (*NOI*)	$900,041	$976,042	$1,005,770	$1,036,400	$1,067,960	$1,100,479

EXHIBIT 10–18
Projection of Resale Proceeds for Oakwood Apartments

Resale	$12,227,545
Selling cost	$611,377
Net resale	$11,616,168

EXHIBIT 10–19
Present Value of *NOI* and Resale Proceeds

PV of *NOI*	$ 3,654,927
PV of resale	$ 6,893,630
Total value	$10,548,557

EXHIBIT 10–20
ARGUS Screen for Oakwood Apartments

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ARGUS Solution

A trial version of ARGUS is provided with this book. ARGUS is a Windows-based program that is used by many appraisers and other real estate analysts to value real estate income properties like apartments, office buildings, shopping centers, and industrial properties. When you run the installation program on the CD that is included with this book, the trial version of ARGUS will be installed and several data files will be included that provide the solution to several of the examples illustrated in this book, like Oakwood Apartments. The data file for Oakwood Apartments is called "Oakwood Apartments.sf."

Exhibit 10–20 shows what the initial ARGUS screen will look like when you load the Oakwood Apartments file into ARGUS. This ARGUS screen summarizes some of the key inputs for the property being valued and has links to other inputs. A graph of the *NOI* (shown as cash flow before debt service) is included. Note that the value shown as the "Unleveraged Present Value" is $10,548,560, which is virtually the same as that shown in the example above ($3 difference due to rounding).

Students should install ARGUS and see how the data was input for Oakwood Apartments and explore the various reports produced by ARGUS showing the projected cash flows and other summary information. Some of the end-of-chapter problems in this and later chapters will use ARGUS to extend the example presented in the chapter.

Web App

There are many sites that provide articles related to the current real estate investment climate. Go to a site like Institutional Real Estate, Inc. (**www.irei.com/profiles/profiles.html**) or one that you find by using a search engine like Google (**www.Google.com**) to search for a phrase like "real estate capital market trends" and find an article related to the current investment climate. Summarize the current investment climate either for the national market or for a particular property type and/or location. Can you find examples of recent deals that provide insights into the investment climate?

Conclusion

We have demonstrated three approaches to valuation along with many of the techniques used in conjunction with each. Many combinations of approaches and techniques to valuation could be used; approaches and techniques should be chosen that best complement the data available for estimation. Stated another way, *the availability and quality of data should always dictate the methods and approaches chosen for valuation.* If perfect information were available, then theoretically the same value would result regardless of the method chosen, be it cost, market, or income capitalization. Even with imperfect information, the three approaches to value should correspond to some extent, which is the reason appraisal reports will typically contain estimates of value based on at least two approaches to determining value. While this procedure helps to corroborate the opinion of value, in the final analysis, it is up to the user of the report to interpret, understand, and critically analyze the assumptions, techniques, and methods used to estimate value. Appraisals are only estimates of market value based on market conditions and information available at the time of the appraisal. Economic conditions are subject to much uncertainty, and appraisals should be interpreted and used in light of that uncertainty. Lenders and investors should be familiar with the techniques used by appraisers and with the assumptions made in developing the estimate of value. The appraisal should be viewed as a complement, not a substitute, for sound underwriting or investment analysis by the particular lender or investor.

Key Terms

- appraisal process, *281*
- capitalization rate, *286*
- comparable properties, *305*
- cost approach, *304*
- discount rate, *289*
- effective age, *306*
- effective gross income, *285*
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- reversion value, *290*
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- terminal cap rate (R_T), *291*
- unit of comparison, *289*

Useful Web Sites

www.appraisalinstitute.org—The Appraisal Institute gives information on appraisal education, products, news, and conferences.

www.naifa.com/information/process/—National Association of Independent Fee Appraisers—link to discussion of the appraisal process.

www.nreionline.com/—National Real Estate Investor—good source of current trends.

www.irei.com/profiles/profiles.html—Institutional Real Estate, Inc., provides current news and on the "research" page includes links to research reports provided by several institutional investment firms.

www.buildings.com—*Buildings Magazine* Web site. Good source of articles on buildings and trends affecting the value of buildings.

www.crea.ca—This site gives the average housing prices in different Canadian cities and provinces. It also gives recent news related to real estate in Canada.

www.cbre.com/Global/Research—This site gives US office and industrial vacancy reports. Its Insight Reports section gives information about conditions and forces that shape the US and Canadian real estate market in industrial, office, and retail areas. Its Global Market View report helps in finding commercial real estate trends including prime office yield and rent, availability and vacancy in the office, industrial, and retail sectors for Asia Pacific, Europe, North America, Latin America and the Caribbean.

www.realestate-tokyo.com—This website is good source for Residential and Commercial Real Estate properties in Tokyo. It also offers information on apartments and houses to rent in the Tokyo area, properties for sale, offices for rent, and in general about life in Japan and the real estate market.

www.naea.co.uk/—This site is hosted by The National Association of Estate Agents (NAEA), which is the UK's leading professional body for estate agency personnel, representing the interests of approximately 10,000 members who practice across all aspects of property services both in the UK and overseas. These include residential and commercial sales and lettings, property management, business transfer and auctioneering.

www.epra.com—This site is hosted by The European Public Real Estate Association (EPRA), which is not-for-profit body established under Dutch law. This website gives quarterly review reports of developments in European Real Estate Sector. It also provides different research reports published related to Real Estate.

http://www.demographia.com/—This site is a very good resource for finding relevant demographic information about different markets spread across the world. Some of the main features of this site are that it gives International housing affordability rankings, different surveys, different economic reports and different trends related to real estate. It's also a good source to find regulations and policies related to real estate.

http://www.fedstats.gov/—This site is a federal government sponsored website and it's a very good resource for finding relevant demographic information about different states of USA. This website is a gateway to statistics for more than 100 U.S. Federal agencies.

http://www.city-data.com/—This website gives very descriptive and interesting profiles of all U.S. cities. It has tens of thousands of city photos not found anywhere else, hundreds of thousands of maps, satellite photos, stats about residents (race, income, ancestries, education, employment...), geographical data, state profiles, crime data, housing, businesses, birthplaces of famous people, political contributions, city government employment, weather, hospitals, schools, libraries, houses, airports, radio and TV stations, zip codes, area codes, user-submitted facts, similar cities list, comparisons to averages. In sum, it's a very good website for doing real estate analysis.

Questions

1. What is the economic rationale for the cost approach? Under what conditions would the cost approach tend to give the best value estimate?
2. What is the economic rationale for the sales comparison approach? What information is necessary to use this approach? What does it mean for a property to be comparable?
3. What is a capitalization rate? What are the different ways of arriving at this rate to use for an appraisal?
4. If investors buy properties based on expected future benefits, what is the rationale for appraising a property without making any income or resale price projections?
5. What is the relationship between a discount rate and a capitalization rate?
6. What is meant by a unit of comparison? Why is it important?
7. Why do you think appraisers usually use three different approaches when estimating value?
8. Under what conditions should financing be explicitly considered when estimating the value of a property?
9. What is meant by depreciation for the cost approach?
10. When may a "terminal" cap rate be lower than a "going in" cap rate? When may it be higher?

11. In general, what effect would a reduction in risk have on "going in" cap rates? What would this effect be if it occurred at the same time as an unexpected increase in demand? What would the effect on property values be?
12. What are some of the potential problems with using a "going in" capitalization rate that is obtained from previous property sales transactions to value a property being offered for sale today?
13. When estimating the reversion value in the year of sale, why is the terminal cap rate applied to *NOI* for the year *after* the holding period?
14. Is a cap rate the same as an *IRR*? Which is generally greater? Why?
15. Discuss the differences between using (1) a terminal cap rate and (2) an appreciation rate in property value when estimating reversion values.

Problems

1. Zenith Investment Company is considering the purchase of an office property. It has done an extensive market analysis and has estimated that based on current market supply/demand relationships, rents, and its estimate of operating expenses, annual *NOI* will be as follows:

Year	*NOI*
1	$1,000,000
2	1,000,000
3	1,000,000
4	1,200,000
5	1,250,000
6	1,300,000
7	1,339,000
8	1,379,170

A market that is currently oversupplied is expected to result in cash flows remaining *flat* for the next three years at $1,000,000. During years 4, 5, and 6, market rents are expected to be higher. It is further expected that beginning in year 7 and every year thereafter, *NOI* will tend to reflect a stable, balanced market and should grow at 3 percent per year indefinitely. Zenith believes that investors should earn a 12 percent return (r) on an investment of this kind.

a. Assuming that the investment is expected to be owned for seven years and then sold, what would be the value for this property today? Hint: Begin by estimating the reversion value at the end of year 7.

b. What would the terminal capitalization rate (R_T) be at the end of year 7?

c. What would the "going in" capitalization rate (R) be based on year 1 *NOI*?

d. What explains the difference between the "going in" and "terminal" cap rates?

2. Ace Investment Company is considering the purchase of the Apartment Arms project. Next year's *NOI* and cash flow is expected to be $2,000,000, and based on Ace's economic forecast, market supply and demand and vacancy levels appear to be in balance, and as a result, NOI should increase at 4 percent each year for the foreseeable future. Ace believes that it should earn at least a 13 percent return on its investment.

a. Assuming the above facts, what would the estimated value for the property be now?

b. What cap rates should be indicated from recently sold properties that are comparable to Apartment Arms?

c. Assuming that in part (*a*) the required return is 14 percent, what would the value be now?

d. Assume results in part (*c*). What must the investor consider relative to "comparable" sales in (*b*) that may account for the differences in value?

3. Acme Investors is considering the purchase of the undeveloped Baker Tract of land. It is currently zoned for agricultural use. If purchased, however, Acme must decide how to have the property rezoned for commercial use and then how to develop the site. Based on its market

study, Acme has made estimates for the two uses that it deems possible, that is, office or retail. Based on its estimates, the land could be developed as follows:

	Office	Retail
Rentable square feet	100,000	80,000
Rents per square foot	$24.00	$30.00
Operating expense ratio	40%	50%
Avg. growth in *NOI* per annum	3%	3%
Required return (r)	13%	14%
Total construction cost per square foot	$100	$100

Which would be the highest and best use of this site?

4. Ajax Investment Company is considering the purchase of land that could be developed into a class A office project. At the present time, Ajax believes that the site could support a 300,000 rentable square foot project with average rents of $20 per square foot and operating expenses equal to 40 percent of that amount. It also expects rents to grow at 3 percent indefinitely and believes that Ajax should earn a 12 percent return (r) on investment. The building would cost $100 per square foot to build:

a. What would the estimated property value *and* land value be under the above assumptions?

b. If rents are suddenly expected to *grow* at 4 percent indefinitely, what would the property value and land value be now? What percentage change in land value would this be relative to the land value in (*a*)?

c. If instead of (*b*), suppose rents will grow only by 1 percent because of excessive supply. What would land value be now? What percentage change would this be relative to the land value in (*a*)?

d. Suppose the land owner is asking $12,000,000 for the land. *Under assumptions in part (a)* would this project be feasible?

e. If the land *must* be acquired for $12,000,000, returning to the assumptions in (*a*), how much of a change in the following would have to occur to make the project feasible? (Consider each item one at a time and hold all other variables constant.)

(1) Expected return on investment (r).

(2) Expected growth (g) in cash flows.

(3) Building cost.

(4) Rents.

5. Armor Investment Company is considering the acquisition of a heavily [illegible] building on 10 acres of land. At some time in the future it will demolish the building and build something more desirable. In the interim it expects to rent the building [illegible] and expects to collect cash flows equal to $100,000 next year. However [illegible] is expected to increase, Armor expects cash flows to decline [illegible] percent per year [illegible]. Armor expects to earn an *IRR* on investment return [illegible] percent. What is the [illegible] of this property?

6. [illegible] Investment Company is considering the purchase of an office property. [illegible] review of the market and the leases that are in place, Athena [illegible] will be $100,000. It also believes that the cash flow will rise in the amount of [illegible] per year for the foreseeable future. It plans to own the property for at least 10 years. [illegible] property sales of properties that are *now* 10 years older than the [illegible] determined that cap rates are in a range of .10. Athena believes that [illegible] return) of at least 11 percent.

a. What is the estimated value of this office property (assume [illegible])?

b. What is the current, or going-in, cap rate for this property?

c. What accounts for the difference between the cap rate in (*b*) and .10 [illegible]?

d. What assumptions are being made regarding future economic conditions when using current comparable sales to estimate terminal cap rates?

7. An investor is considering the purchase of an existing suburban office building approximately five years old. The building, when constructed, was estimated to have an economic life of 50 years, and the building-to-value ratio was 80 percent. Based on current cost estimates, the structure would cost $5 million to reproduce today. The building is expected to continue to wear out evenly over the 50-year period of its economic life. Estimates of other economic costs associated with the improvement are as follows:

Repairable physical depreciation	$300,000 to repair
Functional obsolescence (repairable)	$200,000 to repair
Functional obsolescence (nonrepairable)	$ 25,000 per year rent loss

The land value has been established at $1 million by comparable sales in the area. The investor believes that an appropriate opportunity cost for any deferred outlays or costs should be 12 percent per year. What would be the estimated value for this property?

8. ABC Residential Investors, LLP, is considering the purchase of a 120-unit apartment complex in Steel City, Pennsylvania. A market study of the area reveals that an average rental of $600 per month per unit could be realized in the appropriate market area. During the last six months, two very comparable apartment complexes have sold in the same market area. The Oaks, a 140-unit project, sold for $9 million. Its rental schedule indicates that the average rent per unit is $550 per month. Palms, a 90-unit complex, is presently renting units at $650 per month, and its selling price was $6.6 million. The mix of number of bedrooms and sizes of units for both complexes is very similar to that of the subject property, and both appear to have normal vacancy rates of about 10 percent annually. All rents are net as tenants pay all utilities and expenses.
   a. Based on the data provided here, how would an appraiser establish an estimate of value?
   b. What other information would be desirable in reaching a conclusion about the probable value for the property?

9. The *NOI* for a small income property is expected to be $150,000 for the first year. Financing will be based on a 1.2 *DCR* applied to the first year *NOI*, will have a 10 percent interest rate, and will be amortized over 20 years with monthly payments. The *NOI* will increase 3 percent per year after the first year. The investor expects to hold the property for five years. The resale price is estimated by applying a 9 percent terminal capitalization rate to the sixth-year *NOI*. Investors require a 12 percent rate of return on *equity* (equity yield rate) for this type of property.
   a. What is the present value of the equity interest in the property?
   b. What is the total present value of the property (mortgage and equity interests)?
   c. Based on your answer to part (*b*), what is the implied overall capitalization rate?

10. Sammie's Club wants to buy a 320,000-square-foot distribution facility on the northern edge of a large midwestern city. The subject facility is presently renting for $4 per square foot. Based on recent market activity, two properties have sold within a two-mile distance from the subject facility and are very comparable in size, design, and age. One facility is 350,000 square feet and is presently being leased for $3.90 per square foot annually. The second facility contains 300,000 square feet and is being leased for $4.10 per square foot. Market data indicate that current vacancies and operating expenses should run approximately 50 percent of gross income for these facilities. The first facility sold for $9.4 million, and the second sold for $7.9 million.
   a. With a direct capitalization rate approach to value, how would you estimate value for the subject distribution facility?
   b. What additional information would be desirable before the final direct rate (*R*) is selected?

11. Refer to the highest and best use analysis in Exhibit 10–8. Suppose the warehouse income would grow at 3 percent per year instead of 2 percent. Does this change the highest and best use of the site? If so, what is the new implied land value?

12. You are an analyst with Perception Partners and have been asked to make pricing recommendations regarding the acquisition of Rose Garden Apartments. This project was built five years ago and contains 250 units in a suburban market area. The broker that brought the project to your attention

indicates that the asking price will be $27,000,000. She has also provided the attached information based on a market survey showing data from three sales of comparable apartment properties that have occurred in a one-mile radius of Rose Garden during the past six months (see table below).

Perception believes that market returns(IRR) should be in a range of 9 percent (compounded annually) for this type of investment. Perception (1) plans to own the property for five years and then sell it and (2) believes that rents will grow at 3 percent per year. At the present time, Per-

	Rose Garden	Comparable 1	Comparable 2	Comparable 3
Age	5	6	7	10
Acres	14	10	8.75	12.5
# Units	250	200	175	250
Units per acre	17.9	20.0	20.0	20.0
Price		$20,000,000	$16,625,000	$21,000,000
Bedroom / Bathroom:	$ Rent / # Units / SF:	$ Rent / # Units / SF:	$ Rent / # Units / SF:	$ Rent / # Units / SF:
1 / 1	830 / 75 / 780	820 / 60 / 770	791 / 53 / 740	775 / 75 / 750
1 / 1.5	850 / 50 / 810	835 / 40 / 800	810 / 35 / 780	795 / 50 / 775
2 / 2	1,040 / 100 / 960	1,030 / 80 / 950	1,000 / 70 / 920	970 / 110 / 900
3 / 2	1,270 / 25 / 1,180	1,250 / 20 / 1,170	1,200 / 18 / 1,130	1,170 / 15 / 1,100
Weighted average	962 / x / 898	950 / x / 888	925 / x / 864	888.5 / x / 842
Rentable area (SF)	224,500	177,600	150,130	210,500
Vacancy	5%	5%	5%	5%
Operating expense	40%	40%	40%	45%
Gross rent	$2,886,000	$2,280,000	$1,928,076	$2,665,500
GIM		8.77	8.62	7.88
Net income	$1,645,000	$1,300,000	$1,099,000	$1,393,000
Cap rate		0.0650	0.0661	0.0663
Wt. Avg month rent/unit	$962	$950	$918	$889
Rent per SF	$12.855	$12.838	$12.843	$12.663
Price per unit		$100,000	$95,000	$84,000
Price per SF		$112.61	$110.74	$99.76
Quality	Excellent	Very good	Average	Average
Location	Excellent	Desirable	Desirable	Slightly less desirable
Parking spaces per unit	2.00	1.75	1.60	1.50
Security gate	Yes	Yes	Yes	No
Washer / dryer	Yes	Yes	Yes	Not in 1/1
A / C	Yes	Yes	Yes	Yes
Built-ins	Yes	Yes	Yes	Yes
Covered parking	Yes	Yes	No	No
Free cable TV	No	No	Yes	Yes
Fireplaces	No	No	Yes	No
Exercise room	No	No	No	Yes
Swimming pool / BBQ	Yes	Yes	Yes	Yes

ception believes that the sale price that it hopes to achieve at the end of year 5 should be based on a *going-out* cap rate that will be .005 greater than the *going-in* cap rate. The property will be acquired on an "*all cash*" basis.
   a. Prepare an analysis of Rose Garden with the three comparable properties. Based on this analysis, should the going-in cap rate for Rose Garden be higher or lower than the cap rates shown for the comparables?
   b. If Rose Garden is acquired for $27,000,000, what would be the going-in cap rate at that price? How does this compare to cap rates for the comparables?

c. If Rose Garden is acquired for $27,000,000 would the 9 percent required return be achieved over the five-year period of ownership?

d. Based on the results in (*c*), what price would you recommend to achieve 9 percent? What would be the going-in cap rate at that price?

13. An investor is considering the purchase of a small office building. The *NOI* is expected to be the following: year 1, $200,000; year 2, $210,000; year 3, $220,000; year 4, $230,000; year 5, $240,000. The property will be sold at the end of year 5 and the investor believes that the property value should have appreciated at a rate of 3 percent per year during the five-year period. The investor plans to pay all cash for the property and wants to earn a 10 percent return compounded annually.

a. What should be the present value of the property today?

b. Based on your calculations in (*a*) what should be the property value at the end of year 5?

c. How can the value at the end of year 5 be estimated if today's present value also must be estimated?

d. Based on your answer in (*a*), if this office building could be reproduced for $2,300,000 today, what would be the underlying value of the land?

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14. **Spreadsheet Problem.** Refer to the Ch10_Mort Eq Cap tab in the Excel Workbook. This replicates the example discussed on page 295 of the book.

a. Suppose there is an aggressive lender that is willing to allow the debt coverage ratio (*DCR*) to be as low as 1.0. Keep all other assumptions, including the loan interest rate and equity discount rate (before-tax equity yield), the same. How does this affect the amount that can be borrowed and the property value?

b. Refer to part (*a*). Is it reasonable to assume that the loan interest rate and equity discount rate would be the same? If not, would you expect each to be higher or lower? Why?

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15. **Spreadsheet Problem.** Refer to the Ch10_H&BU tab in the spreadsheet which replicates the highest and best use analysis example in the chapter.

a. Suppose the construction cost is $3.5 million on office, $6.5 million on retail, $2.5 million on apartment, and $3.5 million on warehouse. How does this change the highest and best use of the site and the land value?

b. Use the same construction costs as part (a) but assume that office income would increase by 4 percent per year instead of 3 percent per year. Does this change the highest and best use of the site and the land value?

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16. **Spreadsheet and ARGUS Problem.** Use the Oakwood Apartments.SF file provided on the book CD to use with ARGUS. This replicates the Oakwood Apartments example in the book. This same example is also solved with Excel in the Ch10_Apartment tab of the Excel Workbook provided on the book CD. Suppose investors required only a 9 percent rate of return (discount rate) instead of 11 percent and the terminal cap rate used to estimate the resale price was 8 percent instead of 9 percent.

a. Use the Excel template to see how your answer would change.

b. Use ARGUS to see how your answer would change.

Chapter 11

Investment Analysis and Taxation of Income Properties

The investor must consider many variables when acquiring income properties, among them market factors, occupancy rates, tax influences, the level of risk, the amount of debt financing, and the proper procedures to use when measuring return on investment. Lenders are concerned with many of the same questions because these factors affect the value and marketability of the properties being used as collateral for loans. In addition, lenders are concerned with whether properties they finance will generate enough cash flow to cover the loan payments. This chapter provides the framework for analyzing additional issues addressed in many of the remaining chapters in this text.

Motivations for Investing

We have seen that there are many different categories of income property. We now consider why investors and lenders choose investments in one or more of these properties. We first consider the equity investor. The term **equity** refers to funds invested by an "owner," or the person acquiring the property. The particular form of ownership could be any of the freehold estates discussed in Chapter 2. That is, equity funds could be invested in a fee simple estate, a leased fee estate, a leasehold estate, and so forth. We contrast equity funds with debt, which is provided by a lender with the real estate used as collateral for the loan as discussed in Chapter 2.

What motivates the investor to make an equity investment in income properties? First, investors anticipate that market demand for space in the property will be sufficient to produce net income after collecting rents and paying operating expenses. This income constitutes part of an investor's return (before considering taxes and financing costs).

Second, the investor anticipates selling properties after holding them for some period of time. (A discussion regarding how long a property will be held is discussed in Chapter 14.) Investors often expect prices to rise over the holding period, particularly in an inflationary environment. Thus, any price increase also contributes to an investor's return.

A third reason for investing in real estate is to achieve diversification. By this we mean that most investors want to hold a variety of different types of investments such as stocks, bonds, money market funds, and real estate.

A final reason for investing in real estate, which may be more important to some investors than others, is the preferential tax benefits that may result. Because of favorable tax treatment of real estate, investors paid little or no taxes on returns from real estate investments for many years. Although many of these favorable tax benefits have been eliminated over the years, understanding real estate tax law is still important. Investors must be able to understand changes in such laws and interpret their interaction on rents and real estate values. As tax laws change, investor decisions regarding purchase prices, how much financing should be used, and when to sell the property are also affected.

Motivations for Investing in Income Properties

1. Rate of return.
2. Price appreciation.
3. Diversification.
4. Tax benefits.

Real Estate Market Characteristics and Investment Strategies

Based on our discussion of economic base analysis and local supply and demand analysis in previous chapters, it should be evident that expected market conditions are important when making estimates of future cash flows. For example, if supply and demand for a given property type are considered to be out of balance and these conditions are expected to persist, the effects on vacancies and rents should be taken into account in forecasts of cash flows. If done properly, estimates of value and investment returns will reflect these expectations. What follows is a description of (1) the cyclical nature of the real estate market and (2) a description of various *investment styles* that are widely used in all segments of the investment community (stocks, bonds, real estate, and so on). As the reader will come to realize, descriptions used to identify these "styles of investing" usually correspond to some underlying expectations regarding market conditions. We *do not advocate* any one or combination of such investment styles. Nonetheless, these terms and descriptions are widely used by investment professionals to help classify and describe conditions in investment markets, and the reader should be aware of what they are.

"The Real Estate Cycle"

It may be useful at this point to discuss the "**real estate cycle,**" that is, the cyclical nature of the real estate industry as background material for the more specific investment styles and strategies we will discuss. Some underlying facts regarding the real estate industry are (1) it is a very large market, in terms of both the number of properties and square footage, (2) it is highly competitive, and (3) ownership is highly fragmented, that is, no one owner or developer controls a significant share of the real estate market in major cities in the United States.

It is also a fact that when local real estate owners and investors sense that vacancy rates are declining and rents are rising, it generally implies that the amount of leaseable space is also declining. As a result, more development may be feasible. Consequently, developers begin to conduct highest and best use studies for specific sites and also analyze markets to determine if additional space, if developed, can be leased profitably. Because many competing developers may sense this opportunity simultaneously, they may all begin to obtain financing and develop at once in order to satisfy the demand. Even though there may be a definite need for additional space, the potential for overdevelopment will exist as each developer rushes to deliver additional space to the market before competitors. There is no way to determine exactly how much space should be developed because the depth and extent of

EXHIBIT 11–1
"The Real Estate Cycle"

demand are difficult to predict. As a result, the real estate industry is sometimes said to be prone to periodic *cycles* of "overdevelopment." Because of the highly competitive nature of the industry and its difficulty in forecasting demand, there are certain times when excess supply is unintentionally produced, thereby increasing vacancy rates, reducing rents, and causing volatility in property values.

The cyclical nature of this market pattern is shown in Exhibit 11–1, which shows a *hypothetical cycle* for all property types relative to a "normal" level of occupancy for each property type. All points above the normal occupancy range for each property type indicate a condition of high occupancy and rising rents. This is a condition when further development is likely. All areas below the normal range indicate a condition of low occupancy and the potential for declining rents, a condition not suitable for development.[1] To illustrate, based on the pattern shown in Exhibit 11–1, apartment properties are in a recovery phase of the cycle after experiencing a condition of either excess supply or lack of demand. As implied in the exhibit, this property class is expected to continue to "recover" as the occupancy rate improves and demand increases relative to supply.

On the other hand, office properties are shown to be in a condition of high occupancy due to either excess demand or a shortage of rentable space. This market imbalance is expected to result in rising occupancy and higher rents. Therefore, this market segment may be expected to undergo future development. Warehouse properties appear to be in a well-balanced condition. No material change in occupancy or rents is expected and, as a result, no unexpected amount of development is likely. Retail properties, however, are in a declining occupancy phase of the cycle due to either an excessive amount of space for lease or lack of demand. The graph also indicates that retail occupancy is expected to decline further.

In summary, Exhibit 11–1 is intended to provide a framework of the supply demand balance for each property type at one point in time. Based on the current stage in this cycle, investors considering investing in apartments should anticipate a period of vacancies and soft rents in cash flow projections even though this market is in recovery. Office property investors should expect to enjoy a period of low vacancies and higher-than-normal rents. However, these investors should also expect more office development and, therefore, competition that will eventually result in rents, occupancies, and cash flows trending back to normal levels.

[1] It should not be inferred from this exhibit that the normal level of occupancy shown in the graph is exactly the same for each property. This is a conceptual exhibit and is intended to depict general market conditions.

Warehouse investors should not expect material changes in vacancies or rents. Retail property investors, on the other hand, should expect deteriorating conditions to continue and should forecast a continuing decline and an eventual turning point in cash flow forecasts. The time period associated with the cycle in Exhibit 11–1 is very difficult to forecast. It may be expected to exist only for a short period and must be continuously reevaluated (1) as new construction is being completed, or (2) as the market experiences an unanticipated surge in demand for space. While the illustration in Exhibit 11–1 is very simplistic, it does serve as a starting point for investors in understanding the nature of the supply/demand balance by property type and should help the reader understand the general strategies that follow.

Investment Strategies

Thus far, we have approached the subject of pricing and investing in properties by stressing that investors should carefully make forecasts of future cash flows given the expected market supply and demand and capital market conditions. This section contains a summary of some strategies or styles that are followed by real estate investors and portfolio managers. These styles are chosen with the intent of realizing superior investment performance. Think about these styles in conjunction with the discussion of the real estate cycle and formulate a critique of each approach. Exhibit 11–2 provides you with a general perspective on real estate market cycles and investment strategies. It should be obvious that many of these strategies overlap and may include combinations of one or more strategies. For example, an investor may combine a sector strategy with a timing strategy in that sector. Nevertheless, these strategies may be helpful in understanding much of the industry terminology that is used when describing the current state of a real estate market and the motivations of those seeking real estate investments.

Making Investments: Projecting Cash Flows

We will now look more closely at how investors and lenders project expected cash flows when they consider investing in income-producing properties. This will be followed by a discussion of various performance measures used to determine the attractiveness of a particular property.

Office Building Example

To illustrate how to make a projection of income, we consider the possible purchase of an office building by an investor for $8.5 million. Construction of the Monument Office Building was completed two years ago. The lead tenant is a bank that signed a five-year lease, which started when the building was completed two years ago. A law firm signed a five-year lease one year ago and a mortgage broker just signed a five-year lease on the remaining space. A summary of the existing leases is shown below.

Summary Lease Information—Monument Office Building

Tenant	Square Feet	Rent (per square foot)	Base Rent	Remaining Lease Term (years)	CPI Adjustment (percent)
Bank	70,000	$14.00	$ 980,000	3	50.00
Law firm	10,000	14.50	145,000	4	50.00
Mortgage broker	16,000	15.00	240,000	5	50.00
Total	96,000		$1,365,000		

Note: Additional assumptions about the tenant's responsibility for increases in operating expenses (expense stops) will be discussed later.

EXHIBIT 11–2
Investment Styles Used by Real Estate Investors—Sector Investing

A. Investing in Core Properties
This style is based on a goal of acquiring existing, seasoned, relatively low-risk properties that are at least 80 percent leased to tenants with good credit. These properties may also be acquired as a foundation for building a larger portfolio. The goal is to realize a relatively stable cash flow with returns that are competitive with comparable properties. No major change in the operation of the property or major capital improvements would be expected.

B. Investing in Core Properties (A.) with a "Value Add" Strategy
This strategy combines core investment with a strategy to make changes in the management of the property with a releasing program or by making some specific capital improvements. These latter changes tend to be very specific and are targeted toward increasing rents and outperforming competing properties in the same submarket.

C. Property Sector Investing
This style is based on the belief that over the long term, based on economic and demographic research, one *property type* will outperform other property sectors. For example, if research shows that prospects for the office sector are excellent and that this sector will outperform the retail, apartment, and warehouse property sectors over the long term, then an investor would specialize in office properties as a preferred sector investment. After the sector is chosen, then, based on market research, specific properties in specific cities and locations would be acquired. (This style is analogous to mutual funds that are created to invest only in stocks in specific industry sectors, such as the computer industry, energy, and health care companies.)

D. Contrarian Investing
This strategy is based on the premise that some major economic, technological, or other event will make the investment outlook for a given property type poor and "out of favor" among investors. Contrarians believe that investors tend to overreact to negative news and tend to oversell out-of-favor properties. For example, investors may believe that shopping on the Internet may have a very negative effect on retail properties; other investors may believe that outsourcing to overseas manufacturers may reduce the demand for industrial warehouse properties in the United States. If the majority of investors believe that these investments will perform poorly and sell them, a contrarian may wait until these properties become available at very low prices, and then *purchase* them with the expectation that after other investors realize that this property sector has been oversold, a price recovery will occur.

E. Market Timing
This strategy is based on the belief that with an understanding of the stage of each property type in the real estate cycle and future economic conditions, some investors [illegible] to [illegible] when to buy or sell properties. For example, in Exhibit 11–1, [illegible] that occupancy and rents will definitely improve and that the apartment [illegible] definitely passed the bottom of its cycle and is in a recovery phase [illegible] a target investment for a "market timer." Similarly, [illegible] the retail property sector in a given market *because* of excess supply [illegible] "time or wait" to enter this market when it appears [illegible] be eliminated, and then acquire properties in the hope [illegible] market price cycle upward. (Note that this strategy may be [illegible] to external events such as e-commerce, [illegible] current supply/demand or cyclical conditions in their evaluation [illegible] also believe that they should sell when a specific property [illegible] cyclical peak and buy a different property type in a different phase of the [illegible] of timing is sometimes referred to as a property sector rotation strategy.

F. Growth Investing
This strategy is based on "discovering," through research, those properties in [illegible] that are likely to experience significant or above average appreciation in [illegible]

EXHIBIT 11–2
Continued

these properties believe that economic conditions favor demand for specific property types in specific growth markets. This investment style is heavily dependent on the value of market research and the ability to understand changes in the economic environment/technology, and its effects on all real estate sectors. For example, growth in e-commerce and technology may be expected to *favor* warehouse properties in specific strategic geographic locations. A growth investor would search those strategic locations to invest in warehouse properties. These properties would be purchased with the expectation that as more investors discover these markets and properties, they will make investments and drive prices up, thereby producing superior appreciation in property values. Investors using the strategy should expect to bear more risk than average as these markets are apt to be more valitile as they expand and contract in concert with the industries that are driving the demand for space.

G. Value Investing
This strategy is based more on a "tried and true" performance approach where research is directed toward finding those properties that have been "overlooked" by investors. Using careful research efforts, value investors try to identify properties with the ability to produce greater-than-expected income and appreciation. For example, investors may prefer to invest in office properties that are located in central business districts and leased on a long-term basis to many large corporate tenants. In this case, rental income is more assured as tenants are large tenants with good credit histories. Because many leases may be about ready to expire, the ability of landlords to increase rents may be good. In trying to execute this strategy, investors attempt to focus on properties that have been overlooked by other investors and, therefore, appear to be undervalued.

H. Strategy as to Size of Property
This strategy is based on a preference for a subsector within a property type because investor/owners believe that they can better understand the operation of tenant-users and, therefore, better understand the demand for space in that subsector. As a result, such property owners tend to specialize in one property sector believing that it may be more cost-effective to lease and manage that property type. For example, an investor/owner may choose to invest *only* in neighborhood or community size retail shopping centers and not invest in larger regional malls. Or, an investor may prefer to invest in small, low-rise suburban office buildings rather than high-rise buildings located in central cities. They believe that a better understanding of these property subsectors and the tenants in these market sectors will be more profitable than would be the case if they invested in larger, more complicated, properties.

I. Strategy as to Tenants
This strategy is based on a preference for properties leased to multiple tenants or leased to a single or very few tenants. In the former case, owners may prefer to take the risk of higher tenant turnover because the ability to adjust rents to market levels more frequently is also greater. On the other hand, many investors may prefer properties that are leased to single tenants. These properties may be less risky because of low tenant turnover and the creditworthiness of tenants. These properties may be preferred even though they may not offer the opportunity for frequent adjustment in rents.

J. Arbitrage Investing
This strategy is based on the ability of investors to recognize differences in prices that buyers are willing to pay for the same real estate investments in different markets. For example, this strategy has been used by investors who buy properties directly in private market transactions and then earn a profit by creating a publicly traded entity, such as a REIT, and issuing stock to the public. In this case, positive arbitrage profits are realized when the total market value of the REIT stock sold to the public exceeds the acquisition cost of the individual properties plus the cost of issuing stock. This strategy may also be reversed by purchasing all share of a REIT and "taking at private," and then selling properties to private investors at higher prices than reflected in share prices of the REIT.

EXHIBIT 11–2
Concluded

K. Turnaround/Special Situation
These strategies are generally based on the belief that successful investments can be made by investors who see opportunities by changing or modifying the use of existing properties. For example investors may:

1. Acquire underperforming or undermanaged properties. After a period of more intensive leasing, renovation, and property management, these properties can be sold one at the time, such that the total amount received when all properties are sold exceeds the initial total cost.
2. Acquire "real estate rich" firms that own an extensive amount of real estate in their business. These firms may not realize that the market value of their real estate is not fully reflected in the value of their business operation. In this case, investors realize that the value of the business and the value of the real estate are separable. Consequently, a gain may be earned by acquiring the firm and then selling its real estate. The necessary space to run the business could then be leased. If successful, the value of the real estate and the value of the business after separation would be greater than the previously combined entity.

L. Opportunistic Investing
Acquire properties from investors in financial difficulty or properties needing renovation, upgrading, or repositioning. The success of this investment plan is usually dependent on:

1. The ability to purchase properties at a discount.
2. Management understanding the opportunity and how to upgrade, modify, or perhaps reposition the property (e.g., from office use to retail use). The success of such an investment may also be dependent on an exit strategy such as:
   a. Market acceptance of the repositioned assets.
   b. The ability of buyers to obtain financing to purchase such assets.

M. Investing in "Trophy" or "Blue Chip" Properties
This strategy is based on a "blue chip" approach to investing; that is, only very visible, well-located properties should be the targets for acquisition. While similar to value investing discussed above, investors in trophy assets believe that properties with some unique historical, architectural, or locational attribute (e.g., Empire State Building, Rockefeller Center, Transamerica Tower, Mall of America, Watergate Apartments) will prove to be excellent investments for the long term.

N. Development
This strategy usually involves the acquisition of land, design of the building, and a leasing program to reach stable occupancy. By embarking on this riskier strategy, investors believe that most value creation may occur through development, design, leasing, etc., thereby leading to superior investment returns than would be the case by investing in existing properties.

Additional assumptions are as follows:

Current market rent (per square foot): $15.
Leaseable square feet area: 96,000.
Projected increase in market rent per year: 4.00 percent.
Management costs (percent of effective gross income): 5.00 percent.
Estimated annual increase in the consumer price index: 4.00 percent.

Base Rent

From this summary we see that the total **base rent** is $1,365,000. Note that the base rent for the bank ($14) that was signed two years ago is less than the current market rent of $15 per square foot. Similarly, the base rent for the law firm ($14.50) signed one year ago is less than the current market rent of $15 per square foot. The market rent has increased over the past two years.

CPI Adjustment

In this example, we illustrate how rental adjustments are made based on expected increases in the consumer price index (CPI), that is, the **CPI adjustment**. As shown in an earlier chapter, there are a number of other ways that rent collections can be negotiated. In this example, we assume the rental rate is adjusted each year based on any increase in the CPI that occurred in the current year. One possibility is that rents are increased by the same percentage amount that the CPI increases. For example, if the CPI rises 4 percent as projected in our example, then the base rent would be increased 4 percent. However, lease payments are not always increased by the full amount of the increase in the CPI. Inclusion of inflationary adjustments in lease terms depends on market conditions and the willingness of tenants to bear the risk of unanticipated inflation. Inflation adjustments may be limited by caps or by specific step-ups in base rents. Further, as we have discussed, many building operating expenses incurred by owners are passed through to tenants. Because tenants will be paying a portion of these expenses (which will increase with inflation), it is not always necessary for a building owner to charge rents that are fully adjusted to the rate of inflation. On the other hand, if the market has an oversupply of space, no adjustment in base rent for inflation may be possible. Another reason rents may not be adjusted by the full amount of the CPI is that the lease can have a separate provision to reimburse the owner for any increase in expenses. This is discussed in the following section.

In our example, we assume that rents will increase by 50 percent of any increase in the CPI. Our assumption that the CPI will increase at a rate of 4 percent per year means that the base rental payment will increase by 2 percent per year (50 percent of 4 percent).

Based on our assumptions, the base rental income can be projected as shown in the projected rental income summary for the Monument Office Building below: You can verify some of the numbers in the exhibit by recalling that, as discussed above, base rents depend on (1) the initial base rent at the time the lease is signed, (2) CPI adjustments to the base rent, and (3) the market rent prevailing at the time of lease renewals.

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Projected Base Rental Income and CPI Adjustments

Year	1	2	3	4	5	6
Base rent:						
Bank	$980,000	$980,000	$980,000	$1,181,107	$1,181,107	$1,181,107
Law firm	145,000	145,000	145,000	145,000	175,479	175,479
Broker	240,000	240,000	240,000	240,000	240,000	291,997
CPI adjustment:						
Bank	19,600	39,592	59,984	0	23,622	47,717
Law firm	2,900	5,858	8,875	11,953	0	3,510
Broker	0	4,800	9,696	14,690	19,784	0
Total CPI adj.	22,500	50,250	78,555	26,643	43,406	51,226
Total:						
Bank	$999,600	$1,019,592	$1,039,984	$1,181,107	$1,204,729	$1,228,824
Law firm	$147,900	$150,858	$153,875	$156,953	$175,479	$178,989
Broker	$240,000	$244,800	$249,696	$254,690	$259,784	$291,997
Total rent	$1,387,500	$1,415,250	$1,443,555	$1,592,750	$1,639,992	$1,699,809

Market rent for our example is $15 per square foot during the first year. This is also the base rent for leases signed that year. Base rent on the leases is projected to increase at 2 percent

per year because of the CPI adjustment (half of 4 percent). However, we use a 4 percent annual rate of increase for projecting market rents that will be in effect when leases are renewed. This is because space will be re-leased at market rates at the expiration of each of the leases, and we assume that market rates will increase at the same rate as the CPI.

It appears that a tenant will face much higher rents when the lease is renewed because the new lease is based on a market rate that is projected to rise by the full amount of the CPI, whereas the tenant's rent has increased by only half the CPI over the term of the lease. However, we will see in the next section that the amount of expenses for which the tenant must reimburse the owner when the lease is renewed may also be reduced.

In the case of the bank, the initial base rent is $980,000, which is projected to increase 2 percent per year due to the CPI adjustment until the lease expires in the third year. The base rent in year 4 is projected to be $1,181,107,[2] which assumes the market rent (which applies to new leases) of $15 per square foot will have increased 4 percent per year by that time. Note that there is no CPI adjustment the first year of a new lease. Thus, there is no CPI adjustment for the brokerage company.

Expense Stops

We have discussed the use of a CPI adjustment to increase rents for unanticipated inflation. Office leases also commonly include a provision that protects the owner from increases in operating expenses beyond what they were during the year the lease was signed because of extraordinary expenses that may be related to the operation of one or more tenants. In our example, each lease for the office building has an **expense stop.** As briefly discussed in Chapter 9, these stops place an upper limit on the amount of operating expenses that will have to be paid by the owner. Any operating expenses in excess of the stop must be paid by the tenant. The amount of the stop is usually based on (1) the tenant's pro rata share (percent of total rentable area), (2) categories of expenses that the lessor and lessee agree will be included in the stop, and (3) the actual amount of operating expenses at the time the lease is signed.

For a newly developed property the tenant and property owner usually negotiate the amount of the stop. For older properties the owner generally provides the prospective tenant with operating expense statements, and the stop will be based on the tenant's pro rata share of the actual expenses on such statements.

In this case the lessor and lessee agreed that the stop will include all operating expenses. However, the owner of the property will incur property management expenses that will not be chargeable to the tenants. All amounts in excess of the expense stop must be paid by the tenant in addition to the base rent specified in the lease. For example, if the expense stop in the lease is $4.00 per square foot and current expenses are [illegible] per square foot, then in addition to rent, the tenant must pay the owner [illegible] per square foot as an expense reimbursement. The reason for an expense stop is obviously to assure the owner that net income in subsequent years will be at least equal to the initial net income. Using expense stops is particularly important in leases containing fixed base rents (those without CPI adjustments). If expense stops are not used, operating expenses may rise during the term of the lease and net income will decline. The particular expenses passed through to the tenants are negotiable and vary with market conditions. In our example, we have assumed that all expenses except management will be passed through. Tenants are usually reluctant to allow these expenses to be passed through because they are the responsibility of the building owner, and any attempt to pass these through to tenants may be viewed as excessive.

[2] $\$15(1.04)^3 \times 70{,}000$ square feet $= \$1{,}181{,}107$.

Expense stops in the existing lease are assumed to be as follows:

Lease	Stop
Bank	$4.00
Law firm	4.25
Brokerage	4.45

Panel A of Exhibit 11–3 shows the current expenses for the office building and the estimated annual increase in the expenses.

We can see from Panel A of Exhibit 11–3 that the projection of total operating expenses subject to expense stops is $427,200, or $4.45 per rentable square foot. Panel B shows projections for the increase in each expense category. Future rates of increase depend on estimates of how each cost is expected to change. In our example, utilities (heat and air conditioning) are expected to increase at a higher rate than the other items. We assume that property taxes will be level for two years, but then will increase when property values are reassessed. We expect property taxes to be level again for at least four years after the reassessment.

Panel C of Exhibit 11–3 uses the information on expense projections and expense stops to project expense reimbursements. Note that in year 1 the first four tenants will be making expense reimbursements to the owner because actual expenses are $4.45 per square foot, which exceeds the $4.00 expense stops in their leases. Also note that no expense reimbursement is projected for the year that leases are renewed because the stops included in lease renewals will be based on actual expenses at that time.

Net Operating Income

Based on the rental information and expense information in Exhibit 11–3, we can project **net operating income (*NOI*)** for the office building. Exhibit 11–4 projects net operating income for the next six years. Recall that we assumed management expenses to be 5 percent of **effective gross income (*EGI*)**. *EGI* is the actual rent expected to be collected after allowing for any vacancy. Management expenses are not reimbursable in these leases. The management expense may be incurred by the owner or paid to a property management company. In either case it is not passed on to the tenant, so the owner has an incentive to control management expenses. Our example projects vacancy at 5 percent of the base rent, beginning in the fourth year when the first lease is renewed.

Although expense stops provide for some reimbursement and protect owners against increases in expenses, they do not provide for any increase in *NOI* to offset inflation. An expense stop simply guarantees that *NOI* will not decline. Thus, we see why it may be desirable to have a CPI adjustment as in our example. *A CPI adjustment allows the NOI to increase each year even if no leases are renewed.* We can now also see why the CPI adjustment is not always made for the full amount of the increase in CPI. As we have seen, the expense stop has already adjusted for the effect of any increase in expenses due to inflation or any other factors. In general, expense stops and inflationary adjustments should be considered along with the initial base rent as part of the total rent for using space.

Expected Outlays for Replacements and Capital Improvements

As discussed in Chapter 9, the analyst should also consider outlays of a recurring nature for replacement of items that wear out in the normal operating cycle of a property. These items may be included in operating expenses. In the case of capital outlays for major, nonrecurring items such as roof replacement, parking garage construction, and so on, these should

EXHIBIT 11–3
Summary of Operating Expenses—Monument Tower

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Panel A: First-Year Reimbursable Expenses and Projected Increases

	Dollars	Dollars per Square Foot	Projected Increases
Property tax	$148,800	$1.55	Level 2 yrs. 10% increase, then level
Insurance	14,400	0.15	Increase 4.00% per yr.
Utilities	120,000	1.25	Increase 5.00 per yr.
Janitorial	76,800	0.80	Increase 3.00 per yr.
Maintenance	67,200	0.70	Increase 3.00 per yr.
Total	$427,200	$4.45	

Panel B: Projection of Reimbursable Expenses per Year

	1	2	3	4	5	6
Property tax	$148,800	$148,800	$163,680	$163,680	$163,680	$163,680
Insurance	14,400	14,976	15,575	16,198	16,846	17,520
Utilities	120,000	126,000	132,300	138,915	145,861	153,154
Janitorial	76,800	79,104	81,477	83,921	86,439	89,032
Maintenance	67,200	69,216	71,292	73,431	75,634	77,903
Total reimbursable expenses	$427,200	$438,096	$464,325	$476,146	$488,460	$501,289
Per square foot	$ 4.4500	$ 4.5635	$ 4.8367	$ 4.9599	$ 5.0881	$ 5.2218

Panel C: Projected Expense Reimbursement per Year*

	1	2	3	4	5	6
Bank	$31,500	$39,445	$58,571	$ 0	$ 8,979	$18,334
Law firm	2,001	3,135	5,868	7,098	0	1,336
Brokerage	0	1,816	6,188	8,158	10,210	0
Total	$33,501	$44,396	$70,627	$15,256	$19,189	$19,670

*We have made an estimate for a potential vacancy in Exhibit 11–4 that may occur when any of Tenants 1, 2, or 3 is scheduled to renew their lease. It is possible that any or all of these tenants may vacate and a new tenant or tenants would have to occupy the space at market rents. However, there may be some revenue loss during this time required for re-leasing.

be shown as an additional deduction from *NOI* in the year that the outlay will occur. In our example, Monument Office Building is not expected to require any major capital outlays during the six-year projection made in Exhibit 11–4.

Estimated Sale Price

To calculate measures of investment performance over an investment holding period, we must also estimate what our property might sell for. We first need to choose a holding period over which to analyze the investment. For now we will choose five years. When estimating a sale price, investors commonly use two general procedures. The first procedure is to estimate a rate at which property values in general are expected to increase in the area. This is sometimes related to expected inflation rates, although office buildings in some areas may do better or worse than the overall inflation rate for the economy depending on employment. For our office building, we assumed that the market rental rate would increase 4 percent per year. However, the rate at which *NOI* increases depends on the nature of the expense stops and the degree to which the lease payments are adjusted with the CPI. In our example the increase in *NOI* for the five-year lease term is about 3 percent per year. It seems reasonable, therefore, that the price for our property would also increase about 3 percent per year. If the asking price is used as a starting point, a 3 percent annual increase would result in a sale

EXHIBIT 11–4 Projected Net Operating Income

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	Year					
	1	2	3	4	5	6
Base income	$1,365,000	$1,365,000	$1,365,000	$1,566,107	$1,596,586	$1,648,583
Plus CPI adjustment	22,500	50,250	78,555	26,643	43,406	51,226
Plus reimbursements	$ 33,500	$ 44,396	$ 70,625	$ 15,256	$ 19,189	$ 19,670
Total potential income	$1,421,000	$1,459,646	$1,514,180	$1,608,006	$1,659,181	$1,719,479
Less vacancy	0	0	0	80,400	82,959	85,974
Effective gross income	1,421,000	1,459,646	1,514,180	1,527,606	1,576,222	1,633,505
Less operating expenses:						
Reimbursable expenses	427,200	438,096	464,325	476,146	488,460	501,289
Nonreimbursable expenses*	71,050	72,982	75,709	76,380	78,811	81,675
NOI	$ 922,750	$ 948,568	$ 974,146	$975,080	$1,008,951	$1,050,541

*Management (5% of *EGI*)

price after five years of about $9,850,000.[3] Two problems are associated with using this approach to estimate the resale price. First, it is based on the assumed purchase price, which we may decide is not what the property is really worth once we complete our analysis. Second, it assumes that the resale price depends on how the historical value (purchase price) changed over time rather than looking forward to what will happen in the future. The approach to estimating a resale price discussed below addresses these issues.

A second way of estimating a resale price is to use the "terminal" capitalization rate concept discussed in an earlier chapter. Recall that the "going in" capitalization rate (cap rate for short) is defined as the ratio of the first-year *NOI* to the purchase price. For our office building example the cap rate based on the purchase price is 10.62 percent.[4] This ratio expresses the relationship between the purchase price of the property and the *NOI* that the purchaser expects to receive during the first year of ownership. The investor may find that, in general, office buildings that have recently been purchased by other investors have similar rates.

When estimating a sale price in the future, investors often add a slight premium to current (going-in) capitalization rates to reflect any depreciation, obsolescence, and the uncertainty of income in the future when the property will be sold. Thus, we might assume that the terminal capitalization rate used to estimate the resale price should be about 11 percent.[5] Because we assume the property will be sold at the end of the fifth year, the *NOI* in year 6 will be the first-year *NOI* to the new owner. Using *NOI* of $1,050,541 in year 6 and a capitalization rate of 11 percent results in an estimated resale price of $9,550,373.[6]

We now have two separate estimates of the resale price. Using a growth rate, we arrived at an estimate of $9,850,000. Using a capitalization rate, we arrived at an estimate of about $9,550,000. Considering both estimated prices, we might conclude that for purposes of analysis an estimated resale price about midpoint between these two estimates, or about $9.7 million, would be reasonable. Clearly, the analyst must use some judgment at this point regarding what is a reasonable estimate for the resale price. We are simply pointing out some of the considerations that might go into the investor's thought process. No single precise methodology can be rigidly followed. It is also common to round off the numerical estimate to convey the subjective nature of the estimate.

[3] $8,500,000 times $(1.03)^5$.

[4] Recall from previous chapters that this is sometimes referred to as the "going in" cap rate because it applies to the rate at the time of purchase.

[5] This assumes that no significant changes will occur in the market for office space during the six-year period that would change the relationship between *NOI* and value. The capitalization rate could change if a change in the supply and demand for office space affects market rental rates or if the rate of return required by investors in office space changes.

[6] Recall that when a capitalization rate is used to estimate the resale price it is often referred to as a *terminal capitalization rate.*

Introduction to Investment Analysis

In general, when we refer to **investment analysis** in real estate we are referring to analyzing a particular property to evaluate its investment potential. This analysis should also help answer other important questions: Should the property be purchased? How long should it be held? How should it be financed? What are the tax implications of owning the investment? How risky is the investment?

We will provide the analytic tools to answer these questions in the next several chapters. However, we can now begin to answer the first question: Should the property be purchased at a price of $8.5 million? To illustrate how we might approach this question, we continue with the pro forma statements from the office building example introduced above.

Internal Rate of Return (*IRR*)

In our previous discussion of the Monument Office Building we have calculated the net operating income (*NOI*) for the property as well as the projected resale price. These numbers, along with the proposed purchase price, can be used to calculate the **internal rate of return (*IRR*)** for the property.

Exhibit 11–5 shows the cash flows used to calculate the *IRR*. Recall that this is the rate that makes the present value of the projected cash flows equal to the initial investment. In this case the *IRR* is 13.46 percent. This is the return on the entire property. It does not consider the effect of borrowing money. Thus, it would be referred to as an "unleveraged *IRR*." Financing is in the next section of this chapter.

Present Value

The *IRR* for Monument Office Building (calculated above) is 13.46 percent. Suppose the investor requires a 14 percent rate of return? How much would he be willing to pay? To answer this question we discount the cash flows (*NOI* and sale price) at a 14 percent discount rate. The purchase price is not included in these cash flows because we are calculating how much the investor is willing to pay. Using a financial calculator of spreadsheet, the reader should be able to verify that the present value of the cash flows above, when discounted at 14 percent, is $8,336,000 (rounded to nearest thousand dollars). At a purchase price of $8,500,000 the property would have a net present value (*NPV*) of $8,336,000 − $8,500,000 or − $164,000.

EXHIBIT 11–5 Calculation of *IRR*

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Year	0	1	2	3	4	5
Purchase price	($8,500,000)					
Net operating income (*NOI*)		922,750	948,568	974,146	975,080	1,008,951
Sales price						9,700,000
Cash flow	($8,500,000)	922,750	948,568	974,146	975,080	10,708,951
IRR	13.46%					

ARGUS Solution

The Monument Office Building example can also be solved using the trial version of ARGUS provided with this book. The file is called "Monument Office.sf." Exhibit 11–6 shows what the initial screen looks like for this example. Note that the unleveraged *IRR* is 13.46 percent (same as calculated above) and the unleveraged present value is $8,336,000 (rounded to nearest thousand dollars).

Introduction to Debt Financing

In many cases, an investor will pay for a property by combining his own money (equity) with a loan (debt). In Chapter 12, we will discuss reasons why investors often find that a combination of equity and debt is desirable for real estate ownership. For now we will focus on how the use of debt affects the cash flows a real estate investor expects to receive.

To illustrate, we again return to our previous example of the Monument Office Building. Let us assume that an investor can obtain a loan for to percent of the property value at a 10 percent interest rate to be amortized over 20 years with monthly payments. The amount of the loan will be (.70 × $8,500,000), or $5,950,000. Monthly payments would be $57,418.79, or $689,025 per year. Traditional investment analysis computes loan payments based on monthly payments (assuming that is the way the payments will be made), but all cash flows are summarized on an annual basis for financial projections.

Exhibit 11–7 shows a summary loan schedule for the property for the first five years. From this point on projections will be made for five years under the assumption that the property will be sold after five years. The reason for projecting *NOI* for an *additional* year will become apparent when we discuss estimating the sale price of the property at the end of the five-year holding period.

Exhibit 11–8 shows the results of including the financing costs in the calculation of cash flows to the equity investor.

Subtracting debt service from *NOI* results in before-tax cash flow from operations ($BTCF_o$). $BTCF_o$ is also referred to as the **equity dividend** because it represents the cash flow that will actually be received by the investor each year, analogous to a dividend on common stocks.

Measures of Investment Performance Using Ratios

Equity Dividend Rate

The **equity dividend rate** is calculated by dividing the *BTCF* (also referred to as the equity dividend) in the first year by the initial *equity investment*. The investor's initial *equity* in the project *is equal to the purchase price less* the amount borrowed. Thus, the equity is $8,500,000 − $5,950,000 = $2,550,000. The equity dividend rate is therefore $233,725 ÷ $2,550,000 = 9.17 percent. This is a rough measure of current return on equity. Note, however, that it is not an investment yield because it does not take into account future cash flows from operation or sale of the property. The difference between the equity dividend rate and an investment yield, or *IRR*, for the equity investor is an important one, which we will discuss later in the chapter.

Debt Coverage Ratios

To obtain financing on the property, the lender must be satisfied that it is a good investment. One consideration obviously is the rate of return the lender will receive over the term of the loan, which depends on factors such as the interest rate charged, points, and so forth, as discussed earlier in this text. But the lender's rate of return is only one consideration. The lender will also evaluate the riskiness of the loan. One widely used indication of the riskiness of the loan is the degree to which the *NOI* from the property is expected to exceed the mortgage payments. The lender would like a sufficient cushion so that if the *NOI* is less than anticipated (e.g., from unexpected vacancy) the borrower will still be able to make the mortgage payments without using personal funds.

A common measure of this risk is the **debt coverage ratio (DCR)**. The *DCR* is the ratio of *NOI* to the mortgage payment. When *NOI* is projected to change over time, the investor typically uses first-year *NOI*. For the office building example, the projected *NOI* in year 1 is $922,751. The mortgage payment (debt service) is $689,025. These figures result in a debt coverage ratio of 1.34. Lenders typically want the first-year debt coverage ratio to be at least 1.2.

EXHIBIT 11–6
ARGUS Main Screen

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EXHIBIT 11–7
Summary Loan Information

	End of Year				
	1	2	3	4	5
Payment	$ 689,025	$ 689,025	$ 689,025	$ 689,025	$ 689,025
Mortgage balance	5,851,543	5,742,776	5,622,620	5,489,883	5,343,245
Interest	590,569	580,259	568,869	556,288	542,388
Principal	98,457	108,767	120,156	132,738	146,637

EXHIBIT 11–8
Estimates of Before-Tax Cash Flow

	Year				
	1	2	3	4	5
Net operating income (*NOI*)	$922,750	$948,568	$974,146	$975,080	$1,008,951
Less debt service (DS)	689,025	689,025	689,025	689,025	689,025
Before-tax cash flow	$233,725	$259,542	$285,121	$286,054	$319,925

We see that this project has a debt coverage of about 1.3 for the first year. Thus, it meets the minimum debt coverage ratio typically required by lenders.

Before-Tax Cash Flow from Sale

When the property is sold, the mortgage balance must be repaid from the sale proceeds. Repayment results in before-tax cash flow from sale ($BTCF_5$). After the fifth year, the mortgage balance is $5,343,245. Subtracting this from the sale price of $9,700,000 results in before-tax cash flow ($BTCF_5$) of $4,356,755. We can summarize the process as follows:

Estimates of Cash Flows from Sale in Year 5	
Sale price	$ 9,700,000
Mortgage balance	− 5,343,245
Before-tax cash flow *($BTCF_5$)*	$ 4,356,755

Internal Rate of Return to Equity Investor

Recall that the initial equity investment is $2,550,000, found by subtracting the $5,950,000 loan amount from the $8,500,000 purchase price. We have also already calculated the before-tax cash flow to the equity investor. Exhibit 11–9 presents the cash flows.

You should confirm that this process results in an *IRR* of 20.08 percent, which we will refer to as the *BTIRR* since it is a before-tax *IRR*. This is the before-tax yield that the investor may expect to earn on equity over the investment period. This considers the effect of the loan on the investor's return.

Is the return adequate? The answer to this question depends on what the investor can earn on comparable investments, such as similar office buildings or even other real estate investments with similar risk characteristics. We have discussed comparing capitalization rates and price per square foot with comparable properties. Similarly, we could also ask what rate of return we would expect to earn had we bought another property at the price paid by another investor. This may give us some idea of what returns other investors are expecting. Of course, we would have to make our own projections of *NOI* and resale price unless the other investor told us exactly what he was thinking. We would also make similar projections and *IRR* calculations for other properties that are for sale, using their asking price. That is, we should earn a return that is at least as good as the return we could earn on other properties that are for sale that have similar risk characteristics.

Another test of the reasonableness of the *BTIRR* is to compare it with the effective interest cost of any mortgage financing that could be obtained to purchase the property. Normally, we would expect the return on the property to be greater than the effective cost of financing on the property, because the investor accepts more risk than the lender. The lender assumes less risk because a lender would have first claim on income and proceeds from sale of the property should there be a default. For example, we should expect that the *IRR* for the office building (*BTIRR* of 20.08 percent) would be more than the 10 percent mortgage interest rate. Otherwise, the investor would be better off lending on real estate

EXHIBIT 11–9
Before-Tax Cash-Flow Summary—Monument Office Building

Year	0	1	2	3	4	5
Before-tax cash flow	($2,550,000)	$233,725	$259,542	$285,121	$286,054	$4,676,680

Abuses in Pro Forma Cash Flow Projections

When making pro forma cash flow projections for real estate income properties, the analysts must be realistic about the assumptions being made. The following abuses common in pro forma cash flow projections are based on an article in *Real Estate Review* by Vernon Martin:

1. Mismatched growth rates between rental income and expenses.
2. Failure to consider rental concessions and effective rents.
3. Absence of lease-by-lease analysis in properties encumbered by long-term leases.
4. Projection for expense recovery income that increases at the same growth rate as other expenses for a property encumbered by gross leases with expense stops.
5. Projections for vacancy and collection losses that are not synchronized with market conditions.
6. Omitting outlays for non operating expenses such as tenant improvements and leasing commissions.
7. Unsupported use of terminal capitalization rates that are lower than "going in" capitalization rates. Terminal capitalization rates should be related to the property's age and remaining economic life.
8. Underestimation of selling expenses.
9. Use of an inappropriate internal rate of return (discount rate).
10. Failure to recognize capital outlays for rennovations needed to maintain a property.

EXHIBIT 11–10
Summary of Monument Office Building Investment Analysis Measures

Capitalization rate	10.62%
IRR on property (unleveraged)	13.46%
IRR on equity (*BTIRR*)	20.08%

rather than investing in it. We will discuss approaches to measuring and evaluating risk to investors and show how debt affects that risk and return for equity investors in Chapter 13.

Summary of Investment Analysis Calculations

Exhibit 11–10 shows a summary of the calculations for the office building. The performance measures in Exhibit 11–10 should all be compared with other investment alternatives. The comparison will give a good indication of whether acquisition of the office building is a good investment. However, these measures may still not be sufficient to allow us to decide whether we should purchase the investment because we have not yet considered how *federal income taxes* might affect the results. We also need to know more about the *riskiness* of the investment so that we can be reasonably sure that we are comparing the performance measures outlined in Exhibit 11–10 with alternatives of comparable risk, as we discuss in the next section. We will also want to know whether we should borrow more or less money, and whether there are other, better ways of financing the property. Chapter 12 covers financing. Being able to obtain a loan on the property also depends on the appraised value an independent appraiser presents. This value may be more or less than the investor is willing to pay. If the appraised value is too low, it will be difficult to finance the property with the amount of debt that we have assumed in our projections.

It should be obvious that we have only begun to do the in-depth analysis the potential acquisition of our office building requires. Whether investors consider all of these issues in practice depends on their level of sophistication. Our objective will be to cover all the issues that *should* be considered to be certain of making an intelligent investment decision.

Taxation of Income-Producing Real Estate

Earlier in this chapter we introduced investment analysis of income-producing property. We calculated measures of investment performance such as the *IRR* and *NPV*. However, these calculations did not consider the effect of federal income taxes on the investment and financing decision; consequently, we referred to the analysis thus far as a before-tax analysis. We now extend investment analysis to include the effect of federal income taxes, which is referred to as an after-tax analysis.

Our discussion of taxes is intended only as a general overview of how taxes affect after-tax rates of return for real estate income property. Tax laws change frequently, and many complexities in the tax law are beyond the scope of this chapter. It is important, however, to have a sense of how tax laws influence investment decisions and how possible tax law changes may affect the desirability of real estate relative to other investments.

This chapter does *not* deal with real estate held as a *personal residence* by individuals. Special rules apply to the taxation of personal residences. For example, personal residences cannot be depreciated for tax purposes. We also assume that the property is not held for resale to others. Individuals holding property for resale to others in the ordinary course of business are referred to as **dealers,** *not investors*. Examples of individuals or firms with *dealer* status would be developers who develop lots for resale, builders of houses for resale, or others who do not intend to hold real estate as an investment, but rather for immediate resale. Real property held for resale by a dealer is *not depreciable* for tax purposes. (Depreciation rules are discussed later in the chapter.)

In this chapter we only consider property "held for use in a trade or business." *Most income-producing real estate investments are included in this category*. An owner acquires real estate with the intent to operate, modify, or do whatever is necessary to produce income in a trade or business. Individuals in other occupations who own and operate rental properties are also in this category, although they must be actively engaged in the management of the property. Investors in a partnership, corporation, or trust may also hold property for use in a trade or business.[7] Real estate used in trade or businesses includes land and improvements, such as income-producing rental properties and commercial properties, that are subject to depreciation. This category of real estate is the primary focus of the chapter.

Owners of real estate used in the production of income in a trade or business report income from rents and may deduct expenses incurred in operating the property, such as maintenance, repair, and utilities. They may also deduct property taxes, interest on mortgage loans made to acquire property, and interest on loans made in the operation of the business. In addition, they are allowed deductions for depreciation, and when properties are sold, certain capital gain and loss provisions (discussed in a later section) also apply.

Taxable Income from Operation of Real Estate

We have discussed at length how to calculate net operating income (*NOI*) for income-producing property. Recall that the calculation of *NOI* involves deducting expenses associated with *operating* a property, such as property taxes, insurance, maintenance, management, and utilities. Then, subtracting the mortgage payment from the *NOI* results in before-tax cash

[7] Real estate used for the production of income in a trade or business is categorized as Section 1231 assets. Capital equipment (such as machinery) purchased by businesses that use such assets in the production of income are also designated as Section 1231 assets.

flow from operating the property ($BTCF_n$). We will now see that **taxable income** from operating real estate income property differs from $BTCF_n$ for two main reasons.[8] First, only the *interest* portion of a loan payment, not the total payment, is deductible from *NOI* for tax purposes. Second, the tax code allows owners to deduct a **depreciation allowance** from *NOI*. Thus, taxable income from operating a real estate income property can be stated as follows:

$$\text{Taxable Income} = NOI - \text{Interest} - \text{Depreciation Allowance}$$

The amount of interest deductible in a given taxable year equals the total interest paid to the lender during that year. We have discussed the separation of loan payments into principal and interest in considerable detail in earlier chapters.[9] We have not covered calculating depreciation allowances for tax purposes yet, and we will discuss this subject in the following section.

Depreciation Allowances

Physical assets like buildings suffer from physical depreciation over time that, *ceteris paribus*, reduces their economic value. Because buildings must ultimately be replaced, and because tax law allows investment in improvements to be recovered before income produced from the improvement is taxed, the investor may take a deduction for capital recovery (depreciation) from net operating income prior to the determination of taxable income. Otherwise, net operating income and taxable income would be overstated by an amount equal to the annual decrease in value due to economic depreciation. Thus, in theory, investors should only be taxed on the income net of this economic allowance for depreciation. This is the theoretical basis for tax depreciation.

However, because of inflation, changes in supply and demand, and other economic factors that also affect the value of real estate, it is difficult to know what portion of any net change in value is caused by physical depreciation. Further, our tax system has historically provided for depreciation allowances that are greater than any actual decline in the economic value of the property. As we will see, to the extent that tax depreciation *allowances* exceed *actual* economic depreciation, investors realize tax benefits. Exhibit 11–11 summarizes the methods for computing depreciation allowances that various tax laws in effect in recent years have allowed.

EXHIBIT 11–11
Depreciation Rules for Real Estate[a]

Years	Depreciable Life	Methods Allowed
1969–1980	Useful life, approximately 30–40 years	Accelerated or straight line[b]
1981–1983	15 years	ACRS based on 175% of straight-line depreciation[c]
1984–1985	18 years	ACRS based on 175% of straight-line depreciation[c]
1986	19 years	ACRS based on 175% of straight-line depreciation[c]
1987–1992	27.5 years for residential	Straight line
	31.5 years for nonresidential	Straight line
1993–?	27.5 years for residential	Straight line
	39 years for nonresidential	Straight line

[a] Some real estate investments also include personal property such as furniture and fixtures. Personal property [illegible] much shorter time period than the real property (e.g., eight years under the current tax law).
[b] Investors generally selected accelerated depreciation methods that ranged from 125 to 200 percent of straight-line [illegible], depending on whether the property was residential or nonresidential, new or existing.
[c] Because of severe "recapture" rules that affected investors who used accelerated depreciation on [illegible] used straight-line depreciation in nonresidential real estate during this period.

[8] Additional differences will be shown in later chapters.
[9] You may want to review the appendix to Chapter 6 at this time.

It should be obvious from the exhibit that tax policy on depreciation allowances has varied considerably. As indicated, this is because, historically, Congress has provided for allowances in excess of economic depreciation to stimulate investment in real estate in the belief that this policy would increase construction and, hence, the supply of rentable space in the economy. Unfortunately, it may also have contributed to much of the overbuilding that occurred during the early 1980s. As shown in the exhibit, the Tax Reform Act (TRA), which passed in 1986, lengthened depreciable life from its length during the period from 1981 to 1986. Increasing the depreciable life of real estate is one of several features in the 1986 law that reduced the favorable tax treatment that real estate had enjoyed previously. Later in this chapter we will see that depreciation is one source of tax benefits to investors in real estate.

Depreciable Basis

The amount that can be depreciated for real estate improvements depends on the **depreciable basis** of the asset. The basis for a real estate investment is generally equal to the *cost* of the improvements (unless inherited or acquired by gift). *Cost* is generally defined to include the acquisition price of the improvements plus any installation costs associated with placing them into service. The cost of any capital improvements to the property made during the ownership period is also included in the basis when such outlays are made. Only improvements can be depreciated, not the cost of land. In this chapter, we focus on the tax treatment for existing properties. (Differences for properties that will be *developed and constructed* are discussed in a later chapter.)

Loan Points

Points paid in connection with obtaining a loan to purchase, refinance, or operate a real estate income property investment must be deducted ratably over the term of the loan. For example, suppose an investor secures a loan for $800,000 to purchase an office building. The loan is to be amortized over a 25-year term but has a term of 10 years with a balloon payment due at the end of the 10th year. Suppose two points, or $16,000, are paid on the loan. For tax purposes, the $16,000 would have to be amortized over 10 years, or $1,600 per year. If the investor sells the property before the points are fully amortized (year 10 in this example) the balance can be expensed in the year of sale. Thus, in the above example, if the property is sold and the loan is repaid after five years, $8,000 could be expensed against ordinary income.

Tax Liability and After-Tax Cash Flow

Once we have calculated taxable income, we can calculate the tax liability that results from operating the property. The tax liability is calculated by multiplying the taxable income by the investor's marginal tax rate. The **marginal tax rate** is the rate which the *additional* income from the investment under consideration will be taxed. In general, we can think of it as the investor's tax bracket. The tax rate that corresponds to a particular tax bracket is the rate that applies to an *additional* or *marginal* dollar of income that falls in a particular bracket. For investment decisions, we want to know how the additional income from adding the particular investment under consideration will affect the investor's taxes. Thus, we are interested in knowing what marginal tax rate (or rates) applies to the investment. For example, suppose the individual to whom the rates in Exhibit 11–12 apply already has taxable income of $100,000. Furthermore, suppose a real estate investment would produce taxable income of $10,000. According to the exhibit, the additional $10,000 of income would be taxed at a 31 percent rate, resulting in $3,100 in taxes.

EXHIBIT 11–12
2000 Marginal Ordinary Income Tax Rates for a Married Taxpayer Filing Jointly

Taxable Income	Marginal Tax Rate
$0–$43,850	15%
43,851–105,950	28
105,951–161,450	31
161,451–288,350	36
Over 288,350	39.6

Taxable Income from Disposal of Depreciable Real Property

In establishing whether a taxable **capital gain** or loss has occurred when a property is sold, we must determine the gross sales price. The gross sales price is equal to any cash or other property received in payment for the property sold, plus any liabilities against the property assumed by the buyer. Any selling expenses (e.g., legal fees, recording fees, and brokerage fees) may then be deducted to establish *net sales proceeds*. To determine gain or loss, subtract the *adjusted basis* of the property from net sales proceeds. The adjusted basis of a property is its *original basis* (cost of land and improvements, acquisition and installation fees) plus the cost of any capital improvement, alterations, or additions made during the period of ownership, less accumulated depreciation taken to date. Any excess of the net sales proceeds over the adjusted basis results in a taxable gain, and any deficit results in a taxable loss.

In the case of depreciable real estate held for use in trade or business, *net* gains on the sale are treated as long-term capital gains. The tax rate on long-term capital gains is often less than the rate on ordinary income. For example, the 1993 Tax Act set the maximum capital gain tax rate at 28 percent even if the investor is in a higher tax bracket for ordinary income. In 1997 the capital gain tax rate was lowered to 20 percent for that portion of the gain due to any increase in the value of the property and 25 percent for that portion of the gain due to depreciation taken (recapture) during the seller's holding period. It is currently 15 percent for the portion of gain due to any increase in the property value and 25 percent for the gain due to depreciation recapture.

After-Tax Investment Analysis

We now consider the effect of federal income taxes on the office building investment analysis example introduced earlier in this chapter. As a starting point for our discussion, Exhibit 11–13 summarizes the calculation of before-tax cash flow from the office building example introduced earlier in the chapter.

After-Tax Cash Flow from Operations

We have estimated *before-tax* cash flows from the investment and now must determine the increase or decrease in the investor's taxable income as a result of undertaking it. Because taxes will either increase or decrease as a result of the investment, the increase or decrease must be added to or subtracted from before-tax cash flows to determine cash flow on an *after-tax* basis. To do this we must consider how much taxable income is produced each year from operations and then consider taxes in the year that the property is sold. Exhibit 11–14 shows the calculation of taxable income and after-tax cash flow from operating the property. In Exhibit 11–14 we see that we can find taxable income by subtracting interest and depreciation from the *NOI*. Note that only the interest, not the total loan payment, is tax deductible. In our example, interest was based on having a $5,950,000 loan amortized over

EXHIBIT 11–13 Estimates of Before-Tax Cash Flow from Operations and Sale

	Year				
	1	2	3	4	5
Cash flow from operations:					
Net operating income (*NOI*)	$922,750	$948,568	$974,146	$975,080	$1,008,951
Less debt service (DS)	689,025	689,025	689,025	689,025	689,025
Before-tax cash flow	$233,725	$259,542	$285,121	$286,054	$319,925
Estimates of cash flows from sale in year 5:					
Sale price					$9,700,000
Less mortgage balance					5,343,245
Before-tax cash flow (*$BTCF_s$*)					$4,356,755

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EXHIBIT 11–14 Taxable Income and After-Tax Cash Flow from Operations

	End of Year				
	1	2	3	4	5
Taxable income:					
Net operating income (*NOI*)	922,750	948,568	974,146	975,080	1,008,951
Less Interest	590,569	580,259	568,869	556,288	542,388
Depreciation	185,256	185,256	185,256	185,256	185,256
Taxable income (loss)	146,925	183,053	220,020	233,536	281,306
Tax (savings) at 36%	52,893	65,899	79,207	84,073	101,270
After-tax cash flow:					
Before-tax cash flow	$233,725	$259,542	$285,121	$286,054	$319,925
Less tax	52,893	65,899	79,207	84,073	101,270
After-tax cash flow	$180,832	$193,643	$205,913	$201,981	$218,655

a 20-year term with monthly payments based on a 10 percent interest rate. Exhibit 11–15 reproduces the summary loan schedule from earlier in this chapter.

Depreciation

Taxable income is also affected by an allowance for *depreciation*. As discussed earlier in the chapter, residential properties may be depreciated over 27.5 years, and nonresidential real property must be depreciated over 39 years. Both must be depreciated on a straight-line basis.[10] Also recall that only the improvements, not land, can be depreciated. Thus, we need to know what portion of the $8.5 million purchase price of the office building represents building improvements as opposed to land. For our case example, we assume that land cost

[10] In the case of mixed use properties (those with both residential and nonresidential uses), if *one* of the uses produces 80 percent of revenues, the total improvement may be depreciated over the tax life corresponding to that use.

EXHIBIT 11–15 Summary Loan Information

	End of Year				
	1	2	3	4	5
Payment	$ 689,025	$ 689,025	$ 689,025	$ 689,025	$ 689,025
Mortgage balance	5,851,543	5,742,776	5,622,620	5,489,883	5,343,245
Interest	590,569	580,259	568,869	556,288	542,388
Principal	98,457	108,767	120,156	132,738	146,637

requirements are 15 percent of the purchase price or $1,275,000, leaving improvements of $7,225,000. Dividing improvement cost by 39 results in an annual depreciation deduction of $185,256.[11]

Recall that depreciation allowances represent recovery of capital and do not represent an actual cash outflow for the investor (that occurs when the property is acquired). The deduction only affects taxable income and not operating cash flows. In our example, taxable income is $146,925 in year 1. Assuming the investor is in a 36 percent tax bracket, the increase in tax liability as a result of owning the property will be $52,893 (.36 × $146,925). Subtracting this from before-tax cash flow results in after-tax cash flow of $180,832 in year 1.

Note that taxable income is *positive* during each year in this example. If the taxable income were negative (i.e., a tax loss), additional assumptions would have to be made regarding the investor's ability to use the losses to offset other taxable income. We discuss negative taxable income later in this chapter.

After-Tax Cash Flow from Sale

Exhibit 11–16 illustrates how sale of the property affects the investor's taxable income. When determining the investor's capital gain from sale of the property, we should keep in mind that the investor will have depreciated the property for five years. Hence, the investor's *cost basis* in the property will be reduced. In our example, depreciation was $185,256 per year for five years, resulting in total depreciation (accumulated depreciation) of $926,282. Subtracting the accumulated depreciation from the original cost basis of the property (cost of the land and improvements) results in an adjusted basis of $7,573,718. (Adjusted basis is also sometimes referred to as the *book value* of the property.) The difference between the adjusted basis ($7,573,718) and the sale price ($9,700,000) is the capital gain, $2,126,282. As discussed earlier, the portion of this gain due to price appreciation (sale price less original cost basis) has a maximum capital gain tax rate of 15 percent. The portion of the gain due to depreciation taken over the holding period (accumulated depreciation) has a maximum tax rate of 25 percent. Thus, the capital gain tax in this example can be calculated as follows:

Price appreciation ($9,700,000 − $8,500,000)		$1,200,000
Accumulated depreciation		926,282
Total gain		$2,126,282
Tax on price appreciation	$1,200,000 × .15 =	$ 180,000
Tax on accumulated depreciation	926,282 × .25 =	231,571
Total capital gain tax		$ 411,571

[11] The IRS publishes tables that taxpayers must use to calculate depreciation deductions. The tables assume that the investor purchases the property in the middle of the month, and they prorate the first-year depreciation according to the actual month of the year the property is purchased. We are simply dividing by 39 years.

EXHIBIT 11–16
After-Tax Cash Flow from Sale in Year 5

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Sale price			$9,700,000
Less mortgage balance			5,343,245
Before-tax cash flow (*BTCF*$_s$)			4,356,755
Taxes in year of sale			
Sale price		$9,700,000	
Original cost basis	$8,500,000		
Accumulated depreciation	926,282		
Adjusted basis		7,573,718	
Capital gain		$2,126,282	
Tax on gain*			411,571
After-tax cash flow from sale (*ATCF*$_s$)			$3,945,184

*[($9,700,000 − $8,500,000) × .15] + [$926,282 × .25] = 411,571

Subtracting tax from the before-tax cash flow results in **after-tax cash flow** from sale of $3,945,184.

After-Tax *IRR*

Using the information from Exhibits 11–14 and 11–16, we may now calculate the **after-tax *IRR***. Exhibit 11–17 summarizes the cash flows along with the before-tax cash flows for comparison. As we might expect, the after-tax *IRR* of 15.75 percent is lower than the before-tax *IRR*, which is 19.64 percent. However, although the investor's tax rate was 36 percent, the after-tax *IRR* is not 36 percent lower than the before-tax *IRR*. Rather, it is about 23 percent lower (1 − 15.75 ÷ 20.08 = 21.57%).

Effective Tax Rate

In the previous section, we indicated that the after-tax *IRR* is 23 percent lower than the before-tax *IRR*, even though the investor had a 36 percent marginal tax rate. In this case we would say that the **effective tax rate** on income from this investment would be about 22 percent. Why is the effective tax rate on this investment lower than the marginal tax rate? The reason is that investors can reduce taxable income each year by the amount of depreciation deductions even though the property is not really decreasing in value. In fact, in this example it is increasing in value. Although depreciation allowances also reduce the adjusted basis of the property each year and will eventually result in an increase in taxes paid on the capital gain in the year of sale, the "time value of money" makes lower taxes paid on income each year a benefit to the investor. Furthermore, recall that the portion of capital gain due to price appreciation was only taxed at 15 percent and the portion due to depreciation recapture was taxed at 25 percent. Thus, the investor is able to defer taxes until the property is sold and convert (through depreciation deductions) some of the ordinary income to capital gains, which are taxed at a lower rate for investors than ordinary income.

EXHIBIT 11–17 **Cash Flow Summary** www.mhhe.com/bf13e

	End of Year					
	0	1	2	3	4	5
Before-tax cash flow	($2,550,000)	$233,725	$259,542	$285,121	$286,054	$4,676,680
After-tax cash flow	($2,550,000)	$180,832	$193,643	$205,913	$201,981	$4,163,839
Before-tax *IRR* (*BTIRR*)	20.08%					
After-tax *IRR* (*ATIRR*)	15.75%					

A Note about Passive Losses

Starting with the Tax Reform Act of 1986, income and loss from all sources, including real estate, had to be divided into three categories as follows:

1. **Passive income** (or loss): Income or loss from a trade or business where the investor does not materially participate in the management or operation of the property. Material participation is defined as "involvement in the operations of the activity on a regular, continuous, and substantial basis." Investment in rental real estate is considered to be a passive activity. Hence, even if an investor materially participates in the operation of the property, income and losses earned from such activity are categorized as passive income or loss. Income (or loss) received by a limited partner in a partnership is considered passive by definition.
2. **Active income** (or loss): Salaries, wages, fees for services, and income from a trade or business in which the investor materially participates. However, even if a taxpayer materially participates, income or loss from rental activity is not considered active income. Thus, income from rental housing, office buildings, shopping centers, and other real estate activities in which a taxpayer is a landlord is not classified as active income (or loss). This income or loss is classified as *passive income*. However, the operation of a hotel, other transient lodging, or a nursing home is *not* a rental activity, and therefore its owners will have active income if they materially participate.
3. **Portfolio income** (or loss): Interest and dividend income from stocks, bonds, and some categories of real estate that are classified as *capital assets*. As stated earlier in the chapter, most real estate investments are classified as being held for a trade or business and not as capital assets. Examples of portfolio income from real estate activity include dividends received on shares in a real estate investment trust (REIT) or income received on long-term land leases or net leases on real estate where the owner does not materially participate in its operation.

These income classifications are very important because, in general, passive losses cannot be used to offset income from another category (special exceptions are discussed in the next section). This stipulation is referred to as the *passive activity loss limitation* (PAL). Prior to the 1986 Tax Reform Act, many investors purchased real estate that was held as a trade or business by a limited partnership in which the individual investor (limited partner) did not materially participate. These investments often produced (and may still be producing) tax losses that the investor used to offset other taxable income. The passive activity loss limitation prevents investors from offsetting taxable income with passive losses. Passive losses produced from real estate investments and other passive activities now must be used to offset passive income earned during the tax year. Any remaining or unused passive losses must be "suspended" and carried forward to offset any passive income earned in future years.

When an investment producing passive income is *sold* and a capital gain occurs, any unused or suspended losses from that activity (1) must first be used to offset any capital gain from the sale of that activity, (2) must then be used to offset any other passive income produced from other passive activities during that year, and (3) can then be used to offset *any income*, including active and portfolio income earned during that year. To the extent that unused losses remain, they may be carried forward into succeeding years as capital losses, not subject to passive loss rules. For Section 1231 property, any remaining losses would be deductible as ordinary losses.

In cases where the sale of a passive activity, such as real estate, produces a capital loss, *and* unused suspended losses from previous years also remain, the unused passive losses may be used to offset any other sources of income (active, passive, or portfolio). Of the capital loss portion, $3,000 of the loss may be used to offset any other source of income that year. Any excess must be carried forward to the next taxable year as a capital loss. It would no longer be subject to passive loss rules, and the excess as well as any unused passive losses may be deducted from ordinary income as a Section 1231 loss.[12]

Special Exceptions to PAL Rules

One special exception to the PAL rules that was included in the 1986 Tax Reform Act (TRA) applies to individual rental property owners (other than limited partners). These investors are allowed to offset active income with up to $25,000 of passive activity losses (to the extent such losses exceed income from passive activities) from rental real estate activities in which the individual *actively* participates. Active participation is less restrictive than the material participation standard referred to earlier and requires less personal involvement. In general, the individual must own a 10 percent or greater interest in the activity and be involved in management decisions, such as selection of tenants and determination of rents, or must arrange for others to provide services (e.g., a property manager to manage the property on a day-to-day basis).

The TRA phases out this special rule for individuals with adjusted gross incomes between $100,000 and $150,000. It reduces the $25,000 loss allowance by 50 percent of the amount of the individual's adjusted gross income when such income for the taxable year exceeds $100,000. Thus, individuals with an adjusted gross income of $120,000 would only be allowed to use up to $15,000 of any passive losses to reduce active income. An individual with adjusted gross income in excess of $150,000 would receive no loss allowance.

The Tax Act of 1993 introduced a second exception to the PAL rules that provides relief for real estate brokers, sales associates, and other real estate professionals who can demonstrate "material involvement in the real estate business."[13] These individuals are eligible to deduct unlimited real estate losses (1) if more than half of all personal services they perform during the year are for real property trades or businesses in which they materially participate, and (2) if they perform more than 750 hours of service per year in those real estate activities.

Web App

The Web site for Commercial Investment Real Estate Magazine is part of the Web site for the Certified Commercial Investment Managers (CCIM) Institute. It includes the ability to do a keyword search of articles at **www.ccim.com/magazine/searcharticles.asp.** Find a recent article related to investment in commercial real estate and provide an executive summary of the article. Explain how it relates to the material in this chapter.

[12] For further explanation see P. Fass, R. Haft, L. Loffman, and S. Presant, *Tax Reform Act of 1986* (New York: Clark Boardman, 1986).

[13] Material involvement generally means that the taxpayer is involved in real estate operations on a regular, continuous, and substantial basis. Limited partners (discussed in Chapter 18) do not materially participate because active involvement could cause them to lose their limited liability status.

Conclusion

This chapter has introduced concepts and techniques important in the analysis of real estate income property. We discussed ways of projecting cash flows for an investor and ways of evaluating those cash flows with various measures of investment performance. The performance measures discussed in this chapter (*IRR, NPV, DCR,* etc.) will be used throughout the remainder of the text.

Although the techniques in this chapter provide a good initial analysis of a project, as demonstrated by the office building example, many questions remain to explore in more depth. For example, How will taxes affect the performance of the property? Are there alternative ways of financing the property that would be better? The remaining chapters in this part of the text will cover these and other questions.

Another area this chapter covered was the key tax considerations that affect real estate investment decisions. These considerations include determining the appropriate marginal tax rate, rules for depreciating real property, calculation of taxable income from operation of the property, and calculation of capital gain. These tax considerations will enter into different types of analyses that we will address in many of the remaining chapters of the text. In several cases we will be applying the tax rules introduced in this chapter to see how they affect investment. We will consider issues such as ,What is the optimal time to dispose of a property? and, Is it profitable to renovate a building? Additional tax considerations, such as the taxation of limited partnerships and development projects, will also be introduced in future chapters. Remember, however, that tax laws are subject to revisions that can have a substantial impact on the calculation of taxable income and taxes for real estate income property. Thus, this chapter is not intended to be a substitute for a comprehensive analysis of how current and future tax laws may affect a specific investor. It does, however, point out the general issues that investors should take into consideration regardless of the specifics of the tax law in effect at a particular point in time.

Key Terms

active income, *343*
after-tax cash flow, *342*
after-tax IRR, *342*
arbitrage investing, *324*
base rent, *326*
capital gain, *339*
contrarian investing, *323*
CPI adjustment, *326*
dealers, *336*
debt coverage ratio (*DCR*), *333*
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depreciation allowance, *337*
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equity, *319*
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market timing, *323*
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passive income, *343*
portfolio income, *343*
"real estate cycle", *320*
sector investing, *32[illegible]*
taxable income, *337*
trophy properties, *32[illegible]*
turnaround investing, *325*
value investing, *32[illegible]*

Useful Web Sites

www.ncreif.com—The National Council of Real Estate Investment Fiduciaries (NCREIF) is an association of institutional real estate professionals who share a common interest in their industry. This site provides real estate information on standards, indices, membership, and resources.

www.reiac.org—This is the Real Estate Investment Advisory Council Web site, who's purpose is to provide for the exchange of ideas, concerns, and experiences between people who conduct commercial real estate transactions within the structure of a nonprofit organization.

www.gecapitalrealestate.com/—GE Capital Real Estate. Site offers information on a wide variety of real estate financial products that the company offers.

www.gmaccm.com—GMAC Commercial Mortgage. Details a large array of commercial real estate services offered, including commercial real estate financing. Also has links to current financial indexes used in real estate finance (LIBOR, U.S. Prime rate, etc.)

www.mortgage-loan-search.com—Explains a few general types of loans, as well as a link that recommends a loan type given your criteria.

www.irs.gov—The IRS Web site can be useful to find information on the taxation of real estate income property. The main page has a search engine to search the IRS Web site.

www.ccim.com/magazine—Web site for the Certified Commercial Investment Manager's Commercial Investment Real Estate magazine. Great source of articles related to investing in commercial real estate.

www.fiabci.com—This site is good source for a comparison between legislation, professional standards, taxation, and licensing among different countries run. It also gives a comparative snapshot of various requirements for commercial leases in several countries.

www.china-window.com/china_market/china_real_estate/index.shtml—This website gives information about real estate market in China. It also gives useful information about the laws and regulations concerning real estate, different websites related to real estate in China and contact information of different government agencies.

http://www.city-data.com/—This website gives very descriptive and interesting profiles of all U.S. cities. It has tens of thousands of city photos not found anywhere else, hundreds of thousands of maps, satellite photos, stats about residents (race, income, ancestries, education, employment...), geographical data, state profiles, crime data, housing, businesses, birthplaces of famous people, political contributions, city government employment, weather, hospitals, schools, libraries, houses, airports, radio and TV stations, zip codes, area codes, user-submitted facts, similar cities list, comparisons to averages. In sum, it's a very good website for doing real estate analysis.

uestions

1. What are the primary benefits from investing in real estate income property?
2. What factors affect a property's projected *NOI*?
3. What factors would result in a property increasing in value over a holding period?
4. How do you think expense stops and CPI adjustments in leases affect the riskiness of the lease from the lessor's point of view?
5. Why should investors be concerned about market rents if they are purchasing a property subject to leases?
6. What is meant by *equity?*
7. What are the similarities and differences between an overall rate and an equity dividend rate?
8. What is the significance of a debt coverage ratio?
9. What is meant by a *tax shelter?*
10. How is the gain from the sale of real estate taxed?
11. What is meant by an *effective tax rate?* What does it measure?
12. Do you think taxes affect the value of real estate versus other investments?
13. What is the significance of the passive activity loss limitation (PAL) rules for real estate investors?

oblems

1. An office building has three floors of rentable space with a single tenant on each floor. The first floor has 20,000 square feet of rentable space and is currently renting for $15 per square foot. Three years remain on the lease. The lease has an expense stop at $4 per square foot. The second floor has 15,000 square feet of rentable space and is leasing for $15.50 per square foot and has four years remaining on the lease. This lease has an expense stop at $4.50 per square foot. The third floor has 15,000 square feet of leasable space and a lease just signed for the next five years at a rental rate of $17 per square foot, which is the current market rate. The expense stop is at $5 per square foot, which is what expenses per square foot are estimated to be during the next year (excluding management). Management expenses are expected to be 5 percent of effective gross income and are not included in the expense stop. Each lease also has a CPI adjustment that provides for the base rent to increase at half the increase in the CPI. The CPI is projected to increase 3 percent per year. Estimated operating expenses for the next year include the following:

Property taxes	$100,000
Insurance	10,000
Utilities	75,000
Janitorial	25,000
Maintenance	40,000
Total	$250,000

All expenses are projected to increase 3 percent per year. The market rental rate at which leases are expected to be renewed is also projected to increase 3 percent per year. When a lease is renewed, it would have an expense stop equal to operating expenses per square foot during the first year of the lease. To account for any time that may be necessary to find new tenants after the first leases expire, vacancy is estimated to be 10 percent of *EGI* for the last two years (years 4 and 5).

a. Project the effective gross income *(EGI)* for the next five years.
b. Project the expense reimbursements for the next five years.
c. Project the net operating income *(NOI)* for the next five years.
d. How much does the *NOI* increase (average compound rate) over the five years?
e. Assuming the property is purchased for $5 million, what is the overall capitalization rate (going-in rate)?

2. You are an employee of University Consultants, Ltd., and have been given the following assignment. You are to present an investment analysis of a new small residential income-producing property for sale to a potential investor. The asking price for the property is $1,250,000; rents are estimated at $200,000 during the first year and are expected to grow at 3 percent per year thereafter. Vacancies and collection losses are expected to be 10 percent of rents. Operating expenses will be 35 percent of effective gross income. A 70 percent loan can be obtained at 11 percent interest for 30 years. The property is expected to appreciate in value at 3 percent per year and is expected to be owned for five years and then sold.

a. What is the investor's expected before-tax internal rate of return on equity invested *(BTIRR)*?
b. What is the first-year debt coverage ratio?
c. What is the terminal capitalization rate?
d. What is the *NPV* using a 14 percent discount rate? What does this mean?
e. What is the profitability index using a 14 percent discount rate? What does this mean?

3. (Extension of problem 2) You are still an employee of University Consultants, Ltd. The investor tells you she would also like to know how tax considerations affect your investment analysis. You determine that the building represents 90 percent of value and would be depreciated over 39 years (use 1/39 per year). The potential investor indicates that she is in the 36 percent tax bracket and has enough passive income from other activities so that any passive losses from this activity would not be subject to any passive activity loss limitations. Capital gains from price appreciation will be taxed at 20 percent and depreciation recapture will be taxed at 25 percent.

a. What is the investor's expected after-tax internal rate of return on equity invested *(ATIRR)*? How does this compare with the before-tax *IRR (BTIRR)* calculated earlier?
b. What is the effective tax rate and before-tax equivalent yield?
c. How would you evaluate the tax benefits of this investment?
d. Recalculate the *ATIRR* in part (*b*) under the assumption that the investor *cannot* deduct any of the passive losses (they all become suspended) until the property is sold after five years.

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4. Excel. Refer to the Monument Office example. Assume the capital gain tax rate is lowered to 5 percent for all capital gain (price increase and depreciation recapture). How does this affect the investor's after-tax *IRR?*

5. ARGUS. Refer to the Monument Office example. Suppose market rents do not increase over time for lease renewals. How does this affect the unleveraged *IRR?*

Chapter 12

Financial Leverage and Financing Alternatives

In Chapter 6 we introduced a number of issues related to analyzing financing alternatives. Important concepts from that chapter include the effective cost of borrowing (before and after tax) and the incremental cost of borrowing additional funds. We also discussed how to evaluate whether a loan should be refinanced when interest rates decline. Although this discussion focused on *residential* property, all of the above concepts also apply to the analysis of income property.

The three preceding chapters have dealt with analyzing investment returns and risk on income property. In that analysis, we introduced financing and alluded to its effect on the before- and after-tax cash flow to the equity investor.

The purpose of this chapter will be to extend the discussion of debt from the earlier chapters in three additional ways. First, we consider how the level of financing affects the investor's before- and after-tax *IRR*. Second, we consider important underwriting procedures used by lenders when financing is sought by investors. Third, we consider several different financing alternatives that are used with real estate income property. Since it is impossible to discuss all the varieties of loans that are used in practice, we will concentrate on the primary alternatives and focus our discussion on concepts and techniques that you can apply to any type of financing alternative that you might consider.

Introduction to Financial Leverage

Why should an investor use debt? One obvious reason is simply that the investor may not have enough equity capital to buy the property. On the other hand, the investor may have enough equity capital but may choose to borrow anyway and use the excess equity to buy other properties. Because equity funds could be spread over several properties, the investor could reduce the overall risk of the portfolio. A second reason to borrow is to take advantage of the tax deductibility of mortgage interest, which amplifies tax benefits to the equity investor. The third reason usually given for using debt is to realize the potential benefit associated with financial leverage. **Financial leverage** is defined as benefits that may result for an investor who borrows money at a rate of interest lower than the expected rate of return on total funds invested in a property. If the return on the total investment invested in a property is greater than the rate of interest on the debt, the return on equity is magnified.

To examine the way financial leverage affects the investor's rate of return, we consider investment in a small commercial property with the following assumptions:

Purchase price	
Building value	\$ 85,000
Land value	15,000
Total value	\$100,000
Loan assumptions	
Loan amount	\$ 80,000
Interest rate	10.00%
Term	Interest only
Income assumptions	
NOI	\$12,000 per year (level)
Income tax rate*	28.00%
Depreciation	31.5 years (straight line)†
Resale price	\$100,000
Holding period	5 years

*Used to illustrate this example only. Tax rates are subject to change.

†Recall from Chapter 11 that the Tax Act of 1993 allows residential property to be depreciated over 27.5 years and nonresidential property to be depreciated over 39 years. These rates are subject to change, however, and we use 31.5 years in this example for illustration only.

Using those assumptions, we obtain the cash flow estimates shown in Exhibit 12–1.

Exhibit 12–2 shows the cash flow summary and *IRR* calculations for the cash flows in Exhibit 12–1. From Exhibit 12–2 we see that the before-tax *IRR* (*BTIRR*) is 20 percent and the after-tax *IRR* (*ATIRR*) is 15.40 percent with an 80 percent loan. We now consider how these returns would be affected by a change in the amount of debt. Exhibits 12–3 and 12–4 show the cash flow and return calculations for the example assuming *no loan* is used.

From Exhibit 12–4 we see that both the *BTIRR* and *ATIRR* have fallen. That is, both returns are higher with debt than without debt. When this occurs, we say that the investment has **positive (favorable) financial leverage.** We now examine the conditions that result in positive financial leverage more carefully. To do so, we first look at the conditions for positive leverage on a *before-tax* basis (the effect of leverage on *BTIRR*). Later, we examine the relationship on an *after-tax* basis (on *ATIRR*).

Conditions for Positive Leverage—Before Tax

In the example when no debt was used, the *BTIRR* was 12 percent. We will refer to this as the *unleveraged BTIRR*, since it equals the return when no debt is used. In the case where 80 percent debt was used, the *BTIRR* increased to 20 percent. Why does this increase occur? It occurs because the *unleveraged BTIRR is greater than the interest rate paid on the debt.*[1] The interest rate on the debt was 10 percent, which is less than the 12 percent unleveraged *BTIRR*. We could say that the return on investment (before debt) is greater than the rate that has to be paid on the debt. This differential (12 percent versus 10 percent) means that positive leverage exists that will magnify the *BTIRR* on equity.

This relationship is formalized in a formula that estimates the return on equity, given the return on the property and the mortgage interest rate:[2]

$$BTIRR_E = BTIRR_P + (BTIRR_P - BTIRR_D)(D/E)$$

[1] More precisely, the unleveraged *IRR* is greater than the effective cost of the loan. Recall that the effective cost of a loan reflects points, prepayments, and other factors that affect the borrower.

[2] This is an approximation when the ratio of debt to equity changes over time.

EXHIBIT 12–1 **Cash Flow for Commercial Building**

	Estimates of Cash Flow from Operations Year				
	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income (*NOI*)	$12,000	$12,000	$12,000	$12,000	$12,000
Less debt service (*DS*)	8,000	8,000	8,000	8,000	8,000
Before-tax cash flow	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000
B. Taxable income or loss:					
Net operating income (*NOI*)	$12,000	$12,000	$12,000	$12,000	$12,000
Less interest	8,000	8,000	8,000	8,000	8,000
Depreciation	2,698	2,698	2,698	2,698	2,698
Taxable income (loss)	1,302	1,302	1,302	1,302	1,302
Tax	$ 364	$ 364	$ 364	$ 364	$ 364
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$ 4,000	$ 4,000	$ 4,000	$ 4,000	$ 4,000
Less tax	364	364	364	364	364
After-tax cash flow (*ATCF*)	$ 3,636	$ 3,636	$ 3,636	$ 3,636	$ 3,636

	Estimates of Cash Flows from Sale in Year 5		
Sale price			$100,000
Less mortgage balance			80,000
Before-tax cash flow ($BTCF_s$)			$ 20,000
Taxes in year of sale			
Sale price		$100,000	
Original cost basis	$100,000		
Less accumulated depreciation	13,492		
Adjusted basis		86,508	
Capital gain		$ 13,492	
Tax from sale			3,778
After-tax cash flow from sale ($ATCF_s$)			$ 16,222

where

$BTIRR_E$ = Before-tax *IRR* on equity invested

$BTIRR_P$ = Before-tax *IRR* on total investment in the property (debt and equity)

$BTIRR_D$ = Before-tax *IRR* on debt (effective cost of the loan considering points)

D/E = Ratio of debt to equity

Using the numbers for our example, we have

$$BTIRR_E = 12.00\% + (12.00\% - 10.00\%) \times (80\% \div 20\%)$$
$$= 20.00\%$$

This formula indicates that as long as $BTIRR_P$ is greater than $BTIRR_D$, then $BTIRR_E$ will be greater than $BTIRR_P$. This situation is referred to as favorable, or positive, leverage.

EXHIBIT 12–2 **Cash Flow Summary and *IRR***

	End of Year					
	0	1	2	3	4	5
BTCF	$ −20,000	$4,000	$4,000	$4,000	$4,000	24,000
ATCF	−20,000	3,636	3,636	3,636	3,636	19,858
Before-tax *IRR* (*BTIRR*) = 20.00%						
After-tax *IRR* (*ATIRR*) = 15.40%						

EXHIBIT 12–3 **Cash Flow Estimates (no loan)**

	Estimates of Cash Flow from Operations Year				
	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income (*NOI*)	$12,000	$12,000	$12,000	$12,000	$12,000
Less debt service (*DS*)	0	0	0	0	0
Before-tax cash flow	$12,000	$12,000	$12,000	$12,000	$12,000
B. Taxable income or loss:					
Net operating income (*NOI*)	$12,000	$12,000	$12,000	$12,000	$12,000
Less interest	0	0	0	0	0
Depreciation	2,698	2,698	2,698	2,698	2,698
Taxable income (loss)	9,302	9,302	9,302	9,302	9,302
Tax	$ 2,604	$ 2,604	$ 2,604	$ 2,604	$ 2,604
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$12,000	$12,000	$12,000	$12,000	$12,000
Less tax	2,604	2,604	2,604	2,604	2,604
After-tax cash flow (*ATCF*)	$ 9,396	$ 9,396	$ 9,396	$ 9,396	$ 9,396

	Estimates of Cash Flows from Sale in Year 5		
Sale price			$100,000
Less mortgage balance			0
Before-tax cash flow ($BTCF_s$)			$100,000
Taxes in year of sale			
Sale price		$100,000	
Original cost basis	$100,000		
Less accumulated depreciation	13,492		
Adjusted basis		86,508	
Capital gain		$ 13,492	
Tax from sale			3,778
After-tax cash flow from sale ($ATCF_s$)			$ 96,222

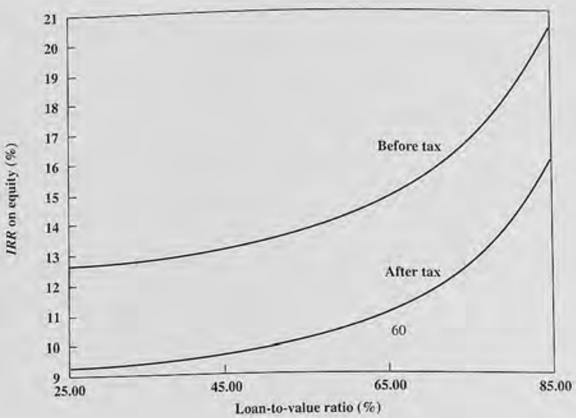
Whenever leverage is positive, the greater the amount of debt, the higher the return to the equity investor. From this result many investors conclude that they should borrow as much as possible. (We will see later that this conclusion is not necessarily valid when risk is considered.) The graph in Exhibit 12–5 illustrates the effect of different loan-to-value ratios on the *IRR* for our example.

EXHIBIT 12–4
Cash Flow Summary and Rates of Return (no loan)

	Cash Flow Summary End of Year					
	0	1	2	3	4	5
Before-tax cash flow	\$−100,000	\$12,000	\$12,000	\$12,000	\$12,000	\$112,000
After-tax cash flow	−100,000	9,396	9,396	9,396	9,396	105,618

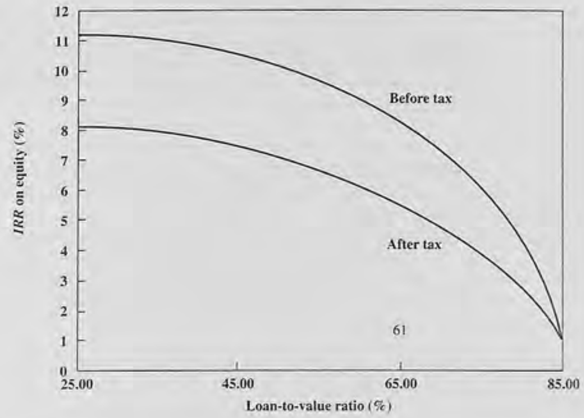
Before-tax *IRR* (*BTIRR*) = 12.00%
After-tax *IRR* (*ATIRR*) = 8.76%

EXHIBIT 12–5
Before- and After-Tax Leverage



While the relationships in Exhibit 12–5 are relatively straightforward, the amount of debt that may be used is limited. What are the limits? First, for various amounts of debt the debt coverage ratio may exceed the lender's limits, as discussed in Chapter 11. Because the *NOI* does not change when more debt is used, increasing the amount of debt increases the debt service relative to the *NOI*. Second, at higher loan-to-value ratios and declining debt coverage ratios, risk to the lender increases. As a result, the interest rate on additional debt will also increase. Indeed, at some point $BTIRR_p$ may no longer exceed $BTIRR_D$ (leverage will no longer be positive). Third, additional borrowing has additional risks for the equity investor. We will deal with the effect of leverage on risk more formally later in this chapter. However, we can point out now that leverage works both ways in the sense that it can magnify either returns or losses. That is, if the loan offers **negative (unfavorable) financial leverage,** or $ATIRR_D > BTIRR_P$, the use of more debt will magnify losses on equity invested in the property. We saw earlier that $BTIRR_P$ must exceed $BTIRR_D$ for the leverage to be favorable. Suppose that the interest rate is 14 percent instead of 10 percent. This results in negative leverage because the unlevered $BTIRR_E$ (12 percent) is now less than the 14 percent cost of debt. Exhibit 12–6 illustrates the effect that different loan-to-value ratios will have on the before- and after-tax *IRR*s. Note that when $BTIRR_P$ is less than $BTIRR_D$, then $BTIRR_E$ is also less than $BTIRR_D$ and declines even further as the amount borrowed (debt-to-equity ratio) increases. The next section develops this relationship more formally.

EXHIBIT 12–6
Before- and After-Tax Leverage



Conditions for Positive Leverage—After Tax

Looking at the after-tax *IRR* (*ATIRR*) in Exhibits 12–2 and 12–4, we see that *ATIRRP* (on total investment) is 8.76 percent and *ATIRR* on equity invested is 15.4 percent. Thus, the investor has favorable, or positive, leverage on an after-tax basis. That is, the expected after-tax *IRR* is higher if we can borrow money at a 10 percent rate as assumed in the example. How can leverage be favorable if the unlevered *ATIRR* (8.76 percent) is less than the cost of debt (10 percent)? The reason is because interest is tax deductible; hence, we must consider the after-tax cost of debt. Because there are no points involved in this example, the after-tax cost of debt is equal to the before-tax cost times $(1 - t)$, where t is the tax rate. Thus, the after-tax cost of debt is

$$.10(1 - .28) = 7.2\%$$

In the previous section we showed a formula to estimate the return on equity, given the return on the property and the mortgage interest rate. That formula can be modified to consider taxes as follows:

$$ATIRR_E = ATIRR_P + (ATIRR_P - ATIRR_D)(D/E)$$

where

$ATIRR_E$ = After-tax *IRR* on equity invested
$ATIRR_P$ = After-tax *IRR* on total funds invested in the property
$ATIRR_D$ = After-tax *IRR* on debt (effective after-tax cost of the loan)
D/E = Ratio of debt to equity

Using the above equation, we have

$$ATIRR_E = 8.76\% + (8.76\% - 7.2\%)(80\% \div 20\%)$$
$$= 15.00\%$$

EXHIBIT 12–7
Summary *IRR* Measures

	$BTIRR_E$	$ATIRR_E$
No loan*	12.00%	8.76%
80% loan	20.00%	15.40%

*Note that $IRR_E = IRR_P$ when there is no loan.

Hence, the approximation is 15 percent versus the actual *ATIRR* of 15.40 percent, as shown in Exhibit 12–2. The formula is an approximation because the debt-to-equity ratio increases over the holding period. That is, although the initial debt-to-equity ratio is 4.0 ($80,000 ÷ $20,000), when the property is sold, the debt is still $80,000, but the equity is $16,222 ($ATCF_S$ of $96,222 less the loan of $80,000), resulting in a debt-to-equity ratio of 4.93. Thus, the average *D/E* for the holding period is greater than the initial *D/E* of 4 that we used in the formula. However, using the initial *D/E* is still a good approximation. And the pivotal point for leverage is still the after-tax cost of debt. That is, for leverage to be favorable on an *after-tax* basis, the after-tax return on total funds invested must exceed the after-tax cost of the debt. For example, in our illustration, if the $ATIRR_P$ was less than 7.2 percent, leverage would be unfavorable.

It is useful to summarize the various *IRR* calculations we have made for the office example. Exhibit 12–7 shows the before- and after-tax *IRR* with and without a loan. It is important to understand the difference between each of these returns. When using the term *return* (or *IRR*), it is obviously very important to specify whether that return is before tax or after tax, and whether it is based on having a loan (a *leveraged* return) or not having a loan (an *unleveraged* return).

Break-Even Interest Rate

In the previous discussion we saw that the relationship between the after-tax *IRR* on the property (before debt) and the after-tax cost of debt determines whether leverage is favorable or unfavorable. It is sometimes useful to determine the maximum interest rate that could be paid on the debt before the leverage becomes unfavorable. This is referred to as the **break-even interest rate** and represents the interest rate at which the leverage is neutral (neither favorable or unfavorable). By examining the after-tax leverage equation in the previous section, we see that the point of neutral leverage can be expressed as follows:

$$ATIRR_D = ATIRR_P$$

Based on this relationship, we want to know the interest rate that will result in an after-tax cost of debt that is equal to the after-tax *IRR* on total funds invested in the property. In general, recall from Chapter 6 that the after-tax cost of debt, $ATIRR_D$, can be estimated as follows:

$$ATIRR_D = BTIRR_D(1 - t)$$

Solving this for the before-tax cost of debt, we have

$$BTIRR_D = \frac{ATIRR_D}{1 - t}$$

Because the break-even point for leverage occurs when $ATIRR_D = ATIRR_P$, we can substitute $ATIRR_P$ for $ATIRR_D$ in the above equation and obtain a break-even interest rate:

$$BTIRR_D = \frac{ATIRR_P}{1 - t}$$

For our example, the break-even interest rate (*BEIR*) would be

$$\frac{8.76\%}{1 - .28} = 12.17\%$$

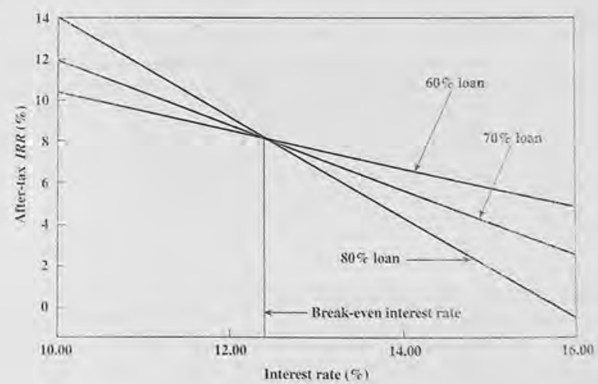
This means that regardless of the amount borrowed, or degree of leverage desired, the maximum rate of interest that may be paid on debt and not reduce the return on equity is 12.17 percent. To demonstrate this concept further, Exhibit 12–8 shows the after-tax *IRR* for interest rates ranging from 10 to 16 percent for three different loan-to-value ratios. Note that for interest rates above the break-even interest rate of 12.17 percent, the after-tax *IRR* for an equity investor ($ATIRR_E$) is less than the after-tax *IRR* on total investment ($ATIRR_P$), which is 8.76 percent. Conversely, for interest rates below the break-even interest rate, the after-tax *IRR* for the equity investor is greater than the after-tax *IRR* on the property.

Exhibit 12–9 graphs the information in Exhibit 12–8 and shows the break-even interest rate. Again note that the break-even interest rate remains 12.17 percent regardless of the amount borrowed (that is, 60, 70, or 80 percent of the property value).

EXHIBIT 12–8
Effect of Interest Rates on the After-Tax *IRR* on Equity

	$ATIRR_E$ (%) Loan to Value		
Interest Rate (%)	60%	70%	80%
10.00	10.83	11.86	13.73
10.50	10.36	11.16	12.61
11.00	9.89	10.45	11.48
11.50	9.41	9.73	10.32
12.00	8.92	9.01	9.16
12.50	8.44	8.27	7.98
13.00	7.95	7.53	6.78
13.50	7.45	6.79	5.57
14.00	6.95	6.03	4.34
14.50	6.45	5.27	3.10
15.00	5.95	4.50	1.85
15.50	5.44	3.73	0.58
16.00	4.92	2.94	−0.70

EXHIBIT 12–9
After-Tax *IRR* versus Interest Rates



If an investor borrowed funds at an effective interest rate that was just equal to the break-even interest rate, leverage would be neutral; that is, it would not be unfavorable or favorable. However, at the break-even interest rate $ATIRR_P$ is exactly equal to $ATIRR_D$ (by definition), which means that $ATIRR_E$ will exactly equal $ATIRR_D$. That is, the investor earns the same after-tax rate of return as a lender in the same project. But borrowing at the break-even interest rate will not provide a risk premium for the equity investor. Equity investors normally require a risk premium because they bear the risk of variations in the performance of the property. We will show this situation more formally in the section following the next one.

Leverage and the Incremental Cost of Debt

As mentioned earlier in this chapter, at high amounts of debt a higher interest rate may have to be paid to obtain additional financing. Recall that in Chapter 6 we discussed the concept of the **incremental cost of debt** as it related to loans on residential property. We showed that the decision to borrow additional funds should be made by considering the incremental, or marginal, cost of the additional funds obtained. Knowing the incremental cost of funds is equally important in analyzing the amount to borrow on income property.

In the example we have been using, an 80 percent loan was available at a 10 percent interest rate. This rate was less than the unleveraged return of 12 percent; thus, we concluded that leverage was favorable and the leveraged return was 15.40 percent. Now suppose that the investor can obtain an 85 percent loan, but at a 10.25 percent interest rate instead of 10 percent (we assume the loan would be an interest-only loan for simplicity). The *incremental* cost of the additional \$5,000 received on the 85 percent loan is 14.25 percent.[3] Recall from Chapter 6 that whenever the investor has a choice of obtaining a higher loan amount at a higher interest rate, an incremental cost is associated with obtaining the additional funds. Thus, the additional funds obtained with an 85 percent loan versus an 80 percent loan have a cost of 14.25 percent. It might appear that borrowing the extra money at an incremental cost of 14.25 percent would be unfavorable because the unleveraged return is 12 percent. But 14.25 percent is less than the leveraged return of 20 percent that the property is already earning on the 80 percent loan. Thus, there will be favorable leverage from the *additional* funds because the incremental cost of the funds is less than the return on equity before borrowing the additional funds. The investor's *IRR* on equity will increase with the 85 percent loan compared to what it is with the 80 percent loan.

Risk and Leverage

We have seen how favorable financial leverage can increase $BTIRR_E$ and $ATIRR_E$. We also saw that increasing the amount of debt magnifies the effect of leverage. It is no wonder that many people conclude that they should borrow as much as possible (look at the number of "no money down" seminars and advocates of using "OPM," or other people's money). The point of the following discussion is to emphasize that *there is an implicit cost associated with the use of financial leverage.* This cost comes in the form of *higher risk.* To illustrate, consider the following investment opportunity:

[3] Interest on the 85 percent loan is (.1025)(\$85,000) = \$8,712. Subtracting the \$8,000 interest on the 80 percent loan (.10) (\$80,000), we obtain a difference of \$712.50 per year. Dividing this by the \$5,000 additional funds received results in an incremental cost of 14.25 percent. Note that because it is an interest only loan, the total payments are the same as the interest payments. And because the balance of the loan does not change, the *IRR* can be found by simply dividing the payment by the loan amount, rather than using present value factors.

Total project costs (land, improvements, etc.) will be \$1 million. In our initial example, the investor does not use debt to finance the project. Three possible scenarios for a project are as follows:

Pessimistic—*NOI* will be \$100,000 the first year and decrease 2 percent per year over a five-year holding period. The property will sell for \$900,000 after five years.

Most likely—*NOI* will be level at \$110,000 per year for the next five years, and the property will sell for \$1.1 million.

Optimistic—*NOI* will be \$120,000 the first year and increase 5 percent per year for five years. The property will then sell for \$1.3 million.

The investor thinks probability for the pessimistic scenario is about 20 percent, for the most likely scenario, 50 percent, and for the optimistic scenario, 30 percent.

Using the preceding information, we have computed (calculations not shown) $BTIRR_P$ for each scenario, the expected $BTIRR_P$, the variance of the $BTIRR_P$, and the standard deviation of the $BTIRR_P$. The results are as follows:

Unleveraged						
	(1) Estimated $BTIRR_P$	(2) Expected $BTIRR_P$*	(3) Deviation (1) − (2)	(4) Squared Deviation	(5) Probability	(6) Product (4)(5)
Pessimistic	7.93	13.06	−5.13	26.31	0.20	5.26
Most likely	12.56	13.06	−0.50	0.25	0.50	0.12
Optimistic	17.31	13.06	4.25	18.07	0.30	5.42
					Variance	10.81
					Standard deviation = $\sqrt{10.81}$ =	3.29

*7.93(.2) + 12.56(.5) + 17.31(.3) = 13.06%.

We now assume the same investment is financed with a loan for \$900,000, which is obtained at a 10 percent interest rate for a 15-year term. What will be the expected $BTIRR_E$ and the standard deviation of the $BTIRR_E$? The results are as follows:

Leveraged						
	(1) Estimated $BTIRR_P$	(2) Expected $BTIRR_P$*	(3) Deviation (1) − (2)	(4) Squared Deviation	(5) Probability	(6) Product (4)(5)
Pessimistic	−5.09	26.49	−31.58	997.36	0.20	199.47
Most likely	25.99	26.49	−0.50	0.25	0.50	[illegible]
Optimistic	48.38	26.49	21.89	479.13	0.30	143.74
					Variance	343.34
					Standard deviation = $\sqrt{343.34}$ =	18.53

*−5.09(.2) + 25.99(.5) + 48.38(.3) = 26.49%.

Note that under the most likely and optimistic scenarios, estimated *IRRs* are higher with the loan (leveraged) than with no loan (unleveraged), indicating that these cases offer favorable leverage. In the pessimistic case, however, the estimated return is lower, indicating that if that scenario occurs, leverage will be very unfavorable. Looking at the range in expected $BTIRR_E$, however, which is higher with the loan, one might think that it is still a good idea to borrow. Note, however, that the standard deviation is considerably higher in the levered case, 18.53 percent versus 3.29 percent. Thus, the investment is clearly riskier when leverage is used. (This would also be true regardless of whether the leverage is favorable or unfavorable.) The point is that the decision to use leverage cannot be made by only looking at $BTIRR_P$ and $BTIRR_E$. The investor must ask whether the higher expected return with leverage is commensurate with the higher risk. Alternatively, the investor should ask if there is a way to realize the higher return with less risk, such as another investment in a different property or in the same property but with a different way of financing. The impact of financial leverage on risk will be discussed further in the next chapter.

Underwriting Loans on Income Properties

Chapter 8 dealt with residential underwriting and lending. However, there are many additional issues that must be addressed by lenders when loan applications from investors in *commercial* and *multifamily* properties are evaluated. We focus only on the areas of major concern in the explanation that follows.

Market Study and Appraisal

When someone applies for debt financing, lenders usually require that the application be accompanied by a *market study* that includes an analysis of the economic base (see Chapter 7), and prospective employment growth for the city or region in which the property is located. Also included should be an analysis of the submarket showing vacancy rates and rents on competing properties, as well as any new construction and the expected demand by renters. In short, the lender must be assured that occupancy and rent will be adequate to support mortgage loan payments.

In addition to a market analysis for higher value properties, the loan application must be accompanied by an *appraisal* of the property being financed. This appraisal will usually be done by a third party (i.e., not the lender or the borrower), who will use one or more of the sales comparison, income capitalization, or cost approaches to value discussed in detail in Chapter 9. Each approach used to estimate value will be carefully reviewed by the lender, who may change any assumptions that are viewed to be too aggressive or otherwise inconsistent with the lender's assessment of the market, and a property value for lending purposes will be established. The loan will be secured by a mortgage on the property; therefore, the lender must be certain that the value of the property is sufficient to repay the loan in the event that the investor defaults and the property must be sold.

Borrower Financials

In addition to the mortgage security provided by the property, unless stated otherwise the borrower/investor will provide additional loan security in the form of personal liability on the note. Therefore, the lender will require a set of personal financial statements, or in the case of a corporate borrower, a set of corporate financial statements. The lender will consider the borrower's ability to pay should income from the property be insufficient to pay debt services. However, in many cases borrowers and lenders may agree that a **nonrecourse clause** will be included in the note. This clause releases the borrower from personal liability and makes the property the sole source of security for the loan. To obtain a nonrecourse provision, lenders will usually require an additional fee and/or a higher interest rate as compensation for this lesser amount of loan security. From the standpoint of the borrower this nonrecourse provision can be viewed as a **put option.** If default occurs and the value of the property is lower than the outstanding loan balance, the investor may "put," or give, the property security to the lender. The borrower/investor would lose any equity that existed when the loan was closed, plus the fee paid for the nonrecourse loan. These amounts can be thought of as the cost of the investor's option.

In this case after default, assuming that the loan cannot be restructured in a workout agreement, the borrower would give the lender the deed to the property. This is sometimes referred to as deed in lieu of foreclosure, although depending on the state in which the property is located, the lender may have to go through a legal process to assure that title has been transferred to the lender and that the lender will be able to sell and transfer title to another investor.

The Loan-to-Value Ratio

Most lenders usually require that the loan amount being applied will not exceed more than 75 to 80 percent of the value of the property. Therefore, should a borrower default on such a loan, the property serving as security for the loan would have to *decline* in value by 20 to 25 percent from the date of closing before the outstanding loan balance owed to the lender would be jeopardized. As a result, lenders tend to consider this range in the **loan-to-value ratio** to be important in underwriting.

The Debt Coverage Ratio

An additional underwriting benchmark widely used by lenders to limit default risk is the debt coverage ratio. This ratio measures the extent that the *NOI* from the property is expected to exceed the mortgage payments. The lender would like a sufficient cushion so that if the *NOI* becomes less than anticipated (e.g., from unexpected vacancy or a decline in rents), the borrower will still be able to make the mortgage payments without using personal funds.

The **debt coverage ratio** (*DCR*) is the ratio of *NOI* to the mortgage payment. For example, in Exhibit 12–1 the *NOI* projected in year 1 is $12,000 and the interest-only mortgage payment (debt service) is $8,000; these figures result in a debt coverage ratio of 1.50. Lenders typically want the debt coverage ratio to be at least 1.20. In this way, the operating income could decline by as much as 20 percent before the mortgage payment is in jeopardy. This 20 percent cushion is likely to be sufficient for most lenders. In the case shown in Exhibit 12–1, the cushion is 50 percent, which is far greater than 20 percent. Therefore, this property should easily meet the *DCR* target desired by the lender. However, one additional question of interest to the inventor would be, "How high could the loan-to-value ratio be in order to reduce the loan-to-value ratio to 1.20?" The answer can be found as follows:

$$\frac{NOI}{\text{Desired } DCR \text{ target}} = \text{Max debt service}$$

$$\frac{\$12{,}000}{1.20} = \$10{,}000$$

This calculation indicates that a total of $10,000 *could* be expended on debt service while maintaining the desired debt coverage ratio of 1.20. The maximum loan amount will depend on the interest rate that the lender charges for loans greater than 80 percent. For example, if the lender required 11 percent for interest-only loans greater than 80 percent, then the maximum loan amount would be based on the debt service required at 11 percent interest while maintaining a debt coverage ratio of 1.20. This can be calculated as:

$$\frac{\text{Maximum debt service}}{\text{Mortgage loan constant}^4} = \text{Max loan amount}$$

$$\frac{\$10{,}000}{.11} = \$90{,}909$$

[4] We are using an interest-only loan in our example, so the mortgage loan constant is simply the loan interest rate. In cases where the loan is amortizing, the denominator should be the mortgage loan constant that corresponds to the appropriate interest rate and amortization period expressed on an annual basis, i.e., 12 times the monthly loan constant discussed in Chapter 4.

However, this would amount to a loan of over 90 percent of the property value, which is far in excess of the more typical 75 to 80 percent loan-to-value benchmark. In this example, even though a $90,909 loan at 11 percent interest would meet the 1.20 debt coverage ratio requirement, it is unlikely that a lender would agree to a loan because it is far in excess of 80 percent. Furthermore, the marginal cost of funds to the borrower to obtain such a high leverage loan would also be very high. This cost can be approximated as follows:

$$\frac{(\$90{,}909 \times .11) - (\$80{,}000 \times .10)}{(\$90{,}909 - \$80{,}000)} = 18.3\% \text{ incremental cost}$$

Obviously, the cost of obtaining incremental financing of $10,909 is very expensive. Furthermore, it would increase the $BTIRR_E$ only very slightly to 21 percent while significantly increasing risk to the investor. Recall our leverage formula:

$$BTIRR_p + (BTIRR_p - BTIRR_d)\, D/E = BTIRR_E$$
$$12\% + (12\% - 11\%) \times .90 = BTIRR_E$$
$$21\% = BTIRR_E$$

This compares to a 20 percent $BTIRR_E$ at a loan-to-value ratio of 80 percent. Therefore, if the greater amount of leverage were used, the investor would only achieve a 1 percent higher return while risking 10 percent more equity if the 90 percent loan were made.

In short, when lenders underwrite loans, they assess risk by using benchmark, or target, debt coverage ratios and loan-to-value ratios. They attempt to maintain a balance in the risk of default due to (1) an unanticipated decline in property value relative to the amount loaned or (2) significant deterioration in the debt coverage ratio. While these targets may vary depending on market conditions at the time of application, the above example should illustrate the trade-offs faced by lenders and borrowers when different amounts of leverage are considered.

Other Loan Terms and Mortgage Covenants

In addition to underwriting considerations relative to loan-to-value and debt coverage ratios, there are many other requirements that lenders may insist upon as a condition for making a loan. Many of these general requirements were discussed previously in Chapter 2. Recall that the lender will require the borrower to maintain and insure the property and pay property taxes and will not allow a sale of the property on an assumption of the loan by a third party without lender approval.

In commercial lending situations, the lender will also require notification of any material changes that may affect the value of the property. Illustrations of some **covenants** that may be included in the mortgage document are listed as follows:

1. Lender must approve all new major leases made for space exceeding a specified amount of square footage (e.g., 5,000 square feet).
2. Lender must approve any modification to existing leases.
3. Lender must approve any additional construction or modifications to the structure and/or site.
4. Borrower must supply periodic updates of property operating and/or cash flow statements.
5. Borrower must supply an annual property appraisal.
6. Borrower must notify the lender of any lawsuits brought by tenants or outside entities, any regulatory violations (e.g., environmental, building code), eminent domain actions, insurance claims filed by the borrower, and so on.

7. Borrower must notify lender of any major capital expenditures to correct structural or other property defects.
8. Lender will have the right to visit and inspect the property, and so on.

This list is meant to be illustrative and not exhaustive of the notifications, approvals, and so on, that a lender may require. The lender's goal is to be assured that *after the loan is closed,* no material deterioration in (1) the value of the property (the mortgage security) and/or (2) the income-producing ability of the property has occurred. (In the case of loans made *with recourse,* the lender will also require that personal financial statements be provided periodically to the lender.) In the event that any of these covenants/requirements are not met by the borrower, the lender will usually notify the borrower that he is in default, and unless the violation of the covenant is corrected, the lender will accelerate on the note and institute foreclosure proceedings.

Lockout Period and Prepayment Penalties

Finally, additional areas that should be discussed here are the topics of the "lockout clause" and prepayment penalties. The **lockout clause** *prohibits* the borrower from prepaying the loan within a specified period of time (usually 7 to 10 years). It is used because if the borrower were to sell the property or want to refinance within the lockout period, the lender would receive funds earlier than anticipated and face the prospect of having to reloan such funds at an interest rate that may be lower than the rate at which the loan was made. Similarly, if the loan has a 15-year maturity, the lender may also want protection against prepayment *after* the lockout period but before the loan matures, while still providing the borrower with an option to prepay. To accomplish this, the lender will charge a penalty usually referred to as a **yield maintenance fee** (*YMF*). One of many possible examples of how a *YMF* may be calculated can be explained as follows. Assume that a loan in the amount of $10,000,000 is made at 8 percent "interest only" with a 15-year maturity and a lockout period of 10 years. At the time the loan is closed, the risk-free rate of interest (10-year Treasury bond) is 6 percent. Therefore, the loan *spread* over Treasuries is 2 percent (8 percent − 6 percent).

We now assume that at the end of year 11 the borrower wants to consider prepaying this loan. However, the risk free interest rate for a 4-year Treasury obligation has fallen to 5 percent at the time of prepayment. Therefore, assuming that the lender and borrower had originally agreed that in the event of prepayment, the lender must continue to earn a minimum of 8 percent for the remaining four years (hence the term *yield maintenance*), the borrower must pay the *difference* between the lender's lowest potential reinvestment rate (which is the prevailing risk-free rate of 5 percent plus the 2 percent spread, or 7 percent) and the 8 percent original yield. Therefore, the yield maintenance fee (*YMF*) to be calculated and paid when the loan is repaid at the end of year 11 (month 132) would be:

$$YMF_{132} = \left(\frac{8\% - 7\%}{12}\right)(\$10{,}000{,}000)\,(MIFPV_{a},\ 8\%,\ 48 \text{ mos.})$$
$$= \$8{,}333\,(MIFPV_{a},\ 8\%,\ 48 \text{ mos.})$$
$$= \$341{,}336$$

This means that in order for the borrower to prepay this loan after the lockout period (sale of property, refinancing, and so on) the borrower must pay the lender a fee of $341,336 upon prepayment. In this case, if the lender collects the fee of $341,336 plus the $10,000,000 loan balance and makes a new loan for $10,000,000 at 7 percent interest (a 2 percent spread over the prevailing risk free rate of 5 percent) for four years, the lender will earn a yield of 8 percent over 15 years. This result would be the same to the lender as though the original loan had remained outstanding for 15 years.[5]

Alternatives to Fixed Rate Loan Structures

Loans on real estate income property can be structured in a variety of ways to meet the needs of the borrower and the lender. Lenders generally want the loan to be structured in such a way that the income generated by the property is expected to be sufficient to cover the mortgage payments each year. This relationship is often achieved by setting a minimum debt coverage ratio such as 1.20. At the same time, borrowers generally want to have a relatively high loan-to-value ratio.[6]

The income from real estate income property may be expected to increase substantially over the investment holding period for several reasons. First, in an inflationary environment income may be expected to rise—especially when the lease is structured to allow the lease payments to increase each year.[7] Second, the income for a building that was just developed may be expected to increase for several years because of the time required to lease the new space. Third, the income may be expected to increase because the property has below-market leases at the time it is purchased. If these leases will expire during the investment holding period, the investor may project that income will rise as the leases are renewed at the higher projected market rate.

When the income from the property is expected to increase over time, it becomes difficult to structure a conventional (fixed rate, level payment) mortgage loan such that the loan-to-value ratio is high and the debt coverage ratio exceeds the minimum during the initial years of the loan term. This is because the present value of property includes the higher expected *future increases* in income, whereas the debt coverage ratio is based on the *current* income. The difference between future income and current income has an especially strong impact in an inflationary environment because fixed-rate mortgages include a premium for expected inflation, as discussed in Chapter 4. Because the payments on a conventional mortgage are level, the expected inflation results in higher payments during the first year of the loan term. These higher initial payments result in a mismatch between the level payments on the mortgage and the income from the property, which is expected to increase each year to offset the effect of inflation. This mismatch is greatest during the first year of the investment holding period and results in a low and often unacceptable debt coverage ratio.

Because of the problems discussed, the mortgage may have to be structured so that the initial payments are lower but the lender receives additional compensation in the future to ensure a competitive rate of return. This compensation can come in a variety of ways. For example, the mortgage payments could increase over time (like a graduated payment mortgage). Or the lender could receive a portion of the proceeds from sale of the property (like

[5] Obviously, there is some risk that the lender may not be able to maintain the 2 percent spread when making a new loan after prepayment. Therefore, when determining the calculation for *YMF*, the lender and borrower may also have to negotiate the spread that will be added to the risk-free rate for the remainder of the loan period.

[6] Although financial risk increases with the loan-to-value ratio, investors are often willing to incur this additional risk either because they have limited funds to invest and want to minimize their equity investment or because they desire the higher expected rate of return as part of their investment strategy.

[7] For example, an office building lease could include a CPI adjustment and/or expense stops, as discussed in Chapter 11.

a shared appreciation mortgage). Sometimes the lender receives an option to purchase the property at a specified exercise price, which allows the lender to earn a greater return if the value of the property exceeds the exercise price when acquired by the lender.[8]

The remaining part of this chapter will focus on the analysis of alternative loan structures such as the ones mentioned above. We will examine how these structures affect the payment pattern, and the way that the loan structure affects the risk and expected rates of return to both the borrower and lender.

Participation Loans

We begin our discussion of financing alternatives by introducing **equity participation loans,** also referred to as *participations* or *equity kickers*. Actually the term *equity participation* is somewhat a misnomer because the lender does not actually acquire an ownership interest in the property. Rather, in return for a lower stated interest rate on the loan, the lender *participates* in some way in the income or cash flow from the property. Thus, the lender's rate of return depends, in part, on the performance of the property.

Determining the amount of participation can be done in many ways. For example, the lender might receive a percentage of one or more of the following: (1) potential gross income, (2) net operating income (*NOI*), and (3) cash flow after regular debt service (but before the participation). In addition, there might be a participation at the time the property is sold based on total sale proceeds or the appreciation in property value since it was purchased.

A participation in cash flows often begins for newly developed properties after some preagreed amount of leasing and rental achievement is reached. For example, the participation might be based on a percentage of all *NOI in excess* of \$100,000. In the case of existing properties, the break-even point is typically set so that the participation begins after the first operating year. For example, *NOI* might be expected to be \$100,000 during the first year. Thus, the lender would receive a participation only when *NOI* increases to more than \$100,000, which might occur in the second year.

In return for receiving a participation, the lender charges a lower stated interest rate on the loan—how much lower depends on the amount of participation. Participations are highly negotiable, and there is no standard way of structuring them.

Lender Motivations

Why would a lender be willing to make a participation loan? As we will discuss, the lender will want to structure the participation in such a way that the lender's rate of return (including the expected participation) is at least comparable to what the return would have been with a fixed interest rate loan (no participation). Whether the lender will accept a lower expected return with the participation or demand a premium depends on how risky the participation loan is perceived to be relative to a fixed interest rate loan. Clearly, some uncertainty is associated with a participation because receipts depend on the performance of the property. At the same time, however, the lender does not participate in any losses. The lender still receives some minimum interest rate (unless the borrower defaults). Furthermore, the participation provides the lender with a hedge of sorts against unanticipated inflation because the *NOI* and resale prices for an income property often increase as a result of inflation. Thus, to some extent a participation protects the lender's "real" rate of return.

[8] The exercise price of the option is the price that the lender must pay for the property. It is normally greater than the value of the property when the loan is made but could be less than the value of the property when the option can be exercised.

Investor Motivations

Why would an investor-borrower want a participation loan? As indicated above, participation loans are often structured so that the lender's participation is based on income or cash flow above some specified break-even point. Hence, the participation may be very little or zero for one or more years. During this time period the borrower will be paying less than he would have with a straight loan. Lower initial payments may be quite desirable for the investor since *NOI* may be lower during the first couple of years of ownership, especially on a new project that is not fully rented. Thus, the investor may have more cash flow during the early years of a participation loan than with a straight loan. Increased early cash flow also increases the debt coverage ratio. That is, the investor may be better able to meet debt service during the initial years of the loan with a participation.

You may wonder why the investor wouldn't accept a participation loan with a lower rate and a participation that doesn't kick in for a couple of years, and sell the property before the participation kicks in! This problem is handled by having a **lockout period** during which the property cannot be sold or refinanced without a prepayment penalty to compensate the lender.

Participation Example

To illustrate a participation loan, we assume that an apartment project that an investor is considering for purchase is projected to have *NOI* of \$100,000 during the first year. After that the *NOI* is projected to increase 3 percent per year. The property can be purchased for \$1 million. This price includes a building value of \$900,000, which will be depreciated over 27.5 years. The property value is projected to increase 3 percent per year over a five-year holding period. The investor is in the 28 percent tax bracket for ordinary income and capital gains.

The lender has offered the following alternatives:

- A conventional, fixed-rate, constant-payment loan for \$700,000 at a 10 percent interest rate (with monthly payments) over a 15-year term.
- A loan for \$700,000 at 8 percent interest with monthly payments over 15 years and a participation in 50 percent of any *NOI* in excess of \$100,000, plus a participation in 45 percent of any gain (Sale price − Original cost) when the property is sold.

Note that the *amount* of the loan for the two alternatives is the same. This is important because otherwise financial leverage would cause differences in risk. At this point we want to focus on analyzing different ways of *structuring* the debt independently of the decision about the *amount* of debt, which we have already discussed.

Exhibit 12–10 shows the cash flows for the conventional loan. Note that the debt coverage ratio (*DCR*) during the first year of the conventional loan is only 1.11. This is lower than many lenders would find acceptable. Recall that lenders typically require a minimum *DCR* of 1.2. Thus, the borrower may have difficulty borrowing \$700,000 with a conventional loan. Of course, the amount of the loan could be reduced to increase the debt coverage ratio. As we will see, however, a participation loan may be structured to alleviate the *DCR* problem.

Exhibit 12–11 shows the cash flows for the participation loan. The cash flow patterns differ significantly due to the different nature of the participation. Note that the participation loan offers lower payments (debt service plus participation payments) during the early years. This is because of the lower interest rate on the participation loan plus the fact that the participation does not start until the second year. Also, the part of the payments due to the lender from the participation loan does not come until the property is sold.

Despite the difference in payment patterns, the before-tax *IRR* ($BTIRR_E$) is virtually the same for both the conventional loan and the participation loan as a result of the terms for this particular participation loan.

EXHIBIT 12–10 Conventional Loan

	Estimates of Cash Flow from Operations Year				
	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income (*NOI*)	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less debt service (*DS*)	90,267	90,267	90,267	90,267	90,267
Cash flow before participation	9,733	12,733	15,823	19,006	22,284
Participation	0	0	0	0	0
Before-tax cash flow	\$ 9,733	\$ 12,733	\$ 15,823	\$ 19,006	\$ 22,284
B. Taxable income or loss:					
Net operating income (*NOI*)	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less interest	69,045	66,823	64,368	61,656	58,660
Participation	0	0	0	0	0
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	−1,772	3,450	8,995	14,890	21,164
Tax	\$ −496	\$966	\$ 2,519	\$4,169	\$ 5,926
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	\$ 9,733	\$ 12,733	\$ 15,823	\$ 19,006	\$ 22,284
Less tax*	−496	966	2,519	4,169	5,926
After-tax cash flow (*ATCF*)	\$ 10,229	\$ 11,767	\$ 13,305	\$ 14,837	\$ 16,358

	Estimates of Cash Flows from Sale in Year 5		
Sale price			\$1,159,274
Less mortgage balance			569,216
Before-tax cash flow (*BTCFs*)			\$ 590,058
Taxes in year of sale:			
Sale price		\$1,159,274	
Original cost basis	\$1,000,000		
Accumulated depreciation	163,636		
Adjusted basis		836,364	
Capital gain		\$ 322,910	
Tax from sale			90,415
After-tax cash flow from sale (*ATCFs*)			\$ 499,643

	Cash Flow Summary End of Year					
	0	1	2	3	4	5
BTCF	\$−300,000	\$9,733	\$12,733	\$15,823	\$19,006	\$612,342
ATCF	−300,000	10,229	11,767	13,305	14,837	516,001

Before-tax *IRR* = 18.37%
After-tax *IRR* = 14.30%

*It is assumed that the investor is not subject to passive activity loss limitations. For simplicity the same tax rate is used for ordinary income and all capital gains.

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EXHIBIT 12–11 Participation Example

	Estimates of Cash Flow from Operations Year				
	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income (*NOI*)	$100,000	$103,000	$106,090	$109,273	$112,551
Less debt service (*DS*)	80,275	80,275	80,275	80,275	80,275
Cash flow before participation	19,725	22,725	25,815	28,998	32,276
Participation	0	1,500	3,045	4,636	6,275
Before-tax cash flow	$ 19,725	$ 21,225	$ 22,770	$ 24,362	$ 26,001
B. Taxable income or loss:					
Net operating income (*NOI*)	$100,000	$103,000	$106,090	$109,273	$112,551
Less interest	55,090	53,000	50,736	48,284	45,629
Participation	0	1,500	3,045	4,636	6,275
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	12,183	15,773	19,582	23,625	27,919
Tax	$ 3,411	$ 4,417	$ 5,483	$ 6,615	$ 7,817
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$ 19,725	$ 21,225	$ 22,770	$ 24,362	$ 26,001
Less tax	3,411	4,417	5,483	6,615	7,817
After-tax cash flow(*ATCF*)	$ 16,314	$ 16,809	$ 17,287	$ 17,747	$ 18,183

	Estimates of Cash Flows from Sale in Year 5		
Sale price			$1,159,274
Less mortgage balance			551,364
Cash flow before participation			607,910
Less participation in gain from sale			71,673
Before-tax cash flow (*BTCFs*)			$ 536,237
Taxes in year of sale:			
Sale price		$1,159,274	
Participation		71,673	
Original cost basis	$1,000,000		
Accumulated depreciation	163,636		
Adjusted basis		836,364	
Capital gain		$ 251,237	
Tax from sale			70,346
After-tax cash flow from sale (*ATCFs*)			$ 465,891

	Cash Flow Summary: Investor End of Year					
	0	1	2	3	4	5
Before-tax cash flow	$−300,000	$19,725	$21,225	$22,770	$24,362	$562,238
After-tax cash flow	−300,000	16,314	16,809	17,287	17,747	484,074

Before-tax *IRR* = 18.36%
After-tax *IRR* = 14.07%

EXHIBIT 12–11 Participation Example (concluded)

	Cash Flow Summary: Lender						
	0	1–12	13–24	25–36	37–48	49–60	60
Loan amount	$−700,000						
Debt service		$6,690	$6,690	$6,690	$6,690	$6,690	
Participation		0	125	254	386	523	$71,673
Loan balance							551,364
Total $	−700,000	$6,690	$6,815	$6,944	$7,076	$7,213	$623,037
Lender's *IRR* 10%							

For a participation loan to be attractive to the lender, the expected rate of return to the lender, which is also the effective cost of the loan, must be attractive relative to the interest rate available on conventional loans. In this case, the lender's *IRR*, considering both debt service and participation payments, is about 10 percent.[9] This *IRR* is the same as the *IRR* for the conventional loan, which is also 10 percent (the same as the interest rate on the loan because there are no points).

Although the lender's *IRR* is also about the same for each alternative, note that the *DCR* for the first year is 1.25 for the participation loan, whereas it is only 1.11 for the conventional loan. Recall that lenders typically require a *DCR* of at least 1.2. Thus, the participation loan might be much more acceptable to the lender. The investor may also prefer this payment pattern because the pattern of debt service (regular mortgage payment plus the participation) is a better match with the pattern of *NOI*. In an inflationary environment, the nominal increase in *NOI* will be greater than the real increase in *NOI*. Recall our discussion in Chapter 4 of problems associated with a constant payment mortgage in an inflationary environment. A participating mortgage helps alleviate the tilt effect by allowing the nominal debt service to start at a lower amount than necessary for a conventional loan, and then increase in nominal terms as a function of the nominal increase in the *NOI*.

Note that because part of the lender's return depends on the likelihood of income being produced by the property, the participation payments are referred to as *contingent* interest. Because the contingent interest is contingent on the performance of the property and its ability to produce income, this interest is also tax-deductible, as shown in Exhibit 12–11. Thus, one feature of a participation loan is that the entire participation payment is tax-deductible, whereas only the interest portion of a conventional loan is deductible. However, because the amount of participation is lower during the early years in this case, the present value of the interest deductions on the conventional loan is greater than the present value of the deductions for interest and participation payments on the participation loan. This results in an after-tax *IRR* ($ATIRR_E$) that is lower for the participation loan even though the before-tax *IRR* ($BTIRR_E$) is virtually the same for each loan alternative. Exhibit 12–12 summarizes the *IRR*s for each financing alternative and shows the *DCR* for each case (based on first-year cash flows).

From the foregoing analysis, it appears that the participation loan is a viable alternative to the conventional loan. The lender receives virtually the same *IRR*, and the *DCR* is higher.

[9] This *IRR* is found by calculating the interest rate that equates the amount of loan ($700,000) with the present value of *both* the debt service paid each year ($80,275) *plus* the participation paid each year *plus* the loan balance and participation paid at the end of the holding period. The cash flows differ each year due to the participation. The answer we calculated (10.17 percent) was based on the assumption that the debt service and participation were paid monthly.

EXHIBIT 12–12
Summary of Returns to the Lender and Investor

	Before-Tax *IRR*	After-Tax *IRR*	*DCR*	Lender's *IRR*
Conventional loan	18.37%	14.30%	1.11	10.00%
Participation loan	18.36	14.07	1.25	10.17

The expected *BTIRR* for the investor is also virtually the same for each, and the expected *ATIRR* is only slightly less. Furthermore, the borrower might have difficulty obtaining the conventional loan due to the low *DCR*.

Sale-Leaseback of the Land

Up to this point in this chapter we have considered alternative ways of financing acquisition of a property (land and building). We have assumed that the investor finances both the land and building with the same loan. It is possible, however, to obtain financing on the building only (e.g., with the building as collateral for the loan). The investor may obtain a separate loan on the land or finance it with a land lease. That is, the investor would own the building but lease the land from a different investor. If the investor already owns the land, she can sell it with an agreement to lease the land back from the purchaser. This is referred to as a **sale-leaseback of the land.** Either way, the investor is, in effect, financing the land.

To illustrate the use of a sale-leaseback of the land, we will use the same example used in the previous section. We now assume that the land could be sold for \$100,000 and leased back at an annual payment of \$7,800 per year for 25 years. The building would be financed for \$630,000 (70 percent of the *building* value) at a 10 percent rate and a 15-year term. The amount of equity invested is therefore equal to the purchase price (\$1 million) less the price of the land (\$100,000) less the amount of loan on the building (\$630,000), resulting in equity of \$270,000. Exhibit 12–13 shows the cash flows for this alternative. Note that the resale price is now lower because only the building is being sold.[10]

An investor may find a sale-leaseback an attractive financing alternative for several reasons. First, it is, in effect, a way of obtaining 100 percent financing on the land. For example, a loan on the entire property (land and building) for 70 percent of the value also amounts to a 70 percent loan on the land. With the sale-leaseback, the investor receives funds in an amount equal to 100 percent of the value of the land. Instead of a mortgage payment on the land, the investor would make lease payments on the land.

A second benefit of a sale-leaseback is that lease payments are tax-deductible. Recall that only the interest, not the principal portion of the payment, is tax-deductible with a mortgage.

Third, whereas the building can be depreciated for tax purposes, the land cannot be depreciated. Thus, the investor may deduct the same depreciation charges whether or not he owns the land. Because, as discussed above, less equity is required with a sale-leaseback of the land, the sale-leaseback results in the same depreciation for a smaller equity investment.

Finally, the investor may have the option to purchase the land back at the end of the lease. This option provides the investor the opportunity to regain ownership of the land if desired.

Whether or not the sale-leaseback is a desirable financing alternative depends on the "cost" of obtaining funds this way. One of the obvious costs is the lease payments that must be made. Another aspect of the cost is the "opportunity cost" associated with any appreciation in the

[10] We assumed that the building will still increase in value 3 percent per year, the same rate that we assumed the property value (land and building) would grow. Obviously the building value may grow at a slower rate than the land, with the 3 percent growth rate for the property being a weighted average of the land and building growth rates. Using a rate of 3 percent for the building, the sale price is $(\$900{,}000)(1.03)^5 = \$1{,}043{,}347$.

EXHIBIT 12–13 **Sale-Leaseback of the Land**

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Estimates of Cash Flow from Operations	Year 1	2	3	4	5
A. Before-tax cash flow:					
Net operating income	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less debt service	81,240	81,240	81,240	81,240	81,240
Less land lease payment	7,800	7,800	7,800	7,800	7,800
Before-tax cash flow	\$ 10,960	\$ 13,960	\$ 17,050	\$ 20,233	\$ 23,511
B. Taxable income or loss:					
Net operating income (*NOI*)	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less interest	62,140	60,140	57,931	55,490	52,794
Land lease payment	7,800	7,800	7,800	7,800	7,800
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	−2,668	2,332	7,632	13,255	19,230
Tax	\$ −747	\$ 653	\$ 2,137	\$ 3,711	\$ 5,384
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	\$ 10,960	\$ 13,960	\$ 17,050	\$ 20,233	\$ 23,511
Less tax	−747	653	2,137	3,711	5,384
After-tax cash flow (*ATCF*)	\$ 11,707	\$ 13,307	\$ 14,913	\$ 16,521	\$ 18,126

Estimates of Cash Flows from Sale in Year 5			
Sale price			\$1,043,347
Less mortgage balance			512,295
Before-tax cash flow (*BTCFs*)			\$531,052
Taxes in year of sale:			
Sale price		\$1,043,347	
Original cost basis	\$900,000		
Accumulated depreciation	163,636		
Adjusted basis		736,364	
Capital gain		\$ 306,983	
Tax from sale			85,955
After-tax cash flow from sale (*ATCFs*)			\$ 445,097

Cash Flow Summary End of Year	0	1	2	3	4	5
Before-tax cash flow	\$ −270,000	\$10,960	\$13,960	\$17,050	\$20,233	\$554,563
After-tax cash flow	−270,000	11,707	13,307	14,913	16,521	463,223

Before-tax *IRR* = 19.16%
After-tax *IRR* = 14.98%

value of the land over the holding period. That is, by doing a sale-leaseback, the investor gives up the opportunity to sell the land at the end of the holding period along with the building.

Effective Cost of the Sale-Leaseback

Calculating the effective cost of the sale-leaseback (before-tax return to the investor who purchases the land) is similar to calculating the cost of other financing alternatives. However, we must consider the opportunity cost of the proceeds from sale of the land.

When the land is sold at the time of the sale-leaseback, the building investor receives \$100,000. During the five years of the holding period, the investor makes lease payments of \$7,800. At the end of the five-year holding period, the investor receives \$115,927 *less* than if he had not done the sale-leaseback (Exhibit 12–13). That is, the entire property could be sold for \$1,159,274 without the sale-and-leaseback (see Exhibit 12–11). In other words, if the sale-leaseback is used, the building alone will sell for \$1,043,347 at the end of the holding period, for a difference of \$115,927. We can now solve for the effective cost as follows:

$$100{,}000 = 7{,}800/12\ (MPVIFA,\ ?\%,\ 5\ \text{yrs.}) + 115{,}927\ (MPVIF,\ ?\%,\ 5\ \text{yrs.})$$

The resulting yield is 10.25 percent. Thus, the cost of the sale-and-leaseback of the land (return to the purchaser-lessor of the land) is 10.25 percent, which is about 25 percentage points more than the return from the conventional loan. At the same time, the building investor's return on equity invested is greater than that for a straight loan. Furthermore, the lender for the building loan is still receiving the 10 percent return that would have been available on a straight loan on the land and building, and the building lender's risk is slightly less if the land lease is subordinated to the building loan.

Interest-Only Loans

Loans on real estate income properties are sometimes structured such that no amortization is required for a specified period of time, for example, three to five years. This is referred to as an **interest-only loan** because the monthly payment is just sufficient to cover the interest charges. Because the loan is not amortized, the balance of the loan does not change over time. At the end of the interest-only period, the loan is either amortized over the remaining loan term or the balance of the loan is due as a **balloon payment.** Lenders for income-producing properties refer to these loans as **bullet loans** because they are short-term and require little or no amortization. Since the loan does not fully amortize, the term *balloon payment* refers to payment of the loan balance at maturity. Most of these loans are refinanced at maturity based on appraised values at that time.

To illustrate an interest-only loan, we use the same basic assumptions as in the previous two examples (a \$700,000 loan at 10 percent interest), but assume that the investor makes interest-only payments for the first five years of the loan with a balloon payment due in year 5 when the property is sold. Exhibit 12–14 illustrates the after-tax cash flows. In contrast to the conventional loan, the after-tax *IRR* increases slightly from 14.30 percent to 14.94 percent. This increase is due to the higher cash flows during the operating years, which, in present value terms, more than offset the lower cash flow from sale due to the larger loan balance. Another benefit of the interest-only loan is that the debt coverage ratio increases to 1.43 versus 1.11 for the conventional loan. The rate of return to the lender would still be 10 percent because the lender earns interest on the outstanding balance of the loan at this rate. Of course, the lender might require a slightly higher interest rate if the loan is viewed as riskier because it is not amortized for five years.

Accrual Loans

In the previous example we analyzed a loan with interest-only payments. In that case the monthly payment just covered the interest payment and the amortization was zero.

EXHIBIT 12–14 Interest-Only Loan

	Estimates of Cash Flow from Operations				
	Year				
	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less debt service	70,000	70,000	70,000	70,000	70,000
Before-tax cash flow	\$ 30,000	\$ 33,000	\$36,090	\$ 39,273	\$ 42,551
B. Taxable income or loss:					
Net operating income (*NOI*)	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
Less interest	70,000	70,000	70,000	70,000	70,000
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	−2,727	273	3,363	6,546	9,824
Tax	\$ −764	\$ 76	\$ 942	\$ 1,833	\$ 2,751
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	\$ 30,000	\$ 33,000	\$ 36,090	\$ 39,273	\$ 42,551
Less tax	−764	76	942	1,833	2,751
After-tax cash flow (*ATCF*)	\$ 30,764	\$ 32,924	\$ 35,148	\$ 37,440	\$ 39,800

Estimates of Cash Flows from Sale in Year 5			
Sale price			\$1,159,274
Less mortgage balance			700,000
Before-tax cash flow (*BTCFs*)			\$ 459,274
Sale price		\$1,159,274	
Original cost basis	\$1,000,000		
Accumulated depreciation	163,636		
Adjusted basis		836,364	
Capital gain			322,910
Tax from sale			90,415
After-tax cash flow from sale (*ATCFs*)			\$ 368,859

	Cash Flow Summary End of Year					
	0	1	2	3	4	5
Before-tax cash flow	\$−300,000	\$30,000	\$33,000	\$36,090	\$39,273	\$501,825
After-tax cash flow	−300,000	30,764	32,924	35,148	37,440	408,659

Before-tax *IRR* = 18.98%
After-tax *IRR* = 14.94%

Sometimes loans are structured so the payments for a specified number of years are lower than the amount that would be required to cover the monthly interest charge. These loans, when made on income properties, are referred to as **accrual loans** and they have negative amortization. The structure of these loans is similar to the graduated payment mortgage as illustrated in Chapter 4 for residential loans.

Loan payments are sometimes calculated by using a rate to calculate the loan payment (referred to as the **pay rate**) that is different from the rate used to calculate the interest charged (referred to as the **accrual rate**). The pay rate is used in place of the interest rate when calculating monthly payments. The pay rate is not the same as the loan constant. The accrual rate is the interest rate that the borrower is legally required to pay on the loan. If the payment rate is less than the accrual rate, the loan will have negative amortization. To illustrate, we now assume that a loan is obtained with a payment rate of 8 percent and an accrual rate of 10 percent. To further lower the payments, the payments are based on a 30-year amortization term although the loan will be due in 15 years with a balloon payment. All other assumptions remain the same as in the previous examples. Exhibit 12–15 illustrates the cash flows for this loan. The annual debt service (12 times the monthly loan payment) is now $61,636 versus $90,267 for the conventional loan. (The annual loan constant is 8.81 percent.) The lender's yield is still 10 percent because the lender earns interest on the outstanding balance at the accrual rate. The lender may view a negative amortization loan as riskier and might charge a higher accrual rate relative to a conventional loan. The debt coverage ratio has increased from 1.11 for the conventional loan to 1.62 for the negative amortization loan because of the lower annual debt service. Note that the loan balance reaches $753,972 in year 5 as a result of negative amortization. (Recall that the monthly interest differential between the 8 percent pay rate and the 10 percent accrual rate must be compounded at 10 percent and added to the loan balance.)

In many cases, loan payments may be structured based on the pay rate with no amortization. Regardless of whether amortization is required or not, when loans are structured with a pay rate that is lower than the accrual rate, a loan payment that is less than the amount of interest due on the outstanding loan balance usually results. This shortfall (**negative amortization**) causes the loan balance to increase. However, the lender will still require either that the loan be repaid at the end of a specified time period or that the loan begin to amortize at some point. These requirements can be met in a variety of ways. Frequently, negative amortization loans have a term of about 7 to 10 years; hence, the loan balance, which includes accrued interest, will be repaid at that time. Alternatively, when loans have longer terms, say 10 to 15 years, the pay rate increases after a specified number of years. At that point, the pay rate may be increased so that the loan will be amortized over the remaining loan term. Sometimes loan agreements are structured so that the pay rate increases each year for a certain number of years. For example, the loan may require that the pay rate begin at 8 percent the first year, then increase by 0.5 percent each year until the 10th year when the pay rate remains at 12.5 percent until the loan is fully amortized.

Structuring the Payment for a Target Debt Coverage Ratio

One of the primary motivations for structuring loans with negative amortization is to increase the debt coverage ratio without reducing the loan amount. As previously discussed, lenders typically require a loan to have a minimum debt coverage ratio (*DCR*). In the above example, the conventional loan had a *DCR* of 1.11. Suppose the lender required a minimum debt coverage ratio of 1.25. The negative amortization loan discussed above resulted in a *DCR* that exceeded this minimum. Another way of determining the mortgage payment necessary to have a specified debt coverage ratio during the first year. To do so, we can simply divide the *NOI* by the specified debt coverage ratio. For example, the mortgage payment that results in a *DCR* of 1.25 during the first year is $100,000 ÷ 1.25 = $80,000. This amount is greater than the payment for the negative amortization loan discussed above, but less than the payment on the conventional loan. In this case the payment would not result in negative amortization because it is sufficient to cover the required interest payment. However, the loan amortization period is not sufficient

EXHIBIT 12–15 Negative Amortization Loan

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Estimates of Cash Flow from Operations	Year 1	2	3	4	5
A. Before-tax cash flow:					
Net operating income	$100,000	$103,000	$106,090	$109,273	$112,551
Less debt service	61,636	61,636	61,636	61,636	61,636
Before-tax cash flow	$ 38,364	$ 41,364	$ 44,454	$ 47,637	$ 50,915
B. Taxable income or loss:					
Net operating income	$100,000	$103,000	$106,090	$109,273	$112,551
Less interest*	70,394	71,311	72,324	73,444	74,680
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	−3,121	−1,038	1,039	3,102	5,144
Tax	$ −874	$ −291	$ 291	$ 869	$ 1,440
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$ 38,364	$ 41,364	$ 44,454	$ 47,637	$ 50,915
Less tax	−874	−291	291	869	1,440
After-tax cash flow (*ATCF*)	$ 39,238	$ 41,655	$ 44,163	$ 46,768	$ 49,475

Estimates of Cash Flows from Sale in Year 5

Sale price			$1,159,274
Less mortgage balance			753,972
Before-tax cash flow (*BTCFs*)			$ 405,302
Sale price		$1,159,274	
Original cost basis	$1,000,000		
Accumulated depreciation	163,636		
Adjusted basis		836,364	
Capital gain		$ 322,910	
Tax from sale			90,415
After-tax cash flow from sale (*ATCFs*)			$ 314,887

Cash Flow Summary
End of Year

	0	1	2	3	4	5
Before-tax cash flow	$300,000	$38,364	$41,364	$44,454	$47,637	$456,217
After-tax cash flow	−300,000	39,238	41,655	44,163	46,768	364,362

Before-tax *IRR* = 19.27%
After-tax *IRR* = 15.25%

*The table assumes that interest can be deducted on an accrual basis for tax purposes.

to fully amortize the loan. For full amortization to occur, the loan has to be extended beyond 30 years. Hence, it is likely that the lender would require a balloon payment on or before the 30th year. Alternatively, the lender could shorten the amortization period by increasing payments each year or after a specified number of years. One possibility is to recalculate the payment each year to maintain a constant debt coverage ratio over time. For example, the above loan may have a payment during year 2 of $103,000 ÷ 1.25 = $82,400, and so on, until the loan begins to amortize sufficiently to be repaid at the end of the term. At that point, loan payments would remain fixed.

Convertible Mortgages

A **convertible mortgage** gives the lender an option to purchase a full or a partial interest in the property at the end of some specified period of time. This purchase option allows the lender to convert its mortgage to equity ownership, hence the term *convertible mortgage*. The lender may view a convertible mortgage as a combination of a mortgage loan and purchase of a call option, or as a right to acquire a full or partial equity interest for a predetermined price on the option's expiration date.

To illustrate, we assume that the property evaluated in the previous examples will be financed with a $700,000 (70 percent of value) convertible mortgage that allows the lender to acquire 65 percent of the equity ownership in the property at the end of the fifth year.[11] The loan will be amortized over 30 years with monthly payments. We assume the interest rate on the loan to be 8.5 percent versus 10 percent for the conventional loan. The lender is willing to accept the lower interest rate in exchange for the conversion option. The 150-basis-point difference in interest rates between the conventional mortgage and the convertible mortgage represents the "price" that the lender must pay for the option associated with the convertible loan.[12]

Exhibit 12–16 illustrates the after-tax cash flows for the investor under the assumption that the property is financed with the convertible mortgage described above and that the lender exercises the option to purchase a 65 percent interest in the property at the end of the fifth year. We would expect the lender to exercise this option because 65 percent of the estimated sale price ($753,528) is greater than the mortgage balance at the end of the fifth year ($668,432). That is, the option is "in the money" at the time it can be exercised. For comparison with the previous examples, we also assume that the investor will sell the remaining 35 percent interest in the property.

Lender's Yield on Convertible Mortgage

The lender's yield on a convertible mortgage depends on the interest rate charged on the mortgage as well as any gain on conversion of the mortgage into an equity position. If the mortgage is not converted, the lender's yield will equal the interest rate on the loan.[13] The interest rate is the lower limit of the yield, assuming that the borrower does not default on the mortgage. In the above example, the lender's yield on the convertible mortgage is greater than the 8.5 percent interest rate on the loan because of the gain on conversion of the mortgage balance into an equity position. This gain occurred because the conversion option included with the mortgage was assumed to be "in the money" on its exercise date.

[11] Generally, the Internal Revenue Service requires that the loan-to-value ratio on the date of financing must be greater than the conversion ratio. This is because if the conversion ratio is greater, the IRS considers the option to be "in the money." Although the lender may have to wait to exercise the conversion option, the lender may have the right to sell or assign the convertible mortgage before the exercise date.

[12] That is, rather than pay an amount up front for the call option, the lender accepts a lower interest rate on the mortgage loan.

[13] Of course, the yield would be higher if points were also charged on the loan.

EXHIBIT 12–16 Convertible Mortgage

excel
www.mhhe.com/bf13e

Estimate of Cash Flow from Operations					
Year	1	2	3	4	5
A. Before-tax cash flow:					
Net operating income	$100,000	$103,000	$106,090	$109,273	$112,551
Less debt service	64,589	64,589	64,589	64,589	64,589
Before-tax cash flow	$ 35,411	$ 38,411	$ 41,501	$ 44,684	$ 47,962
B. Taxable income or loss:					
Net operating income	$100,000	$103,000	$106,090	$109,273	$112,551
Less interest	59,297	58,829	58,320	57,766	57,163
Depreciation	32,727	32,727	32,727	32,727	32,727
Taxable income (loss)	7,976	11,443	15,043	18,779	22,661
Tax	$ 2,233	$ 3,204	$ 4,212	$ 5,258	$ 6,345
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$ 35,411	$ 38,411	$ 41,501	$ 44,684	$ 47,962
Less tax	2,233	3,204	4,212	5,258	6,345
After-tax cash flow (*ATCF*)	$ 33,178	$ 35,207	$ 37,289	$ 39,426	$ 41,617

Estimate of Cash Flow from Sale in Year 5			
Exchange of 65% interest in property for loan balance*			$000,000
Sale of remaining 35% interest in the property			405,746
Before-tax cash flow (*BTCFs*)			$405,746
Sale price		$1,159,274	
Original cost basis	$1,000,000		
Accumulated depreciation	163,636		
Adjusted basis		836,364	
Capital gain		$ 322,910	
Tax from sale			90,415
After-tax cash flow from sale (*ATCFs*)			$315,331

Cash Flow Summary End of Year	0	1	2	3	4	5
Before-tax cash flow	$300,000	$35,411	$38,411	$41,501	$44,684	$453,708
After-tax cash flow	−300,000	33,178	35,207	37,289	39,426	356,948

Before-tax *IRR* = 18.40%
After-tax *IRR* = 13.06%

*The lender receives 65 percent of the property in exchange for the loan balance. The net cash flow to the investor is zero.

Thus, the mortgage lender receives mortgage payments of $5,382.39 per month, plus a 65 percent interest in the property worth $753,528 at the end of the fifth year. The lender's effective yield is calculated as follows:

$$700{,}000 = 64{,}589 \div 12\ (MPVIFA, ?\%, 5\text{ yrs.}) + \$753{,}528\ (MPVIF, ?\%, 5\text{ years})$$

EXHIBIT 12–17
Comparison of Financing Alternatives

	$BTIRR_E$	$ATIRR_E$	DCR	IRR_D*
Conventional mortgage	18.37%	14.30%	1.11	10.00%
Participating mortgage	18.36	14.07	1.25	10.17
Sale-and-leaseback of land	19.16	14.98	1.12†	10.25‡
Interest-only mortgage	18.98	14.94	1.43	10.00
Accrual mortgage	19.27	15.25	1.62	10.00
Convertible mortgage	18.40	13.06	1.55	10.40

*Based on monthly cash flows for debt service and participation payments.
†Includes land lease payment with debt service. The *DCR* is 1.23 when land lease payments are not included.
‡This is the yield to the purchaser of the land who provides the sale-leaseback financing. The yield (IRR_D) on the building loan is 10 percent.

Using a financial calculator we obtain a yield of 10.40 percent. This is the lender's before-tax rate of return on the convertible mortgage.[14] The yield can also be interpreted as the borrower's effective borrowing cost for the convertible mortgage (before tax).

Comparison of Financing Alternatives

Exhibit 12–17 shows a summary of performance measures for each of the financing alternatives evaluated in the previous examples. In this case, the accrual loan results in the highest return to the investor on both a before- and an after-tax basis. This loan also has the highest debt coverage ratio. Thus, it would appear to be the most attractive from the borrower's point of view. This result, however, is based on the assumption that the lender is willing to charge the same interest rate (10 percent) as a conventional loan. Although the debt coverage ratio is lower for the negative amortization loan, the loan balance *increases* over time, thereby *decreasing* equity in the property and *increasing* the default risk. Thus, we might expect the lender to charge a higher interest rate on the negative amortization loan.

Based on the above discussion, it is not surprising that the interest-only loan results in a lower return to the investor than the negative amortization loan but a higher return than the conventional loan. It requires lower payments than the conventional loan but higher payments than the negative amortization loan. Considering the differences in default risk, we would expect lenders to charge a slightly higher rate on the interest-only loan than the conventional loan, but not as high as for the negative amortization loan.

The before- and after-tax returns to the investor for the sale-leaseback of the land are the second highest of the financing alternatives even though the effective borrowing cost for the sale-leaseback is slightly higher than for the conventional loan (10.25 percent versus 10.00 percent). Note, however, that less equity ($30,000) is required when the land is leased rather than owned because the land lease is, in effect, equivalent to a 100 percent loan on the land. Thus, the amount of financing for the land has increased from 70 percent (in the case of a conventional mortgage) to 100 percent of the land value. This increases the amount of financial leverage and financial risk. Thus, the investor should expect to earn a slightly higher rate of return with a sale-leaseback than a conventional mortgage loan.

Another reason that the investor's return is higher with the sale-leaseback of the land is that the payments on the land lease are less than the debt service would be if a loan were made on the land. Furthermore, a significant portion of the cost of the sale-leaseback to the

[14] It should be noted that the borrower has a taxable gain when the mortgage balance is converted into an equity interest in the property. This would have to be considered if the lender's after-tax yield is calculated.

borrower is because of the opportunity rate, or increase in land value, which is given up. This opportunity cost is not incurred, however, until the property is sold.

The debt coverage ratio for the sale-leaseback is 1.2, which is about the same as a conventional loan. To be consistent with the other examples, we calculate this ratio with the land lease payments added to the mortgage payments. We use the combination of mortgage and land lease payments because the land lease payment is a substitute for mortgage debt service.

The participation loan allows the lender to share in any increase in the net operating income from the property as well as any increase in the value of the property. This type of loan, then, is similar to the convertible mortgage in the sense that the lender receives an additional return if the property performs well that is, its income and value increase. Although the participation loan does not allow the lender to obtain an equity position, part of the lender's interest is contingent on the performance of the property. In both cases the lender accepts a lower contract interest rate in exchange for a "piece of the action" on the upside. In the above examples, the convertible mortgage results in a higher return to the lender than the participation loan and a lower after-tax return to the investor. At the same time, the lender would view the convertible mortgage as having greater risk than the participation loan. This is because the participation payments are expected sooner as *NOI* increases in the second year whereas the gain from conversion does not occur until the fifth year.

If we assume all the mortgages discussed above are nonrecourse to the borrower,[15] as is often the case, the lender bears the downside risk of receiving the property through default. In effect, the borrower has an option to "put" the property to the mortgage lender if the value decreases below the mortgage balance. Thus, with a convertible loan, and to some extent with a participation loan, the lender bears both the upside and downside risk of property ownership. Consequently, the expected return on each loan structure should be commensurate with this risk.

We approached the analysis of different financing alternatives by considering each one independently. However, features of the different financing alternatives are often combined. For example, a convertible mortgage could also include a participation in *NOI* during the operating years as well as interest-only or negative amortization feature.

The above discussion provides a structure for thinking about the risk and return trade-offs for different financing alternatives. These alternatives allow the investor and lender to structure the financing so that the risk and return for the property are shared acceptably. The expected rate of return to each party must be commensurate with the risk. To a large extent, structuring the loan in different ways simply determines how that risk is shared between the borrower and the lender. Different tax status for the borrower and lender, however, may provide gains to both with some loan structures. For example, the lender may have a lower marginal tax rate than the investor, which would make the tax depreciation allowance associated with ownership of the property more valuable to the investor than to the lender. Thus, a participation loan that allows the investor to retain all of the ownership and tax depreciation may be more desirable than a convertible mortgage with the same before-tax cash flows to each party. Alternatively, the lender may desire to eventually own the property. By using a convertible mortgage, the investor would receive all the tax benefits of depreciation until the mortgage is converted into equity. In return for allowing the investor to capture these tax benefits and for taking the risk of buying the ownership option under a convertible mortgage, the lender would expect to earn a return higher than the interest rate on a more conventional loan structure. Thus, both parties may gain by attempting to structure the transaction in an optimal manner.

[15] Recall that this means that the borrower incurs no personal liability in the event of loan default.

Web App

The GE Real Estate Web site (**www.gecapitalreal estate.com**) provides information about a plethora of finance products, including higher-leverage loans and participating debt. Find out the current types of financing that are available from GE Real Estate for commercial real estate and provide several examples of different types of financing that are available.

EXHIBIT 12–18
Loan Inputs in ARGUS

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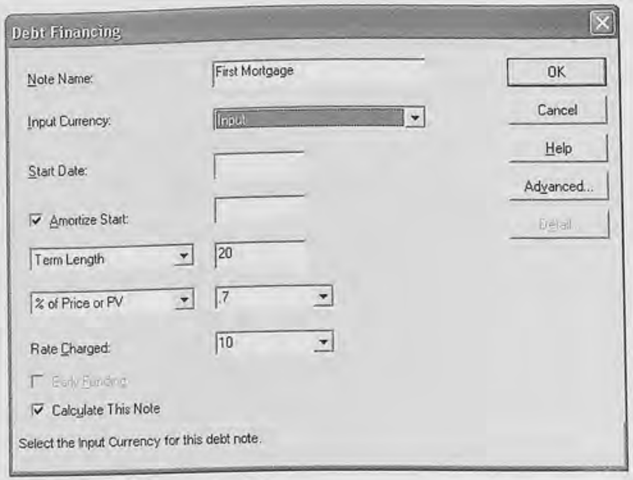

Monument Office Example—ARGUS Solution with a Loan

In Chapter 11 we showed that ARGUS can solve for the same unleveraged return as the chapter example. The unleveraged return was 13.46 percent. We also saw that the leveraged return for Monument Office was 20.08 percent. We can get this same answer using ARGUS by putting in the inputs for the loan, which was a 70 percent loan at a 10 percent interest rate and 20-year amortization. Exhibit 12–18 shows the debt financing input, which is found in yield–debt financing on the toolbar.

Exhibit 12–19 shows the operating cash flows after debt service from ARGUS and Exhibit 12–20 shows the cash flows from resale after paying off the loan. The leveraged return of 20.08 percent is also shown on this screen.

The advantage of using ARGUS for this analysis is that it is easy to change the loan assumptions and even add various types of participations (included in the "Advanced" menu). The reader is encouraged to explore some of these options in ARGUS.

EXHIBIT 12–19
Cash Flow Report from ARGUS

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SCHEDULE OF PROSPECTIVE CASH FLOW
In Inflated Dollars for the Fiscal Year Beginning 6/1/2000

For the Years Ending	Year 1 May-2001	Year 2 May-2002	Year 3 May-2003	Year 4 May-2004	Year 5 May-2005
POTENTIAL GROSS REVENUE					
Base Rental Revenue	$1,365,000	$1,365,000	$1,365,000	$1,566,107	$1,596,566
Scheduled Base Rental Revenue	1,365,000	1,365,000	1,365,000	1,566,107	1,596,566
CPI & Other Adjustment Revenue	22,500	50,250	78,555	26,643	43,406
Expense Reimbursement Revenue					
Property Taxes	11,669	15,080	24,896	5,244	6,430
Property Insurance	1,129	1,517	2,370	519	662
Utilities	9,410	12,769	20,123	4,451	5,730
Janitorial	6,023	8,016	12,394	2,689	3,396
Maintenance	5,270	7,014	10,844	2,353	2,971
Total Reimbursement Revenue	33,501	44,396	70,627	15,256	19,189
TOTAL POTENTIAL GROSS REVENUE	1,421,001	1,459,646	1,514,182	1,608,006	1,659,181
General Vacancy				(80,400)	(82,959)
EFFECTIVE GROSS REVENUE	1,421,001	1,459,646	1,514,182	1,527,606	1,576,222
OPERATING EXPENSES					
Property Taxes	148,800	148,800	163,680	163,680	163,680
Property Insurance	14,400	14,976	15,575	16,198	16,846
Utilities	120,000	126,000	132,300	138,915	145,861
Janitorial	76,800	79,104	81,477	83,921	86,439
Maintenance	67,200	69,216	71,292	73,431	75,634
Management Fee	71,050	72,982	75,709	76,380	78,811
TOTAL OPERATING EXPENSES	498,250	511,078	540,033	552,525	567,271
NET OPERATING INCOME	922,751	948,568	974,149	975,081	1,008,951
DEBT SERVICE					
Interest Payments	590,569	580,259	568,869	556,288	542,388
Principal Payments	98,457	108,767	120,156	132,738	146,637
TOTAL DEBT SERVICE	689,026	689,026	689,025	689,026	689,025
CASH FLOW AFTER DEBT SERVICE BUT BEFORE TAXES	233,725	259,542	285,124	286,055	319,926
INCOME TAX	52,893	65,899	79,209	84,073	101,271
CASH FLOW AFTER TAXES	$180,832	$193,643	$205,915	$201,982	$218,655

EXHIBIT 12–20
Resale Report from ARGUS

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PROSPECTIVE PROPERTY RESALE

For the Years Ending	Year 1 May-2001	Year 2 May-2002	Year 3 May-2003	Year 4 May-2004	Year 5 May-2005
RESALE AMOUNT					
Gross Proceeds from Sale					[illegible]
NET PROCEEDS FROM SALE					[illegible]
OUTSTANDING DEBT RETIREMENT					
Total Principal Balances					[illegible]
NET RESALE PROCEEDS AFTER DEBT					[illegible]
UNLEVERAGED ANNUAL IRR					13.46%
LEVERAGED ANNUAL IRR					[illegible]

Other Financing Alternatives

An alternative to using a second mortgage to obtain additional financing is to use what is referred to as a **mezzanine loan**. A mezzanine loan bridges the gap between the first mortgage debt on the property and the equity investment. It differs from a second mortgage in that it is not secured as a mortgage on the property. Rather, it is secured by the investor's equity in the property. This means that instead of following the normal foreclosure procedure in the event of default on the mezzanine loan, the mezzanine lender would engage in legal proceedings that would give them an equity interest in the property.

The mezzanine lender usually enters into an intercreditor agreement with the first-mortgage lender to have the right to take over the first mortgage in the event of default. The first-mortgage lender is willing to enter into this agreement because it gives them another party to look to for payment on the first mortgage. This can also result in more rapid control of the property by the mezzanine lender because equity in the corporation or partnership is a personal asset and can be seized through a legal process that does not require as much time as foreclosure on a mortgage that is in default.

Another financing alternative is to issue **preferred equity** in addition to the regular or common equity. Preferred equity is an equity interest in the property but has debtlike characteristics because it has a claim on cash flows from the property that comes before that of the regular (common) equity investors. For example, the preferred equity may receive an 8 percent preferred return on equity invested, which means that they receive an 8 percent return on their investment before the regular equity investors receive any cash flow. This return may be cumulative, which means that if the preferred investors do not receive their 8 percent return in a given year, any shortfall carries over to succeeding years and must be paid before the regular equity holders receive any cash distributions. After payment of the preferred return, the remaining cash flows are often split between the preferred equity investors and regular equity investors. The preferred equity holder might also receive a preferred portion of the resale proceeds before the regular equity investors receive any of the cash flow from sale. This can take the form of a preferred *IRR*, which means that the preferred equity receives enough cash flow from the sale to achieve a specified *IRR* before any cash goes to the regular equity investor. The preferred *IRR* would be based on all cash flows distributed to the preferred investor, including any cash flows received from operating the property before it is sold. The idea is that cash flow is first distributed so that the preferred equity first receives enough cash from sale so that over the entire holding period the preferred investor receives a specified *IRR* on his or her original equity investment.

Preferred equity is somewhat analogous to mortgages with participations, discussed previously in this chapter. Although it is considered a form of equity, from the regular equity investor's perspective it serves as an additional source of financial leverage.

Conclusion

This chapter illustrated the concept of financial leverage and discussed the conditions for favorable leverage on both before-tax and after-tax bases. We also showed that the use of financial leverage in the hopes of increasing the rate of return on equity is *not riskless*. That is, increasing the level of debt increases the riskiness of the investment, as we illustrated by showing that debt increases the variance of the rate of returns. Thus, when investors use leverage, they must consider whether the additional risk is commensurate with the higher expected return (assuming positive leverage).

Financial leverage deals with the *amount* of financing. The chapter also discussed several financing alternatives, including different types of participation loans and a sale-leaseback of the land. We also considered the effect of each of these alternatives on the investor's cash flows, rates of return, and the debt coverage ratio, and we calculated the effective cost of each alternative. These calculations are used to make decisions regarding the type of financing alternative to choose (the *structure* of the debt).

It is impossible to discuss all the possible types of financing alternatives. However, the concepts discussed in this chapter should help you analyze any alternative encountered in practice.

Key Terms

accrual loans, *371*
accrual rate, *372*
balloon payment, *370*
break-even interest rate, *354*
bullet loans, *370*
convertible mortgage, *374*
covenants (in mortgage agreements), *360*
debt coverage ratio, *359*
equity participation loans, *363*
financial leverage, *348*
incremental cost of debt, *356*
interest-only loan, *370*
loan-to-value ratio, *359*
lockout clause, *361*
lockout period, *364*
mezzanine loan, *380*
negative amortization, *372*
negative (unfavorable) financial leverage, *352*
nonrecourse clause, *358*
pay rate, *372*
positive (favorable) financial leverage, *349*
preferred equity, *380*
put option, *358*
sale-leaseback of land, *368*
yield maintenance fee, *361*

Useful Web Sites

www.mortgage-loan-search.com—This site has a link that explains a few general types of loans, as well as a link that recommends a loan type given your criteria.

www.homeresearcher.com—The "articles" link on the site provides several articles related to financing alternatives and leverage.

www.century21.com/learn—This area of the Century 21 Web site has several articles related to different loan alternatives and concepts such as negative amortization.

www.gecapitalrealestate.com—Web site for GE Real Estate provides information about a plethora of finance products, including higher-leverage loans and participating debt.

Questions

1. What is financial leverage? Why is a one-year measure of return on investment inadequate in determining whether positive or negative financial leverage exists?
2. What is the break-even mortgage interest rate *(BEIR)* in the context of financial leverage? Would you ever expect an investor to pay a break-even interest rate when financing a property? Why or why not?
3. What are *positive* and *negative* financial leverage? How are returns or losses magnified as the degree of leverage increases? How does leverage on a before-tax basis differ from leverage on an after-tax basis?
4. In what way does leverage increase the riskiness of a loan?
5. What is meant by a participation loan? What does the lender participate in? Why would a lender want to make a participation loan? Why would an investor want to obtain a participation loan?
6. What is meant by a sale-leaseback? Why would a building investor want to do a sale-leaseback of the land? What is the benefit to the party that purchases the land under a sale-leaseback?
7. Why might an investor prefer a loan with a lower interest rate and a participation?
8. Why might a lender prefer a loan with a lower interest rate and a participation?
9. How do you think participations affect the riskiness of a loan?
10. What is the motivation for a sale-leaseback of the land?
11. What criteria should be used to choose between two financing alternatives?
12. What is the traditional cash equivalency approach to determine how below-market-rate loans affect value?
13. How can the effect of below-market-rate loans on value be determined using investor criteria?

Problems

1. An investor would like to purchase a new apartment property for $2 million. However, she faces the decision of whether to use 70 percent or 80 percent financing. The 70 percent loan can be obtained at 10 percent interest for 25 years. The 80 percent loan can be obtained at 11 percent interest for 25 years.

   NOI is expected to be $190,000 per year and increase at 3 percent annually, the same rate at which the property is expected to increase in value. The building and improvements represent 80 percent of value and will be depreciated over 27.5 years (1 ÷ 27.5 per year). The project is expected to be sold after five years. Assume a 36 percent tax bracket for all income and capital gains taxes.

a. What would the *BTIRR* and *ATIRR* be at each level of financing (assume monthly mortgage amortization)?

b. What is the break-even interest rate *(BEIR)* for this project?

c. What is the marginal cost of the 80 percent loan? What does this mean?

d. Does each loan offer favorable financial leverage? Which would you recommend?

2. You are advising a group of investors who are considering the purchase of a shopping center complex. They would like to finance 75 percent of the purchase price. A loan has been offered to them on the following terms: The contract interest rate is 10 percent and will be amortized with monthly payments over 25 years. The loan also will have an equity participation of 40 percent of the cash flow after debt service. The loan has a "lockout" provision that prevents it from being prepaid before year 5.

   The property is expected to cost $5 million. *NOI* is estimated to be $475,000, including overages, during the first year, and to increase at the rate of 3 percent per year for the next five years. The property is expected to be worth $6 million at the end of five years. The improvement represents 80 percent of cost, and depreciation will be over 39 years. Assume a 28% tax bracket for all income and capital gains and a holding period of five years.

   a. Compute the *BTIRR* and *ATIRR* after five years, taking into account the equity participation.

   b. What would the *BEIR* be on such a project? What is the projected cost of the equity participation financing?

   c. Is there favorable leverage with the proposed loan?

3. A developer wants to finance a project costing $1.5 million with a 70 percent, 25-year loan at an interest rate of 8 percent. The project's *NOI* is expected to be $120,000 during year 1 and the *NOI*, as well as its value, is expected to increase at an annual rate of 3 percent thereafter. The lender will require an initial debt coverage ratio of at least 1.20.

   a. Would the lender be likely to make the loan to the developer? Support your answer with a cash flow statement for a five-year period. What would be the developer's before-tax yield on equity (*BTIRR*)?

   b. Based on the projection in (*a*), what would be the maximum loan amount that the lender would make if the debt coverage ratio was 1.15 for year 1? What would be the loan-to-value ratio?

   c. Assuming conditions in part (*a*), suppose that mortgage interest rates suddenly increase from 8 percent to 10 percent. *NOI* and value will now increase at a rate of 5 percent. If the desired *DCR* is 1.20, will the lender be as willing to make a conventional loan now? Support your answer with a cash flow statement.

4. Ace Development Company is trying to structure a loan with the First National Bank. Ace would like to purchase a property for $2.5 million. The property is projected to produce a first year *NOI* of $200,000. The lender will allow only up to an 80 percent loan on the property and requires a *DCR* in the first year of at least 1.25. All loan payments are to be made monthly, but will increase by 10 percent at the beginning of each year for five years. The contract rate of interest on the loan is 12 percent. The lender is willing to allow the loan to negatively amortize, however, the loan will mature at the end of the five-year period.

   a. What will the balloon payment be at the end of the fifth year?

   b. If the property value does not change, what will the loan-to-value ratio be at the end of the five-year period?

5. An institutional lender is willing to make a loan for $1 million on an office building at a 10 percent interest (accrual) rate with payments calculated using an 8 percent pay rate and a 30-year loan term. (That is, payments are calculated as if the interest rate were 8 percent with monthly payments over 30 years.) After the first five years the payments are to be adjusted so that the loan can be amortized over the remaining 25-year term.

   a. What is the initial payment?

   b. How much interest will accrue during the first year?

   c. What will the balance be after five years?

   d. What will the monthly payments be starting in year 6?

6. A property is expected to have *NOI* of $100,000 the first year. The *NOI* is expected to increase by 3 percent per year thereafter. The appraised value of the property is currently $1 million and the lender is willing to make a $900,000 participation loan with a contract interest rate of 8 percent. The loan will be amortized with monthly payments over a 20-year term. In addition to the regular mortgage payments, the lender will receive 50 percent of the *NOI* in excess of $100,000 each year until the loan is repaid. The lender also will receive 50 percent of any increase in the value of the property. The loan includes a substantial prepayment penalty for repayment before year 5, and the balance of the loan is due in year 10. (If the property has not been sold, the participation will be based on the appraised value of the property.) Assume that the appraiser would estimate the value in year 10 by dividing the *NOI* for year 11 by a 10 percent capitalization rate.

   Calculate the effective cost (to the borrower) of the participation loan assuming the loan is held for 10 years. (Note that this is also the expected return to the lender.)

7. Refer to problem 6. Assume that another alternative is a convertible mortgage (instead of a participation loan) that gives the lender the option to convert the mortgage balance into a 60 percent equity position at the end of year 10. That is, instead of receiving the payoff on the mortgage, the lender would own 60 percent of the property. The loan would be for $900,000 with a contract rate of 9 percent, and it would be amortized over 20 years. Assume that the borrower will default if the property value is less than the loan balance in year 10.

   a. What is the lender's *IRR* if the property sells for the same price in year 10 as the previous example?

   b. What is the lender's *IRR* if the property sells for only $1 million after 10 years?

   c. What is the lender's *IRR* if the property sells for only $500,000 after 10 years?

8. A borrower and lender negotiate a $20,000,000 interest-only loan at a 9 percent interest rate for a term of 15 years. There is a lockout period of 10 years. Should the borrower choose to prepay this loan at any time after the end of the 10th year, a yield maintenance fee (*YMF*) will be charged. The *YMF* will be calculated as follows: A treasury security with a maturity equal to the number of months remaining on the loan will be selected, to which a spread of 150 basis points (1.50 percent) will be added to determine the lender's reinvestment rate. The penalty will be determined as the present value of the difference between the original loan rate and the lender's reinvestment rate.

   a. How much will the *YMF* be if the loan is repaid at the end of year 13 if 2-year treasury rates are 6 percent? What if two-year treasury rates are 8 percent?

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ARGUS

9. Excel. Refer to the participation loan example in the chapter. Suppose the participation was reduced to 25 percent of the *NOI* in excess of $100,000 but increased to 75 percent of the gain in value.

   a. What is the investor's before- and after-tax *IRR*?

   b. What is the lender's *IRR*?

10. ARGUS. Refer to the Monument Office example. What is the leveraged *IRR* if the loan-to-value ratio is increased to 80 percent?

Chapter 13

Risk Analysis

Introduction

In previous chapters we have discussed how to calculate the *IRR*, *NPV*, and other measures of investment performance. Because of risk differences, comparing *IRR*s or *NPV*s when making choices among alternative investments is usually not possible. Indeed, such a comparison may be made only if we assume that the risk associated with the different investments being analyzed is the same. In this chapter we provide some techniques for evaluating risk that enable us to make a more thorough comparison of alternatives. We start with a brief discussion of sources of risk and how they may differ among investment alternatives.

Comparing Investment Returns

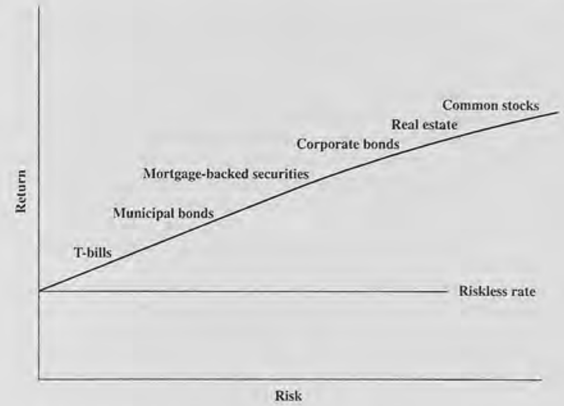
To begin our discussion, we will briefly explore considerations that investors should take into account when comparing measures of return on investment on a specific real estate investment with other real estate investments and other investments generally.

After the investor has gone through a reasonably detailed analysis of an income-producing property, and after having developed measures of return on the investment, the investor must decide whether or not the investment will provide an adequate or competitive return. The answer to this question will depend on (1) the nature of alternative real estate investments, (2) other investments that are available to the investor, (3) the respective returns that those alternatives are expected to yield, and (4) differences in *risk* between the investment being considered relative to those alternative investments available to the investor.

In Exhibit 13–1, we have constructed a hypothetical relationship between rates of return and risk for various classes of alternative investments. The vertical axis represents the expected return,[1] and the horizontal axis represents the degree of risk inherent in each category of investment. Note that we are dealing with the average risk for an entire class of assets. There are obviously significant differences in risk within each class. For example, some bonds will be riskier than other bonds within the general bond category. Also, less variance occurs within some asset classes than others (e.g., Treasury bills are considered to be riskless). Assets within one category may have more risk than some of the assets in a higher-risk category. For example, some bonds are riskier than some stocks, even though as a *class*, stocks are riskier than bonds.

[1] To be most comparable, returns should be calculated on an after-tax basis, as discussed later in this chapter.

EXHIBIT 13–1
Risk and Return (alternative investments)



Risk, as presented in Exhibit 13–1, is considered only by class of investments in relative terms; that is, as one moves to the right on the axis, an investment is considered riskier and to the left less risky. Hence, investments with higher risks should yield investors higher returns, and vice versa.

Note that, based on the risk-return "ranking" indicated in Exhibit 13–1, the security with the lowest return, U.S. Treasury bills, also has the lowest risk.[2] As we move out on the risk-return line in the exhibit, we see that expected before-tax returns on investments in real estate offer a considerably higher expected return but are also much riskier than investing in U.S. Treasury bills.

Types of Risk

What are the investment characteristics peculiar to real estate that make it riskier than investing in government securities? Similarly, what risk characteristics differentiate real estate investment from the alternatives such as common stock, corporate bonds, and municipal bonds also shown in Exhibit 13–1? To answer this question we must consider the source of risk differences among various categories of investments. What follows is a brief summary of major investment risk characteristics that must be considered by investors when deciding among alternative investments.

Business Risk

Real estate investors are in the business of renting space. They incur the business risk of loss due to fluctuations in economic activity that affect the variability of income produced by the property. Changes in economic conditions often affect some properties more than others depending on the type of property, its location, and any existing leases. Many regions of the country and locations within cities experience differences in the rate of growth due to changes in demand, population changes, and so on. Those properties that are affected to a greater degree than others would be riskier. A property with a well-diversified

[2] Treasury bills are free from default risk although they are subject to some interest rate risk and inflation risk.

tenant mix is likely to be less subject to business risk. Similarly, properties with leases that provide the owner with protection against unexpected changes in expenses (e.g., with expense stops in the lease) would have less business risk.

Financial Risk

The use of debt financing (referred to as financial leverage) magnifies the business risk. **Financial risk** increases as the amount of debt on a real estate investment is increased. The degree of financial risk also depends on the cost and structure of the debt. For example, a loan that gives the lender a participation in any appreciation in the value of the property in exchange for lower monthly payments may have less financial risk. Chapter 12 provided a discussion of financial leverage and the use of different types of loans such as participation loans. We will explore financial risk further later in this chapter.

Liquidity Risk

This risk occurs when a continuous market with many buyers and sellers and frequent transactions is not available. The more difficult an investment is to liquidate, the greater the risk that a price concession may have to be given to a buyer should the seller have to dispose of the investment quickly. Real estate has a relatively high degree of **liquidity risk.** It can take from six months to a year or more to sell real estate income properties, especially during periods of weak demand for investment real estate such as occurred during the early 1990s. Special-purpose properties would tend to have much more liquidity risk than properties that can easily be adapted to alternative uses.

Inflation Risk

Unexpected inflation can reduce an investor's rate of return if the income from the investment does not increase sufficiently to offset the impact of inflation, thereby reducing the real value of the investment. Some investments are more favorably or adversely affected by inflation than others. Despite **inflation risk**, real estate has historically done well during periods of inflation. This might be attributed to the use of leases that allow the *NOI* to adjust with unexpected changes in inflation. Furthermore, the replacement cost of real estate tends to increase with inflation. During periods of high vacancy rates, however, when the demand for space is weak and new construction is not feasible, the income from real estate does not tend to increase with unexpected inflation.

Management Risk

Most real estate investments require management to keep the space leased and maintained to preserve the value of the investment. The rate of return that the investor earns can depend on the competency of the management, known as **management risk.** This risk is based on the capability of management and its ability to innovate, respond to competitive conditions, and operate the business activity efficiently. Some properties require a higher level of management expertise than others. For example, regional malls require continuous marketing of the mall and leasing of space to keep a viable mix of tenants that draws customers to the mall.

Interest Rate Risk

Changes in interest rates will affect the price of all securities and investments. Depending on the relative maturity (short-term versus long-term investments), however, some investment prices will respond more than others, thereby increasing the potential for loss or gain, that is, the **interest rate risk.** Real estate tends to be highly leveraged, and thus the rate of return earned by equity investors can be affected by changes in interest rates. Even if an existing investor has a fixed-rate mortgage or no mortgage, an increase in the level of interest

rates may lower the price that a subsequent buyer is willing to pay. Furthermore, yield rates that investors require for real estate tend to move with the overall level of interest rates in the economy.

Legislative Risk

Real estate is subject to numerous regulations such as tax laws, rent control, zoning, and other restrictions imposed by government. **Legislative risk** results from the fact that changes in regulations can adversely affect the profitability of the investment. Some state and local governments have more restrictive legislation than others—especially for new development.

Environmental Risk

The value of real estate is often affected by changes in its environment or sudden awareness that the existing environment is potentially hazardous. For example, while it used to be common to use asbestos to insulate buildings, asbestos in buildings is now perceived as a potential health hazard. A property may also have become contaminated by toxic waste that is spilled or was once buried on the site or an adjacent site. **Environmental risk** can cause more of a loss than the other risks mentioned because the investor can be subject to cleanup costs that far exceed the value of the property.

In the final analysis, a prospective investor in a specific real estate project must estimate and compute an expected return on the project and compare that return with expected returns on other *specific* real estate investments as well as all other investments. Any risk differentials must then be carefully considered relative to any risk premium, or difference in expected returns, in all such comparisons. Investors must then make the final judgment as to whether an investment is justified.

Due Diligence in Real Estate Investment Risk Analysis

The term **due diligence** is used in the real estate investment community to describe the investigation that an investor should undertake when considering the acquisition of a property.[3] Although this process should be followed by any investor, it is particularly important when a firm is making investments on behalf of other investors. Essentially, due diligence is a process of discovering information needed to assess whether or not investment risk is suitable given a set of investment objectives. Exhibit 13–2 provides a general checklist of the areas that should be investigated along with some commentary regarding the importance of each. In most cases, a prospective investor will insist that any risks discovered in the due diligence process must be remedied by the current property owner as a condition of sale.

Sensitivity Analysis

We have discussed various types of risk that must be considered when evaluating different investment alternatives. Unfortunately, it is not easy to *measure* the riskiness of an investment. We will learn that there are different ways of measuring risk, depending on the degree and manner in which the analyst attempts to quantify the risk.

The performance of some properties will be more sensitive to unexpected changes in market conditions than that of other properties. For example, the effect of unexpected inflation on the net operating income for a property is affected by lease provisions such as expense stops and CPI adjustments. A property that is located in an area that has limited land available for new development is likely to be less sensitive to the risk that vacancy rates will increase as a result of overbuilding.

[3] The term is also used to describe investigations that should be undertaken in corporate mergers, formation of partnerships, and so on.

EXHIBIT 13–2 Sample Due Diligence Checklist (continued on next page)

Areas of Review	Commentary
1. **Rent roll analysis**	Review to determine whether rent information and the payment history of tenants provided by the property owner are accurate and to discover whether there are any disagreements between tenants and landlord (e.g., withholding of rent) that may result in a future confrontation with tenants. Tenant creditworthiness and rent arrearages as well as bankruptcies are also important.
2. **Lease agreement review** Renewal option rights Expansion option rights First refusal rights Permitted uses Restrictive uses Tenant improvements Commissions Parking Signage	Review to determine the contents of leases as well as options that tenants possess and the responsibility and calculation of expenses. This may affect future expansion commitments relative to rents, expenses, expansions, etc. Also, commitments made to tenants by the current owner regarding parking, future improvements, payment of commissions, rights to sublet, erect signs, etc. Discover and review any amendments to existing leases.
3. **Review of service and maintenance agreements** Landscape, janitorial, trash removal, elevator, security, building systems, certificates of occupancy, mechanical, fire inspection, etc.	Review made to establish the frequency and extent of any problems with building equipment and the steps taken to remedy/repair/replace by the owner. Chronic problems in this area could indicate future major expenses, problems obtaining insurance coverage, etc. All equipment warranties should also be reviewed.
4. **Pending or threatened matters review**	Review to determine if there are any condemnation proceedings, tax suits, regulatory suits, governmental litigation, or private lawsuits that may affect the property.
5. **Review of title/deed documents to determine:** Nature and extent of easements Deed restrictions Quality of title Existence of liens • Financing liens • Mechanics' liens • Tax liens • Judgment liens	Examination to reveal any easements granted to other parties that could benefit or detract from the value of the property. It should also reveal any liens that may exist because of unpaid taxes, disputes over payments due to suppliers and contractors, and the existence of civil judgments against the current property owner.
6. **Property survey** Boundary lines Location of buildings, structures, and other improvements	Important review to determine whether or not the physical improvements are properly located on the site, or if they are in violation of any legal boundaries or site restrictions, including rights of way, setback requirements, etc. It should also address issues regarding the location of all rights of way, driveways, walkways, curbcuts, utility lines, streams, rivers, and ditches and the location of any setback lines and of all roads, streets, and highways bordering the property, showing access to and from these.
7. **Government compliance** Compliance with current zoning ordinances, permitted uses/grandfather provisions including: • Parking ratios • Setback lines • Height limitations	Review to determine whether the current and intended use of the property is allowed under zoning. Also to determine whether any grandfather provisions currently apply. Environmental concerns may include a number of issues including the existence of toxic wastes, destruction of wetlands, trees, endangered species, etc., and whether a property lies in a designated special flood hazard area or the 100-year flood plain. This review is usually performed by an environmental engineering firm and requires an opinion letter.

EXHIBIT 13–2 Sample Due Diligence Checklist (concluded)

Areas of Review	Commentary
• Density limitations (*a*) Number of units (*b*) Floor area ratios • Environmental regulations: toxic waste/air quality	
8. **Physical inspection** Management files on repairs, maintenance, and warranties	Survey taken to determine the physical condition of the structure and if defects exist, whether needed repairs are covered by warranties. A report should be prepared assessing the existence of "as built" plans and specifications, the condition of building systems, structures, utilities, foundation, walls, and adequacy and availability of utilities. The presence of communication devices, such as satellite dishes, any variances from "as built" plans and specifications, and the existence of defects should be noted. Should also indicate compliance with ADA (Americans with Disabilities Act) regulations.
9. **Tax matters** Property taxes • Assessed value • Special assessments • Payment history	Review to determine whether payment of all taxes and assessments is current. Also to discover any abatements or existence of special local tax districts, etc.
10. **Insurance policies** 11. **Engineering studies** 12. **Market studies** 13. **List of personal property**	These reviews would include the insurance claims history and any denial of insurance to the current property owner. The investor has a right to ask for any reports commissioned by the current property owner, such as market studies, engineering studies, etc., that may be relevant to the transaction. The investor may request a list of personal property that may be conveyed with the real property in order to avoid disputes.

One of the most straightforward ways of analyzing risk is to do **sensitivity analysis**, or a what-if analysis, of the property. This involves changing one or more of the key assumptions for which there is uncertainty to see how sensitive the investment performance of the property is to changes in that assumption. Assumptions that are typically examined in a sensitivity analysis include the expected market rental rate, vacancy rates, operating expenses, and the expected resale price.

A sensitivity analysis starts with a *base case*, that is, a set of assumptions to be analyzed that will provide a frame of reference for the sensitivity analysis. This set of assumptions usually represents the analyst's best estimate of the most likely situation.[4]

Once the base case set of assumptions is identified, the analyst first computes the *IRR*, *NPV*, and other measures of investment performance using this base set of assumptions. Then the analyst varies the assumptions one or more at a time to see how each change affects the results. Usually the approach to changing assumptions is (1) to change a single assumption at a time or (2) to identify several scenarios in which more than one variable changes within a particular scenario.

Change a Single Assumption at a Time

The advantage of this approach is that it allows the analyst to isolate the impact of a specific input assumption. For example, in the office building analyzed in Chapter 11, we

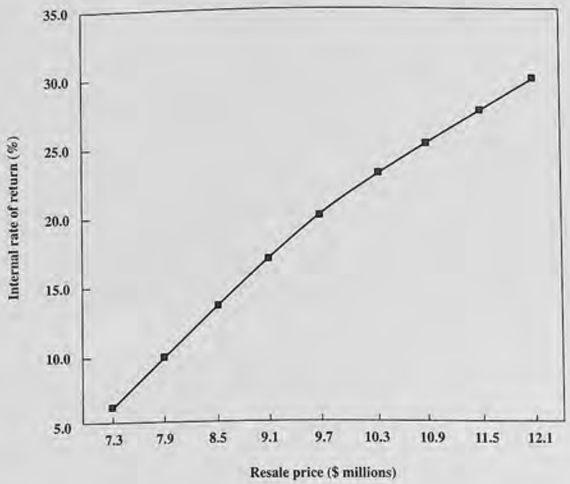
[4] In a statistical sense the "most likely" case would be the one with the highest probability of occurrence. We will consider probabilities in more detail in a later section.

EXHIBIT 13–3
Sensitivity Analysis

Resale Price	Annual Change*	*BTIRR*
$7,300,000	−3.00%	6.69%
7,900,000	−1.45	10.74
8,500,000	0.00	14.23
9,100,000	1.37	17.32
9,700,000	2.68	20.08
10,300,000	3.92	22.60
10,900,000	5.10	24.91
11,500,000	6.23	27.05
12,100,000	7.32	29.05

*Compound annual rate of change from the purchase price of $8.5 million.

EXHIBIT 13–4
Monument Office Building Example: Sensitivity of *IRR* to Resale Price



estimated the *IRR* to be 20.08 percent under a specific set of assumptions that might be considered a base case. Included in these assumptions was an estimate that the property would sell for $9.7 million after five years. What if the property sells for more or less than this? How would a change in sale price affect the *IRR?* Exhibit 13–3 shows the *IRR* for a range of possible resale prices. This chart shows how sensitive the *IRR* is to a change in the resale price. Exhibit 13–4 graphs the results.

Scenarios

An alternative to changing a single variable at a time is to identify different **scenarios**. The base case assumptions might be viewed as a most likely scenario. Similarly, one could conceive of a pessimistic scenario in which the assumptions reflect a situation where things don't go as well as the most likely scenario. For example, vacancy might be higher, which in turn might mean future market rents are lower, and the resale price is lower. Scenario analysis allows the analyst to see how much investment performance is affected by a

combination of negative or worst-case assumptions. Likewise, a set of optimistic assumptions would be identified that indicates how well the investment would perform if everything goes well. We will illustrate the use of scenarios later in this chapter.

Partitioning the *IRR*

We have given a considerable amount of attention to the development of the internal rate of return on equity invested in real estate projects. While this measure of return is useful in helping the investor decide whether or not to invest in a project, it is helpful to "partition" that rate of return to obtain some idea as to the relative weights of components of the return and some idea as to the timing of the receipt of the largest portion of that return.

To illustrate what we mean by **partitioning the IRR,** recall that the internal rate of return on equity investment in real estate comprises two sources of cash flow: (1) cash flow from operations and (2) cash flow from the sale of the investment.

In Exhibit 13–5, we present the cash flow from operating the property ($BTCF_o$) and the cash flow from sale of the property ($BTCF_s$) for the office building example discussed in Chapter 11. Recall that the internal rate of return on equity for a five-year holding period was 20.08 percent. However, because both of the above-mentioned sources of cash flow make up the 20.08 percent internal rate of return, we have no way of knowing what proportion *each component bears to the total return.* A breakdown of each component would be useful to an investor concerned with how much of the return is made up of cash flow from *operations* realized from the project and how much is due to proceeds from *sale* in value of the property.

To consider these problems, it is a simple matter to reconsider the present value of the $BTCF_o$ and $BTCF_s$ in a slightly different manner, as shown in Exhibit 13–5. We should note that all cash flow components the investor expects to receive from the project are discounted to find the internal rate of return of 20.08 percent. Then the *PV* of $BTCF_o$ and $BTCF_s$ are summed to get the total *PV* of $2,550,000. The ratio of the *PV* of $BTCF_o$ and *PV* of $BTCF_s$ can now be taken to the total present value. These ratios now represent the respective proportion of the internal rate of return made up by cash flow (30 percent) and cash flow from appreciation and sale after five years (70 percent).

EXHIBIT 13–5
Partitioning the *IRR*—Monument Office Building

PV of $BTCF_o$:			
Year	Cash Flow	*IFPV*	Present Value
1	$ 233,725	0.832778	$ 194,641
2	259,542	0.693519	179,996
3	285,121	0.577548	164,671
4	286,054	0.480969	137,583
5	319,925	0.400541	128,143
Total			$ 805,035
PV of $BTCF_s$:			
5	$4,356,755	0.400541	$1,745,057
PV of $BTCF_o$'		$ 805,035	
PV of *BTCFs*'		1,745,057	
Total *PV*		$2,550,093	(rounded to $2,550,000)

Ratio of:
PV, $BTCF_o$ to Total *PV* = 31.6%
PV, $BTCF_s$ to Total *PV* = 68.4%

Why is partitioning an internal rate of return important? Because it helps the investor to determine how much of the return depends on annual operating cash flow and how much depends on the projected cash flow from resale. Generally more certainty is associated with projecting cash flows that will occur during the operating years of the investment—especially when they are partially determined by existing leases. The resale price depends on expected cash flows that will occur beyond the current holding period. Thus, it would seem that the greater a proportion of the internal rate of return is made up of *expected appreciation in the future*, the greater the risk facing the investor. For example, the investment return for the office building example in Chapter 11 is 20.08 percent. This is made up of about 30 percent annual $BTCF_o$, and 70 percent $BTCF_s$. A second project might also require an investment of $2,550,000 and also provide the investor with the same *IRR* of 20.08 percent. When the *IRR* is partitioned, however, we may find that the proportions of the return are much different—suppose 3 percent from annual $BTCF_o$ and 97 percent from $BTCF_s$. Hence, even though both investments have a 20.08 percent *IRR*, a much higher proportion of the return in the second case depends on future appreciation in property value.[5] Given this outcome, the investor may want to compare any differences in risk between projects more carefully because even though the two projects are estimated to yield the same *IRR*, the likelihood of significant risk differences between the two is strong.

n Returns and Risk

Many of the sources of risk discussed in the chapter, such as business risk, financial risk, and so on, affect returns on real estate investment by making such returns more *variable*. Generally speaking, the higher the variability in returns, the greater the risk in a project. For example, consider the office building that we have been analyzing. Assume that we are considering two additional properties for investment, a hotel and an apartment building.

To illustrate, Exhibit 13–6 contains an estimate of the internal rate of return over a five-year investment period for the three properties under three different economic scenarios. Essentially, Exhibit 13–6 shows estimates of the *IRR* for all three investments under three general economic scenarios that could occur over the investment period.[6] That is, the investor would estimate rents and expenses for both investment alternatives under three assumptions regarding economic conditions. Then, given the debt-service effects (and perhaps the tax effects) appropriate for each investment, the cash flow would be projected, as well as an estimate of the property value at the end of the investment period.

After computing the *IRR* under each case, the investor could then estimate the probability that each of the economic scenarios that affect the income-producing potential for each alternative will occur. The estimated *IRR*, when multiplied by the probability that a given economic scenario will occur, produces the expected return for each investment.

Based on the results in Exhibit 13–6, we see that the hotel property produces the highest expected return, 20 percent, compared to the 18.52 percent expected return for the office building and 15 percent for the apartment building. Does this mean that the hotel property should be selected over the office building and the apartment building? Not necessarily. At this point the reader should recall our discussion of risk characteristics in the chapter and how each investment may be affected by those considerations. A property that provides a high expected return may also be riskier relative to investments with somewhat lower returns.

[5] Be aware that it is possible to have negative *BTCF* and still have a *positive IRR*. Hence, it is important to take the operating cash flows into account in addition to the *IRR*.

[6] The information in Exhibit 13–3 was used to select the rates of return for the office building. The pessimistic scenario assumes that the building is sold for $7.3 million and the optimistic scenario assumes that it is sold for $12.1 million.

EXHIBIT 13–6
Return and Risk (office, apartment, and hotel properties)

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Office Building

	Return (*R*)	Probability (*P*)	*R* × *P*	*R* − Expected Return	*P* × (*R* − Expected Return)²
Pessimistic	6.17%	25.00%	1.54%	−12.35%	0.3812%
Most likely	19.64	50.00	9.82	1.12	0.0062
Optimistic	28.64	25.00	7.16	10.12	0.2559
Σ Expected return			18.52%	Variance	0.6434%
				Std. Dev.	8.02%

Apartment Building

	Return (*R*)	Probability (*P*)	*R* × *P*	*R* − Expected Return	*P* × (*R* − Expected Return)²
Pessimistic	10.00%	25.00%	2.50%	−5.00%	0.0625%
Most likely	15.00	50.00	7.50	0.00	0.0000
Optimistic	20.00	25.00	5.00	5.00	0.0625
Σ Expected return			15.00%	Variance	0.1250%
				Std. Dev.	3.54%

Hotel

	Return (*R*)	Probability (*P*)	*R* × *P*	*R* − Expected Return	*P* × (*R* − Expected Return)²
Pessimistic	5.00%	25.00%	1.25%	−15.00%	0.5625%
Most likely	20.00	50.00	10.00	0.00	0.0000
Optimistic	35.00	25.00	8.75	15.00	0.5625
Σ Expected return			20.00%	Variance	1.1250%
				Std. Dev.	10.61%

Summary

Property	Expected Return	Risk
Office	18.52%	8.02%
Apartment	15.00	3.54
Hotel	20.00	10.61

In dealing with the problem of comparing risk and return among investments, analysts can use some techniques to complement the qualitative considerations discussed at the end of the chapter. We now turn to a more quantitative discussion of the treatment of projected risk.

In trying to deal with all risk characteristics particular to an investment, some researchers and market analysts argue that in combination these risks (e.g., business risk, financial risk, and the other risks discussed in the chapter) serve to induce *variability in a project's rate of return*. In our above example, the hotel project is riskier than the commercial property or apartment, and, in fact, if you closely examine the estimates of *IRR* under each economic scenario, you encounter a much *wider range* in possible *IRR*s with the hotel property compared to the other properties. In fact, if we diagramed the relationship between the probability of the possible economic states of nature and the expected *IRR* for each economic state of nature, we would have a pattern such as that shown in Exhibit 13–7. In that exhibit, we have plotted the probability of the state of the economy and expected *IRR* on each investment given the state of the economy. We have "smoothed" the curves in the diagram between each probability point to show what the *IRR* would most likely be at points between those specifically estimated. The key concept to grasp from the exhibit is that even though the expected return for the hotel property is higher than that computed for the office building, the range of expected

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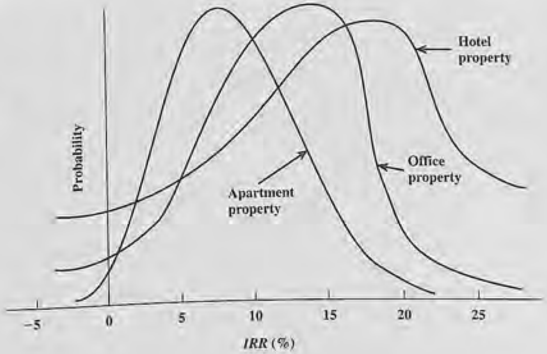


returns for the hotel property is far greater than that for the office building. The narrowness in the range of outcomes for the office building relative to the outcomes for the hotel property indicates that there is *lower variability* in expected returns for the office building than for the recreation property. Many analysts consider *lower variability* in returns to be associated with *lower risk,* and vice versa. Therefore, by using a statistical measure of *variance,* the investor has an indication of the extent of the risk in an investment.

Measures of Variance and Risk

Computing the statistical variance in returns is a very simple procedure, as Exhibit 13–6 shows for the three properties. The *standard deviation about the mean return* for the hotel property is 10.61 percent, which is *greater* than that for the office building, which is only 8.02 percent, or for the apartment, which is 3.54 percent. This measure of *dispersion* tells us that the actual return for the apartment building is *more likely* to be *closer* to its expected return of 15.0 percent when compared to the hotel property or the office building. Because the standard deviation for the hotel property is 10.61 percent, the actual return for the hotel property is *less likely* to be closer to its expected return of 20 percent when compared to the office building or apartment property. Hence, if variation in returns is a good indicator of risk, then the hotel is clearly the riskiest of the three investments.

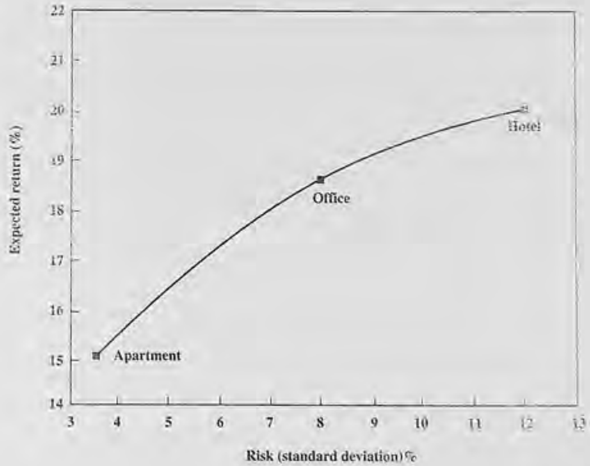
If the probability distribution of *IRR*s for the two investments being considered is normal, the standard deviation of returns for each investment also gives us valuable information. The standard deviation gives us a specific range within which we can expect the actual return for each investment to fall in relation to its expected return. For example, for the hotel property, we can expect its *actual* return to fall within + or − one standard deviation of its expected return of 20 percent 68 percent of the time. This means that 68 percent of the time we can expect the return on the hotel property to fall between 9.39 and 30.61 percent. We can expect its actual return to fall within + or − two standard deviations from its expected return approximately 95.5 percent of the time and + or − three standard deviations from its expected return approximately 99.7 percent of the time. In contrast, the actual return on the apartment building will fall in a much more narrow range of + or − one standard deviation from its expected return, or 15 percent + 3.54 percent = 18.54 percent and 15 percent − 3.54 percent = 11.46 percent, about 68 percent of the time, and so on.

Risk and Return

The relevance of these statistical measures, in addition to giving the investor a more quantitative perspective on dispersion and variance as proxies for risk, can also be related to the *IRR* in developing a measure of *risk per unit of expected return.* To do so for the investments, divide the standard deviation of the *IRR*s by the expected mean *IRR.* For the office building this computation would be 8.02 ÷ 18.52, or 0.433; for the hotel property it would be 10.61 ÷ 20.0, or 0.5305; and for the apartment it would be 3.54 ÷ 15, or 0.236. This statistic, called the *coefficient of variation,* is a measure of relative variation; that is, it measures *risk per unit of expected return.* In the case of the hotel property, the coefficient of variation is higher than that of the office building. The apartment has the lowest coefficient of variation. This suggests that return per unit of risk for the apartment building is not as high as it is for the office building and hotel. This comparison does not necessarily mean that the investor will decide not to accept the additional risk in exchange for the additional return; it depends on the investor's attitude toward risk. All investors are assumed to be *risk averse,* which means that they require a higher expected return as compensation for incurring additional risk. We cannot say, however, how much that return should be for a particular investor. If the returns for each of the three properties we have analyzed are based on market prices for each property, then the trade-off between risk and return reflects the price of risk in the market, which implies that investors would purchase each of the above properties based on their risk and return characteristics.

In Exhibit 13–8 we plot the expected return versus the risk (standard deviation) for each of the three properties. This exhibit is similar to Exhibit 13–1, which showed the risk and return trade-off for all assets. In fact, the part of the curve represented by Exhibit 13–8 can be thought of as a small slice from the portion of Exhibit 13–1 that passes through real estate as an asset class.

EXHIBIT 13–8
Risk versus Return



Portfolio Considerations

We have not considered the possibility of reducing risk (variance) by combining investments into a *portfolio*. By developing a portfolio of *different* investment properties, and also including stocks and bonds, the investor can significantly reduce risk through *diversification*. For example, economic events that result in the pessimistic scenario for the hotel property do not necessarily affect the apartment or office properties, and vice versa. Hence, the returns for the three properties may not be perfectly correlated. Diversifying among the three investment types rather than choosing only one can reduce the overall risk of the portfolio. Diversification lowers the variance of total returns from all investments in a portfolio because high and low returns tend to offset one another when combined, resulting in less variation about an expected mean return for the entire investment portfolio. In the context of Exhibit 13–8, then, the portfolio would have an expected return and variance that is to the left of the curve in the exhibit, in other words, less risk for the same expected rate of return. Chapter 22 discusses the role of diversification in reducing risk.

Retail Case Study—Westgate Shopping Center

Westgate Shopping Center is a neighborhood strip center that is 100,000 square feet. An investor is considering purchasing the property on July 1, 2000. He would hold the property for five years and expects to sell it based on a terminal cap rate of 10.5 percent applied to end-of-year-6 *NOI*. Selling costs would be 3 percent of the sale price. He hopes to get an 11 percent rate of return (before tax, unleveraged) over the five years.

Inflation over the next five years is expected to be 3 percent per year. In general, vacancy for similar shopping centers is about 5 percent, with credit loss an additional 1 percent. Although none of the existing tenants are expected to leave before the end of their lease, a 5 percent "general" vacancy rate will be assumed to allow for the possibility of losing a tenant before their lease expires.

Expenses for the center are projected as follows:

Real estate taxes are $40,000 the first year—increasing 2.5 percent per year.

Insurance is $.18 per square foot—increasing 3 percent per year.

Common area maintenance[7] is $.75 per square foot—increasing 3 percent per year.

Management fee will be 6 percent of effective gross income.

There are currently three tenants.

The first tenant is a drug store leasing 25,000 square feet. Their lease began on July 1, 1995, and will end on June 31, 2005. Their base rent is $12 per square foot and they will pay expense recoveries for real estate taxes, insurance, and common area maintenance on a net basis. At the expiration of their lease the space is projected to be re-leased based on market rents at that time. Market rents are currently $12 per square foot and projected to increase by 3 percent per year until the lease is renewed. The new lease is projected to have a five-year term with no expense recoveries.

The second tenant is a food store leasing 60,000 square feet. Their lease began on July 1, 1999, and will end on June 31, 2014. Their base rent is $8.50 per square foot and they will pay expense recoveries for real estate taxes, insurance, and common area maintenance on a net basis. At the expiration of their lease the space is projected to be re-leased based on market rents at that time. Market rents are currently $9 per square foot and projected to

[7] These are charges to maintain public areas such as walkways and parking.

increase by 3 percent per year until the lease is renewed. The new lease is projected to have a 10-year term with no expense recoveries.

The third tenant is a restaurant leasing 5,000 square feet. Their lease began on July 1, 1999, and will end on June 31, 2002. Their base rent is $15 per square foot and they will pay expense recoveries for real estate taxes, insurance, and common area maintenance on a net basis. This tenant also pays **percentage rent** based on their retail sales volume. They pay an **overage** percentage of 5 percent of retail sales in excess of $225 per square foot **breakpoint** sales volume. Their sales are currently $250 per square foot. At the expiration of their lease the space is projected to be re-leased based on market rents at that time. Market rents are currently $16 per square foot for in-line space and projected to increase by 3 percent per year until the lease is renewed. The new lease is projected to have a three-year term with no expense recoveries. In-line tenants would expect to receive tenant improvements,[8] which are currently $5 per square foot but expected to increase 3 percent per year. Leasing commissions will be 4 percent per of the base rent for the lease.[9]

There is also 10,000 square feet of vacant in-line space in the center. It is projected that this space will be leased to two additional tenants. The first lease is expected to be signed on July 1, 2000, and the second, one year later (July 1, 2001). Each will be a three-year lease. Current market rents for in-line space is $16 per square foot. Leasing costs are 5 percent of the rent collected. Tenant improvement cost for the new tenants are expected to be $10 per square foot and the tenants will have expense recoveries on a net basis for real estate taxes, insurance, and common area maintenance. It is assumed that when these leases are renewed after three years that they will be typical leases for in-line space. Exhibit 13–9 summarizes the key tenant assumptions.

EXHIBIT 13–9
Westgate Shopping Center: Key Tenant Assumptions

Inputs	Tenant 1	Tenant 2	Tenant 3
Name	Drug Store	Food Store	Restaurant
Tenant size	25,000	60,000	5,000
Rent/SF	$12.00	$8.50	$15.00
Lease term (yrs)	5	15	2
Market rent	$12.00	$9.00	$16.00
Market rent increase	3.00%	3.00%	3.00%
Sales volume/SF			$250.00
Sales annual change			3.00%
Breakpoint/SF			$225.00
Overage %			5.00%
Lease renewal term	10	5	3
Lease renewal tenant improvement	$0.00	$0.00	$5.00
Lease renewal commissions	0.00%	0.00%	4.00%
Tenant improvement inflation	0.00%	0.00%	3.00%

[8] Recall that the leasing of a space to a new tenant often requires the fixing up or "up fitting" the interior space to suit the tenant's need. Frequently the landlord sets a standard base amount for up fit and if the tenant exceeds the allowance, either the rent is increased or the tenant pays the overage amount directly to the building owner.

[9] Generally the leasing of a space to a new tenant requires the payment of leasing commissions to an outside broker or to a leasing agent in the owner's firm. There are multiple options as to how the actual commission is calculated and paid. The typical method used is to multiply the first-year rent times a leasing commission percentage times the lease term.

Exhibit 13–10A shows the projected cash flow from operations. Rental income from existing leases, as well as market rent from lease renewals, is projected for each tenant. Total income also includes expense recoveries and overage rent for the restaurant. Income from lease up of vacant space is also included. Tenant improvements (TI) and leasing commissions also have to be paid for lease up of the vacant space and renewal of the restaurant lease (in-line space).

Exhibit 13–10B shows the projected cash flow from resale, and Exhibit 13–11 shows the unleveraged *IRR*, which is 10.48 percent.

Using the 10.48 percent *IRR* as a discount rate, we can partition the *IRR*, as shown in Exhibit 13–12. We could say that about 38 percent of the *IRR* is from cash flow from operations and about 62 percent from the cash flow from resale.

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EXHIBIT 13–10A Westgate Shopping Center—Projected Cash Flow from Operations

Year	1	2	3	4	5	6
Rental income:						
Drug store rent	$300,000	$300,000	$300,000	$300,000	$300,000	$0
Drug store market rent*	$0	$0	$0	$0	$0	$347,782
Drug store recoveries	$33,250	$34,198	$35,172	$36,175	$37,206	$0
Food store rent	$510,000	$510,000	$510,000	$510,000	$510,000	$510,000
Food store market rent	$0	$0	$0	$0	$0	$0
Food store recoveries	$79,800	$82,074	$84,413	$86,820	$89,295	$91,841
Restaurant rent	$75,000	$75,000	$0	$0	$0	$0
Restaurant market rent	$0	$0	$84,872	$87,418	$90,041	$92,742
Restaurant recoveries	$6,650	$6,840	$0	$0	$0	$0
Restaurant overage rent	$6,250	$8,125	$0	$0	$0	$0
Vacant space 1 rent	$80,000	$80,000	$80,000	$0	$0	$0
Vacant space 1 renewal rent	$0	$0	$0	$87,418	$90,041	$92,742
Vacant space 1 recoveries	$6,650	$6,840	$7,034	$0	$0	$0
Vacant space 2 rent	$80,000	$80,000	$80,000	$80,000	$0	$0
Vacant space 2 renewal rent	$0	$0	$0	$0	$90,041	$92,742
Vacant space 2 recoveries	$0	$6,840	$7,034	$7,235	$0	$0
Total income	$1,177,600	$1,189,915	$1,188,526	$1,195,066	$1,206,623	$1,227,849
Vacant space vacancy	$80,000	$0	$0	$0	$0	$0
General vacancy	$58,880	$59,496	$59,426	$59,753	$60,331	$61,392
Effective gross income	$1,038,720	$1,130,419	$1,129,100	$1,135,312	$1,146,292	$1,166,457
Management fee	$62,323	$67,825	$67,746	$68,119	$68,778	$69,987
Property tax	$40,000	$41,000	$42,025	$43,076	$44,153	$45,256
Insurance	$18,000	$18,540	$19,096	$19,669	$20,259	$20,867
CAM	$75,000	$77,250	$79,568	$81,955	$84,413	$86,946
Total expenses	$195,323	$204,615	$208,435	$212,818	$217,602	$223,056
NOI	$843,397	$925,804	$920,665	$922,494	$928,690	$943,401
Vacant space TIs	$50,000	$50,000	$0	$0	$0	
In-line space TIs	$0	$0	$26,523	$27,318	$28,138	
Total TIs	$50,000	$50,000	$26,523	$27,318	$28,138	
Vacant space leasing commissions	$12,000	$12,000	$0	$0	$0	
In-line space leasing commissions	$0	$0	$10,185	$10,490	$10,805	
Total leasing commissions	$12,000	$12,000	$10,185	$10,490	$10,805	
Cash flow from operations	$781,397	$863,804	$883,958	$884,686	$889,747	

*Market rent is from lease renewals.

EXHIBIT 13–10B Westgate Shopping Center—Cash Flow from Resale

Cash flow from resale	
Resale	$8,984,768
Selling cost	$269,543
Net resale	$8,715,225

EXHIBIT 13–11 Westgate Shopping Center—Calculation of *IRR*

Year	0	1	2	3	4	5
Total cash flow:						
Cash flow	($8,500,000)	$781,397	$863,804	$883,958	$884,686	$9,604,972
IRR	10.48%					

EXHIBIT 13–12 Westgate Shopping Center—Partitioning the *IRR*

Partitioning the *IRR*:		
Using *IRR* as a discount rate:		
PV of cash flow from operation	$3,204,921	37.70%
PV of cash flow from resale	5,295,079	62.30%
Total PV	$8,500,000	100.00%

Westgate Shopping Center Scenario Analysis

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The investor also would like to know what his rate of return would be under a "pessimistic" scenario as follows:

- Market rents do not increase for lease renewals of any of the existing tenants.
- Retail sales do not increase for the restaurant.
- The general vacancy rate will be 10 percent instead of 5 percent to allow for the possibility of one tenant's defaulting on the lease.

Note that this will also result in a lower resale price because the year 6 *NOI* that is capitalized is lower.

Exhibit 13–13 shows the results. The *IRR* has dropped from 10.48 percent to 7.33 percent.

Westgate Shopping Center—ARGUS Analysis

It is cumbersome to do a lot of sensitivity or scenario analysis even with the use of a spreadsheet when there are complex leases involved. Specialized software designed for lease-by-lease analysis like ARGUS makes this simpler. Exhibit 13–14 shows the first screen for Westgate Shopping Center using ARGUS to solve for the value. Note that the unleveraged *IRR* is the same as what was discussed earlier for the "base case." Readers are encouraged to make the same changes outlined above for the pessimistic scenario using ARGUS by starting with the "Westgate Shopping Center.SF" file provided on the CD accompanying this book.

Lease Rollover Risk

In the previous chapters and in the Westgate Shopping Center example in [illegible] made assumptions about what rate either the existing tenant or a new tenant would pay when the current lease expires. For simplicity it was assumed that what would happen at lease renewal was known with certainty.

In practice there is uncertainty as to whether the existing tenants will renew their lease. Some may renew while others may vacate. The difference can be significant. If the existing tenant renews the lease, then there will be no additional vacancy due to the tenant's leaving; and the owner may not have to pay any tenant improvements to get the tenant to renew (because the space already meets the tenant's needs). Also, if there is any commission paid

EXHIBIT 13–13 Westgate Shopping Center—Pessimistic Scenario

Year	1	2	3	4	5	6
Rental income:						
Drug store rent	$300,000	$300,000	$300,000	$300,000	$300,000	$0
Drug store renewal rent	$0	$0	$0	$0	$0	$300,000
Drug store recoveries	$33,250	$34,198	$35,172	$36,175	$37,206	$0
Food store rent	$510,000	$510,000	$510,000	$510,000	$510,000	$510,000
Food store renewal rent	$0	$0	$0	$0	$0	$0
Food store recoveries	$79,800	$82,074	$84,413	$86,820	$89,295	$91,841
Restaurant rent	$75,000	$75,000	$0	$0	$0	$0
Restaurant renewal rent	$0	$0	$80,000	$80,000	$80,000	$80,000
Restaurant recoveries	$6,650	$6,840	$0	$0	$0	$0
Restaurant overage rent	$6,250	$6,250	$0	$0	$0	$0
Vacant space 1 rent	$80,000	$80,000	$80,000	$0	$0	$0
Vacant space 1 renewal rent	$0	$0	$0	$80,000	$80,000	$80,000
Vacant space 1 recoveries	$6,650	$6,840	$7,034	$0	$0	$0
Vacant space 2 rent	$80,000	$80,000	$80,000	$80,000	$0	$0
Vacant space 2 renewal rent	$0	$0	$0	$0	$80,000	$80,000
Vacant space 2 recoveries	$0	$6,840	$7,034	$7,235	$0	$0
Total income	$1,177,600	$1,188,040	$1,183,654	$1,180,229	$1,176,501	$1,141,841
Vacant space vacancy	$80,000	$0	$0	$0	$0	$0
General vacancy	$117,760	$118,804	$118,365	$118,023	$117,650	$114,184
Effective gross income	$979,840	$1,069,236	$1,065,289	$1,062,206	$1,058,851	$1,027,657
Management fee	$58,790	$64,154	$63,917	$63,732	$63,531	$61,659
Property tax	$40,000	$41,000	$42,025	$43,076	$44,153	$45,256
Insurance	$18,000	$18,540	$19,096	$19,669	$20,259	$20,867
CAM	$75,000	$77,250	$79,568	$81,955	$84,413	$86,946
Total expenses	$191,790	$200,944	$204,606	$208,432	$212,356	$214,728
NOI	$788,050	$868,292	$860,683	$853,775	$846,495	$812,929
Vacant space TIs	$50,000	$50,000	$0	$0	$0	
In-line space TIs	$0	$0	$26,523	$27,318	$28,138	
Total TIs	$50,000	$50,000	$26,523	$27,318	$28,138	
Vacant space leasing commissions	$12,000	$12,000	$0	$0	$0	
In-line space leasing commissions	$0	$0	$9,600	$9,600	$9,600	
Total leasing commissions	$12,000	$12,000	$9,600	$9,600	$9,600	
Cash flow from operations	$726,050	$806,292	$824,560	$816,857	$808,757	
Cash flow from resale						
Resale	$7,742,180					
Selling cost	$232,265					
Net resale	$7,509,915					

Year	0	1	2	3	4	5
Total cash flow						
Cash flow	($8,500,000)	$726,050	$806,292	$824,560	$816,857	$8,318,672
IRR	7.33%					

EXHIBIT 13–14
Westgate Shopping Center ARGUS Analysis

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to a broker for the lease renewal, it is often a lower rate than that which would have to be paid to find a new tenant. On the other hand, the owner may be willing, in order to avoid these additional costs and vacancy, to provide a discount from current market rents to get an existing tenant to renew the lease.

If the existing tenant does not renew the lease, there will often be some vacancy for several months until a new tenant is found to lease the space. Furthermore, the new tenant is likely to require money for tenant improvements as part of the deal, and commissions may have to be paid to a leasing agent.

When we are projecting cash flows to do a discounted cash flow analysis for investment analysis, as discussed in Chapter 11, or valuation of income properties, as discussed in Chapter 10, we need to make an assumption about what will happen when the existing lease expires. Because we don't know whether the existing tenant will renew or not, one way this issue is handled in practice is to make an assumption about the **renewal probability** at the end of existing leases. For example, if the renewal probability is 60 percent, this means that there is a 60 percent chance that the existing tenant will renew the lease and a 40 percent chance that a new tenant must be found.

Market Leasing Assumptions with Renewal Probabilities

Because most tenant leases will expire during the holding period used in a discounted cash flow analysis, some releasing forecast must be made as discussed above. Typically this is handled by selecting a series of market base forecasts for the various types of spaces in a building. These forecasts are referred to as **market leasing assumptions.** The forecast could be as simplistic as those made in previous chapters, that is, that there is a 100 percent probability of renewal.

In more sophisticated analysis, the market leasing forecast typically includes different market rents for new versus renewal leases, renewal probabilities to reflect the likelihood that an existing tenant will sign a new lease, the number of months vacant until a new tenant is found if the existing tenant does not renew the lease, leasing commissions for new and renewal leases, and the amount of tenant improvements for new and renewal leases.

There can be a single market leasing assumption that applies to the entire property or different market leasing assumptions for groups of leases or even for each individual lease.

Using only one market leasing assumption could satisfy a simple office building where all tenant spaces are similar. However, more complicated retail properties may require using multiple market leasing assumptions. For example, a community shopping center may require separate market leasing assumptions for large tenant spaces, medium-sized tenant spaces, and the local small spaces. It is unusual to have different assumptions for each lease, although a particular lease may have its own market leasing assumption if the analyst feels that it is unique or the analyst has a better idea of the likelihood of that tenant renewing or vacating at the end of the lease.

Market Rent

When a renewal probability is less than 100 percent and there is a difference between market rent for new and renewal tenants, the implied rent is the weighted average of the two. For example, suppose that the renewal probability is 60 percent and the market rent for a new tenant would be \$18 but for a renewal tenant it would be \$17. The implied new market rent when the lease is renewed would be

$$(.60 \times \$17) + (.40 \times \$18) = \$17.40$$

Months Vacant

Typically, when a lease expires and is not renewed, the building owner will suffer some downtime until a new tenant is found and therefore will experience vacancy for a period of time. This is sometimes referred to as **turnover vacancy.** When the renewal probability selected is 100 percent, the months of expected vacancy would be zero. When a renewal probability is less than 100 percent, the implied **months vacant** is equal to (1 − renewal) times the months vacant entry. For example, if the renewal probability is 60 percent and the number of months vacant would be 10 if the tenant does not renew the lease, then this is equivalent to

$$10 \times (1 - .60) = 4 \text{ months vacant}$$

The number is typically rounded up to the nearest integer.

Leasing Commissions

As discussed earlier, the leasing commission rate may be lower for renewal tenants than new tenants. When a renewal probability is less than 100 percent and there is a difference between the leasing commission for new tenants and the leasing commission for renewal tenants, the implied rate is the weighted average of the two multiplied by the lease term. For example, if the renewal probability is 60 percent and the leasing commission for new tenants is 5 percent and for renewal tenants is 3 percent, then the implied leasing rate is

$$(.60 \times 3\%) + (.40 \times 5\%) = 3.80\%$$

Tenant Improvements

As discussed above, tenant improvement rates may differ for new and renewal leases. When a renewal probability is less than 100 percent and there is a difference between the tenant improvement for new leases and the tenant improvement for renewal leases, the implied rate is the weighted average of the two multiplied by the lease term. For example, if the renewal probability is 60 percent and the amount of tenant improvements would be \$20 for a new tenant and \$5 for a renewal tenant, then we have

$$(.60 \times \$5) + (.40 \times \$20) = \$11.00$$

Industrial Case Study—Worthington Distribution Center

Worthington Distribution Center is a 140,000-square-foot building that is being analyzed as of June 1, 2000. It is assumed that it will be sold after five years based on a terminal capitalization rate of 9.75 percent applied to the year 6 *NOI*. Selling costs will be 5 percent of the resale price. The rate of inflation over the next five years is projected to be 3 percent per year. There are currently three tenants occupying the property.

An electrical supply company is leasing 50,000 square feet of space. Their lease began June 1, 1999, and will end on May 30, 2003. They pay rent of \$6 per square foot with no expense recoveries in their lease. They have already indicated that they may renew their lease at the end of the lease term at market rents.

The second tenant is a sign company that is leasing 42,500 square feet with a lease that began June 1, 1998, at a rent of \$6.50. The lease will terminate on May 30, 2002, and there are no expense recoveries in the lease. This tenant is expected to vacate their space.

The third tenant is a computer distribution company leasing 47,500 square feet. Their lease began June 1, 1977, and will end on May 30, 2004. Their rent is \$5.75 with no expense recoveries. It is not certain at this time whether they will renew their lease or not. The renewal probability is estimated to be 70 percent.

The market rent is currently \$7.00 per square foot for a new tenant and \$6.50 per square foot for existing tenants who renew their lease. There would be no expense recoveries in either case. Market rents are projected to increase at the inflation rate of 3 percent from now until leases are renewed. The typical lease term for new leases (new or renewal) is five years. Tenant improvements would be \$5 for new leases and \$2 for renewal leases.

Leasing commissions would be 3 percent for either new or renewal tenants payable to the property manager. If a tenant does not renew the lease, the downtime is expected to be six months until a new tenant would start paying rent.

Expenses and capital expenditures associated with operating the property are projected as follows:

Real Estate Taxes of \$23,000 the first year, increasing 2.5 percent per year.

Insurance of \$.15 per square foot the first year, increasing 4 percent per year.

Common area maintenance charges of \$.20 per square foot increasing 3 percent per year.

Management fee of 5 percent of effective gross revenue paid to the property manager.

Roof repair of \$45,000 in year 1.

What is the value of this property using a before-tax unleveraged discount rate of 10.5 percent?

Exhibit 13–15 summarizes some of the key assumptions outlined above. Note that it was assumed that tenant 1 would renew for sure, tenant 2 would vacate for sure, but tenant 3 would use a renewal probability based on market leasing assumptions.

Exhibit 13–16 summarizes the calculations for months vacant, market rent, leasing commissions, and tenant improvements based on weighting the new and renewal assumptions by the renewal probability. Note that the weighted numbers are as of the first year of the analysis. They will increase over time with the inflation assumptions.

Exhibit 13–17 shows the projection of cash flows for Worthington Distribution Center. For each tenant the rent from the current lease, as well as the "market" rent from the lease renewal assumptions, is projected. Turnover vacancy is a result of tenant 2 vacating for sure and the 30 percent probability that tenant 3 will not renew.

Note that tenant improvements and leasing commissions as well as the capital cost associated with the roof replacement must be deducted from *NOI* to calculate the cash flow.

EXHIBIT 13–15
Worthington Distribution Center—Key Assumptions

Building name	Worthington Distribution Center		
Address			
City		Anywhere	
State		USA	
Building size (SF)		140,000	
Analysis begin date		6/1/2000	
Holding period		5	
Discount rate		10.50%	
Terminal cap rate		9.75%	
Selling cost		3.00%	
Inputs	**Tenant 1**	**Tenant 2**	**Tenant 3**
Name	Electric Supply	Sign Company	Computer Dist.
Tenant size	50,000	42,500	47,500
Rent/SF	$6.00	$6.50	$5.75
Lease term (yrs)	3	2	4
At expiration	Renew	Vacate	Market

EXHIBIT 13–16
Worthington Distribution Center Market Leasing Assumptions

	Lease Term	Renewal Prob.	Months Vacant	Market Rent	Leasing Commissions	Tenant Improvements
New	5	70.0%	10	$7.00	3.00%	$5.00
Renewal			0	$6.50	1.00%	$2.00
Weighted			3	$6.65	1.60%	$2.90

Finally, Exhibit 13–18 shows the cash flow from sale and value calculations. The resale is based on applying the terminal cap rate to the year 6 *NOI*. Selling costs are deducted to arrive at the net resale of $8,863,598. The property value is then calculated by adding the present value of the annual cash flow plus the present value of the resale. The property value is $7,629,201.

Solution with ARGUS

A file called "Worthington Distribution.SF" is provided on the CD that accompanies this book that is the ARGUS solution to this problem. Exhibit 13–19 shows the initial input screen. Note that the value is virtually the same at $7,629,197. (The difference of $4 is obviously rounding.) Exhibit 13–20 shows the input screen in ARGUS for the market leasing assumptions that were discussed above.

Risk and Leverage

One of the types of risk discussed earlier was "financial risk" that is due to the use of financial leverage. The use of financial leverage increases uncertainty as to what the equity investor's rate of return will be. This can be illustrated with an example that shows how leverage affects the expected return and the standard deviation of returns.

Assume that a property can be purchased for $100,000 and its initial *NOI* is $9,000. It will be sold after five years abased on a 10 percent terminal capitalization rate applied to year 6 *NOI*. There are three possible scenarios for an investment as follows:

EXHIBIT 13–17 Worthington Distribution Center

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	Year 1	2	3	4	5	6
Income:						
Electric supply rent	$300,000	$300,000	$300,000	$0	$0	$0
Electric supply market rent	$0	$0	$0	$355,136	$355,136	$355,136
Sign company rent	$276,250	$276,250	$0	$0	$0	$0
Sign company market rent	$0	$0	$315,618	$315,618	$315,618	$315,618
Computer dist. rent	$273,125	$273,125	$273,125	$273,125	$0	$0
Computer dist. market rent	$0	$0	$0	$0	$355,520	$355,520
Total income	$849,375	$849,375	$888,743	$943,879	$1,026,274	$1,026,274
Turnover vacancy	$0	$0	$263,015	$0	$88,880	$0
Effective gross income	$849,375	$849,375	$625,728	$943,879	$937,394	$1,026,274
Expenses:						
Management fee	$42,469	$42,469	$31,286	$47,194	$46,870	$51,314
Property tax	$23,000	$23,575	$24,164	$24,768	$25,388	$26,022
Insurance	$21,000	$21,840	$22,714	$23,622	$24,567	$25,550
CAM	$28,000	$28,840	$29,705	$30,596	$31,514	$32,460
Total	$114,469	$116,724	$107,870	$126,181	$128,339	$135,345
Cash Flow:						
NOI	$734,906	$732,651	$517,858	$817,698	$809,055	$890,929
Tenant improvements	$0	$0	$225,441	$109,273	$155,039	
Leasing commissions	$0	$0	$47,343	$17,757	$28,442	
Total TI and LC	$0	$0	$272,784	$127,030	$183,480	
Capital costs	$45,000	$0	$0	$0	$0	
Cash flow	$689,906	$732,651	$245,074	$690,669	$625,575	
PV factors	0.90498	0.81898	0.74116	0.67073	0.60700	
Present value of cash flow	$624,350	$600,030	$181,640	$463,256	$379,724	

EXHIBIT 13–18
Worthington Distribution Center—Resale and Estimated Value

Resale Calculations:		**Value:**	
Resale	$9,137,730	PV resale	$5,380,203
Selling cost	$ 274,132	PV cash flow	$2,24[illegible],999
Net resale	$8,863,598	Value	$[illegible],629,201
PV factor	0.60700		
PV resale	$5,380,203		

Scenario	*NOI* Growth	Probability (*P*)
Pessimistic	−3.00%	30%
Most likely	0.00%	50%
Optimistic	3.00%	20%

The *IRR* for each scenario is shown in Exhibit 13–21 on an unleveraged basis. The returns range from 4.33 percent to 10.21 percent. Exhibit 13–22 shows that the expected return is 6.98 percent and the standard deviation of returns is 2.06 percent.

EXHIBIT 13–19
Worthington Distribution Center—ARGUS Main Screen

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EXHIBIT 13–20
Worthington Distribution Center—ARGUS Market Leasing Assumptions

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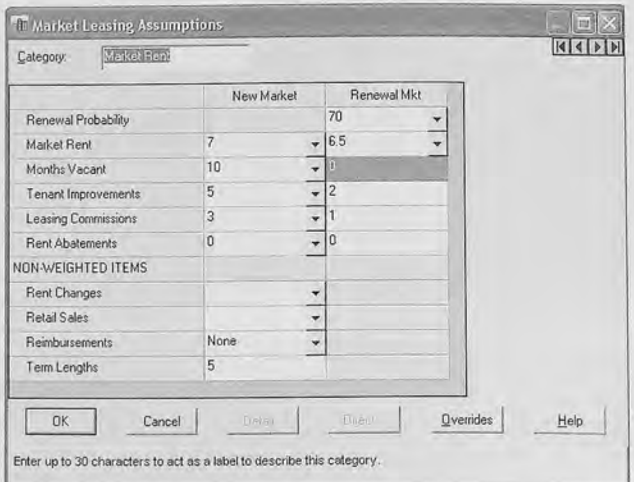

Now assume that the investor finances the purchase with a 70 percent loan ($70,000) at a 6 percent interest rate and a 25-year loan term with annual amortization for simplicity. The leveraged return calculations are shown in Exhibit 13–23.

The returns now range from −.45 percent to 18.59 percent. For the pessimistic scenario, the unleveraged return was 4.33 percent. With a loan at a 6 percent interest rate there is negative leverage in this scenario. (Recall from the previous chapter that unfavorable leverage occurs when the unleveraged return is less than the cost of debt.) Thus, the leveraged return is lower than the unleveraged return under this scenario.

EXHIBIT 13–21
Unleveraged Returns for Each Scenario

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Pessimistic							
Year	0	1	2	3	4	5	6
Purchase	−100,000						
NOI		9,000	8,730	8,468	8,214	7,968	7,729
Resale						77,286	
Total cash flow	−100,000	9,000	8,730	8,468	8,214	85,254	
IRR	4.33%						

Most Likely							
Year	0	1	2	3	4	5	6
Purchase	−100,000						
NOI		9,000	9,000	9,000	9,000	9,000	9,000
Resale						90,000	
Total cash flow	−100,000	9,000	9,000	9,000	9,000	99,000	
IRR	7.27%						

Optimistic							
Year	0	1	2	3	4	5	6
Purchase	−100,000						
NOI		9,000	9,270	9,548	9,835	10,130	10,433
Resale						104,335	
Total cash flow	−100,000	9,000	9,270	9,548	9,835	114,464	
IRR	10.21%						

EXHIBIT 13–22
Expected Return and Standard Deviation of Unleveraged Returns

Scenario	Return (or *R*)	Probability (*P*)	(Return × Probability)	*R* − Expected *R*	*P* × (*R* − Expected *R*)^2
Pessimistic	4.33%	30%	1.30%	−2.64%	0.0210%
Most likely	7.27%	50%	3.64%	0.29%	0.0004%
Optimistic	10.21%	20%	2.04%	3.23%	0.0209%
		Expected return	6.98%		
		Variance	0.04%		
		Standard deviation	2.06%		

For the most likely scenario, the unleveraged return was 7.27 percent. Thus, the leverage is slightly positive and the leveraged return is 10.22 percent under this scenario.

For the optimistic scenario, the unleveraged return was 10.21 percent. The leverage is even more positive under this scenario and the leveraged return is 18.59 percent.

We can also compute the expected return and standard deviation of the leveraged returns. This is shown in Exhibit 13–24.

The expected leveraged return is 8.68 percent, which is higher than the unleveraged return. This is because the *expected* unleveraged return of 6.98 percent exceeds the interest cost 6 percent. It is important to note that the leverage relationship discussed in Chapter 12

EXHIBIT 13–23
Leveraged Returns for Each Scenario

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Pessimistic

Year	0	1	2	3	4	5	6
Purchase	−100,000						
Loan	70,000						
NOI		9,000	8,730	8,468	8,214	7,968	7,729
Payment		−5,476	−5,476	−5,476	−5,476	−5,476	
Resale						77,286	
Loan balance						−62,808	
Total cash flow	−30,000	3,524	3,254	2,992	2,738	16,970	
IRR	−0.45%						

Most Likely

Year	0	1	2	3	4	5	6
Purchase	−100,000						
Loan	70,000						
NOI		9,000	9,000	9,000	9,000	9,000	9,000
Payment		−5,476	−5,476	−5,476	−5,476	−5,476	
Resale						90,000	
Loan balance						−62,808	
Total cash flow	−30,000	3,524	3,524	3,524	3,524	30,716	
IRR	10.22%						

Optimistic

Year	0	1	2	3	4	5	6
Purchase	−100,000						
Loan	70,000						
NOI		9,000	9,270	9,548	9,835	10,130	10,433
Payment		−5,476	−5,476	−5,476	−5,476	−5,476	
Resale						104,335	
Loan balance						−62,808	
Total cash flow	−30,000	3,524	3,794	4,072	4,359	46,181	
IRR	18.59%						

EXHIBIT 13–24
Expected Return and Standard Deviation of Leveraged Returns

Scenario	Return (or *R*)	Probability (*P*)	(Return × Probability)	*R* − Expected *R*	*P* × (*R* − Expected *R*)²
Pessimistic	−0.45%	30%	−0.13%	−7.43%	0.1654%
Most Likely	10.22%	50%	5.11%	3.24%	0.0526%
Optimistic	18.59%	20%	3.72%	11.62%	0.2699%
		Expected return	8.69%		
		Variance	0.49%		
		Standard deviation	6.99%		

also applies when using expected returns. That is, *if the expected unleveraged return exceeds the cost of debt, then the expected leveraged return will be positive.*

Also note that in Exhibit 13–24 the standard deviation for the leveraged returns (6.99 percent) is much higher than the standard deviation for the unleveraged returns (2.06 percent). This is because the variability of returns increases with the use of leverage. The return for the pessimistic scenario is more negative, and the return for the optimistic scenario is more positive.

It is also important to note that the risk and standard deviation of the leveraged returns will be higher than for the unleveraged returns regardless of whether the leverage is positive or negative. That is, even if the leverage is negative based on expected returns, the standard deviation of the leveraged returns will still be higher than the standard deviation of the unleveraged returns.

A "Real Options" Approach to Investment Decisions

Earlier in this chapter we saw how to calculate the "expected value" or "expected return" on investments by taking into consideration the probabilities associated with different outcomes. This captures the uncertainty of future events when making investment decisions. This approach is often used to evaluate the expected return on an investment when we must decide whether to purchase the property at a specific price *today* where there is uncertainty as to what the performance of the investment will be in the future.

There are often situations, however, where we do not have to fully commit to invest all our capital at one point in time. For example, on a development project we could purchase the land today but wait for a while before deciding whether or not to begin construction of a building. The market may not be such that starting construction immediately is feasible, but the developer may think that there is a good chance that the market will improve over the next year or so such that development will be feasible. On the other hand, the market may not improve and the building should not be constructed. The developer may want to go ahead and purchase the land, however, so that he has the land tied up to be able to construct the building if the market does improve. The land might be available for sale today and the developer may be concerned that another developer will purchase the land if he doesn't.

In situations like this, the developer who purchases the land, but can wait to decide whether to start construction, is said to have a **real option** on the land. The option is to develop the building in the future. The developer does not have to decide to construct the building. The land can remain vacant (perhaps it is leased to a farmer so that it generates some income). Thus, the developer has an option either to construct or not to construct a building depending on economic conditions in the future.

It is important to note that we are *not* talking about the developer getting an option from the seller of the land to purchase the land after some point in time. This is also often done as a way of dealing with uncertainty as to whether the property should actually be developed or not—especially when the developer may need to get zoning changed or development approvals which he may not be certain of getting. This strategy involves the use of options by the developer to deal with risk. But what is important to realize is that purchasing the land outright without the use of an option from the seller still gives the developer an option to either develop or not develop the land. It is this option that is referred to as a real option.

The reason that it is important to recognize the existence of an option when land is purchased is because this affects the way we should analyze what we would be willing to pay for the land. To illustrate, we will use an example where we first ignore the option aspect of owning the land, and then we will return to the importance of considering the option.

Consider the following assumptions:

- The developer plans to start construction of a building in one year if at that point rent levels make construction feasible.
- The building will cost $800,000 to construct.

- During the first year after construction would take place, there is a 50 percent chance that *NOI* will be \$130,000 and a 50 percent chance that the *NOI* will be \$70,000.
- In either case, *NOI* would be expected to increase at 2 percent per year after the first year.

How much should the developer be willing to pay for the land if she wants a 12 percent return?

Traditional Approach to Land Valuation

Note that this looks very similar to the "highest and best use" analysis that was discussed in Chapter 9. In that chapter we found the land value by first calculating the value of the property based on its *NOI* and then subtracting the construction cost of the building to get the residual land value. This process was applied to several possible uses of the site in order to determine the highest and best use which maximized the land value.

But in Chapter 9 we assumed that the *NOI* for each potential use was either certain or that the *NOI* was really the "expected" *NOI*, even though we didn't explicitly consider probabilities for different *NOI* scenarios.

In this case the expected *NOI* is as follows:

$$\text{Expected } NOI = (.50 \times \$130{,}000) + (.50 \times \$70{,}000) = \$100{,}000$$

The capitalization rate would be 10 percent (12 percent discount rate less 2 percent growth rate for *NOI*). Thus, the value of the property after construction would be \$100,000/.10 = \$1,000,000. Subtracting the construction cost of \$800,000 results in a value at the beginning of the first year (after construction is complete) of \$200,000. Since construction will not begin for a year, we have to discount this back for one additional year at the 12 percent discount rate so that the value of the land today under this approach would be \$200,000/1.12 = \$178,571.

Assuming this use results in the highest land value and is the highest and best use of the site, we would expect the developer to pay \$178,571 for the land.

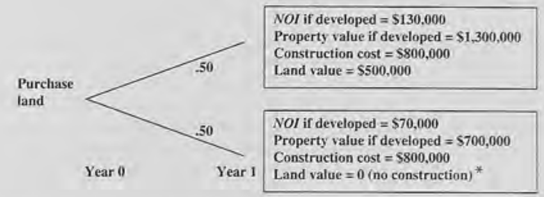
Real Option Approach to Land Valuation

What we failed to consider in the approach above is that the developer *does not have to decide today* whether the building will be constructed in a year. The developer can buy the land (so he has the land tied up) but wait until the end of the year to find out what the *NOI* is at that time before making a decision.

If at the end of the year the *NOI* is \$130,000, then the property would be worth \$130,000/.10 = \$1,300,000, which far exceeds the construction cost of \$800,000, making the land worth \$500,000. But if the *NOI* is \$70,000 after a year, the property would be worth only \$700,000, which is less than the construction cost of the building, so development would not be feasible. The land value would be zero assuming no interim use like farming.

Thus, the developer is really looking at the following situation. There is a 50 percent chance that the *NOI* will be \$130,000, that he will construct the building, and that the value of the property will be \$1,300,000. There is also a 50 percent chance the land will be worth nothing after a year. But the land will not have a negative value after a year! The developer will just decide to keep it vacant. In fact, he still has the option to construct something on it at some future point in time, but for simplicity we will assume that it is worth nothing. The scenarios are summarized in the following diagram:

Real Option



*Land value is the maximum of property value if developed − construction cost or zero.

Web App

Environmental risk is of great concern to real estate investors because of the significant costs that can be associated with mitigating this type of risk. Visit one of the sites recommended in the "Useful Web Sites" for this chapter, such as **www.environmental-center.com**, or use a search engine like Google (**www.Google.com**) and search for "environmental risk." Select a type of environmental risk and summarize the nature of the risk and why it is a concern for real estate investors.

Based on the above scenarios and probabilities related to the different possible land values after a year, the land value would be as follows after a year:

$$\text{Land value} = (.50 \times \$500{,}000) + (.50 \times \$0) = \$250{,}000$$

Discounting this back for one year to today at a 12 percent rate we have

$$\$250{,}000/1.12 = \$223{,}214$$

Note that this implies a higher land value than we arrived at with the traditional approach considered earlier where the land was \$178,571. The difference is \$223,214 − \$178,571 = \$44,643. This difference represents the value of the option to wait to decide whether to construct the building. It is the value of the real option inherent in the ownership of vacant land with an option to develop the land in the future.

Real Options Extensions and Strategy

The above example was simplified to illustrate the importance of thinking in terms of having options in real estate investments. In the above example the value of the land was higher when this was considered. The developer most likely to purchase the land, and in turn determine the highest and best use of the site, will be the one that recognizes the value of this option.

There are many other situations where implicit options exist in real estate investments. Some additional examples are as follows:

Excess land purchased with a site that is not needed for the initial use is an option for future development. For instance, a developer for a shopping center may purchase more land than needed for the shopping center (including parking). This land might be developed into additional retail developments in the future, or even apartments or office space.

A development project can have different phases to the development. For example, a site might allow for three different apartment or condominium buildings but only one will be constructed initially, and then the developer can wait to see how well they rent or sell before deciding to construct the additional buildings. Similarly, a land development project (discussed more in Chapter 17) can have different phases to the development so that roads, sewers, and so forth, are first put in only for one phase and then additional funds committed only if the lots in the first phase sell well enough.

Having the ability to renovate a building is also an option. The building does not have to be renovated. It can be used "as is." So the owner/investor can wait to see whether the market will support a renovation before committing the funds. Purchasing the building under its current condition (before renovation) is analogous to purchasing the land.

These are just a few examples of the way that real options can exist in real estate investments. Considering these options can significantly affect how investors view the value of investments with real options. Furthermore, an astute developer can often create options in the way that he or she creates a development strategy. Projects should be designed to give the developer options to decide whether to commit additional funds at future points in time (such as the phasing examples discussed above) to maximize the expected value of the project and mitigate the risk.

Conclusion

This chapter discussed the importance of considering risk when analyzing investments. Rates of return for alternative investments cannot be directly compared if the investments have different degrees of risk. We introduced several methods the investor can use to attempt to evaluate the riskiness of a real estate investment, including sensitivity analysis, scenarios, partitioning the return, and the use of probability distributions to compute the expected return and standard deviation of returns.

We were able to look more closely at the effect of leverage (introduced in the previous chapter) on risk by seeing how leverage affects the expected return and standard deviation of returns. We saw that the standard deviation increases with leverage regardless of whether it is positive or negative.

Two case studies (an industrial property and a shopping center) were introduced to illustrate risk analysis as well as provide insight into some of the unique aspects of modeling cash flows for these property types. Previous chapters introduced apartment and office building investments.

The use of renewal probabilities was discussed to illustrate how to deal with the uncertainty regarding whether a tenant will renew the lease at the end of the lease term. We saw how this affects tenant improvements, leasing commissions, and vacancy rates at lease renewal.

Finally, the concept of real options was introduced as a way of thinking about the value of real estate investments where the investor has options after the initial investment is made as to whether additional funds should be invested in the project. We saw that having the option to delay or abandon any additional investment can increase the value of the investment. This was illustrated with the use of vacant land, the purchase of which gives the owner an option to either develop a building on the land in the future or keep the land vacant.

Although this is the only chapter that formally deals with risk, the concepts and techniques introduced in this chapter should be kept in mind throughout the remainder of this book.

Key Terms

Useful Web Sites

www.ecologeris.com—Site has a searchable environmental risk database for Canada.

www.eiainc.org—An environmental risk insurance company. Provides good information on types of environmental risk.

www.environmental-center.com—Site has good information on different types of environmental risk and brownfields developments. Includes links to articles and news.

Questions

1. What is meant by partitioning the internal rate of return? Why is this procedure meaningful?
2. What is a risk premium? Why does such a premium exist between interest rates on mortgages and rates of return earned on equity invested in real estate?
3. What are some of the types of risk that should be considered when analyzing real estate?
4. What is the difference between business risk and financial risk?
5. Why is the variance (or standard deviation) used as a measure of risk? What are the advantages and disadvantages of this risk measure?
6. What is meant by a "real option"?
7. What is meant by the term *overage* for retail space?
8. How does the use of scenarios differ from sensitivity analysis?

Problems

1. Two investments have the following pattern of expected returns:

	Investment A				
Year	1	2	3	4	4 (sale)
BTCF	$5,000	$10,000	$12,000	$15,000	$120,000

	Investment B				
Year	1	2	3	4	4 (sale)
BTCF	$2,000	$4,000	$1,000	$5,000	$180,000

Investment A requires an outlay of $110,000 and Investment B requires an outlay of $120,000.

a. What is the *BTIRR* on each investment?

b. If the *BTIRR* were partitioned based on $BTCF_o$ and $BTCF_s$, what proportions of the *BTIRR* would be represented by each?

c. What do these proportions mean?

2. Mike Riskless is considering two projects. He has estimated the *IRR* for each under three possible scenarios and assigned probabilities of occurrence to each scenario.

State of Economy	Probability	Estimated *BTIRR* Investment I	Estimated *BTIRR* Investment II
Optimistic	0.20	0.15	0.20
Most likely	0.60	0.10	0.15
Pessimistic	0.20	0.05	0.05
	1.00		

Riskless is aware that the pattern of returns for Investment II looks very attractive relative to Investment I; however, he believes that Investment II could be more risky than Investment I. He would like to know how he can compare the two investments considering both the risk and return on each. What do you suggest?

3. An investor has projected three possible scenarios for a project as follows:

   Pessimistic—NOI will be \$200,000 the first year, and then decrease 2 percent per year over a five-year holding period. The property will sell for \$1.8 million after five years.

   Most likely—NOI will be level at \$200,000 per year for the next five years (level *NOI*) and the property will sell for \$2 million.

   Optimistic—NOI will be \$200,000 the first year and increase 3 percent per year over a five-year holding period. The property will then sell for \$2.2 million.

   The asking price for the property is \$2 million. The investor thinks there is about a 30 percent probability for the pessimistic scenario, a 40 percent probability for the most likely scenario, and a 30 percent probability for the optimistic scenario.

   a. Compute the *IRR* for each scenario.

   b. Compute the expected *IRR*.

   c. Compute the variance and standard deviation of the *IRRs*.

   d. Would this project be better than one with a 12 percent expected return and a standard deviation of 4 percent?

4. Use the same information as in problem 3. Now assume a loan for \$1.5 million is obtained at a 10 percent interest rate and a 15-year term.

   a. Calculate the expected *IRR* on equity and the standard deviation of the return on equity.

   b. Contrast the results from (*a*) with those from problem 3. Has the loan increased the risk? Explain.

5. A developer plans to start construction of a building in one year if at that point rent levels make construction feasible. At that time the building will cost \$1,000,000 to construct. During the first year after construction would take place, there is a 60 percent chance that *NOI* will be \$150,000 and a 40 percent chance that the *NOI* will be \$75,000. In either case, *NOI* would be expected to increase at 2 percent per year after the first year. How much should the developer be willing to pay for the land if he wants a 12 percent rate of return?

6. **ARGUS Problem.** Refer to the Worthington Distribution Center example in the chapter. Suppose that the renewal probability for the market leasing assumption that applies to the computer distributing company is only 50 percent and there would be 12 months vacant if they do not renew. How does this affect the property value?

7. **ARGUS Problem.** Refer to the Westgate Shopping Center example. Use ARGUS to replicate the assumptions for the "pessimistic scenario" discussed in the chapter. What inputs did you have to change in order to get the same answer (rounded) as the book?

Chapter 14

Disposition and Renovation of Income Properties

In the preceding chapters dealing with income properties, we have given much attention to measuring returns on investment in real estate and the extent to which financial leverage, federal income taxes, and other factors affect that return. Returns were always calculated based on a projected holding period for the property. In this chapter we take a closer look at the factors that would affect an investor's decision to choose a particular holding period. We also consider alternatives to disposition, such as renovating and refinancing the property.

Disposition Decisions

An investor purchases a real estate investment based on the benefits expected to be received over an *anticipated* holding period. That is, the investor computes the various measures of investment performance based on expectations at the time the property is purchased. After the property is purchased, however, many things can change that affect the actual performance of the property. These same factors may affect the investor's decision as to whether the property continues to meet investment objectives. For example, market rents may not be increasing as fast as expected, thus reducing the investor's cash flow. Tax laws also may have changed. As we saw in Chapter 11, tax laws are frequently revised, which can affect potential new investors in a property differently than existing investors. Hence, investors should periodically evaluate whether it is time for **disposition**, that is, sale of the property.

Even if the investor's projections for a property are accurate, other factors may influence the investor to sell after a specified number of years. One important factor is the potential benefits associated with leverage that we have discussed in several previous chapters. Assuming that the mortgage on the property has positive amortization, the outstanding mortgage balance decreases each year and the investor's equity position increases. Although this **equity buildup** may appear desirable in the sense that the investor will get more cash from the property when it is sold, it also means that each year the investor has more funds tied up in the property. Any increase in the value of the property over time, whether anticipated or not, also contributes to an increase in the investor's equity buildup.

Equity buildup represents funds that the investor could place in another investment if the current property were sold. This is the *opportunity cost* of *not* selling the property. The proceeds that the investor could have received if the property were sold can be thought of as the amount of equity investment made to *keep* the property for an additional period of time. But unless the property is refinanced, a greater portion of equity capital remains invested in relation to the cash flow being received from continuing to operate the property. Further, while the total mortgage payment (debt service) remains the same, the interest portion of the payment decreases each year, resulting in lower tax deductions. Hence, the investor is also losing the benefits of financial leverage each year.

A Decision Rule for Property Disposition

Next we discuss the factors that investors should consider to determine whether to sell a property or retain ownership. This discussion is based on incremental, or marginal, return criteria that investors should utilize when faced with such decisions.

To illustrate the criteria that should be applied when making a decision to keep a property or to sell it, we assume that an investor acquired a very small retail property five years ago at a cost of $200,000. The Apex Center was 15 years old at the time of purchase and was financed with a 75 percent mortgage made at 11 percent interest for 25 years. The investor uses straight-line depreciation with 80 percent of the original cost ($160,000) allocated to the building and 20 percent allocated to land. We assume that when originally purchased the property could be depreciated on a straight-line basis over depreciable life of 19 years and that the investor has had a marginal tax rate of 50 percent over the past five years.[1] Exhibit 14–1 shows operating results during the *past* five years of operation.

If Apex were sold *today,* it is estimated that the property could be sold for $250,000. Selling costs equal to 6 percent of the sale price would have to be paid. Exhibit 14–2 shows

EXHIBIT 14–1 Past Operating Results, Apex Center

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	Year 1	2	3	4	5
A. Before-tax cash flow:					
Rents	$ 39,000	$ 40,560	$ 42,182	$ 43,870	$45,624
Less operating expenses	19,500	20,280	21,091	21,935	22,812
Net operating income (*NOI*)	19,500	20,280	21,091	21,935	22,812
Less debt service (*DS*)	17,642	17,642	17,642	17,642	17,642
Before-tax cash flow	$ 1,858	$ 2,638	$ 3,449	$ 4,293	$ 5,170
B. Taxable income or loss:					
Net operating income (*NOI*)	$ 19,500	$ 20,280	$ 21,091	$ 21,935	$22,812
Less interest	16,441	16,302	16,146	15,973	15,780
Depreciation	8,421	8,421	8,421	8,421	8,421
Taxable income (loss)	−5,362	−4,443	−3,476	−2,460	−1,389
Tax	$−2,681	$−2,221	$−1,738	$−1,230	$ −695
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	$ 1,858	$ 2,638	$ 3,449	$ 4,293	$5,170
Less tax	−2,681	−2,221	−1,738	−1,230	−695
After-tax cash flow (*ATCF*)	$ 4,539	$ 4,859	$ 5,187	$ 5,523	$ 5,865

[1] Tax laws change frequently. The purpose of this example is to illustrate how changes in the tax law and other factors affect disposition decisions. The intent is not to replicate a particular tax regime. See Chapter 11 for a summary of the tax law at the time of this revision.

EXHIBIT 14–2 Estimates of Cash Flows from Sale Today

Sale price			$250,000
Less sale costs (at 6%)			15,000
Less mortgage balance			142,432
Before-tax cash flow (*BTCF*)			$ 92,568
Taxes in year of sale:			
Sale price		$250,000	
Less selling expenses		15,000	
Original cost basis	$200,000		
Less accumulated depreciation	42,105		
Adjusted basis		157,895	
Capital gains tax at 28%		77,105	
Tax from sale			21,589
After-tax cash flow from sale (*ATCFs*)			$ 70,979

EXHIBIT 14–3 Cash Flow Summary Assuming Sale Today

	End of Year 0	1	2	3	4	5
Before-tax cash flow	$−50,000	$1,858	$2,638	$3,449	$4,293	$97,738
After-tax cash flow	−50,000	4,539	4,859	5,187	5,523	76,843

Before-tax *IRR* = 18.26%
After-tax *IRR* = 14.83%

the cash flows from sale of the property (if sold today). We assume that the capital gain from sale of the property is taxed at a maximum rate of 28 percent, the rate that the investor would have to pay if the property were sold today (a function of the tax law in effect at the time of sale). This rate could be different than what the investor expected when the property was originally purchased due to changes in the tax law.

Using the information in Exhibit 14–2, we can calculate the rate of return that the investor would have realized for the past five years if the property were sold. Exhibit 14–3 shows the cash flow summary.

We see that if the property were sold today, the investor would earn an ex post (historical) before-tax return (*BTIRR*) of 18.26 percent and an after-tax return (*ATIRR*) of 14.83 percent. But do these figures really help us decide whether to sell the property? For example, suppose that the investor had expected an after-tax return of 16 percent and now finds that sale of the property produces a return of only 14.83 percent. Does that mean the property should be sold? We really cannot say. All we can say is that the property did not perform as well as originally expected. It may be a good investment in the future.

If the historic return calculated above is also an indication of *future* performance, then it will likely be reflected in the price that the property can be sold for today. The current sale price of the property depends on expected *future* performance for a typical buyer. However, future performance does not necessarily have any relationship to historic returns.

IRR for Holding versus Sale of the Property

If we are to determine whether the investor should keep the property, we must evaluate the *expected future performance* of the property. The essential question facing the investor at this time is whether Apex should be sold and funds from the sale invested in another

EXHIBIT 14–4 Estimated Future Operating Results: Apex Center (if not sold)

excel
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	Year (since purchase)				
	6	7	8	9	10
A. Before-tax cash flow:					
Rent	$47,450	$48,872	$50,340	$51,850	$53,404
Less expenses	23,725	24,436	25,170	25,925	26,702
Net operating income (*NOI*)	23,725	24,436	25,170	25,925	26,702
Less debt service	17,642	17,642	17,642	17,642	17,642
Before-tax cash flow (*BTCF*)	$ 6,083	$ 6,794	$ 7,528	$ 8,283	$ 9,060
B. Taxable income or loss:					
Net operating income (*NOI*)	$23,725	$24,436	$25,170	$25,925	$26,702
Less interest	15,565	15,325	15,056	14,757	14,423
Depreciation	8,421	8,421	8,421	8,421	8,421
Taxable income (loss)	−261	691	1,692	2,746	3,858
Tax	$ −73	$ 193	$ 474	$ 769	$ 1,080
C. After-tax cash flow:					
Before-tax cash flow (*BTCF*)	6,083	6,794	7,528	8,283	9,060
Less tax	−73	193	474	769	1,080
After-tax cash flow (*ATCF*)	$ 6,156	$ 6,601	$ 7,054	$ 7,514	$ 7,980

property. Assuming that the investor believes that a reliable forecast for Apex can be made for the *next* five years, Exhibit 14–4 presents estimates of *ATCF* for years 6 to 10. The investor believes that rents and expenses will *not* continue to grow at the same 4 percent per year rate as for the past five years and projects them to increase at a 3 percent rate for the next five years. Note in the exhibit that depreciation charges remain at $8,421 per year based on *original cost* and the *original depreciation method.* Although our example will assume that a new buyer will be subject to a different depreciation rule, investors who already own a property prior to a tax law change are not usually required to change their method of depreciation. However, the investor's tax rate is now assumed to be 28 percent under the assumption that the investor's tax rate over the next five years is based on the current tax law. Also note that mortgage payments and interest charges are still based on original financing.

If the forecast period is considered to be 5 years (10 years from the date of purchase), the investor must also compute $ATCF_s$. Using a 3 percent per year rate of price appreciation, the owner estimates that Apex should increase in value to $289,819 by then. Exhibit 14–5 computes an estimate of what $ATCF_s$ will be. Note that the mortgage balance and adjusted basis are based on a total period of 10 years, the time from the date of acquisition.

To fully analyze whether a property should be sold also requires investigation into (1) the alternative investments available in which cash realized from a sale may be reinvested and (2) the tax consequences of selling one property and acquiring another. Clearly, if the investor sells Apex and makes an alternative investment, that investment will have to provide a high enough return to make up for the return given up. The question is how much of an *ATIRR* must the alternative investment provide if Apex is sold?

If Apex is sold to acquire another property, the investor must pay capital gains taxes and selling expenses (if any) before funds are available for reinvestment. Hence, when considering the sale of one property and the acquisition of another, the first task is to ascertain how

EXHIBIT 14–5 Calculation of After-Tax Cash Flow from Sale after Five Additional Years

Sales price			$289,819
Mortgage balance			129,348
Selling expenses at 6 percent			17,389
Before-tax cash flow			$143,081
Taxes in year of sale:			
Sales price		$289,819	
Selling expenses		17,389	
Original cost basis	$200,000		
Less: Accumulated depreciation	84,211		
Adjusted basis		115,789	
Total taxable gain		$156,640	
Capital gains tax at 28%			43,859
After-tax cash flow from sale ($ATCF_s$)			$ 99,222

much cash would be available for reinvestment. The estimated sale price for the Apex Center at this time is $250,000. However, the investor must consider how much cash will be available for reinvestment after payment of the mortgage balance, taxes, and selling expenses. We find that figure by computing *ATCF* as if the property were being sold *immediately*, as we did before. We saw in Exhibit 14–2 that if the property were sold today the investor would net $70,978 after repayment of the mortgage and payment of capital gains taxes. Thus, $70,978 would be available for reinvestment should the investor decide to *sell* Apex at this time. Note that capital gains tax rates are expected to remain at 28 percent for the next five years. Sale calculations should always be based on the tax laws that are expected to be in effect when the property is sold. In our case, for example, even though the property was *purchased* at a time when a 60 percent capital gains exclusion was available, because the property is being sold under the new tax law, the capital gains exclusion is no longer available. However, the maximum marginal tax has declined from 50 percent to 28 percent.

The owner must now consider whether or not the $70,978 can be reinvested at a greater rate of return (*ATIRR*) than the return that would be earned *if Apex were not sold.* In other words, we want to know what the *minimum ATIRR* would have to be on an alternative investment (equivalent in risk to Apex) to make the investor indifferent between continuing to own Apex and purchasing the alternative property.

The answer is relatively straightforward. We know that the cash available to reinvest is $70,978 if Apex is sold. Also, we know that if Apex is sold, the investor gives up *ATCF* for the next five years (Exhibit 14–2) and the $ATCF_s$ of $99,222 at the end of the five years. Hence the $70,978 must generate a high enough *ATIRR* to offset the cash flows that would be lost by selling Apex. The cash flow summary and return calculation is as follows:

	Cash Flow Summary Year					
	5	6	7	8	9	10
After-tax cash flow	$−70,978	$6,156	$6,601	$7,054	$7,514	$107,202
Internal rate of return = 15.60%						

Therefore, the investor would have to earn an *ATIRR* greater than 15.60 percent on the funds obtained from the sale of the Apex Center. These funds must be used to purchase some alternative investment, *equal in risk,* to justify selling Apex. In this case, if an alternative investment is equal in risk to Apex and the investor estimates that the $ATIRR_e$ from that alternative would *exceed* 15.60 percent, then the sale of Apex and the acquisition of the alternative would be justified. If the $ATIRR_e$ on the alternative is expected to be less than 15.6 percent, then Apex should be retained.

Return to a New Investor

To examine how incentives for the current investor to hold the property can differ from the incentives for a new investor to invest in the same property, even if both have the same expectations for future rents and expenses, we will assume a new investor purchases the property at the current value. Recall that Apex is currently worth $250,000 and was financed 5 years ago with a $150,000 loan that is being amortized over 25 years with monthly payments at an 11 percent interest rate. To eliminate the effect of financing (leverage) on our comparison with the present owner, we assume that the new investor takes over the existing loan and does not obtain any additional financing. Thus, the only difference for a new investor will be the effect of tax law. First, the new investor will have a new adjusted basis in the property. Assuming that the building is still 80 percent of the total value in year 5, the new investor will be able to depreciate 80 percent of $250,000, or $200,000, compared to depreciation for the present owner based on the original basis of $160,000. Second, a new investor must depreciate the property based on the tax law in effect at the time of purchase. We assume that the new investor would have to depreciate the property over a 31.5-year depreciable life, a much longer period than the 19-year schedule that would still apply to the present owner. In summary, the new investor gets an increased depreciable basis but must use a longer depreciable life. Note, however, that although this example assumes the buyer would have a longer depreciable life than the existing investor, the reverse could also be true. Again, as noted in Chapter 11, depreciable lives for real estate have been shortened and lengthened frequently over time depending on the whims of Congress.

Exhibit 14–6 shows the projected cash flows and $ATIRR_e$. We see that a new investor would earn an $ATIRR_e$ of 9.1 percent. Although this may be a competitive return for a new investor, given opportunity cost, it is less than the current investor can earn (15.6 percent) by keeping the property, primarily because the existing investor can continue to use a depreciation schedule based on the old tax law. Thus, we see that tax law changes affect the relative benefits of existing versus new investors in the same property. If the tax law becomes *less* favorable, as it did in 1986, it tends to favor existing investors. If the tax law becomes *more* favorable, as it did in 1981 when *ACRS* was passed and depreciable lives were shortened considerably, then new investors tend to be favored. Thus, tax law changes tend to affect the turnover, or sale, of real estate. It is important that you understand these concepts since tax laws are always subject to change, and these changes affect the relative risk and return opportunities for new and existing investors.

Marginal Rate of Return

The return for selling versus holding the property calculated earlier (15.6 percent, using cash flows from Exhibits 14–4 and 14–5) is an $ATIRR_e$ based on holding the property for *five additional years.* We chose this period of time based on the assumption that if the property were sold, the funds would be placed in a similar investment, which would also be evaluated on the basis of a holding period of five additional years. A slightly different approach is to consider the return that would result from holding the property only *one* additional year. This return would be calculated the same way as above, but would project only one additional year of operating cash flow, and the $ATCF_s$ from sale after one year. We refer to this one-year $ATIRR_e$ as the **marginal rate of return.** For example, in the year that we are considering the sale of the property, we can ask, "What will the marginal return be if the property is held one more year?" Then (assuming the property has not been sold) at the end of that additional year we ask, "What is the marginal return for holding one more year?" This process can be continued until the property is actually sold (or renovated).

To illustrate calculation of the marginal return, we assume that *NOI* will actually increase 3 percent per year (the same rate used for our projections) over the next 10 years. We assume that the resale price will also actually increase 3 percent per year. Exhibit 14–7 shows the projected after-tax cash flows from operating the property over the next 10 years ($ATCF$). For each of the 10 years (years 6 through 15), the exhibit also shows the projected after-tax cash flow ($ATCF_s$) that would result *if* the property were sold at the end of that year.

EXHIBIT 14–6
Projections for a New Investor

Calculation of After-Tax Cash Flow from Operations

	Year 6	7	8	9	10
Rent	$47,449	$48,873	$50,339	$51,849	$53,405
Less expenses	23,725	24,436	25,170	25,925	26,702
Net operating income	23,725	24,436	25,170	25,925	26,702
Less debt service	17,642	17,642	17,642	17,642	17,642
Before-tax cash flow	$ 6,083	$ 6,794	$ 7,528	$ 8,283	$ 9,060
Net operating income	$23,725	$24,436	$25,170	$25,925	$26,702
Less interest	15,565	15,325	15,065	14,757	14,423
Depreciation	6,349	6,349	6,349	6,349	6,349
Taxable income	1,811	2,763	3,764	4,818	5,930
Tax	$ 507	$ 774	$ 1,054	$ 1,349	$ 1,660
Before-tax cash flow	$ 6,083	$ 6,794	$ 7,528	$ 8,283	$ 9,060
Tax	507	774	1,054	1,349	1,660
After-tax cash flow	$ 5,576	$ 6,021	$ 6,474	$ 6,934	$ 7,400

Calculation of After-Tax Cash Flow from Sale after 5 Years

Sale price			$289,819
Less mortgage balance			129,348
Less selling expenses at 6%			17,389
Before-tax cash flow ($BTCF_s$)			$143,081
Taxes in year of sale			
Sale price		$289,819	
Less selling expenses		17,389	
Original cost basis	$250,000		
Less accumulated depreciation	31,746		
Adjusted basis		218,254	
Total taxable gain		$ 54,176	
Capital gains tax at 28%			15,169
After-tax cash flow from sale ($ATCF_s$)			$127,912

Cash Flow Year Summary

	5	6	7	8	9	10
ATCF	$−107,568	$5,576	$6,021	$6,474	$6,934	$135,312

Internal rate of return ($ATIRR_e$) = 9.10%

EXHIBIT 14–7 Projections of $ATCF_o$ and $ATCF_s$ for 10 Additional Years

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	Calculation of After-Tax Cash Flow from Operations Year (after purchase)									
	6	7	8	9	10	11	12	13	14	15
Rent	$ 47,450	$ 48,872	$ 50,340	$ 51,850	$ 53,404	$ 55,006	$ 56,658	$ 58,356	$ 60,108	$ 61,910
Less expenses	23,725	24,436	25,170	25,925	26,702	27,503	28,329	29,178	30,054	30,955
NOI	23,725	24,436	25,170	25,925	26,702	27,503	28,329	29,178	30,054	30,955
Debt service	17,642	17,642	17,642	17,642	17,642	17,642	17,642	17,642	17,642	17,642
BTCF	$ 6,083	$ 6,794	$ 7,528	$ 8,283	$ 9,060	$ 9,861	$ 10,687	$ 11,536	$ 12,412	$ 13,313
NOI	$ 23,725	$ 24,436	$ 25,170	$ 25,925	$ 26,702	$ 27,503	$ 28,329	$ 29,178	$ 30,054	$ 30,955
Less interest	15,565	15,325	15,056	14,757	14,423	14,051	13,635	13,172	12,654	12,077
Depreciation	8,421	8,421	8,421	8,421	8,421	8,421	8,421	8,421	8,421	8,421
Taxable income	−261	691	1,692	2,746	3,858	5,032	6,272	7,586	8,978	10,457
Tax	$ −73	$ 193	$ 474	$769	$ 1,080	$ 1,409	$ 1,756	$ 2,124	$ 2,514	$ 2,928
BTCF	$ 6,083	$ 6,794	$ 7,528	$ 8,283	$ 9,060	$ 9,861	$ 10,687	$ 11,536	$ 12,412	$ 13,313
Tax	−73	193	474	769	1,080	1,409	1,756	2,124	2,514	2,928
ATCF	$ 6,156	$ 6,601	$ 7,054	$ 7,514	$ 7,980	$ 8,453	$ 8,930	$ 9,412	$ 9,898	$ 10,385
	Calculation of After-Tax Cash Flow from Sale									
Sale price	$257,500	$265,225	$273,182	$281,377	$289,819	$298,513	$307,468	$316,693	$326,193	$335,979
Mortgage balance	140,355	138,037	135,452	132,567	129,348	125,757	121,750	117,280	112,292	106,727
Selling expenses	15,450	15,914	16,391	16,883	17,389	17,911	18,448	19,002	19,572	20,159
BTCF	$101,695	$111,274	$121,339	$131,928	$143,081	$154,845	$167,270	$180,411	$194,330	$209,093
Original cost basis	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
Accumulated depreciation	50,526	58,947	67,368	75,789	84,211	92,632	101,053	109,474	117,895	126,316
Adjusted basis	$149,474	$141,053	$132,632	$124,211	$115,789	$107,368	$ 98,947	$ 90,526	$ 82,105	$ 73,684
Sale price	$257,500	$265,225	$273,182	$281,377	$289,819	$298,513	$307,468	$316,693	$326,193	$335,979
Selling expenses	15,450	15,914	16,391	16,883	17,389	17,911	18,448	19,002	19,572	20,159
Adjusted basis	149,474	141,053	132,632	124,211	115,789	107,368	98,947	90,526	82,105	73,684
Total taxable gain	$92,576	$108,259	$124,159	$140,284	$156,640	$173,234	$190,073	$207,165	$224,516	$242,136
BTCF	$101,695	$111,274	$121,339	$131,928	$143,081	$154,845	$167,270	$180,411	$194,330	$209,093
Capital gains tax	25,921	30,312	34,765	39,280	43,859	48,505	53,220	58,006	62,865	67,798
ATCF	$ 75,774	$ 80,962	$ 86,575	$ 92,648	$ 99,222	$106,340	$114,050	$122,405	$131,465	$141,295

We can use the information in Exhibit 14–7 to calculate the marginal rate of return for each of the next 10 years. Each year the marginal rate of return is based on the benefit of receiving $ATCF_o$ for one additional year and $ATCF_s$ at the end of the additional year. The cost of receiving this cash flow is $ATCF_s$ for the current year. Since only one year is involved, the return calculation is simply as follows:

$$MRR = \frac{ATCF_s\,(\text{year } t+1) + ATCF_o\,(\text{year } t+1) - ATCF_s\,(\text{year } t)}{ATCF_s\,(\text{year } t)}$$

Exhibit 14–8 shows what the *MRR* (marginal rate of return) is for years 6 through 15, and Exhibit 14–9 plots those *MRR*s. We see that the *MRR* rises until year 10 and then begins to fall. Increasing rents and increases in the value of the property tend to increase the *MRR*. Equity buildup from the price appreciation and loan repayment, however, tends to lower the *MRR*. Also, because the depreciation deduction is fixed but rents are rising, the relative amount of tax benefits from depreciation decreases each year. After year 10 the effect of equity buildup dominates. How long should the property be held? The answer is that *the property should be sold when the marginal rate of return falls below the rate at which funds can be reinvested.* For example, suppose the investor believes that funds can be reinvested in a different property (with the same risk) at a rate of 15.5 percent. This means that the property should be sold in the 14th year, because the *MRR* falls below 15.5 percent after year 14.

EXHIBIT 14–8
Marginal Rate of Return for the Next 10 Years

Year	Marginal Rate of Return (%)
6	15.43%
7	15.56
8	15.65
9	15.69
10	15.71
11	15.69
12	15.65
13	15.58
14	15.49
15	15.38

EXHIBIT 14–9
Holding Period Analysis

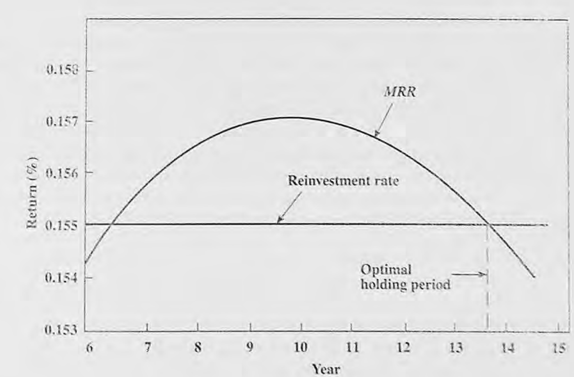
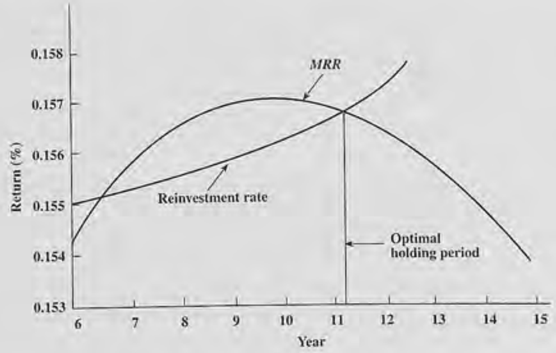


EXHIBIT 14–10
Holding Period Analysis



The above analysis assumes that the **reinvestment rate** would be constant throughout the next 10 years. It is not necessary to make this assumption. For example, the reinvestment rate may be expected to rise through time due to an increase in the general level of interest rates and yields on alternative investments. This increase could obviously change the optimal holding period, as illustrated in Exhibit 14–10. Because of the rising reinvestment rate, the **optimal holding period** would be about 11 years.

Refinancing as an Alternative to Disposition

As we have discussed, after an investor has owned a property for a number of years, equity may build up as a result of an increase in the property value and amortization of the loan. Thus, the loan balance relative to the *current* value of the property will be lower than when the property was originally purchased. In this situation the investor has less financial leverage than when the property was originally financed and may consider *refinancing* the property. Refinancing would allow the investor to increase financial leverage. Because refinancing at a higher loan-to-current-value ratio may provide additional funds to invest, it is, to some extent, an alternative to sale of the property.

If the investor's equity has increased due to an increase in the value of the property and amortization of the existing loan, then the investor should be able to obtain a new loan based on some percentage of the *current* property value. The current property value would normally be based on an appraisal of the property. Of course, points, appraisal fees, and other expenses may be incurred to obtain the new loan. However, no taxes have to be paid on funds received by additional borrowing, whereas taxes would have to be paid if the property is sold.

How should an investor decide whether it is profitable to refinance? To answer this question, we must first determine the cost of the additional funds obtained from refinancing. This is the topic of the next section.

Incremental Cost of Refinancing

In Chapter 6 we discussed the importance of considering the incremental borrowing cost when the borrower is faced with a choice between two different amounts of debt. Recall that when the interest rate is higher on the larger loan amount, the incremental cost of the additional funds borrowed is even higher than the rate on the larger loan because the higher rate has to be paid on all the funds borrowed, not just the additional funds.

The same concept applies to the analysis of refinancing. By refinancing we obtain additional funds. If the interest rate on the new loan is higher than that on the existing loan, the incremental cost of the additional funds will be even higher than the rate on the new loan. To illustrate, we return to the Apex Center example introduced at the beginning of this chapter. Now assume that Apex Center could be refinanced with a loan that is 75 percent of the current value of the property. Thus, the loan would be for 75 percent of $250,000 or $187,500. Suppose the rate on this loan would be 12 percent with a 25-year term. We can calculate the incremental cost of refinancing as follows:

	Current Balance	Monthly Payment	Balance after Five Years
New loan	$187,500	$1,975	$179,350
Existing loan	142,432	1,470	129,348
Difference	$ 45,068	$ 505	$ 50,002

$45,068 = $505 × (*MPVIFA*, ?%, 5 years) + $50,002 × (*MPVIF*, ?%, 5 years)

The difference between the new loan amount of $187,500 and the existing loan balance of $142,432 represents the additional funds obtained by refinancing, $45,068. The incremental cost of these funds depends on the additional payment made after refinancing ($505) and the additional loan balance after five years ($50,002). Solving for the interest rate we obtain 14.93 percent. We refer to this as the *incremental cost of financing*. To justify refinancing, the investor must be able to reinvest the proceeds from refinancing Apex Center in another project earning more than 14.93 percent. Otherwise, favorable financing leverage would not result from use of the funds obtained by refinancing Apex Center.

Refinancing at a Lower Interest Rate

The previous example assumed that the investor had to pay a higher interest rate when refinancing. The methodology would be the same if a lower rate could be obtained on the new loan. In this case the savings associated with the lower interest rate would be reflected in a lower incremental cost of the additional funds obtained from refinancing. To illustrate, suppose the rate on the loan used for refinancing Apex Center was at a 10.5 percent rate for 25 years. The incremental cost of refinancing would be as follows:

	Current Balance	Monthly Payment	Balance after Five Years
New loan	$187,500	$1,770	$177,321
Existing loan	142,432	1,470	129,348
Difference	$ 45,068	$ 300	$ 47,973

$45,068 = $300 × (*MPVIFA*, ?%, 5 years) + $47,973 × (*MPVIF*, ?%, 5 years)

The incremental cost of refinancing in this case is 9.01 percent. Thus, the investor would achieve favorable financial leverage by investing the funds obtained from refinancing Apex Center in a project earning more than 9.01 percent.

Diversification Benefits

As we have pointed out, additional funds can often be obtained by refinancing a property because the property has increased in value since it was initially purchased and the loan balance has been reduced through amortization. The additional funds that are obtained from refinancing the property represent equity capital that can be reinvested in a second property. So refinancing enables the investor to increase the amount of property owned. Furthermore, the investor may be able to diversify investments further by owning more than two properties, especially if different property types could be acquired in different locations. For example, suppose an investor currently owns a property that has a value of $1 million and has an existing loan balance of $500,000. Equity in the project is therefore $500,000. By refinancing with a 75 percent loan, the investor has $250,000 to reinvest in a second project. Assuming the investor could also obtain a 75 percent loan on the second project, she could purchase a second project that has a property value of $1 million. Note that the investor has the same total amount of equity capital invested ($500,000), but it is now being used to acquire *two* projects with a total value of $2 million. The investor has also incurred additional total debt of $1 million. Again, as stressed above, for refinancing to be a profitable strategy, the effective cost of this debt must be less than the unlevered return on the projects being financed.

Other Disposition Considerations—Portfolio Balancing

Thus far, we have analyzed whether an individual property should be sold based on the return that the *individual* property would earn if held versus the return from investing the funds in another project. An investor with a *portfolio* of properties also should take into consideration how sale of a property affects the mix of properties in the portfolio in terms of factors such as the property type (retail, office, industrial, apartment, etc.) and location.

We will see in Chapter 22 that portfolios are often constructed in a way that creates diversification benefits that reduces the risk of the portfolio. Thus, the decision to sell a property can affect the risk of the remaining portfolio if it means that the portfolio will be less diversified after the sale. This is not captured by just looking at the incremental return from holding the property that we evaluated earlier in this chapter. Portfolio analysis will be considered in depth in Chapter 22 but for now it is important to realize that there may be strategic considerations that an investor who holds a portfolio of properties will also consider including the impact of a sale on the diversification of the portfolio. For example, if two properties are being considered for sale and both have about the same return if held, the property that contributes least to the diversification of the portfolio is a more likely candidate for sale. Similarly, the investor may be selling a property and replacing it with one that has about the same expected return as the one being sold but offers more diversification benefits so the risk of the portfolio is reduced by these transactions. For example, an investor may already have a portfolio that is overweighted with office properties relative to only a few retail properties. Hence, the investor may want to reduce exposure to office properties and increase exposure to retail properties to have a more balanced portfolio.

Although investing in different locations and property types may add diversification benefits, there are other factors that should be considered. For example, an investor would not want to invest in properties that are more difficult to manage because the investor lacks the expertise in that property type or the properties are not in a location that is efficient for the investor to manage. Even though the investor may hire a property manager to handle the day-to-day operations of the property, the investor needs to provide some oversight and make longer-term decisions such as whether to do renovation of the property that may require that the investor have an understanding of the property and its location rather than rely completely on the expertise of the property manager. Thus, there must be a balance between having a diversified portfolio and efficient management that is taken into consideration in acquisition and disposition decisions. An investor may decide that certain

properties in the portfolio may be more difficult to manage than others and not fit as well with the overall strategy for the portfolio and thus should be sold and perhaps replaced with properties that are better aligned with the investor's portfolio strategy.

Renovation as an Alternative to Disposition

Rather than selling one property to acquire another, the investor may consider the option of **renovation** of the property. For example, depending on economic trends in the local market and in the area where the property is located, the investor may consider improving a property by enlarging it or by making major capital improvements to upgrade quality and reduce operating costs. Alternatively, the investor may consider converting the improvement to accommodate a different economic use, such as converting a small multifamily residence to a small professional office building in an urban neighborhood (assuming zoning allows such a conversion).

The issue we address here is how to properly analyze such an option. To illustrate, we reconsider renovating the same property we analyzed in the first part of the chapter. Apex Center, which you recall is presently 20 years old, is owned by an investor who purchased it five years ago at a cost of $200,000. It was financed 5 years ago with a $150,000 loan at 11 percent interest for 25 years. We know that the property could be sold today for $250,000 if it is not renovated (Exhibit 14–2). We also know what the return would be if the property was held for five *additional* years and not renovated (Exhibits 14–4 and 14–5). We will now see how to evaluate the return associated with making an additional investment to renovate the property.

The owner is considering renovation that would cost $200,000. We initially assume that, because of the risk involved in the project, the bank will agree only to refinancing the present loan balance ($142,432) plus 75 percent of the $200,000 renovation cost, for a total loan of $292,432.[2] The new mortgage would carry an interest rate of 11 percent for 15 years.[3]

If the owner, who is in a 28 percent tax bracket, undertakes the modernization project and wants to conduct an after-tax analysis of the investment proposal, the *additional* equity that the owner will have to invest in the property must be determined. This will equal the renovation cost less the additional financing (including both the financing for the renovation plus any existing financing on the remainder of the property). In this case, the lender would only provide additional financing to cover 75 percent of the renovation cost. However, it is also common on renovation projects to get an appraisal of what the entire property will be worth after the renovation and to borrow a percent of that value. This approach may allow the investor to get some equity out of the property.

In this case, the renovation cost is $200,000, and the additional financing amounts to 75 percent of the renovation cost, or $150,000. Thus, the *additional* equity investment is $200,000 − $150,000 = $50,000. What does the investor get in return for investing an additional $50,000 in the property? In general, renovation can have many benefits, including increasing rents, lowering vacancy, lowering operating expenses, and increasing the future property value.

[2] The lender will often make a loan based on the present market value rather than on the existing loan balance, which was based on the market value at the time the loan was originally made, plus the cost of improvement. This is considered in the following section.

[3] Another alternative could be a second mortgage for $50,000. The procedure [illegible] still be applicable to the problem.

Given the estimated cost of modernization and refinancing, the critical elements facing the investor are the estimates of rents, expenses, property values, and expected period of ownership. Obviously the results of a planned renovation depend on such estimates, which require a careful market analysis and planning, as we have previously discussed. Assuming such a plan is carried out, the owner-investor's five-year projection for the modernized Apex Center is shown in Exhibit 14–11.

Looking at Exhibit 14–11, we should note that, based on the modernization plan, *NOI* in year 1 is estimated to increase from $23,725 without renovation (see Exhibit 14–4) to $45,000 with modernization. After the renovation, *NOI* is expected to increase at 4 percent per year instead of 3 percent. Debt service is based on the new $292,432 mortgage loan made at 11 percent for 15 years. The depreciation charge of $14,770 is computed by first calculating depreciation for the renovation expenditure, which increases the depreciable basis by $200,000. We assume the renovation depreciates over 31.5 years based on the tax law in effect at the time. Thus, the renovation results in depreciation of $200,000 ÷ 31.5 = $6,349 per year. The depreciation for the existing building (the original depreciable basis)

EXHIBIT 14–11 Projections for Apex Center after Renovation

Calculation of After-Tax Cash Flow from Operations	Year 6	7	8	9	10	11
Net operating income (*NOI*)	$45,000	$46,800	$48,672	$50,619	$52,644	$54,749*
Less debt service	39,885	39,885	39,885	39,885	39,885	
Before-tax cash flow	$ 5,115	$ 6,915	$ 8,787	$10,734	$12,758	
Net operating income	$45,000	$46,800	$48,672	$50,619	$52,644	
Less interest	31,766	30,827	29,779	28,609	27,304	
Depreciation	14,770	14,770	14,770	14,770	14,770	
Taxable income	−1,537	1,203	4,123	7,240	10,569	
Tax	$ −430	$ 337	$ 1,155	$ 2,027	$ 2,959	
Before-tax cash flow	$ 5,115	$ 6,915	$ 8,787	$10,734	$12,758	
Tax	−430	337	1,155	2,027	2,959	
After-tax cash flow	$ 5,545	$ 6,578	$ 7,632	$ 8,707	$ 9,749	

Calculation of After-Tax Cash Flow from Reversion			
Sale price			$547,494
Less selling costs at 6%			32,850
Less mortgage balance			241,290
Before-tax cash flow ($BTCF_s$)			$273,354
Taxes in year of sale			
Sale price		$547,494	
Less selling expenses		32,850	
Original cost basis	$400,000		
Accumulated depreciation	115,957		
Adjusted basis		284,043	
Capital gain		$230,601	
Capital gains tax at 28%			64,568
After-tax cash flow from sale ($ATCF_s$)			$208,786

*Projected *NOI* for year 11 is used to estimate the sale price at the end of year 10.

EXHIBIT 14–12 Incremental Analysis—Renovation versus No Renovation

	Year 5	6	7	8	9	10
ATCF assuming renovation		$5,545	$6,578	$7,632	$8,707	$218,585
ATCF assuming no renovation		6,156	6,601	7,054	7,514	107,202
Incremental cash flow	$−50,000	−611	−23	578	1,193	111,382
IRR on incremental cash flows = 17.58%						

is not affected by the renovation. This depreciation is still $8,421 per year. Adding the original depreciation to the $6,349 depreciation resulting from the renovation results in the total depreciation of $14,770.

A five-year expected investment period has been selected for analysis. To estimate the resale price, the investor uses a 10 percent terminal capitalization rate applied to an estimate of *NOI* six years from now. This method is based on the assumption that the benefit of the renovation will be reflected in the future *NOI*, and a new investor purchasing the property after five years will purchase on the basis of *NOI* starting in year 11.

Now we are interested in determining how much the after-tax cash flow increases as a result of the renovation. That is, how much greater, if any, is the after-tax cash flow *after* renovation compared with the after-tax cash flow *before* renovation? The after-tax cash flow assuming no renovation is the same as determined in Exhibits 14–4 and 14–5 when we analyzed Apex Center assuming no sale. Exhibit 14–12 summarizes the after-tax cash flows for renovation versus no renovation.

From Exhibit 14–12 we see that after-tax cash flows are actually slightly less for the first two years if the property is renovated. After that, however, the after-tax cash flows are increasingly higher. And the after-tax cash flow from sale is higher if the property is renovated. Using the incremental cash flows, we can compute an *IRR* on the additional equity investment of 17.58 percent. This *IRR* means that the investor would earn 17.58 percent on the additional $50,000 spent to renovate the property. Whether this is a good investment depends on what rate the $50,000 could earn in a different investment of comparable risk.

It is important to realize that the 17.58 percent return we have calculated is not a return for the entire investment in Apex. It does not tell us anything about whether Apex is a good investment before renovation. That was the purpose of the analysis in the first part of the chapter. We are now assuming the investor already owns Apex and wants to know whether an additional investment to renovate the property is a viable investment.

Renovation and Refinancing

The previous example assumed that if the property were renovated, the additional financing would equal the existing loan balance of the property (before renovation) plus 75 percent of the renovation costs. When properties are renovated, the investor often uses that opportunity to refinance the entire property. For example, the existing loan balance on the Apex building is only 57 percent of the current value of the property ($142,432 ÷ $250,000). Thus, the investor may be able to borrow more than the renovation requires, especially if the investor plans to obtain a new loan on the entire property rather than a second mortgage to cover the renovation costs.

The total amount of funds that the investor will be able to borrow is usually based on a percentage of estimated value of the property after renovation is completed. This value would be based on an appraisal. If we assume that the *value* added by the renovation is equal to the *cost* of the renovation, then this value would be equal to the existing value of $250,000 plus the renovation cost of $200,000, or $450,000. If the investor can borrow 75 percent of this value, a loan for $337,500 could be obtained. Because the existing loan balance is $142,432, the net additional loan proceeds would be $195,068. Thus, the investor would have to invest only $4,932 of his own equity capital to renovate the property. Obviously this is a highly leveraged situation, and the incremental rate of return should be significantly higher. Exhibit 14–13 shows the cash flows for Apex under the assumption that a loan is obtained for $337,500 at an 11 percent interest rate and a 15-year loan term.

Exhibit 14–14 shows the results of the incremental analysis. As indicated, only $4,932 must be invested to complete the renovation. However, because the new loan is much higher than the existing loan, the additional payments result in negative incremental cash flows for each of the years until the property is sold. Because of the higher value resulting from the renovation, a significant amount of additional cash flow occurs when the property is sold, resulting in an

EXHIBIT 14–13 **After-Tax Cash Flow from Renovation with Refinancing**

www.mhhe.com/bf13e

Calculation of After-Tax Cash Flow from Operations

	Year					
	6	7	8	9	10	11
Net operating income	$ 45,000	$46,800	$48,672	$50,619	$52,644	$54,749*
Less debt service	46,032	46,032	46,032	46,032	46,032	
Before-tax cash flow	$−1,032	$ 768	$ 2,640	$ 4,587	$ 6,612	
Net operating income	$ 45,000	$46,800	$48,672	$50,619	$52,644	
Interest	36,662	35,578	34,368	33,018	31,512	
Depreciation	14,770	14,770	14,770	14,770	14,770	
Taxable income	−6,432	3,548	−466	2,831	6,361	
Tax	$−1,801	$ −993	$ −131	$ 793	$ 1,781	
Before-tax cash flow	−1,032	$ 768	$ 2,640	$ 4,587	$ 6,612	
Tax	−1,801	−993	−131	793	1,781	
After-tax cash flow	$ 769	$ 1,761	$ 2,770	$ 3,794	$ 4,831	

Calculation of After-Tax Cash Flow from Reversion Year 10

Sale price			$547,494
Less selling costs (at 6%)			32,850
Less mortgage balance			278,477
Before-tax cash flow ($BTCF_r$)			$236,168
Taxes in year of sale			
Sale price		$547,494	
Selling costs		32,850	
Original cost basis	$400,000		
Accumulated depreciation	115,957		
Adjusted basis		284,043	
Capital gain		$230,601	
Capital gains tax at 28%			64,568
After-tax cash flow from sale ($ATCF_r$)			$171,599

*Projected *NOI* for year 11 is used to estimate the sale price at the end of year 10.

EXHIBIT 14–14 **Incremental Analysis Assuming Refinancing**

	Year					
	5	6	7	8	9	10
ATCF after renovation		$ 769	$ 1,761	$ 2,770	$ 3,794	$176,430
ATCF before renovation		6,156	6,601	7,054	7,514	107,202
Incremental cash flow	$−4,932	$−5,387	$−4,840	$−4,283	$−3,720	$ 69,227
IRR on incremental cash flow = 37.47%						

incremental *ATIRR* for the investor of 37.47 percent. Thus, the additional financing (leverage) significantly increases the incremental return from renovating the property. As we know, however, there is also more risk due to the additional debt. The investor must decide whether the additional return is commensurate with the additional risk. Some of the additional debt resulted from, in effect, bringing the original loan balance up to a 75 percent loan-to-value ratio. Thus, although the renovation cost is highly levered, total leverage on the property is at a typical level. The investor must consider all of these factors to make an informed investment decision.

Rehabilitation Investment Tax Credits

Investment tax credits are available for certain rehabilitation expenditures during the year (or when expenditures occur). Investment tax credits reduce the investor's *tax liability* (e.g., a dollar of tax credit generally reduces a dollar of taxes otherwise payable). Thus, a dollar of tax credit is usually more valuable to an investor than a dollar of additional deductions (e.g., depreciation) because an additional deduction reduces taxable income that would be taxed at the investor's marginal tax rate. For an investor in the 28 percent tax bracket a dollar of deduction reduces taxes by 28 cents. However, a $1 tax credit reduces taxes by $1.

In general, the credits available for rehabilitation are as follows:

Category	Credit
Placed in service before 1936	10%
Certified historic structures	20%

The credit is available to the investor in the year the property is placed in service—when the property is open for tenants to occupy. The depreciable basis for the property is reduced by the *full* amount of the credit in the year it is deducted. For example, suppose an investor spends $50,000 to rehabilitate a property that is a certified historic structure and meets the necessary requirements for a **rehabilitation investment tax credit**. The amount of tax credit will be $10,000 (20 percent of $50,000). The depreciable basis for the rehabilitation expenditures must be reduced by the amount of credit, or by $10,000. The depreciable basis will therefore be $40,000 ($50,000 − $10,000).

Certified historic structures have no age requirement. However, the building must be located in a registered historic district and approval must be obtained from the secretary of the interior. The rehabilitation must also be "substantial," which means that the amount of rehabilitation exceeds the *greater* of (1) the adjusted basis of the property prior to rehabilitation or (2) $5,000. (Note that this requirement favors investors who have owned the property for a long time and have a low adjusted basis.) Furthermore, at least 75 percent of the existing external walls of the building must have been retained (at least 50 percent still used as external walls) after the rehabilitation. Also, at least 75 percent of the building's internal structural framework must be retained.

Web App

In addition to the federal tax credits discussed in the chapter there are additional tax credits and other economic incentives available for renovation of certain types of property in most states. Research and summarize any state tax credits or other public incentives available in a state that you select. Summarize the nature of the incentive and how you think it might encourage renovation of properties.

If an investor takes a rehabilitation investment tax credit and disposes of the property during the first five years after the rehabilitated building was placed in service, some of the credit will be recaptured. The amount of recapture as a percent of the original tax credit is as follows:

Year of Disposition	Recapture Percent
One full year after placed in service	100%
Second year	80
Third year	60
Fourth year	40
Fifth year	20

Low-Income Housing

A new **low-income housing tax credit** that was introduced with the Tax Reform Act of 1986 allows a tax credit to be claimed by owners of residential rental property providing low-income housing. The credits are claimed annually for a period of 10 years. The *annual* credit has a maximum rate of 9 percent for new construction and rehabilitation, and a maximum rate of 4 percent for the acquisition cost of existing housing. To qualify, the expenditure for construction or rehabilitation must exceed $2,000 per low-income unit. For the property to qualify for the credit, either (1) at least 20 percent of the housing units in the project must be occupied by individuals with incomes 50 percent or less of the area median income, or (2) at least 40 percent of the housing units in the project must be occupied by individuals with incomes of 60 percent or less of area median income. The basis for project depreciation is *not* reduced by the amount of low-income credits claimed.

Conclusion

The primary purpose of this chapter was to answer the following two questions: (1) When should a property be sold? (2) Should a property be renovated? We saw that once a property has been purchased, the return associated with keeping the property might be quite different than the return originally estimated. The concept of a marginal rate of return helps evaluate whether a property should be sold or held for an additional period. The marginal rate of return considers what the investor could get in the future by keeping the property versus what he could get today by selling the property.

To determine whether a property should be renovated, we considered the incremental benefit associated with renovating the property versus not renovating the property. This approach is appropriate when the investor already owns the property and the question is whether an *additional* investment made to renovate the property is justified. If the investor did *not* already own the property, we would take a different approach. In this case the investor would want to know the total rate of return associated with both purchasing and renovating the property. The investor would also want to know the return for purchasing the property but not renovating it, since it still might make sense to purchase the property but not renovate it.

From the above discussion, it should be obvious that the approach we take when analyzing an investment depends on the particular question that we are trying to answer. Poor investment decisions are often made because the analyst did not answer the right question.

Key Terms

disposition, *415*
equity buildup, *415*
low-income housing tax credit, *432*
marginal rate of return, *420*
optimal holding period, *424*
rehabilitation investment tax credits, *431*
reinvestment rate, *424*
renovation, *427*

Useful Web Sites

www.ieausa.com—Investment Equities Associates (IEA), established in 1979, is a comprehensive real estate investment firm specializing in the renovation of underutilized properties in the commercial, multifamily, and hospitality marketplace.

www.GlobeSt.com—Provides current real estate news that is updated daily. Many articles will relate to disposition and renovation of properties.

www.doc.gov/eda—The Economic Development Administration (EDA) provides grants for infrastructure development, local capacity building, and business development. Good site for resources related to economic development.

Questions

1. What factors should an investor consider when trying to decide whether to dispose of a property that he has owned for several years?
2. Why might the actual holding period for a property be different from the holding period that was anticipated when the property was purchased?
3. What is the marginal rate of return? How is it calculated?
4. What causes the marginal rate of return to change over time? How can the marginal rate of return be used to decide when to sell a property?
5. Why might the after-tax internal rate of return on equity ($ATIRR_e$) differ for a new investor versus an existing investor who keeps the property?
6. What factors should be considered when deciding whether to renovate a property?
7. Why is refinancing often done in conjunction with renovation?
8. Why would refinancing be an alternative to sale of the property?
9. How can tax law changes create incentives for investors to sell their properties to other investors?
10. How important are taxes in the decision to sell a property?
11. Are tax considerations important in renovation decisions?
12. What are the benefits and costs of renovation?
13. Do you think renovation is more or less risky than a new investment?
14. What is meant by the *incremental cost of refinancing?*
15. In general, what kinds of tax incentives are available for rehabilitation of [illegible] property?

Problems

1. A property could be sold today for $2 million. It has a loan balance of [illegible] investor would incur a capital gains tax of $250,000. The investor has [illegible] were sold today, she would earn an *IRR* of 15 percent on equity for the [illegible] sold, the property is expected to produce after-tax cash flow of [illegible] year. At the end of the year, the property value is expected to increase to [illegible] loan balance would decrease to $900,000, and the amount of capital gains tax [illegible] to increase to $255,000.
   a. What is the marginal rate of return for keeping the property one additional year?
   b. What advice would you give the investor?
2. Refer to problem 1. The owner determines that if the property were renovated instead of sold, after-tax cash flow over the next year would increase to $60,000 and the property could be sold after one year for $2.4 million. Renovation would cost $250,000. The investor would not borrow any additional funds to renovate the property.

a. What is the rate of return that the investor would earn on the additional funds invested in renovating the property?

b. Would you recommend that the property be renovated?

3. Lonnie Carson purchased Royal Oaks Apartments two years ago. An opportunity has arisen for Carson to purchase a larger apartment project called Royal Palms, but Carson believes that he would have to sell Royal Oaks to have sufficient equity capital to purchase Royal Palms. Carson paid \$2 million for Royal Oaks two years ago, with the land representing approximately \$200,000 of that value. A recent appraisal indicated that the property is worth about \$2.2 million today. When purchased two years ago, Carson financed the property with a 70 percent mortgage at 10 percent interest for 25 years (monthly payments). The property is being depreciated over 27.5 years (1/27.5 per year for simplicity). Effective gross income during the next year is expected to be \$350,000, and operating expenses are projected to be 40 percent of effective gross income. Carson expects the effective gross income to increase 3 percent per year. The property value is expected to increase at the same 3 percent annual rate. Carson is currently in the 36 percent tax bracket and expects to remain in that bracket in the future. Because Carson has other real estate investments that are now generating taxable income, he does not expect any tax losses from Royal Oaks to be subject to the passive activity loss limitations. If he sells Royal Oaks, selling expenses would be 6 percent of the sale price.

a. How much after-tax cash flow ($ATCF_s$) would Carson receive if Royal Oaks was sold today (exactly two years after he purchased it)?

b. What is the projected after-tax cash flow ($ATCF_o$) for the *next* five years if Carson does *not* sell Royal Oaks?

c. How much after-tax cash flow ($ATCF_s$) would Carson receive if he sold Royal Oaks five years from now?

d. Using the results from (*a*) through (*c*), find the after-tax rate of return ($ATIRR_e$) that Carson can expect to earn if he holds Royal Oaks for five additional years versus selling it today.

e. What is the marginal rate of return (*MRR*) if Carson holds the property for *one additional year* (if he sells *next* year versus this year)?

f. Why do you think the *MRR* in (*e*) is higher than the return calculated in (*d*)?

g. Can you think of any other ways that Carson could use to purchase Royal Palms and still retain ownership of Royal Oaks?

h. What is your recommendation to Carson?

i. *Optional for computer users.* What is the *MRR* for each of the next 10 years? How can this calculation be used to determine when Royal Oaks should be sold?

4. Richard Rambo presently owns the Marine Tower office building, which is 20 years old, and is considering renovating it. He purchased the property two years ago for \$800,000 and financed it with a 20-year, 75 percent loan at 10 percent interest (monthly payments). Of the \$800,000, the appraiser indicated that the land was worth \$200,000 and the building \$600,000. Rambo has been using straight-line depreciation over 39 years (1/39 per year for simplicity). At the present time Marine Tower is producing \$90,000 in *NOI*, and the *NOI* and property value are expected to increase 2 percent per year. The current market value of the property is \$820,000. Rambo estimates that if the Marine Tower office building is renovated at a cost of \$200,000, *NOI* would be about 20 percent higher next year (\$108,000 versus \$90,000) due to higher rents and lower expenses. He also expects that with the renovation the *NOI* would increase 3 percent per year instead of 2 percent. Furthermore, Rambo believes that after five years, a new investor would purchase the Marine Tower office building at a price based on capitalizing the projected *NOI* six years from now at a 10 percent capitalization rate. Selling costs would be 6 percent of the sale price. Rambo is in the 28 percent tax bracket and expects to continue to be in that bracket. He also would not be subject to any passive activity loss limitations. If Rambo does the renovation, he believes he could obtain a new loan at an 11 percent interest rate and a 20-year loan term (monthly payments).

a. Assume that if Rambo does the renovation, he will be able to obtain a new loan that is equal to the balance of the existing loan plus 75 percent of the renovation costs. What is the *incremental* return ($ATIRR_s$) for doing the renovation versus not doing the renovation? Assume a five-year holding period.

b. Repeat (*a*) but assume that Rambo is able to obtain a new loan that is equal to 75 percent of the *sum* of the existing value of the property (\$820,000) plus the renovation costs (\$200,000). (This assumes that after renovation the value of the property will at least increase by the cost of the renovation.)

c. Explain the difference between the returns calculated in (*a*) and (*b*). Is there a difference in the risk associated with each financing alternative?

d. What advice would you give Rambo?

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5. **Excel.** Refer to the "Ch14 Renovation" tab in the Excel Workbook. This worksheet calculates the incremental return if the property is renovated as illustrated in the chapter. Suppose the *NOI* after renovation is \$42,000 instead of \$45,000. How does this affect the after-tax incremental return?

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6. **Excel.** Refer to the "Ch14 MRR" tab in the Excel Workbook. Suppose both the *NOI* and property value growth rate are 5 percent instead of 3 percent. How would this change the marginal rate of return for years 1 to 10? Does the *MRR* increase or decrease for the first year? Does it decrease at a faster or slower rate over time?

Chapter 15

Financing Corporate Real Estate

The focus of the previous chapters dealing with income properties has been that of an owner/investor who leases space to tenants. These tenants would generally be firms that use space as part of business operations. For example, a typical user could be a corporation that leases some, or all, of the space in an office building for use by its employees. Thus, the corporation uses the office space but does not own the building as an operating asset. This chapter analyzes real estate from the point of view of firms that are not real estate investors, but use real estate as part of business operations. Because so many of these "user firms" are corporations, their real estate activities are commonly referred to as **corporate real estate.**[1] However, this chapter is intended for any *user* of real estate assets and is not limited to corporations. Even though the primary business of these corporations is not real estate investment, they have to make many decisions regarding the use of real estate because real estate is typically an integral part of the firm's operations. For example, real estate is used for office space, warehouse space, manufacturing, and so on. In addition to using real estate, firms may choose to own real estate for a variety of other reasons, including these:[2]

- Owning, rather than leasing, space used in the operation of the business.
- Investing in real estate as one means of diversification from the core business.
- Retaining, rather than selling, real estate that may have been used previously in business operations.
- Acquiring real estate for future business expansion or relocation.

For these reasons, corporations are by far the largest owners of commercial real estate in the United States. Corporate users control as much as 75 percent of all commercial real estate according to some estimates. On a book-value basis, moreover, roughly one-third of the total assets of Fortune 500 companies is estimated to be real estate. With such a large concentration of corporate wealth in commercial property, it is worth taking a closer look at the way that businesses or users of real estate should make real estate investment and financing decisions.

Benefits associated with ownership of real estate for a corporate user include many of the same benefits realized by a pure investor. For example, a corporate owner that would

[1] Portions of this chapter are based on an article by William B. Brueggeman, Jeffrey D. Fisher, and David M. Porter, "Rethinking Corporate Real Estate," *Journal of Applied Corporate Finance*, 1991 (published by Continental Bank, Chicago).

[2] By "owning" real estate we are referring to fee simple ownership in the property. A corporation may also have a leasehold interest in real estate that has value because the property is leased at a below-market rate.

otherwise lease space saves lease payments, which is analogous to an investor earning lease income. By owning real estate, the corporation also receives the tax benefits from depreciation allowances. Furthermore, by owning real estate the corporation retains the right to sell the property in the future. At that time, the property can be leased back from the purchaser if the firm still needs to use the space. Firms whose core business is not real estate investment, however, must consider additional factors. In particular, the user must consider the opportunity cost of capital invested in real estate, the impact that ownership of the real estate will have on corporate financial statements, and the corporation's ability to use space efficiently. These are some of the issues that this chapter will consider. We begin by considering how a corporate user should analyze whether or not to lease or own space necessary in its business operations.

Lease-versus-Own Analysis

Corporations can either lease or own space needed in business operations and may conduct **lease-versus-own analysis** to decide which option is superior. If a corporation owns space, it is essentially "investing" in real estate. When purchasing these assets, a corporation may decide to finance the purchase by taking out a mortgage secured by the property in addition to equity capital, or it may decide to use only equity capital. Alternatively, depending on the extent of debt already used to finance business operations, capital could consist of a combination of unsecured corporate debt and equity obtained from sale of stock or retained earnings.

If the firm leases space, on the other hand, it can use the space without investing corporate equity, freeing the equity capital for other investment opportunities available to the firm. Whether these investment opportunities are better than investing in the real estate depends on the after-tax rate of return and risk of these opportunities relative to that of the real estate.

Leasing versus Owning—An Example

To illustrate the decision to own rather than lease real estate that the corporation plans to use in its operations, consider the following example. Assume the XYZ Corporation is considering opening an office in a new market area that would allow it to increase its annual sales by $1.5 million. Cost of goods sold is estimated to be 50 percent of sales, and corporate overhead would increase by $200,000 not including the cost of either acquiring or leasing office space. XYZ will also have to invest $1.3 million in office furniture, office equipment, and other up-front costs associated with opening the new office before considering the costs of owning or leasing the office space.[3]

XYZ could purchase a small office building for its sole use at a total price of $1.8 million, of which $225,000 (12.5 percent) of the purchase price would represent land value, and $1,575,000 (87.5 percent) would represent building value. The cost of the building would be depreciated over 31.5 years.[4] XYZ is in a 30 percent tax bracket. As an alternative to owning, an investor has approached XYZ and indicated a willingness to purchase the same building and lease it to XYZ for $180,000 per year for a term of 15 years. XYZ would pay all real estate operating expenses (absolute net lease), which are estimated to be 50 percent of the lease payments. XYZ has estimated that the property value should increase over the 15-year lease term, and the building could be sold for $3 million at the end of the 15 years.[5]

[3] Other costs might include sales training, relocating employees, and the like.

[4] For illustration only. The depreciable life would depend on the tax law in effect at the time of purchase.

[5] Even if the corporation still needs to use the space, it could sell the property and lease it back at the end of the lease term. Sale-leaseback is considered later in this chapter. The corporation could also decide to sell the building and relocate its sales office to another property that is leased or owned.

XYZ has also determined that if it purchases the property, it could arrange financing with an interest-only mortgage on the property for $1,369,000 (76 percent of the purchase price) at an interest rate of 10 percent with a balloon payment due after 10 years.[6]

Cash Flow from Leasing

Exhibit 15–1 shows the calculation of after-tax cash flow associated with opening the office building and obtaining use of the space by leasing. Recall that the initial cash outlay of $1.3 million is the up-front cost of setting up the office. After-tax cash flow of $196,000 is received each year for 15 years. We also assume that XYZ will close the office at the end of the lease, and that the furniture and equipment will have no residual value. An after-tax rate of return of 12.5 percent is assumed to be the opportunity cost, or after-tax reinvestment rate savings of $1.3 million, if XYZ chooses to lease rather than own the office building. This is the rate of return after tax that XYZ can compare with other investment alternatives of equal risk when considering whether it should invest the $1.3 million necessary to open the new office building.

Assuming that XYZ believes that it should open a new regional office, the next question is whether the firm should lease or own the property that will house the new operation. One way to answer this question is to calculate the after-tax cash flows and after-tax rate of return assuming that the space is owned rather than leased.

Cash Flow from Owning

Exhibit 15–2 shows the after-tax cash flow from opening the office building under the assumption that it is owned. The initial cash outlay of $1,731,000 includes the equity invested in the office building of $431,000 as well as the other up-front costs of $1.3 million. During the first 15 years the after-tax cash flow is $241,170. After-tax cash flow from sale of the real estate is $1,046,000. The after-tax *IRR* under this scenario is 12.95 percent. This return is slightly higher than the after-tax rate of return of 12.50 percent if XYZ chooses to lease the space, as shown in Exhibit 15–1. This return suggests that owning is better than leasing. Note, however, that the 12.95 percent rate of return is the after-tax rate of return on *both* the funds invested in opening the office building ($1.3 million) and the additional equity invested in owning the building ($431,000). That is, this rate of return is for two combined investment decisions: (1) to open the office building and (2) to own the office building. Although the rate of return associated with owning the office building is greater than leasing it, the risk may also be greater, depending on the risk of holding the real estate as an investment.[7] To evaluate risk further, we have to isolate the after-tax rate of return associated with making the investment in the real estate only.

EXHIBIT 15–1
After-Tax Cash Flow: Leasing Office Building

Cash Flow from Operations	Lease
Sales	$1,500,000
Cost of goods sold	750,000
Gross income	750,000
Less operating expenses:	
Business	200,000
Real estate*	90,000
Less: Lease payments	180,000
Taxable income	$ 280,000
Tax	84,000
Income after tax	$ 196,000
After-tax cash flow	$ 196,000

Summary of After-Tax Cash Flows

	Outlay	Cash Flow
Year	0	1–15
	$−1,300,000	$196,000
IRR	12.50%	

*Operating expenses on the real estate such as property taxes and insurance that the tenant is responsible for paying under the net lease.

[6] For purposes of illustration, we assume the loan amount to be equal to the present value of the lease payments of $180,000 per year, discounted at the mortgage loan interest rate of 10 percent. This makes the financing comparable with leasing, as we will discuss later in the chapter.

EXHIBIT 15–2
After-Tax Cash Flow: Owning Office Building

Operating Years	
Sales	$1,500,000
Cost of goods sold	750,000
Gross income	750,000
Less operating expenses:	
Business	200,000
Building or property	90,000
Less: Interest	136,900
Depreciation	50,000
Taxable Income	273,100
Less: Tax	81,930
Income after tax	191,170
Plus: Depreciation	50,000
Cash flow	$ 241,170

Sale at End of Lease		
Reversion		$ 3,000,000
Mortgage balance		−1,369,000
Reversion	$ 3,000,000	
Basis	−1,050,000	
Gain	$ 1,950,000	
Tax		−585,000
Cash flow		$ 1,046,000

Calculation of *IRR* Summary

	Outlay	Cash Flow	Reversion
Year	0	1–15	15
Cash flow	$−1,731,000	$241,170	$1,046,000
IRR	12.95%		

[7] The decision whether or not to use the space for an office building should normally be made by considering the after-tax cash flow from leasing the space. This ensures that the decision to use the space is based on the market-determined cost of using the space. It also separates the benefits of owning the space from the benefits of using the space for a new sales office.

Cash Flow from Owning versus Leasing

Thus far we have been dealing with two interrelated decisions. The first decision is whether the corporation should expand its operations by investing funds to *use* the additional office space. The second decision is how to pay for the use of the space. In the preceding analysis, we calculated the rate of return under two different assumptions about how the firm would pay for the use of the space. Assuming that the rate of return under one or both of these alternatives meets the firm's investment criteria, the firm should decide to use the space. It is not clear, however, that the risk and rate of return should be the same for both alternative ways of obtaining use of the space. In this example, both scenarios involve use of the same building with the same sales potential and non–real estate costs.[8]

As we have seen, however, the decision to own the space involves an additional equity investment in the property that is not required when leasing. To look more closely at the equity investment in the property that is included with the decision to own versus lease, we must consider the *difference* in the cash flow to the corporation if it leases the space rather than owns the space. Exhibit 15–3 replicates the after-tax cash flow under both the lease and own scenarios and computes the difference in these cash flows.

The first two columns of Exhibit 15–3 repeat calculations of the after-tax cash flows for owning and leasing, respectively. As we have discussed, these cash flows to the firm would result from using the office building based on each alternative. The $431,000 initial outlay now represents only the equity for investment in the property. During the first 15 years, after-tax cash flow would be $241,000 per year if the property were owned, as compared to $196,000 per year if the property were leased—a difference of $45,170 per year. The firm would realize the $1,046,000 cash flow from sale if it chooses to own the project. When making the lease-versus-own decision, remember that the volume of sales and the operating costs associated with generating those sales will be the same whether the space is leased or owned. Therefore, the decision to lease or own should depend only on the *difference* in cash flows under the two alternatives. In other words, owning or leasing a building should in no way affect XYZ's business operations. The difference in cash flows is shown in column 3 of Exhibit 15–3. By owning rather than leasing, XYZ should save $45,170 per year after taxes.[9] Furthermore, if XYZ owns the space, it will receive $1,046,000 at the end of the 15th year from sale of the office building.

Return from Owning versus Leasing

Recall that the equity investment required to own the property was $431,000. Based on this investment and the incremental cash flows of $45,170 per year and $1,046,000 in year 15 (owning versus leasing), the after-tax *IRR* is 13.79 percent. Whether this is sufficient to justify the additional investment in ownership versus leasing the space depends on the opportunity cost and risk associated with the investment of equity capital in the property. If XYZ believes that an after-tax rate of return of 13.79 percent is not sufficient to warrant the risk associated with owning the space, it should decide to lease rather than own the space. On the other hand, if XYZ thinks that 13.79 percent is an adequate return given the risk of owning and eventually selling the property after 15 years, then it should own.

[8] In practice, space that is available for leasing may not be available for purchase, so that the space that would be leased would not be the same as the space that would be owned. This could result in slightly different assumptions about the sales potential of each alternative. For simplicity we have ignored this potential difference.

[9] Alternatively, by leasing rather than owning, the corporation must pay an additional $45,170 per year.

EXHIBIT 15–3
Lease-versus-Own Analysis

	Own	Lease	Difference (Own – Lease)
Cash Flow from Operations			
Sales	$1,500,000	$1,500,000	0
Cost of goods sold	750,000	750,000	0
Gross income	750,000	750,000	0
Operating expenses:			
Business	200,000	200,000	0
Real estate	90,000	90,000	0
Lease payments	0	180,000	−180,000
Interest	136,900	0	136,900
Depreciation	50,000	0	50,000
Taxable income	273,100	280,000	6,900
Tax	81,930	84,000	2,070
Income after tax	191,170	196,000	4,830
Plus: Depreciation	50,000	0	50,000
After-tax cash flow	$ 241,170	$ 196,000	$ 45,170
Cash Flow from Sale			
Reversion/owning			$ 3,000,000
Mortgage balance			−1,369,000
Reversion	$ 3,000,000		
Basis	−1,050,000		
Gain	$ 1,950,000		
Tax			−585,000
After-tax cash flow			$ 1,046,000

Summary After-Tax Flows

	Outlay	Cash Flow	Reversion
Year	0	1–15	15
Own–Lease	$−431,000	$45,170	$1,046,000
IRR	13.79%		

Importance of the Residual Value of Real Estate

Leasing and owning are often viewed as two financing alternatives because lease payments substitute for debt payments as discussed above. As we saw in the above example, however, the debt liability that is comparable to a lease liability does not cover the portion of the purchase price that represents an investment in the right to the residual value. Hence, leasing property differs from equipment leasing, where the residual value can usually be assumed to be zero.

Generally, leasing or owning real estate differs from leasing or owning equipment because real estate may have a substantial residual value. The owner of the real estate has the right to the residual value and incurs the risk that the residual value will be different from the cost of the property at the time it was purchased. Thus, in addition to having use of the real estate during the term of the lease, *a corporation that chooses* [illegible] *also made an investment in its residual value.* This means that deciding between owning and leasing real estate is not simply a choice between two financing alternatives. Although they are both ways of financing the use of the real estate over the lease term, ownership includes the right to the residual value of the property at the end of the lease term.[10] Leasing does not give the company any interest in the residual value of the property.[11] This residual value can be quite substantial if the property has retained its value or appreciated in value over the lease term, whereas with corporate equipment the expected residual value is so small in most cases that it can usually be ignored.

The residual value of the property is affected by changes in the supply and demand for real estate over the term of the lease and is usually more uncertain than the contract lease payments. Thus, the required rate of return from owning (discount rate) used to evaluate the incremental cash flows from owning versus leasing should probably be higher than the after-tax cost of corporate debt, although the rate of return may not have to be as high as the cost of capital used for the typical corporate investment.[12]

Estimating the Residual Value

Residual value—that is, the reversion value of land and improvements at the end of the lease term—is an important part of the decision to lease or own that causes confusion for corporate managers. Some analysts assume that the residual value of the real estate will be equal to the book value of the property, or the original acquisition cost less accounting depreciation at the expiration of the lease term. Others go to the extreme of assuming that there will be no residual value. Why? Because there will always be a need for a facility and the residual sale price received must be reinvested in a lease or on a new facility at that time.

Because real estate does not typically decline in value as fast as accounting depreciation and rarely has zero value at the end of a typical lease term, assuming no residual value biases the lease-versus-own decision toward leasing. However, it is just as incorrect to assume unrealistically high rates of appreciation that bias the analysis toward ownership. The correct approach is to make a realistic estimate of the residual value of the real estate and the uncertainty of the value estimate. This estimate should consider the *market value* of the real estate (as discussed in Chapter 10), not the investment value to the corporation.

By deciding to own, a corporation chooses, in effect, to bear a residual real estate risk that may be completely unrelated to its operating success. Real estate differs from other corporate assets in that, at the end of the lease term, the range of possible residual values runs from well below to well above the initial cost of the property. Over the life of a medium- to long-term lease, local, regional, and even international economic factors can cause the market values of corporate real estate to change significantly. By deciding to own

[10] Assume that the property in our lease-versus-own example is financed with a nonrecourse mortgage loan. The difference between owning and leasing (aside from the tax benefits) would be an option to keep the property if its value at the end of the lease exceeds the loan balance. If the value of the property is less than the loan balance, the corporation could default on the mortgage, and the property would revert to the lender just as it would to the lessor at the end of the lease. In this case, owning differs from leasing by including the investment made to purchase a call option on the residual value property. The exercise price of the option is the mortgage balance at the end of the lease term. Because we assumed the loan amount to be equal to the present value of the lease payments, the price paid for the call option is essentially the amount of equity that must be invested.

[11] Leases can also be structured to include a claim on the residual value of the property. For example, an "equity lease" gives the lessee an ownership interest in the building. The lessee might also have an option to buy the property at the end of the lease.

[12] The cost of capital typically used by corporations is a weighted average of the cost of corporate debt and equity capital. Because equity is more expensive than debt, the weighted average cost of capital is greater than the cost of debt. (See chapter appendix.)

rather than lease space, the company must bear the risk of any unexpected changes in the residual value of the real estate.

Some analysts argue that the residual value of the real estate is irrelevant because the corporation needs to use space on an ongoing basis. That is, there will always be a need for a facility, and proceeds from the residual sale must be reinvested in a new facility at that time. But this approach ignores the fact that, by owning, the corporation retains ownership of an asset with value at the end of the typical lease term. At that time (when the lease ends) management may or may not decide to continue to *use* the same space. The corporation has the option to relocate if a change in the highest and best use of the site makes the space inefficient for continued use.[13] If the corporation decides to continue to use the space, it can then decide whether to continue to own the space or sell the space and lease it back.[14]

Regardless of what the firm decides to do in the future, the initial decision to own versus lease means that the firm has an asset with an expected market value when the initial lease term would have ended. If property values have risen, the corporation has an asset that is more valuable than when it was purchased. If property values have fallen, the asset is less valuable than when purchased. In either case, the corporation has an asset on the balance sheet that it would not have had if it had decided to lease. If the market capitalization rate for the property has remained fairly constant, any change in the market value of the property and market rental rates should be highly correlated. Thus, by owning, the corporation has in effect invested in an asset that has a rate of return that is correlated with changes in the corporation's cost of leasing the space. As suggested above, this may or may not be correlated with the return on the corporation's core business. If market values and rental rates rise, the opportunity cost of using the space will be greater in the future whether the space is leased or owned. The difference is that by having decided to own, the company has an asset that has appreciated in value and a gain on the value of the real estate. As noted, it can realize this historical gain by a sale and leaseback or by relocating.[15]

Alternatively, if the company had leased, it would still face higher lease costs but may or may not have invested funds in an asset that had increased in value. Of course, if rental rates fall, the company can now lease the space at a lower rate. But by owning instead of leasing, the company has also incurred a loss on the real estate.

The point is that by owning rather than leasing, the corporation has made an investment with a rate of return that depends on what happens to local real estate values. Own-versus-lease decisions must consider how the risk and expected return from this investment fit in the overall corporate investment and financing strategy.

The Investor's Perspective

In the above analysis, we considered the incremental cash flow associated with owning versus leasing. The return from owning (and cost of leasing) from the corporation's point of view was calculated to be 13.79 percent. If the corporation decides to lease the space, our analysis assumes that there is an investor willing to own the space and lease it to the corporation. What rate of return would the investor expect? This depends, of course, on how the investor finances the property, and the investor's tax situation. For the sake of comparison, assume that the investor is in the same tax bracket as the corporation and that the mortgage

[13] Options available to the corporation when the highest and best use of the site has changed are considered in a later section.

[14] Sale-leaseback is examined in more detail later in the chapter.

[15] If lease payments have risen as well as property values, the company may still be better off by continuing to own rather than selling and leasing back the space. This does not negate the fact that the return from owning the real estate may or may not have been greater than the return that the corporation could have earned leasing instead of owning and investing the funds elsewhere.

would be financed the same way. Exhibit 15–4 shows the projected after-tax cash flows from operating the property during the term of the lease and resale at the end of the lease.

The rate of return for the investor is exactly the same as it was for the corporation. This should be no surprise because we have emphasized that the difference between owning and leasing is a real estate equity investment.

A Note on Project Financing

In the lease-versus-own analysis considered earlier, we assumed the corporation took out a mortgage on the property. Rather than a mortgage, the corporation could have used unsecured corporate debt. Using a mortgage loan utilizing real estate as security substitutes for the use of unsecured corporate debt under the assumption that the corporation wants to maintain a constant proportion of total debt (e.g., mortgages on real estate, corporate bonds). However, corporations may find that the rate on a mortgage secured by the real estate is less than the rate it has to pay on a new issue of unsecured corporate debt. This is because the rate on a mortgage tends to reflect the risk of the real estate, whereas the risk for unsecured corporate debt reflects the risk of the corporation.

A corporation with a high credit rating may pay less for unsecured debt than for a mortgage because the rate on mortgage loans, particularly those made without recourse to the borrower, reflects the risk of default—the inability of the cash flows produced by the property to service the debt rather than the default risk associated with the borrower. That is, in the case of nonrecourse financing, the rate on the mortgage includes a risk premium to the lender because the borrower has the "option to default" in the event that the property value

EXHIBIT 15–4
Investment Analysis

Lease income			$180,000
Operating expenses (net lease)			0
Net operating income			180,000
Less: Depreciation			50,000
Less: Interest			136,900
Taxable income			−6,900
Tax			−2,070
Net operating income			180,000
Less: Debt service			136,900
Less: Taxes			−2,070
After-tax cash flow			45,170
Sale at End of Lease			
Reversion			$ 3,000,000
Mortgage balance			−1,369,000
Reversion	$ 3,000,000		
Basis	−1,050,000		
Gain	$ 1,950,000		
Tax			−585,000
Cash flow			$ 1,046,000
Summary			
	Outlay	*ATCF*	Reversion
Year	0	1–15	15
Cash flow	$−431,000	$45,170	$1,046,000
IRR	13.79%		

is less than the loan or cash flow cannot service the debt. In such cases, the finan community may consider debt based on the assets of the corporation less risky than the estate, and, therefore, the unsecured corporate borrowing rate may be lower than that mortgage loan based solely on the real estate as security.

On the other hand, a corporation that has assets that are riskier than the real estate have to pay more for unsecured corporate debt than the mortgage rate used to finance acquisition of real estate when real estate is the only collateral for the debt.

If the corporation can obtain unsecured corporate debt at a lower rate than a mortg on the property, we can assume the lower rate in the analysis in Exhibits 15–2 and 15–3. ternatively, analysts sometimes calculate the incremental cash flows from owning ve leasing (as in Exhibit 15–3) *without explicitly considering the debt financing*. This typ analysis is analogous to calculating the return from owning the real estate (as in Exh 15–4) by using the cash flows before considering financing, that is, as if the property unleveraged. In this case the rate of return from owning (versus leasing) must be comp to the firm's weighted average cost of capital, which is an average of the firm's cost of and equity capital. This approach allows the cost of debt financing to be reflected in the quired rate of return from owning the real estate rather than considering financing in calculation of the cash flows.[16] As shown in the appendix to this chapter, this approach not change the conclusion about the rate of return earned by investing in real estate. lysts often argue that for lease-versus-own decisions, the rate of return on the increme cash flows from owning versus leasing (when financing is not explicitly considered) sh be compared with the corporation's cost-of-debt capital rather than a weighted average of debt and equity. This argument is based on the assumption that the lease liability (b on the present value of the lease payments) is equivalent to the amount of debt finan and that no additional equity would be invested in owning. This assumption is realisti equipment leasing because equipment has no substantial residual value. However, as example illustrated, even if we can borrow an amount equal to the present value of the l payments, real estate requires an additional equity investment due to the expected pre value of the residual.

Factors Affecting Own-versus-Lease Decisions

The above example provides insight into key financial factors that affect the decisio own or lease space. Additional matters, however, must be considered. Some of these difficult to incorporate explicitly in a lease-versus-own analysis, but they may affect th nal decision.

Space Requirements

Leasing would be preferable when the company's space requirements are far less tha optimal development on a given site. In cases where the amount of space a corporate desires is less than the optimal building scale that should be developed on a site, we e (and typically find) corporate users leasing and developers (and their investment part assuming real estate risks. Even in cases where a corporate lessee will be the dominan ant, it may be preferable for the corporate user to lease. For example, companies may be able to negotiate lease concessions (or a share of the developer's profits the developer's use of the corporate credit when obtaining development financing.

Amount of Time Space Is Needed

In cases where the expected life of an asset far exceeds the company's projected per use, companies will also generally choose to lease rather than bear the costs associated

[16] This approach is typically taken in corporate finance texts. The appendix to this chapter discu the use of the weighted average cost of capital approach.

selling an illiquid asset. This tendency can be explained, in part, by the comparative advantage of lessors in creating or locating alternative uses for such assets.

Risk Bearing

We have discussed the importance of the residual value of the real estate, which is affected by changes in local property values. Lease-versus-own analysis should carefully consider any relationship between the factors that influence the company's operating value and those driving local property markets. The aim of such consideration should be to determine whether other real estate investors have a comparative advantage in bearing the risk associated with local real estate markets. Pension funds, for example, generally hold unlevered portfolios of real estate diversified both by property type (offices, warehouses, etc.) and by geographic region. These funds, as well as REITs, are likely to be able to diversify risks in property markets much more efficiently than all but the largest corporations. When a given real estate investment represents a large proportion of the company's total capital, the comparative advantage of other investors in bearing such risks may create a strong preference for leasing. For these reasons of relative risk-bearing capacity, larger companies with broadly dispersed operations are more likely to own than are smaller companies with geographically concentrated operations.

Management Expertise

Owning and managing real estate are not typically a primary part of a corporation's business activity. Thus, the corporation can be at a disadvantage when it comes to owning real estate. The corporation may not have the expertise to manage real estate assets. When property is owned rather than leased, managers may not be as aware of the true cost of using the space, leading to inefficient use of real estate. Leasing is favored when the company does not have a comparative advantage relative to developers and other investors in managing property and eventually selling it.

Maintenance

Companies are more likely to own assets whose values are highly sensitive to the level of maintenance. Lessors that own maintenance-sensitive buildings, unless protected by enforceable maintenance provisions,[17] are likely to charge higher lease rates to compensate for lower expected levels of maintenance undertaken by (particularly short-term) tenants. Therefore, unless corporate users find some means of reassuring lessors that maintenance is in the user's as well as the owner's best interest (perhaps through a very-long-term lease), corporate users are likely to find it more economical to own.

Special Purpose Buildings

Companies are more likely to own buildings that have been "customized" for their operations, especially when those operations are unusual and the company has few competitors. To illustrate the case of customized corporate real estate, we typically observe corporations owning rather than leasing buildings outfitted for hi-tech, R&D operations.[18] (Bulk distribution warehouses, by contrast, are far more likely to be leased than owned.) The high costs of relocating specialized corporate fixtures and machinery are an obvious incentive to own rather than lease. In the case of many single-tenant, **special purpose buildings**, the value of the real estate may well be far higher in its current corporate use than in any conceivable alternative use. To the extent this is the case, a lessor would be effectively holding a corporate security whose value depended almost entirely on the company's operating success. In such cases, corporate users would likely have a considerable advantage over real estate investors in bearing such firm-specific risk.

[17] Effective contracting may be very difficult to achieve even if a net lease is negotiated with the lessor because of time losses in monitoring, assessing blame, and resolving disputes over excessive equipment failures or other problems caused by poor building design or other flaws believed to be the responsibility of the lessor.

[18] The maintenance and specialization issues may in fact be closely related. For example, in an R&D facility requiring specific hardware in its design, technicians employed by the corporate entity may be better able to diagnose and respond to maintenance problems. In such cases, ownership would be preferable to constructing intricate provisions in lease contracts for the lessor to maintain such assets.

Tax Considerations

Tax considerations have historically played a major role in the standard lease-versus-buy analysis. It is less clear today than it was prior to 1986 whether corporations or individuals (through the medium of either partnerships or institutions) are the tax-favored owners of real estate.

The simple rule of thumb on taxes in lease-versus-buy decisions is as follows: If the lessor is in a higher tax bracket than the lessee, then leasing puts "ownership" of the asset in the hands of the party that can most benefit from the tax shelter provided by depreciation. From 1981 to 1986, two elements of the tax code together encouraged the ownership of real estate by individuals in high tax brackets. (1) Depreciation lives were considerably shorter for real estate assets, thus increasing the depreciation tax shield. (2) The marginal tax rate for wealthy individuals (50 percent) was higher than the highest marginal tax rate for corporations (46 percent), and many companies had other tax shields that effectively lowered their marginal rate well below the statutory 46 percent rate. These two conditions, combined with the ability of partnerships to pass through operating losses directly to investors and avoid the double taxation of corporate dividends, created strong incentives for partnerships of high-tax individuals to own real estate and lease it to corporations. These tax incentives for corporations to sell real estate to individuals coupled with the market's perceived reluctance to reflect corporate real estate values in stock prices explain much of the real estate sales and sale-leaseback that occurred during this time period.

The Tax Reform Act of 1986 in several ways substantially reduced the incentive for individuals to lease to corporations. First, it lengthened tax depreciation lives, thus lowering the tax shield. Second, the highest marginal tax rate for corporations (34 percent) is now slightly higher than that of wealthy individuals (31 percent). Third, individuals are subject to limitations on "passive" losses that restrict their ability to use accounting losses from real estate to offset other income. These tax law changes have leveled the playing field among partnerships, corporations, and tax-exempt entities such as pension funds as owners of real estate.[19] For this reason, taxes are far less likely today to be the deciding factor in corporate lease-versus-own decisions.

Access to Capital Markets

Real estate is very capital intensive. The cost of owning real estate is a function of the cost of obtaining debt and equity capital. As mentioned previously, corporations with a high credit rating may be able to obtain unsecured corporate debt and equity at a cost less than the cost of capital for the individual or institutional investor that would be willing to own and lease the real estate to the corporation. This would tend to make owning preferable because the lease rate must cover the owner's cost of capital. On the other hand, a corporation that

[19] In fact, some researchers now claim that, for tax purposes under certain conditions, corporations rather than partnerships may be the optimal organizational form for holding real estate. See Jeffrey D. Fisher and George Lentz, "Tax Reform and Organizational Forms for Holding Investment Real Estate: Corporations vs. Partnerships," *The American Real Estate and Urban Economics Association Journal* 17, no. 3, 1989.

has a high cost of capital relative to a potential lessor might find leasing more attractive than owning.

If a property is mortgaged, we might expect the rate to be the same for the corporation or the investor, assuming the rate is based on the risk of the real estate rather than the risk of the borrower. If the loan is made with recourse to the borrower, however, the mortgage rate for corporations and investors could differ.

Control

The corporation may want to control the real estate by owning the property for financial reasons not considered in the above example. For example, as the corporation does business at a particular site it may build up goodwill that is difficult to transfer to another location. If the space is leased, the lessor may attempt to extract some of this firm-specific value from the corporation by charging a lease rate that is higher than the prevailing market rate. Owning the real estate ensures that the corporation retains goodwill at a reasonable cost.

Effect on Financial Statements

The decision to own versus lease space has an impact on the financial statements of the corporation, which, in turn, may affect the value placed on the corporation by investors and lenders and, consequently, the cost of capital for the corporation. These financial considerations can have a substantial impact on the decision to own versus lease. In fact, because of the nature of real estate versus other corporate assets, corporations are often at a disadvantage owning real estate versus other investors.

Looking again at Exhibit 15–3, note that by owning versus leasing, income after tax is only $4,830 higher during the first 15 years, even though the after-tax cash flow is higher by $45,170. Income based on accounting statements versus cash flows presents potential problems because investors may be aware only of the "earnings per share" reported by the corporation, not the cash flow. Furthermore, much of the benefit of owning in this example comes from the residual value of the real estate at the end of the lease term. This unrealized source of potential gain would not be reflected in the annual income statements. Another potential problem is that real estate is carried at book value on corporate balance sheets. Because book values are based on cost, they are equal to the original acquisition cost less accumulated depreciation. The investment community may not be aware of the market value of real estate held by corporations, or at least real estate value is difficult to determine. Thus, many analysts argue that a corporation's stock price may not reflect the benefit of any above-average appreciation in any real estate assets that it owns.[20]

Indeed, unless real estate assets are valued periodically, corporate managers may not realize that the corporation's real estate is worth more than book value. Thus, they may use real estate inefficiently because they do not consider the true cost of the space. Corporations' inefficient use of real estate can lead to takeover attempts by investors who recognize the value of the real estate and the fact that it is not being put to its highest and best use. After such takeovers, the new owners sell real estate assets, and shift operations to cost facilities elsewhere.

Another distortion in corporate balance sheets occurs when real estate is carried at book value but is financed with a mortgage based on its current market value. If this occurs, the proportion of financing (loan-to-market-value ratio) is lower than the loan-to-book-value ratio. Thus, a mortgage can increase a corporation's overall debt ratio, which is based on assets carried at book value. The debt ratio can make the corporation appear riskier to shareholders and

[20] Investors may know that real estate has a higher value on average than its book value. But without details as to the market value of the real estate for a specific company, the best they can do is assume the market value is higher than the book value by some arbitrary amount.

result in a lower stock price because the assets of the firm may appear to be more highly levered than they actually are. Many have argued that this distortion partially accounts for premiums paid over the prevailing stock prices by investors who are aware of this difference when they seek to take over a firm.

Off-Balance-Sheet Financing

Because ownership of real estate often has an unfavorable impact on the company's financial statements, corporations often attempt to avoid showing real estate on the financial statements. They do this by using **off-balance-sheet financing.** Leasing may allow the corporation to get the real estate off the balance sheet if the lease meets certain criteria. If the lease is accounted for as an **operating lease,** the lease contract does not affect the corporation's balance sheet. If the lease is accounted for as a **capital lease,** however, the lease is recorded on the balance sheet as both a long-term asset and a long-term liability. Both are recorded on the balance sheet at an amount equal to the present value of the lease payments.[21] This obviously increases the corporation's debt-to-assets ratio. Thus, many corporations prefer to account for the lease as an operating lease. Under Financial Accounting Standards Board (FASB) guidelines, however, the lease must be accounted for as a capital lease if it meets any one of four conditions.[22] A lease is a capital lease if it extends for at least 75 percent of the asset's life, if it transfers ownership to the lessee at the end of the lease term, or if it seems likely that ownership will be transferred to the lessee because of a "bargain purchase" option.[23] Finally, if the present value of the contractual lease payments equals or exceeds 90 percent of the fair market value of the asset at the time the lease is signed, then the lease is a capital lease.

In the past, many corporations used unconsolidated subsidiaries to provide a way to own real estate assets but report only the equity ownership interest (not the purchase price and the debt liability) and still report the earnings on consolidated financial statements. Corporations could use subsidiaries in this way when the subsidiary was considered to engage in "nonhomogeneous," or unrelated, activities. Thus, if real estate was unrelated to the firm's core business, the corporation could use an unconsolidated subsidiary to own the real estate without affecting the consolidated balance sheet. FASB guidelines have since been revised, however, to severely restrict the use of unconsolidated subsidiaries for this purpose. Companies wanting to use unconsolidated subsidiaries to keep the real estate off the balance sheet must own less than 50 percent of the subsidiary, which means that they must give up control of the subsidiary.

The Problem of "Hidden Value"

The appreciation in value of some corporate real estate poses a critical problem for management. Many observers claim that, because accounting conventions require companies to carry real estate assets on a "lower of cost or market" basis and many properties contribute little to reported earnings, the value of corporate real estate is "hidden" from investors and, therefore, not fully reflected in stock prices. This is the problem of **hidden value**. To the extent that real estate values are not reflected in share prices, corporate management is vulnerable to the predations of raiders who are able to buy companies at bargain prices and then sell off the undervalued assets.

[21] This was one of the reasons that we assumed in the lease-versus-own example that the loan would equal the present value of the lease payments. FASB guidelines require that the discount rate be appropriate given the creditworthiness of the lessee. Recall that we assumed that the loan amount was equal to the present value of the lease payments discounted at the mortgage interest rate. A lease and a mortgage to the same corporation would be of comparable risk.

[22] FASB, *Statement of Financial Accounting Standards No. 13*, par. 7.

[23] A bargain purchase option gives the lessee the right to purchase the asset for a price less than the fair market value of the asset expected when the option is exercised.

The perceived undervaluation of corporate real estate is leading corporate managers to take careful inventory of real assets and to evaluate their alternative uses. In some cases, this process has led to outright property sales accompanied by major relocations, in others to sale-leaseback, and in still others to a variety of asset-backed refinancing designed to capture hidden values. At the same time, some companies are attempting to reduce occupancy costs as well as the potential for future hidden-value problems through the use of equity leases and joint ventures. Such methods allow corporations to participate in the appreciation of real estate projects in which they are major tenants, while avoiding the costs associated with a major capital commitment to real estate.

The case of real estate presents several special problems that may result in a discount in the share price. For one thing, the costs for outside investors to ascertain the values of such real estate may be large enough to warrant a large discount, especially if management (1) does not know the value of its own real estate or (2) does know it but fails to communicate it to investors.

Second, investors may discount too heavily (if they consider it at all) the expected future value of real estate that produces no current operating cash flow—especially if they believe that management has no intention of selling or developing the real estate. For example, if prices of undeveloped land have risen dramatically but management does not inspire confidence that it has a plan to harvest such value, then investors may be justified in assigning low value to such growth options. Investors, after all, do not have the control necessary to realize hidden values.

Third, in the case of operating real estate, the fact that management persists in using assets with much-higher-valued alternative uses in marginally profitable operations would also warrant a large discount in the stock—again, provided management does not signal to the market its intent to sell or convert the asset.

Still another potential problem in valuing real estate arises even in the case of income-producing properties. Because accounting depreciation charges generally exceed true economic depreciation, the reported earnings of real estate companies typically understate the level of operating cash flow. And if the market responds mechanically to reported earnings, then it could systematically undervalue real estate assets, thus leaving companies prey to raiders concerned only about cash flow. But if markets do look through earnings to cash flow, as much academic research suggests, then accounting conventions should not lead to the undervaluation of real estate.

On the other hand, as mentioned earlier, the ability of acquirers to take over asset-rich companies, write up the value of acquired real estate assets to market, and then depreciate their values over shorter lives (provided by the Economic Recovery Tax Act of 1981) clearly provided an artificial stimulus to takeover activity in the early 1980s. Such a stimulus was removed, however, with the Tax Reform Act of 1986.

To summarize, then, besides the possibility of market inefficiency, information and control problems could be responsible for large disparities between stock prices and perceived real estate values. First, in the case of large industrial companies with dispersed real estate assets, the costs to investors of ascertaining such values may be very large. Second, even if the market knows the value of such assets, the remaining uncertainty about whether management will take steps to realize the value of such real estate options, and about when such steps will be taken, could lead investors to heavily discount real assets in setting stock prices.

The Role of Real Estate in Corporate Restructuring

The business environment of the 1980s, which featured widespread deregulation, heightened international competition, and increased shareholder activism, forced American corporations to reexamine many aspects of their operations in the attempt to increase shareholder value

(and, in some cases, to defend against raiders). By stepping up the urgency of management's search for efficiencies, these competitive forces produced an unprecedented number of mergers and acquisitions, divestitures, spinoffs, leveraged buyouts, and other major recapitalizations. Real estate assets were often a focal point in these restructurings.

As a consequence of this restructuring activity, corporate managements today are far more likely to question the traditional notion that corporations have a comparative advantage in owning real estate. It is important to remember that corporate real assets, while functioning as facilities in corporate operations, are part of local and regional property markets. And unless the company is a dominant force in a small local economy, the market value of those assets is typically governed by factors very different from those that drive the value of the firm's operating business. Developers and real estate investors are likely to be more alert to changes in property values, and to opportunities to take advantage of such changes, than a corporate management focused on operations.

Sale-Leaseback

An additional analysis that is relevant for a corporation that has owned real estate for some time is whether it should sell the real estate and lease it back from the new owner. This procedure would be attractive in cases where the company wants to sell the real estate but needs to continue to use the space because relocation is not practicable. In 1988, for example, Time, Inc., sold its 45 percent interest in its Rockefeller Center headquarters to the building's former co-owner, the Rockefeller Group, and then arranged a long-term lease.

Why might the corporation benefit from a sale-leaseback? In such cases, the corporation receives cash from sale of the property and, assuming that it still needs to use the real estate, leases the facilities back and makes lease payments. It also loses any remaining depreciation allowance on the book value on the building. However, it also removes the risk associated with the residual value of the property.

As discussed in the analysis of leasing versus owning, whether a corporation benefits from continuing to be an investor in the real estate will dictate whether to do a **sale-leaseback**. In fact, the analysis is very similar to that of leasing versus owning. There is one main difference: Because the corporation already owns the real estate, it has to consider the after-tax cash flow it receives from sale of the property (rather than the purchase price), as the amount of funds invested if it decides to continue to own the property.

The after-tax cash flow from sale will be less than the cost of purchasing the property if capital gains tax must be paid. Thus, the rate of return received on funds left in the property (if the company does not do a sale-leaseback) may be greater than if the company were deciding to own or lease the same property that it did not already own.

To see how we might analyze whether a corporation should sell and lease back space, we will extend the example we considered earlier in the lease-versus-own analysis. Suppose that five years ago, the corporation had decided to own rather than lease the real estate. Assume that it is now five years later and management is considering a sale-leaseback of the property. The property can be sold today for $2 million and leased back at a rate of $200,000 per year on a 15-year lease starting today. Exhibit 15–5 shows the after-tax cash flow if the property is sold today, taking into consideration that the company purchased the property five years ago for $1.8 million. Because it has depreciated the property over the past five years, the firm must pay capital gains tax of $135,000, making the after-tax cash flow from the sale today $1,865,000. By leasing instead of owning for the next 15 years, management must pay an additional $155,000 in after-tax cash flow each year.[24] Further, if the property is sold today, the firm will not receive the cash flow from sale of the property

[24] Alternatively, by continuing to own, the corporation saves $155,000 in after-tax cash flow.

at the end of the lease. We assume that the property will be worth $3 million at the end of the 15-year lease.

As shown in Exhibit 15-5, the *IRR* from owning versus leasing is 14.10 percent. This is the *return from continuing to own* instead of leasing. Alternatively, the *IRR* can be viewed as the *cost of the sale-leaseback financing*, that is, the cost of obtaining $496,000 today by

EXHIBIT 15-5
Sale-Leaseback

eXcel

www.mhhe.com/bf13e

Original price: (5 years ago)			
Land	$ 225,000	12.50%	
Building	1,575,000	87.50%	
Total	1,800,000	100.00%	
Depreciation	31.5 years		
Tax rate	30.00%		
ATCF if sold today:			
Reversion		$ 2,000,000	
Mortgage balance		−1,369,000	
Reversion	$ 2,000,000		
Basis	−1,550,000		
Gain	$ 450,000		
Tax		−135,000	
Cash flow		$ 496,000	
Lease payment		$200,000 (15-year net lease)	
Operating expense		50.00% of lease payment	
	Own	**Lease**	**Difference (Own − Lease)**
Sales	$1,500,000	$1,500,000	$ 0
Cost of goods sold	750,000	750,000	0
Gross income	750,000	750,000	0
Operating expenses:			
Business	200,000	200,000	0
Real estate	100,000	100,000	0
Lease payments	0	200,000	−200,000
Interest	−136,900	0	−136,900
Depreciation	−50,000	0	−50,000
Taxable income	263,100	250,000	13,100
Tax	78,930	75,000	3,930
Income after tax	184,170	175,000	9,170
Plus: Depreciation	50,000	0	50,000
Less: Principal	0	0	0
Cash flow	234,170	175,000	59,170
Reversion			$ 3,000,000
Mortgage balance			−1,369,000
Reversion		$3,000,000	
Basis (after 20 yrs.)		−800,000	
Gain		$2,200,000	
Tax			−660,000
Cash flow			$ 971,000
Year	0	1–15	15
Own − Lease	$−496,000	$ 59,170	$ 971,000
IRR	14.10%		

selling the property, then leasing it back. The return from continuing to own is slightly greater than in the original lease-versus-own example. Why? One reason is that taxes must be paid if the property is sold, which increases the benefit of continuing to own. Lease payments are also higher because market rents increased during the past five years. In this situation there are more benefits from owning because the higher lease payments are now saved. Should the firm choose to lease, higher lease payments offset the higher price of the property that would be realized if the property were sold and reduces the benefit of owning relative to leasing.

A sale-leaseback also has implications for the corporation's financial statements. As we discussed, sale of the property results in capital gains tax. At the same time, however, it allows the corporation to report additional income because of the gain on the sale. Additional income results in an increase in reported earnings per share. Managers may have the incentive to do a real estate sale-leaseback to recognize a capital gain when they want to show an increase in earnings per share. Sale-leaseback for that reason is not necessarily in the best interest of the corporation, however.

A sale-leaseback, like any asset sale, removes an option for potential raiders to use real estate as a means of financing. Provided management can profitably reinvest the sale proceeds in its basic business or returns the cash to shareholders, then the opportunity for outside investors to profit from takeover by selling or refinancing the real estate is foreclosed. Furthermore, if the company leases with a short-term lease, it retains its option to relocate. But if a company simply sells and then commits itself to a long-term lease, the ownership transfer may offer no economic gain. The capital inflow from the sale may simply be offset over time by the higher rent charged by the new owner. Moreover, if the sale triggers a large tax liability payment, then the transaction could actually reduce shareholder value.

Assuming, however, that companies can shelter capital gains,[25] corporate shareholders could benefit from sale-leaseback to the extent that U.S. institutional or foreign investors are willing to accept lower yields than the returns required by corporate investors (again, adjusted for risk and leverage). In such cases, the sale proceeds to the company could exceed the present value of the new lease stream as well as any forgone tax savings from ownership.

Another potential benefit of sale-leaseback is its role as a "signaling" device. To the extent investors have been unable or unwilling to recognize real estate values, a sale-leaseback clearly demonstrates those values to the marketplace. Perhaps equally important, a sale-leaseback, especially when combined with stock repurchases, may also persuade investors that management has become more serious about its commitment to increasing shareholder value. For companies in mature industries with limited investment opportunities, a sale-leaseback together with a large distribution to shareholders may add value by returning excess capital to investors.[26]

Still another possible benefit from sale-leaseback is to provide a source of capital that can be used to fund growth opportunities or to refinance existing high-priced debt. Fred Meyer, Inc., for example, recently sold and leased back 35 stores and a distribution center, thereby raising $400 million. Each store was leased for 20 years with a fixed-payment, net-lease rate and an operating lease structure that allowed off-balance-sheet treatment. This transaction effectively enabled the company to capture the full market value of real estate assets, use

[25] Of course, there will always be cases where sale-leaseback may be used to recognize gains from the sale of assets to offset any loss carry-forwards that a corporation may want to utilize.

[26] This is the substance of Michael Jensen's argument known as the "agency costs of free cash flow." For a nontechnical explanation of this concept and its reflection in corporate restructuring activity, see Michael Jensen, "The Takeover Controversy: Analysis and Evidence," *Midland Corporate Finance Journal* 4, no. 2 (Summer 1986).

Web App

A type of off-balance-sheet financing called "synthetic leases" became popular in recent years as a way for corporations to structure leases on real estate that they leased. Many tech companies financed the construction or purchase of their corporate headquarters with these types of leases. Use a search engine to find either a company that used this method or a site that discusses how these leases work. What were the major advantages and disadvantages of this lease structure? Are they still being used?

the sale proceeds to retire some of its higher-yielding debt, and retain control of the assets by means of long-term leases.

Refinancing

One reason that the corporation might be considering a sale-leaseback as discussed in the previous section is to raise capital. An alternative might be to refinance the real estate with a mortgage, especially if unsecured corporate financing sources were initially used. As discussed earlier, mortgage financing may be a substitute for corporate debt if it is shown on the balance sheet and increases the corporation's debt ratio. Thus, the corporation must consider whether a mortgage on the real estate can be obtained at a lower cost than unsecured corporate debt. An additional option available to the corporation is refinancing with a hybrid mortgage, as discussed in Chapter 12.

Investing in Real Estate for Diversification

Corporations may view ownership of real estate as a way of diversifying their business activities, leading to purchase of more real estate than it needs for its operations. For example, the corporation may decide to develop or purchase an office building that is larger than it needs for its own use. The rest of the office building is held as an investment.[27]

A corporation may also own space that was formerly used for the core business but is no longer needed. This excess space might be kept as an investment. In both of these cases, the question is whether the corporation has the expertise to own and manage investment real estate and whether the value of the company's stock will fully reflect the value of the real estate investments. That is, would the real estate be considered more valuable if held by a different entity such as a real estate investment trust or a real estate limited partnership? These investment vehicles will be discussed further in later chapters. The point here is that corporations need to determine whether holding real estate as an investment is in the best interests of their shareholders. Shareholders may prefer to have the corporation own only assets related to its core business.

Conclusion

This chapter focused on the decision to own or lease real estate that is used by a corporation as part of its core business. We showed the decision to own versus lease real estate to be similar to the pure real estate investment decision we analyzed extensively in earlier chapters. A key difference, however, is the impact that ownership or sale-leaseback of real estate can have on the corporation's financial statements. Whether a particular corporation should own or lease depends on whether it has a comparative advantage owning real estate relative to other investors or investment vehicles.

CFOs, realizing the importance of property to their bottom line and share price, are increasingly giving corporate real estate more attention. Facilities managers today must justify ownership of real estate against a variety of alternatives that combine the operating control provided by ownership with reduced investment and greater flexibility. Corporations are more likely to accept such alternatives, which include a variety of leasing forms as well as joint-venture ownership, as ownership becomes unnecessary to maintaining operating control of real estate.

[27] If the corporation needs to expand, building ownership can be an advantage because, in effect, the corporation has the first option on space in the building it owns when another tenant's lease expires.

Key Terms

capital lease, 449
corporate real estate, 436
hidden value, 449
lease-versus-own analysis, 437
off-balance-sheet financing, 449
operating lease, 449
residual value, 442
sale-leaseback, 451
special purpose buildings, 447

Useful Web Sites

www.reis.com—Provides commercial real estate trends, analytics, market research, and news that support transactions by real estate professionals.

www.corenetglobal.org—Corporate Real Estate Network, or CoreNet Global, is the premier organization for business leaders engaged in the strategic management of real estate for major corporations worldwide.

www.naiop.org/—National Association of Industrial and Office Properties. Trade association for developers, owners, investors, and asset managers in industrial, office, and related commercial real estate.

www.equiscorp.com—Company that focuses on managing corporate real estate.

Questions

1. What are the main reasons that corporations may choose to own real estate?
2. What factors would tend to make leasing more desirable than owning?
3. Why might the cost of a mortgage loan be greater than the cost of using unsecured corporate debt to finance corporate real estate?
4. Why might the riskiness of cash flow from the residual value of the real estate differ from the riskiness of cash flow from the corporation's core business? What would cause these cash flows to be correlated?
5. What would cause the rate of return for an investor that purchases real estate and leases it to the corporation to differ from the rate of return earned by the corporation on the incremental investment in owning versus leasing the same property?
6. Why might the decision to own rather than lease real estate have an unfavorable effect on the corporation's financial statements?
7. Why is the value of corporate real estate often considered "hidden" from shareholders?
8. How does the analysis of a sale-leaseback differ from the analysis of owning versus leasing?
9. Why is the cost of financing with a sale-leaseback essentially the same as the return from continuing to own?
10. Why might it be argued that corporations do not have a comparative advantage when investing in real estate as a means of diversification from the core business?
11. Why has real estate often been a key factor in corporate restructuring?
12. Why might refinancing be considered an alternative to a sale-leaseback?
13. What factors might cause the highest and best use of real estate to change during the course of a typical lease term?
14. Why should corporations have their real estate appraised on a regular basis?
15. What factors would tend to affect the value of a lease?

Problems

1. The ABC Corporation is considering opening an office in a new market area that would allow it to increase its annual sales by $2.5 million. Cost of goods sold is estimated to be 40 percent of sales, and corporate overhead would increase by $300,000, not including the cost of either acquiring or leasing office space. The corporation will have to invest $2.5 million in office furniture, office equipment, and other up-front costs associated with opening the new office before considering the costs of owning or leasing the office space.

   A small office building could be purchased for sole use by the corporation at a total price of $3.9 million, of which $600,000 of the purchase price would represent land value, and $3.3 million would represent building value. The cost of the building would be depreciated over 39 years. The corporation is in a 30 percent tax bracket. An investor is willing to purchase the same building and lease it to the corporation for $450,000 per year for a term of 15 years, with the corporation paying all real estate operating expenses (absolute net lease). Real estate operating expenses are estimated to be 50 percent of the lease payments. Estimates are that the property value will increase over the 15-year lease term for a sale price of $4.9 million at the end of the 15 years. If the property is purchased, it would be financed with an interest-only mortgage for $2,730,000 at an interest rate of 10 percent with a balloon payment due after 15 years.

   a. What is the return from opening the office building under the assumption that it is leased?
   b. What is the return from opening the office building under the assumption that it is owned?
   c. What is the return on the incremental cash flow from owning versus leasing?
   d. In general, what other factors might the firm consider before deciding whether to lease or own?

2. Refer to problem 1. Suppose that five years ago the corporation had decided to own rather than lease the real estate. Assume that it is now five years later and management is considering a sale-leaseback of the property. The property can be sold today for $4,240,000 and leased back at a rate of $450,000 per year on a 15-year lease starting today. It was purchased five years ago for $3.9 million. Assume that the property will be worth $5.7 million at the end of the 15-year lease.

   a. How much would the corporation receive from a sale-leaseback of the property?
   b. What is the cost of obtaining financing with a sale-leaseback?
   c. What is the return from continuing to own the property?
   d. In general, what other factors and alternatives might the firm consider in order to decide whether to do a sale-leaseback?

3. Refer to problem 1. ABC realizes that the benefits of leasing versus owning may be sensitive to many of the assumptions being made. Management wants to know how the return on the incremental cash flow from owning versus leasing is affected by different assumptions. (This problem is best done using a spreadsheet.)

   a. How would the return be affected by the corporation being in a zero tax bracket?
   b. How would the return be affected if the property value does not increase over time, if it remains constant?
   c. How would the return be affected if the mortgage were at an 8 percent (rather than 10 percent) interest rate?

eXcel
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4. **Excel.** Refer to the "Ch15 Lease_Own" tab in the Excel Workbook. How does each of the following affect the *IRR* on the *ATCF* difference from owning versus leasing?

   a. The property can be leased for $175,000 instead of $200,000.
   b. A loan can be obtained at an 8 percent interest rate instead of 10 percent.

Appendix

Real Estate Asset Pricing and Capital Budgeting Analysis: *A Synthesis*

Introduction

As we have discussed beginning with Chapter 11, real estate income property is usually valued from the point of view of the equity investor. That is, we discount the cash flows (before or after tax) available to the equity investor based on explicit assumptions about the cost and terms of the mortgage used to finance the property. We use an after-tax discount rate to discount the after-tax cash flows. When analyzing the after-tax basis, the calculation of the after-tax cash flow to the equity investor reflects the tax deductibility of interest. The amount of equity an investor is willing to invest represents the value of the equity position. The amount of loan that a mortgage lender will lend on the property represents the value of the mortgage position. The total property value is the sum of the value of the mortgage and equity positions.

In contrast, the traditional capital budgeting procedures shown in corporate finance textbooks suggests that after-tax cash flows produced by the project *before deducting any financing costs* should be discounted by a weighted average cost of capital that considers after-tax cost of debt and equity. Tax deductibility of interest on debt is treated in one of two ways: (1) the after-tax cost of debt is used when calculating the weighted average cost of capital, or (2) the tax shield created by the interest deduction on debt is added back to the after-tax cash flow produced by the project. In this latter case, the before-tax cost of debt is used to calculate the weighted average cost of capital. In both of these approaches, the after-tax cost of equity is included in the weighted average cost of capital.

This appendix demonstrates that all three approaches mentioned above are consistent and result in the same property value when applied correctly.

Mortgage-Equity Approach

As we saw in Chapter 9, the term *mortgage-equity analysis* is often used in real estate to refer to the valuation of real estate income property by explicitly considering how the property will be financed. For simplicity, in this appendix we assume that all cash flows are a level perpetuity, the loan is interest-only (no amortization), and there is no depreciation allowance.[1] In general, the value of the property can be found with the mortgage-equity approach as follows:

$$V = \frac{(NOI - r_d D)(1 - t)}{R_e} + D$$

where

V = Estimated property value

D = Amount of debt

NOI = Net operating income

t = Tax rate

r_d = Cost of debt (before tax)

R_e = Cost of equity (after tax)

Example

Assume that NOI is $115,000 per year. A loan (D) is availa[ble] for $800,000 with an interest rate (r_d) of 10 percent. T[he] investor's tax rate (t) is 20 percent and the investor's requi[red] after-tax rate of return (R_e) is 14 percent.

Using the preceding formula, we have:

$$V = \frac{(115{,}000 - .10 \times 80{,}000)(1 - .20)}{.14} + 800{,}000$$

$$V = 200{,}000 + 800{,}000$$

$$V = 1{,}000{,}000$$

Weighted Average Cost of Capital—Alternative 1

Use of a weighted average cost of capital assumes the project will have the same proportion of debt as in other projects. In the above example, debt represented 80 percent of property value. Assuming another project is undertaken with the same proportion of debt, the weighted average cost of capital is as follows:

$$R_a = [D/V \times r_d \times (1 - t)] + [E/V \times R_e]$$

where

R_a = Weighted average cost of capital

E = Amount of equity

D/V = Proportion of debt

E/V = Proportion of equity

The value of the property is found as follows:

[1] Assuming that cash flows are not level and that the project is sold after a finite holding period or assuming that there is a depreciation allowance does not change any of the conclusions of this appendix.

$$V = \frac{NOI(1 - t)}{R_a}$$

For the example considered earlier, we have:

$$V = \frac{115{,}000\,(1 - .20)}{[.80 \times .10 \times (1 - .2)] + (.20 \times .14)}$$

$$V = \frac{92{,}000}{.092}$$

$$V = 1{,}000{,}000$$

This is obviously the same answer as before.

Weighted Average Cost of Capital—Alternative 2

An alternative way of valuing the property is to adjust the after-tax cash flows available on the project for the tax shield associated with the deductibility of the debt. This tax shield is equal to the annual interest payment ($r_d \times D$) multiplied by the tax rate (t). In terms of the above symbols, the tax shield is equal to $r_d \times D \times t$. When the cash flows are adjusted by the tax shield, the cost of capital is calculated by using the *before-tax* cost of debt (r_d) rather than the after-tax cost. The after-tax cost of equity (r_e) is still used. In this case the value can be expressed as follows:

$$V = \frac{(NOI)\,(1 - t) + (r_d \times D \times t)}{(D/V \times r_d) + (E/V \times R_e)}$$

Note that the numerator in the above formula is not the cash flow to the equity investor. It represents the cash flow on the entire property plus an adjustment for the additional tax benefit associated with the debt.[2]

For the same example considered above, we have:

$$V = \frac{115{,}000\,(1 - .20) + (.10 \times 800{,}000 \times .20)}{(.80 \times .10) + (.20 \times .14)}$$

$$V = \frac{108{,}000}{.1080}$$

$$V = 1{,}000{,}000$$

Again, the answer is the same as before.

Conclusion

Use of the mortgage-equity approach is consistent with traditional capital budgeting procedures when valuing real estate. When using the mortgage-equity approach, the after-tax cost of equity is used in place of the weighted average cost of capital when discounting the cash flows produced after payment of interest. When using the traditional weighted average cost of capital calculation, an after-tax cost of debt and equity is used to discount before-tax cash flows. An alternative to the latter approach is to adjust the after-tax cash flow from the property by adding back an amount that represents the tax savings associated with the debt. When using this approach, a before-tax cost of debt must be used when calculating the weighted average cost of capital. In either case, the estimated value is the same as the mortgage-equity approach, which is typically used to value real estate.

We simplified the above analysis by assuming cash flows were perpetuities and that the debt was not amortized. This approach implies that the proportion of debt and equity remains constant over time. Analysts argue that corporations can maintain a target proportion of debt in their capital structure by alternating between issuing debt and equity. Thus, it may not be appropriate to value a *particular* project based on the amount of debt or equity used to finance that project. However, mortgage loans are typically amortized and are usually secured by a specific property. Refinancing is expensive and, therefore, it is not feasible to maintain a constant proportion of debt from year to year. As this appendix points out, the value produced by the mortgage-equity approach is the same as that found with traditional capital-budgeting techniques if consistent assumptions are made about the use of financing. However, because real estate is used as security for debt and refinancing to maintain a constant ratio of debt to assets is costly, using the mortgage-equity approach may be more appropriate because it allows financing to be considered explicitly.

[2] This adjustment does not necessarily assume that the use of debt adds to the value of the property relative to an unlevered property. It simply recognizes the fact that interest is tax deductible.

Chapter 16

Financing Project Development

Introduction

This chapter deals with financing the development of income-producing real estate projects such as apartment complexes, office buildings, warehouses, and shopping centers. Developers of such projects face changing conditions in the national and local economies, competitive pressures from other developments, and changes in locational preferences of tenants, all of which influence the long-run profitability of developing and operating an income-producing property. Together they affect the ability of the developer to acquire land, build improvements, lease space to tenants, and earn sufficient revenues to cover operating expenses.

Overview: The Planning and Permitting Process

Although this is not a textbook dealing with land planning, certain concepts and "terms of art" are important to understand when investing in a project development. By *project development*, we refer to the process of financing the acquisition of a tract of land with the intent of constructing a building, leasing, managing, and eventually selling the completed project. As a part of financing the acquisition of the land and estimating the nature and extent of development, certain regulatory terms and processes must be understood as these may affect (1) the size and the cost of the proposed development, (2) the price that an investor may pay to acquire the land, and (3) the price that a project may bring when it is sold. To introduce the reader to some of the basic development terms we have provided Concept Box 16.1. At the top of the box is a very brief check list of major concepts that are considered first when evaluating a tract of land for project development. These terms and selected others are then defined in the lower section of the box.

Permitting

The permitting process usually begins with an application which identifies the site, its location, and a preliminary design of the improvements to be constructed. This application is then used by public officials to verify compliance with its current zoning classification. If it complies, the permit is granted and the construction of the project may commence subject to building codes and inspections. If the permit is denied, the applicant will usually clarify or amend the application and will ask the city planning staff director to review it

This checklist is usually the first step that a developer reviews when evaluating a site for possible development.

1. Allowable uses per zoning classification.
2. Minimum lot size per zoning classification.
3. Maximum floor-to-area ratio (FAR).
4. Building bulk/density limits.
5. Setback/building line.
6. Building height limits.
7. Building footprint/envelope.
8. Parking ratios.

IMPORTANT TERMS/PROJECT DEVELOPMENT

Setback/building line—requirement to construct building a specified number of feet (setback) from the right-of-way line or other landmark. This is to ensure conformity with adjacent buildings and/or provide clear visibility for pedestrians and/or motorists.

Right-of-way line—area designated for a public street or alley that is dedicated for traffic, public use, utilities, etc. Public entities own this area and the general public has a right to use it. As a result, no improvements are generally allowed to be constructed on rights-of-way.

Building-related terms:

Footprint—the space/area included within the perimeter of a slab, wall, or exterior of a structure. It is the shape or outline of the primary building slab or foundation as it will be constructed on the site.

Envelope—the total outside perimeter of a structure, including footprints and any exterior patios, mallways, landscaping, etc.

Facade—the exterior, usually the main entrance of a structure; approval of facades may be required as a part of the preservation of a historically important building or because of unique architecture, etc.

Bulk—a three-dimensional space within which height, width, footprint, and number of structures/elevations/shapes are viewed in total relative to the land area upon which it will sit to determine land use intensity. This is then evaluated by planners relative to other structures in the area to assess the potential for congestion, noise, etc., for the entire area.

Building codes—refer to required materials and methods used to construct improvements within a jurisdiction. Adherence to these codes is enforced by inspections before a certificate of occupancy (CO) is issued.

Permit—document executed by the director of planning authorizing the construction, restoration, alteration, repair, etc., of a structure and acknowledging that it conforms to requirements under the applicable zoning ordinance.

Floor-to-area ratio (FAR)—one of the more important tools used by city planners to control size and activity (use) desired within a geographic area. It is usually calculated as gross building area divided by square footage of land area. For example, an FAR of 3 to 1 would, for one acre of land (43,560 sq. ft.), provide that a structure with a gross building area of 130,680 sq. ft. may be developed ($3 \times 43{,}560 = 130{,}680$). Obviously, the greater the FAR allowed for a site, the larger the project that may be constructed on that site, and vice versa.

Height restrictions—used to limit the vertical height of a structure to be constructed. Usually imposed by a zoning ordinance; however, also subject to FAA aircraft

approach/landing requirements and FCC communication tower reg
locations usually have lower restrictions than central business districts
ally allow both greater heights and FARs.

Allowable use—user activities permitted in a zoning classification, s
agency, insurance agency, etc. Usually based on SIC code classificati

Impact fees—charged by public entities to cover added public s
pected to be caused by a development, such as added traffic contro
sues, drainage, etc.

Incentive zoning—used by city planners to accomplish communi
ously with private sector development. Examples include the public se
veloper additional FAR, height, density, etc., if a development in
housing or a public park.

Inclusionary zoning—that part of a zoning ordinance that requi
type of development be included in order to obtain a permit for tha
clusion of low-income housing units must be included in a multifar
opment for a permit to be granted.

Minimum lot size—per zoning classification. Examples include ligh
no minimum), medium industrial (5 acres), heavy industrial (10 acres
idential (1/4 acre per lots), multifamily (20 units to the acre, i.e., 24
acres). This is used to assure some separation between large-scale de

Parking ratio—required number of parking spaces per sq. ft. of g
or per number of apartment units. Examples: one parking space per
fice space, or 1.5 spaces per apartment unit. Different ratios may app
or elevated parking garages, surface parking, and shared parking (da
structures.

Site plans—drawing done to scale depicting the placement relat
lines and setbacks of structures, circulation, parking, buffers, major la
a site.

Elevations/renderings—may first be conceptual or preliminary, th
nal drawings of the improvements (buildings, etc.) to be constructed
ally accompany the site plan as a part of presentation materials u
zoning, and financings.

Traffic counts—number of vehicle trips per hour past a specific site
to ascertain the current traffic volume and the likely increase to be ca
ment. This study may be required as a part of an application for a p
assessing impact fees by public entities.

Encroachment—occurs when the construction of improvements ex
erty line on to an adjacent property.

Property tax abatements—forgiveness of taxes for a specified
which is used by city planners to attract development to certain l
would include property tax reductions for a hotel if constructed near a
center, sports facility, etc.

Special sales tax districts—special sales tax imposed on retail a
which is dedicated to be used to finance public improvements/street
or dedicated to pay interest on public bonds issued to construct facil
district.

Land-to-value ratio—calculated as dollar value of land to total pr
ing land) anticipated upon completion of project. Used as a benc
whether the ratio of land acquisition price relative to total project val
that of other projects in the market.

Buffer/berm—construction of landscape/slope required to shield or block access, view, or noise from an adjacent property which may be a very different and/or nonconforming use.

Density transfer or transfer of development rights (TDR)—allowed in some jurisdictions whereby one property owner can sell/transfer to another all or part of the development rights for his property, including allowable building height, density, and FAR, allowed under current zoning. This enables the acquiring entity more height and/or density for its development than what would otherwise be possible.

Mixed use development—usually a combination of office, retail, and/or hotel in a project; may also include recreation, sports facilities, etc.

Inverse condemnation—results of a development that affects the value of nearby/adjoining land uses. Examples: building an airport, dam, power stations, etc., in an area that affects property values to a greater/lesser degree but may or may not require condemnation of the entire area via eminent domain.

Cumulative zoning—used in many jurisdictions to automatically allow lower density development than the maximum allowed under current zoning. Example: the most dense, noisy, etc., land use is usually heavy industrial zoning. Under cumulative zoning, land owners in an area zoned heavy industrial may develop less intrusive buildings, such as distribution centers, warehouses, etc., *within* the heavy industrial classification. Other examples would allow single family units (lower density) to be built within a multifamily zoning classification (higher density). However, more intrusive uses are not allowed in a less intrusive zoning classification (e.g., no multifamily development within an area zoned for a single family).

Stacking plan—a floor-by-floor template or layout used to diagram how much space will be available for lease per floor in a building and to track the location and quantity of space currently leased to tenants.

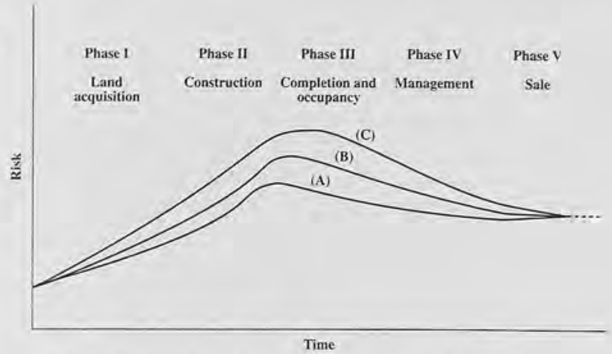
again. If denied again, the applicant usually has the right to a hearing before a subcommittee (zoning and planning) of the city council. A staff recommendation is usually made by the city planning department to this subcommittee regarding the application. It should be stressed that at each step in the process, the planning staff and the applicant engage in a series of negotiations (communications) in which problem areas of the proposed development are discussed. Modifications are usually offered by the applicant. However, in many cases this process fails and a series of appeals and/or reapplication is made by the developer. If the application continues to be denied, the applicant has the right to a hearing before the entire city council. The city council will usually vote to do the following: (1) approve the application, (2) deny and remand the application back to the planning staff, or (3) deny the application with prejudice (meaning that the specific application in question cannot be resubmitted by the developer again for approval).

The Development of Income-Producing Property

As the introduction points out, many types of income property may be developed, and each has its own special set of characteristics. Differences in market demand affect the economic feasibility of each of them. However, a few general concepts are common to all project developments.

The simplified diagram in Exhibit 16–1 shows the typical development process. With the possible exception of the management phase, this process is generally applicable to

EXHIBIT 16–1
Phases of Real Estate Project Development and Risk



(A) Greater than normal predevelopment leasing, completion ahead of schedule.
(B) Normal predevelopment leasing, completion on schedule.
(C) Lower than normal predevelopment leasing, completion behind schedule.

most categories of project development. Essentially, a developer (1) acquires a site, (2) develops the site and constructs building improvements, (3) provides the finish-out and readies the space for occupancy by tenants, (4) manages the property after completion, and (5) may eventually sell the project. How long after development the developer sells the project depends on the business strategy employed. The project has been an economic success if its market value exceeds the sum total of the land and development costs extended to complete it. It is in this sense that developers are said to "create value." That is, by combining land and building improvements, in any way that is highly valued by rent-paying tenants, the developer creates value in excess of the sum of the cost of individual components.

Developers' business strategies can be categorized in three general ways. First, many development firms undertake projects with the intention of owning and managing them for many years after completion. These developers view leasing and management as integral part of their business in addition to the development function. Second, some developers expect to sell their developments after the lease-up phase, or when normal occupancy has been achieved. These developers usually sell projects to institutional investors such as insurance companies or other investment entities, or they may sell completely or in part to syndication firms that form limited partnerships. In these cases, even though they sell the project, development companies may continue to manage them. Third, some developers, particularly those involved in a combination of land development and the development of commercial property such as business parks and industrial parks, normally develop land and buildings for lease in a master-planned development. However, they may also build to suit for single tenants.

The point is that many developers intentionally *specialize* their business activities in one or more phases of the generalized diagram shown in Exhibit 16–1. Those developers intending to sell soon after lease-up rely heavily on external contractors, architects, real estate brokers, leasing agents, and property managers to accomplish much of phases II through V. Alternatively, very large, integrated development firms with activities in many regional markets find it profitable to provide most of the functions shown in the exhibit themselves, using external firms only when it is cost-effective to do so. For firms on both ends of the spectrum, however, it is possible that an unanticipated sale of a project may occur in any phase of development. Most developers are never averse to considering a serious offer to purchase a project at any time.

Market Risks and Project Feasibility

Exhibit 16–1 also depicts a typical risk scenario in a "normal" market, as represented by case (B), or one in which market rents are believed to be sufficient to justify development (a subject that we will elaborate upon later in the chapter). Risk begins with land acquisition and increases steadily as construction commences until expected cash flows from the leasing phase materialize. After lease-up is completed, occupancy takes place and the property management phase begins. At that point, project risk declines because tenants are committed to leases with terms of varying lengths. Assuming that the property is performing well, it is during phase IV that it may be described as a **seasoned property.** An example of a market scenario with less risk is shown as case (A), where market demand for space is increasing and predevelopment leasing, or leasing *prior* to project completion, is occurring at an "above normal" rate, thereby increasing expected cash inflows. The expected increase in cash inflows usually reflects a greater-than-anticipated demand for the type of space being developed and therefore a reduction in project risk. Obviously, if market demand and expected revenues were to decline or if the time required for the leasing phase lengthened considerably, as in case (C), project risk would increase dramatically. Factors such as construction delays, price increases in materials, and interest rate increases cause changes in project risk.

Although regional and urban economics and employment are not the focus of this book, it should be clear that factors determining the demand for the type of space (e.g., office, retail, warehouse) being developed are critical to project risk. These factors may manifest themselves in current market indicators, such as vacancy rate levels, rent levels, or the extent of predevelopment leasing commitments from tenants. A very good understanding of the underlying economic base of an urban area or region is critical when assessing the viability of real estate development because not only is the demand for rental space important during development, but it is important long *after* development is completed. Demand may decline and rents may fall in markets at any time, and tenants may find more attractive space at lower rents. Simply because a project has been developed and leased up does *not* mean that it is no longer vulnerable to competition. As space in new developments is supplied to the market, owners of existing projects become subject to the possibility of a loss in tenants. Indeed, many developers are not willing to undertake this longer-term market risk and the intensive amount of property management necessary to retain tenants. As mentioned earlier, they may prefer to sell to institutional or other investors who are willing to specialize in real estate managing and leasing and bear that risk.

To illustrate a preliminary study dealing with how a project meets preliminary market tests regarding success or failure, we provide Concept Box 16.2, which reviews a feasibility analysis for an apartment project.

Contrasted with developers who generally sell projects shortly after lease-up, larger, more geographically diversified developers may be willing to manage projects in various regions. They view this risk in the context of a portfolio in which risks emanating from longer-term economic growth and declines in individual regions can be sufficiently diversified to provide an adequate risk-adjusted return on their total property holdings. These firms may derive other benefits from continuing to perform the leasing and property management functions after development is completed. One benefit is that leads for future development opportunities may be obtained from the existing tenant base under management. These leads can take the form of (1) expansion of existing tenant facilities, (2) expansion opportunities in other cities as the businesses in which existing tenants are engaged need facilities to pursue growth opportunities elsewhere, and (3) development of different product types (e.g., the development of an office building for a satisfied tenant who currently leases warehouse space elsewhere).

Concept Box 16.2

Preliminary Feasibility Analysis—Apartment Project Development

I. Physical Feasibility:

1. *Goal:* To provide a preliminary development plan analysis to determine whether an apartment project can be built on a specific site in accordance with regulatory requirements and leased at current rental rates in order to justify land acquisition.
2. *Site:* 10 acres, or 435,600 sq. ft.
3. *Asking price:* $2,800,000
4. Basic project description/zoning:
   a. Setback requirements: 15%
   b. Circulation requirements: 15%
   c. Maximum units per acre: 24 (based on a unit mix of 1-, 2-, and 3-bedroom apartments; weighted average = 900 sq. ft. per unit)
   d. Parking requirements: 1.5 spaces per unit @ 400 sq. ft. per space
   e. Open space, berms, landscape, support area: 1.0 acre (required) based on 240 units
   f. Maximum building height: 2 stories
5. *Physical Feasibility* (in square feet):

a. Gross land area	435,600
Less: Setbacks	65,340
Circulation	65,340
Open space/support/other	43,560
b. Area available for building development:	261,360
Less: Surface parking, 240 units × 1.5 spaces × 400 sq. ft.	144,000
c. Net surface area available for building	117,360
d. Proposed total footprint areas for buildings, (240 units × 900 sq. ft.) ÷ 2 stories	108,000
Excess or (deficiency) over zoning requirements:	9,360

Conclusion: It appears that the site can accommodate a 240-unit apartment project and comply with zoning requirements.

II. Financial Feasibility:

1. Construction cost per unit: $80,000 × 240 units	$19,200,000
2. Asking price for land:	2,800,000
Total project cost:	$22,000,000[1]
3. Gross revenue after lease up and stabilization:	
Market rent: $1.10 per sq. ft. @ 900 sq. ft. @ 240 units × 12	$ 2,851,200
Less:	
Average vacancy (5%)	142,560
Operating expenses (35%)	997,920
Net operating income	$ 1,710,720
4. Return on total cost ($1,710,720 ÷ $22,000,000)	7.8%
5. Value:	
a. If cap rate = .078	$22,000,000
b. If cap rate = .08	$21,384,000
c. If cap rate = .07	$24,439,000

III. Conclusion: Project may be feasible if the investor/developer is willing to accept a total return cost of 7.8%. If, upon completion, investors are pricing projects at a cap rate of .08, it would not be feasible because value ($21,384,000) is less than cost ($22,000,000). If projects are being priced at cap rates of .07, the project would produce a sizable development profit of $2,439,000 (or $24,439,000 − $22,000,000).

[1] Includes all infrastructure (roads, drainage, utilities, sewer costs), land and building cost

Project Risks

The general market demand and leasing activity are not the only sources of risk that developers must consider in project development. Obviously, the location of the site to be acquired for the project development is an important consideration because its spatial proximity to other sites in an urban area will affect the cost of doing business for tenants or the demand for the product or service that tenants are selling. It follows that the better the spatial proximity, or location, as perceived by the tenant, the greater the value of site. When developers acquire sites in a given market, the cost of acquisition is an important determinant of the quality and cost of building improvements. Generally, as the cost of a given site increases, the building improvements will be of higher quality and will cost more to develop. Further, as the price of the land increases, the site is likely to be more densely developed. These basic economic relationships partially explain why certain areas of cities, such as downtowns, are more densely developed with high-rise office buildings while suburban areas are less densely developed (e.g., warehouses on relatively low-cost suburban or agricultural land).

A few of the major components for which cost and quality can be differentiated include physical design, functionality in interior layout, quality of interior finish, density on the site and its adequacy of access and egress from transportation, amenities (dining, athletic, retail, etc.), landscaping, parking and circulation on the site, common areas, elevators, quality of heat, ventilation, and air-conditioning (HVAC), and exterior finish (granite, aggregate, wood, etc.). Because of uncertainty about how the quantity and quality of services provided as a part of the development should be combined or "packaged" to meet demand, each of these elements presents a potential source of project risk.

Not all new projects are initially constructed as luxury "class A" space, which is usually complemented with higher-quality interior, exterior, and mechanical components. Indeed, many large national corporations seeking to expand facilities will have set policies regarding the quality of space necessary for various categories of employees. They may provide some employees involved with primary customer contacts (such as marketing) with relatively high-quality space; on the other hand, they may not see the need for such costly space for support services (accounting, computer, etc.). Indeed, if the majority of the expansion space will be required for support service, not only will the corporate tenant be looking for a facility with average finish and construction quality, but also the tenant may prefer a suburban location. Proximity to a residential location for its employees may be an extremely important corporate consideration, since a support facility does not usually involve customer contact. On the other hand, a building to be occupied by tenants who have frequent face-to-face contact with customers (law firms, high-fashion retail shops) generally require facilities with significantly higher finish costs.

The point is that investors must examine the demand for space in terms of the characteristics of the demand by *end users* (tenants) in a given market. This demand, in turn, depends on the type of employment in the local market and the nature of the functions that tenants will perform. Only by understanding the local economy and the nature of employment can the developer anticipate demand accurately and produce or supply the quantity and quality of space in the proper combination to satisfy market demand.

Project Development Financing—An Overview

In phase I of Exhibit 16–1, the developer may use equity or combine equity with debt financing to acquire the land, perhaps after taking an option to purchase the land (to be discussed in Chapter 17). The developer may provide the equity capital, or it may come from a partnership between the developer and the landowner or other investors. Should the developer

expect to move forward on the project immediately after land acquisition, he may negotiate a loan for the cost of constructing improvements, providing his equity requirements from one or a combination of the sources just described. Generally, the loan used for funds to construct the building and other site improvements is referred to as a **construction,** or **interim, loan.** This loan usually comes from a commercial bank, a mortgage banking company, or, in some cases, a savings and loan association. It is generally based on a combination of (1) the appraised value expected upon completion; (2) the **hard costs** of construction (such as materials and labor for site improvements); and (3) **soft costs,** such as leasing costs, planning costs, and management. It may also include some of the costs of finishing the interior space for tenants through the lease-up stage. If the developer owns the land free and clear of debt, it may also be possible to obtain additional financing using the value of the land as security. Lenders prefer to make loans in amounts closely related to the cost of improvements. When possible, they prefer not to finance large amounts of soft costs or off-site improvements as these items *may not* be recovered in the event that the development encounters financial difficulty. However, in a rapidly expanding market, competition among lenders may result in more flexible lending policies. Also, in most cases when interim financing is sought, the developer is personally liable for the note. When construction is complete and the project is leased, the lender may fully or partially release the developer from personal liability. At this point the note becomes nonrecourse against the borrower/developer.

There are three general loan structures that are used to finance development.[1] Generally, the structure chosen will depend on what the developer expects to do with the property after construction and leasing are completed. In most cases developers expect to do one of three things:

1. The property may be sold upon completion and lease-up to investors who want to own real estate but who do not want to bear the risk of development and initial leasing. In this case, the difference between the developer's cost and the price received for the completed property represents profit to the developer. In this case, the developer will usually consider short-term financing structures.
2. The developer may retain ownership with the expectation that she will continue to manage, operate, and lease the property as an integral part of her business. Many developers maintain relationships with tenants and may have opportunities to develop and lease to them if future expansion becomes necessary. In this event, a developer will seek a longer-term financing structure. This may consist of two loans, a permanent loan and a construction loan.
3. A developer may consider the sale or refinancing of a property upon completion. This is an option that combines elements of (1) and (2) above. In this case, the developer may seek short-term construction financing, coupled with either an option, or a commitment, to extend financing for one or two years beyond the construction period. This allows additional time beyond construction to (1) prepare the property for sale, or (2) provide additional financial data from operations to lenders. The latter may provide the opportunity for refinancing at more attractive interest rates as the project should be less risky to lenders. Many of these loans may have maturities ranging from five to seven years and are commonly referred to as **mini-perm loans.** However, the downside of this strategy is that interest rates may be higher than was the case when construction began and the developer may be forced to pay a higher interest rate than may have otherwise been available had a precommitment for a permanent loan been made at the beginning of the development process. If this strategy was chosen, a developer should also investigate the possibility of an interest rate swap or hedge against higher interest rates. After the lease-up stage is completed and normal occupancy levels are achieved, the interim loan will usually be repaid by using either proceeds from the sale of the property or funds obtained

[1] There are many possible loan structures. We focus on three commonly used forms in this chapter.

from a permanent mortgage loan. Permanent loans usually come from life insurance companies, pension funds, or, in some cases, large commercial banks.

In cases where a developer expects to have long-term ownership of a property, a commitment for permanent debt financing may be acquired *before* a commitment for the construction loan is obtained. Even in cases where developers expect to sell or refinance property when a project is completed, if leasing market conditions warrant it, the interim lender may require the developer to obtain a permanent loan commitment or to provide contractual evidence that he will sell the project to an identified buyer before the maturity date of the interim loan. Justification for such loan requirements may occur if the demand for space in a local market is expected to weaken, but the likelihood of sale of a project upon lease-up is high. Too much **speculative** and **open-ended construction lending** in a local market may result in significant overbuilding or an excess supply of space, which in turn may result in more vacancies and a reduction in rents. Property values may then decline, resulting in foreclosures.[2] In this case, a construction lender may want more assurance that the loan will be repaid from a sale or from a permanent loan committed to by another lender.

Lender Requirements in Financing Project Development

When developing income properties, the developer may find the process of obtaining financing more complicated because in some cases *two* lenders, construction and permanent, are involved. Hence, the developer must satisfy *two* sets of lending criteria. *While many components of these two criteria may be the same, some will be specific to each of the lenders.* A further complication is that the nature of the agreement reached with the permanent lender may affect the nature of the agreement that must be reached with the construction lender. When a permanent lender considers making a take-out commitment, that lender is literally "taking out" the construction lender and releasing that lender from any further lending responsibility to the developer. The take-out agreement may create a problem for a developer in that if the requirements of the commitment (lease-up requirements, lease approvals, etc.) are too stringent, it may be difficult to find a construction lender who is willing to comply. In this situation the developer's financing options are narrower and considerable delay may result. Exhibit 16–2 will help you understand the process of obtaining project financing and the nature of the documentation that is generally required by both lenders.[3]

Loan Submission Information for Loan Requests—An Overview

While many of the items in Section A of Exhibit 16–2 are self-explanatory, the initial submission to the *lender* will focus on what can be developed on the site; that is, it will provide a fairly detailed description of the size, design, and cost of the project. The submission will also provide a detailed market and competitive analysis, identify the team that will develop the project, and document all public approvals obtained or needed relative to zoning and permitting. Detailed pro forma operating statements and a set of financial statements from

[2] Many observers believe that the availability of funds is the primary determinant of development activity. Indeed, these observers believe that if funds are available, developers will build regardless of general market indications because they are so optimistic that they believe that their individual projects will always succeed in spite of the nature of competition and local market conditions.

[3] The information contained in Exhibit 16–2 is not meant to be an exhaustive list of required documentation and requirements for obtaining loans. For a good treatment of legal considerations in construction lending, see Richard Harris, *Construction and Development Financing* (New York: Warren, Gorham, and Lamont, 1982).

EXHIBIT 16–2 General Submission and Closing Requirements for Project Development Loans

A. General requirements for a loan submission package.
  1. Project information.
    a. Project description—legal description of site, survey, photographs of site, renderings of building and any parking facilities, development strategy and timing.
    b. Site and circulation plan, identification of any easements, availability of utilities, description of adjacent land uses, soil tests.
    c. Plans for building improvements. Detailed list of amenities.
    d. Identification of architect, general contractor, principal subcontractors. Supporting financial data and past performance of parties. Copies of any agreements executed among parties. Description of construction and development procedures.
  2. Market and financial data.
    a. Full set of financial statements on the borrower and any other principal project sponsors, past development experience, list of previous project lenders.
    b. Pro forma operating statement. Detail on proposed leasing terms to tenants, including base rent, escalations, expense stops, renewal options, common area expense allocation, overage (retail leases), finish-out allowances, other commitments.
    c. Detailed cost breakdowns, including:
      - Any land acquisition costs.
      - Any necessary land development costs.
      - Any required demolition costs.
      - Direct or hard costs with breakdowns for excavation, grading, foundation, masonry, steel work, drywall or plastering, HVAC, plumbing, electrical, elevator, and other mechanical items, any special finish-out or fixtures.
      - Indirect or soft costs, including architects, engineering fees, legal fees, property taxes, interest-construction period, development fees, insurance and bonding fees, estimated contingency reserve, anticipated permanent loan fees.
    d. Any executed lease commitments or letters of intent from tenants detailing all terms of leases.
    e. Market study and appraisal, including all comparables and detached schedule of rents charged by competitors.
    f. Loan request, terms, anticipated interest rate, amortization period, anticipated participation options.
    g. Equity to be provided by developer and/or other sponsors (cash and/or land); anticipated financing of draws/repayment.
  3. Government and regulatory information.
    a. Statement as to zoning status.
    b. Ad valorem taxes, method of payment, reappraisal dates.
    c. All necessary permits, evidence of approved zoning variances, etc. (see list in Exhibit 17–[illegible]).
  4. Legal documentation.
    a. Legal entity applying for loan (evidence of incorporation, partnership agreement).
    b. Statement of land cost or contract evidencing purchase.
    c. Detail regarding deed restrictions, etc. (see Exhibit 17–2).
    d. Subordination agreements (see Exhibit 17–2).
    e. Force majeure provisions (events beyond the control of the developer such as an "act of God").
B. Additional information needed for interim loan package (if two loans are used).
  1. A copy of the permanent or standby commitment from the permanent lender. Details on the amount, [illegible] term, fees, options relative to prepayment, calls, and participation. Details on contingencies that the developer must meet before the commitment is binding (the chapter explains these contingencies).
  2. *Detailed* architectural plans and specifications.
  3. *Detailed* cost breakdown.
  4. All data relative to requirements listed in Part A and *updated* as appropriate.
  Assuming that (1) upon review of all relevant materials in A and B, the interim lender makes a commitment and (2) the developer goes forward with the project, the next step will be to close the interim loan.
C. Interim lender closing requirements.

EXHIBIT 16–2 General Submission and Closing Requirements for Project Development Loans (concluded)

1. Project information: *final* drawings, cost estimates, site plan, etc.
2. Market and financial information: statement that no adverse change in borrower's financial position has occurred since application date.
3. Government and regulatory information: all necessary permits, notification of any approved zoning variances, etc. (also see list in Exhibit 17–2).
4. Legal documentation.
   a. Documentation indicating that the permanent lender has reviewed and approved all information in Part A and all updates in Part B.
   b. All documentation relative to contracts for general contractors, architects, planners, subcontractors. Evidence of bonding, conditional assignment of all contracts to interim lender. Agreements of all contractors to perform for interim lender. Verification of property tax insurance contracts, etc. (see list B in Exhibit 17–2 dealing with closing requirements in land development financing).
   c. Inventory of all personal property that will serve as security for the interim loan (particularly important for shopping centers and hotels).
   d. Any executed leases and approvals by permanent lender.
   e. Copies of ground leases and verification of current payment status by the lessor/owner.
   f. The interim lender will also insist on an assignment of all leases, rents, and other income in the event of default *and* a guarantee of loan payments by the borrower (personal liability). After review of all items indicated above, the interim lender will provide the borrower with a loan commitment detailing the terms of the loan, including amount, rate, term, fees, prepayment and call options, and any participations. However, the *permanent* lender may require certain agreements with the interim lender, including a buy-sell agreement or triparty agreement (discussed in chapter).

D. Permanent lender closing requirements. These requirements are necessary *if* the developer (1) completes construction and (2) satisfies all contingencies (including lease-up requirements) contained in the permanent loan commitment before the expiration date of the permanent commitment.
1. Market and financial data.
   a. Statement of no material changes in financial status of borrower, or,
   b. A certified list of tenants, executed leases, and estoppel certificates indicating verification of rents currently being collected, any amounts owed, and any dispute relative to payments on finish-out costs agreements with the developer.
2. Project information.
   a. Final appraisal of project value.
   b. Final survey of building on site.
3. Government and regulatory information.
   a. Updates on currency of property taxes.
   b. Certificate of occupancy issued by building inspector.
   c. Other permit requirements (fire, safety, health, etc.)
4. Legal documentation.
   a. Delivery of the construction loan mortgage (if assigned to the permanent lender).
   b. Architect's certificate of completion with detailed survey and final plans, etc.
   c. Endorsements of all casualty and hazard insurance policies indicating permanent lender as new loss payee.
   d. Updated title insurance policy.
   e. Updated verification on status of ground rents (if relevant).
   f. An exculpation agreement, relieving the borrower of personal liability (if applicable).
   g. Lien releases from general subcontractors and verification of any payments outstanding and proposed disposition.

the borrower or borrowing entity will also be included. As just indicated, if the permanent lender gives the developer an indication of interest in financing the project, the permanent lender will request more detailed information, and the developer will be required to support the assumptions used in the pro forma operating statements from the market analysis and

provide other data requested. Assuming that the developer provides data to the satisfaction of the lender, the lender usually issues an *intent* to provide financing, and the developer may proceed to work on much more detailed cost breakdowns, drawings, plans, and so on. This intent to finance is usually necessary before the developer invests additional funds in more detailed planning. However, this detailed planning must be completed before the permanent lender issues a *commitment*. The interim lender, who will be monitoring construction progress and compliance with plans and specifications, will certainly require detailed plans. The methods used to underwrite and analyze market and financial data will be covered in a case example later in the chapter.

The information in Part A of Exhibit 16–2 will generally not be complete when the developer first approaches a permanent lender for funding, because in most cases the development concept and strategy will not be finalized. Keep in mind that the submission should contain as much information as possible; however, both lenders will have specific questions and requests for supporting data that the developer must provide. Hence, obtaining both permanent and construction financing should be viewed as a continuing process between all of the parties that may take several rounds of review by all concerned before any written commitments are made.

The Permanent or Take-Out Commitment

Assuming that an interim *and* a permanent loan are to be used, the permanent lender makes a commitment in writing and specifies *contingencies* (to be discussed in more detail below) that the developer-borrower must meet before the permanent lender's commitment becomes legally binding. When these contingencies are met, the permanent lender will provide funds for the developer to repay the construction loan. If any of the contingencies in the take-out commitment are not met, the permanent lender is not obligated to fund the permanent loan. In this event, the developer must seek another permanent loan, or the construction lender may have to continue to carry financing on the completed project, or the developer may face a foreclosure proceeding initiated by the interim lender when the interim loan expires. The intent of the take-out commitment, then, is to create a legally binding agreement between the developer and permanent lender, whereby the permanent lender fully intends to make a long-term loan on the property after the building is completed, satisfactory levels of leasing have been accomplished, and other contingencies have been satisfied.

Standby Commitments

Standby commitments may be obtained occasionally from a "standby" lender (1) when the developer cannot or does not want to pay fees to obtain a permanent loan commitment, (2) because the borrower expects to find a permanent loan commitment elsewhere after construction is under way and preleasing occurs on better borrowing terms, or (3) because the developer is planning to sell the project upon completion and lease-up and does not believe a permanent loan will be needed. Like the permanent loan, standby commitment funds are used to repay the construction loan. While standby commitments are similar to a permanent take-out loan in terms of the contingencies and other contents of the agreement, they differ from permanent take-outs in that neither the borrower nor the standby lender really *expects* the standby commitment to be used. However, because the developer-borrower wants to begin development, and the interim lender wants assurance of a take-out, the developer may have to find a standby commitment *at the insistence* of the interim lender. If the developer does not sell the project or if a permanent take-out cannot be found upon completion of the project, then the standby commitment will be used and the permanent loan will be closed with the lender who made the standby commitment.

Even though permanent lenders who offer standby commitments charge a commitment fee and are legally bound to deliver mortgage funds on the completion date, many banks are unwilling to make construction loans when a borrower has only a standby commitment because the commitment is made with a low expectation of being used. In many cases, should the borrower decide to use the commitment, the standby lender may be very inflexible concerning contingencies in it. For example, lenders who have issued standbys may look for "technical violations" of contingencies in the commitment (e.g., minor changes in construction plans and substitution of building materials that were not approved by the standby lender). One problem interim lenders face is determining when the developer and provider of permanent funding *intend* a commitment to be permanent and when they *intend* it as a standby. The agreement may not have explicit wording as to whether it is a take-out or standby commitment. Careful analysis of the permanent funding agreement the developer provides is important because if market conditions change, the developer and interim lender may consider the standby lender legally bound to provide funds, while the standby lender may balk because of the expectation that the project would be sold or long-term financing would be found on more attractive terms and the standby lender would not have to deliver.

Contingencies in Lending Commitments

When a developer obtains a permanent loan commitment prior to actual development and prior to obtaining a construction loan, the permanent lender usually includes **contingencies** in the commitment. In cases where an interim loan or mini-perm loan is to be used, many of these same contingencies must be satisfied before a lender is willing to release the developer from personal liability, thereby making the note *nonrecourse* against the borrower. As pointed out, if the developer does not fulfill the requirements under these contingencies, the permanent lender does not have to fund the loan. Common contingencies found in take-out commitments obtained from permanent lenders include these:

- The maximum period of time allowed for the developer to acquire a construction loan commitment.
- Completion date for the construction phase of the project.
- Minimum rent-up (leasing) requirements and approval of all major leases in order for permanent financing to become effective.
- Provisions for gap financing should the rent-up requirement not be met.
- Expiration date of the permanent loan commitment and any provisions for extensions.
- Approval of design changes and substitution of any building materials by the permanent lender.

Essentially, these items represent common contingencies that must be negotiated before a lender issues a permanent loan commitment. When financing is being sought on proposed projects, these contingencies are especially important because they establish that the permanent loan will be made when the developer has performed as promised.

These contingencies are indispensable to permanent lenders because they require that developers carry out certain responsibilities during development or prior to the expiration date of the permanent commitment. For example, the first two provisions in the preceding list require that the borrower have a specified time to find an interim lender willing to make a loan to cover construction and development costs, and that the project be completed by a specific date. The permanent lender must rely on a local lender such as a bank to provide construction, or interim, funds and to monitor construction quality. Because large permanent lenders are usually life insurance companies, pension funds, and the like, they are not likely to be located in the city where the project is to be developed. The completion date contingency provides an incentive for developers to work as efficiently as possible toward completing construction and leasing the building space or face the possibility of losing the loan commitment.

As for leasing requirements, this contingency is used to help assure permanent lenders that local economic conditions that are being used to justify the appraised value and feasibility of the project are favorable. The permanent lender requires a provision such as this to shift some project risk to the interim lender, who should be very familiar with the local market and who specializes in construction lending in that market. The interim lender must carefully consider conditions in the local market because should the project not rent up to a specified percentage of occupancy by the expiration date, the rent-up contingency will not be met. This means that the permanent lender will not have to fund the commitment. Unless the permanent lender is willing to modify the terms of the permanent commitment, expiration would force the construction lender to extend its interim loan beyond the term originally intended and, perhaps, to become the permanent lender.

In many cases, the permanent lender may agree that if the occupancy requirement is not met, funds will be advanced on a pro rata basis or in proportion to occupancy achieved by the expiration date. Advances would then be made toward full funding as occupancy increases.

When a construction lender is unwilling to accept a pro rata funding take-out, however, the developer may have to find a third-party lender to stand by and provide a **gap financing** commitment. This commitment provides that the "gap" between any partial funding advanced by the permanent lender (because a rental achievement has not been met by the developer as of the date the permanent loan is scheduled to close) and the funds needed to repay the construction lender will be provided by a gap lender. The gap lender usually takes a second lien position and earns interest at a higher rate than both the interim and permanent lenders plus a nonrefundable gap commitment fee. Funds provided by the gap lender and permanent lender repay the interim lender. As the project leases up and the permanent lender releases more funds, the developer uses them to repay the gap lender.[4] The developer also uses gap lending when cost overruns in excess of both the construction and permanent commitments occur, or if a permanent loan commitment is less than the construction loan. In either instance, the gap lender will analyze the project and, if convinced that it is acceptable risk, may take a second lien position.

The last item in the preceding list of contingencies, that is, approval of construction and design changes, assures permanent lenders that developers will complete projects substantially as agreed—they will not substitute substandard materials and use shortcuts to save costs that may jeopardize project quality. Poor project quality could obviously affect the leasing success of a project and, therefore, the collateral security for the permanent loan. Consequently, interim lenders usually insist that they retain the right to approve all substitutions of material and design changes.

The Construction or Interim Loan

As indicated previously, before developers and lenders negotiate construction loans on income-producing properties, the developer may have already obtained a commitment for a permanent loan or a standby loan. The developer presents much of the same information about the proposed project used to obtain the permanent loan (shown in Part A of Exhibit 16–2) as support for obtaining interim financing. The permanent lender is generally not interested in making the interim loan because construction lenders are knowledgeable about local market conditions and are able to monitor construction progress and disburse funds as phases of the project are completed. This activity in development lending requires knowledge of construction methods and materials, and the construction lender can usually

[4] In some cases, as the expiration date for closing the permanent loan nears, the construction lender may agree to become a "gap lender" if the rental achievement is not met. The construction lender may do so to keep the permanent commitment alive, particularly if the borrower cannot find a third-party gap lender.

perform it more cost-effectively. However, because of the contingencies the permanent lender requires of the developer, the construction lender must also evaluate the information in the permanent loan submission very carefully. In the event that the construction lender makes a commitment to fund the project's development and the developer does not meet the take-out contingencies, the permanent loan will not be funded and the construction lender will be forced to provide permanent funding for the project or call the construction loan due on the completion date, which could force the developer into bankruptcy.

In many cases, rather than negotiating a construction loan and a permanent loan, a developer may obtain a *single* loan from an interim lender and use it to finance construction and operations for a year or two beyond the lease-up stage. This variation, used in place of obtaining both a construction loan and a permanent loan, is the so-called **mini-perm loan.**[5] It was used extensively during the 1980s development boom throughout the United States as lenders aggressively competed against one another for a larger share of the construction loan market. Developers using this approach expected to either sell or refinance the project on very attractive terms at or before maturity. Lenders, primarily savings and loans and commercial banks, offered these loans as "one-stop shopping" that enabled developers to proceed without obtaining a permanent loan.

Methods of Disbursement—Construction Lending

Generally, the construction loan is secured by a mortgage for future advances or by an open-end mortgage. The construction lender usually requires a first lien on the land and all improvements as they are constructed on the site. Construction lenders follow the cardinal rule of never advancing loan funds in excess of the economic value of the property that serves as security for the loan. In other words, the construction lender never wants the developer "to get ahead" on a draw schedule by drawing down funds in excess of the cost of construction improvements made to date.

The most commonly used method to disburse funds for commercial development is the **monthly draw method.** This method is used extensively in the construction of larger-scale projects requiring sizable loans. The developer requests a draw each month based on the work completed during the preceding month. If an architect or engineer verifies to the lender that such work is in place, the lender disburses the funds. Again, the collateral value for the loan increases simultaneously with the disbursement of funds.

In some cases, the developer submits invoices to a title insurance company, if the lender is using one, which updates the title abstract between each draw and then approves payment on the invoices. As payments are made, contractors and subcontractors sign an agreement that they have been paid for work done to date.[6] This usually precludes them from filing mechanics' liens.[7]

Interest Rates and Fees

As with many business loans, interest rates on construction loans are generally based on short-term interest rates that may vary considerably from period to period in response to current lending conditions. Most lenders, particularly commercial banks, usually rely on a system of floating interest rates on construction loans. Floating rates may be based on the

[5] In cases where a mini-perm loan is negotiated, most of the material presented in the chapter is relevant, although some redundancy in documentation and other requirements is eliminated when *one* loan is used to finance a project.

[6] On a very large scale (projects that will take an extensive period of time to finish and involve many vendors and contractors), title companies frequently make disbursements and verify that no liens have been filed since the previous draw.

[7] Liens created during construction can cause problems for a developer in closing the permanent loan or selling the property when it is completed.

bank's prime lending rate or the short-term interest rate charged on commercial loans to the bank's most creditworthy customers. However, some short-term loans may be based on either Treasury bill rates or the London Interbank Offering Rate (LIBOR). The lender normally evaluates a construction loan as to risk during the underwriting process, and the interest rate quoted on the loan reflects the short-term rate to which the loan will be tied *plus* a premium that is added to that rate. For example, an interest rate on a construction loan may be quoted as "two points over prime." This means that if the loan is tied to a 10 percent prime rate at closing, the interest rate charged on the construction loan will be 12 percent. Because the interest rate on construction loans is a "floating rate," the actual interest expense that the developer must pay can differ substantially from the amount budgeted or included in the loan request. In other words, the developer may bear the interest rate risk during the development period. The construction lender may also charge loan commitment fees.

Additional Information for Interim Loan Submission

Section B of Exhibit 16–2 summarizes some additional requirements for an interim loan submission that generally supplements and updates the material provided to the permanent lender. The developer provides this additional information, *assuming* that the preliminary data supplied to the permanent lender are satisfactory and the developer has obtained a permanent take-out commitment. Much of the documentation required by the *construction lender* depends on the terms and conditions contained in the permanent loan commitment. Hence, the interim lender must be in a position to review the permanent, or take-out, commitment as well as the final set of development plans and updated information for each component of the loan submission listed in Part A. Further, the interim lender will usually want assurance that the permanent lender reviews all of these updates prior to closing the construction loan.

Requirements to Close the Interim Loan

Although this chapter focuses on financing, Part C in Exhibit 16–2 lists general requirements the developer supplies to close the interim loan. Generally speaking, if the interim lender has expressed an interest to fund construction, the lender will issue a commitment letter containing all necessary requirements and documentation to close the loan.

Assignment of Commitment Letter

When a developer obtains commitments for two loans to finance a project, a legal obligation exists between the developer and each of the two lenders, but no legal obligation exists between the two lenders. To create such an obligation, the construction lender may require that the borrower obtain the right to assign the take-out commitment from the permanent lender to the interim lender. In this way, if the project is finished by the completion date and all contingencies are met, the construction lender can collect mortgage funds directly from the permanent lender, bypassing the developer. Also, should any disagreement occur between the developer and permanent lender, the construction lender, by obtaining assignment of the commitment, may pursue enforcement of the commitment directly with the permanent lender. Assignment of the commitment also limits the developer's ability to terminate the permanent loan commitment and seek another during construction.

Triparty Buy-Sell Agreement

In lieu of assignment of the take-out commitment, the developer, construction lender, and long-term lender may enter into a more formal agreement in which (1) the permanent lender agrees to buy the construction mortgage loan directly from the construction lender on the completion date, assuming all contingencies are met, and (2) the two lenders agree about their duties and responsibilities. This formal agreement, known as a **triparty buy-sell agreement**, spebeyond the assignment of the take-out commitment and provides that the permanent lender will notify the interim lender that the take-out commitment is in full effect, that the permanent lender will indicate whether all necessary plans and documents have been reviewed and approved prior to closing the construction loan, and that the permanent lender will provide the construction lender with notice of any violations in the terms of the loan commitment by the developer and the time available to cure such a violation.

The goal of this agreement is to create legal responsibilities between the borrower, the permanent lender, and the construction lender. In this way, both lenders are more likely to be better informed as to the progress that the developer is making and whether any problems are likely to occur when it is time to close the permanent loan. With this approach, the permanent lender also has more assurance that the permanent loan will be made at the agreed-upon rate of interest and other terms. Otherwise, when the permanent lender makes the take-out commitment, some question may remain about whether the developer has a mandatory commitment to close the permanent loan. Indeed, if the developer finds another commitment on more favorable terms, he may choose to forfeit any commitment fees and close with the new lender. In that case, since funding will be available to repay the construction loan, the original lender may not object. But, by using a triparty agreement, the construction lender agrees not to accept funding from any source other than the initial permanent lender.

The Permanent Loan Closing

After completion of the construction and lease-up period, assuming that all contingencies enumerated in the take-out commitment are met, the permanent loan will be closed and the construction lender is "taken out," or repaid, with funds advanced from the permanent lender. From this point, the borrower will begin to make monthly mortgage payments from rental revenues. Part D of Exhibit 16–2 lists some of the general requirements for the permanent loan closing. Keep in mind that even though the permanent lender may have made a take-out or permanent commitment, that commitment will not be funded until the loan is ready to be closed, or after the project has been completed. Hence, the permanent lender will be in a position to evaluate whether all building and material specifications, leasing, and so on, have been carried out in conformance with what the developer promised when the permanent funding commitment was issued. Further, the permanent lender will also be in a position to ascertain whether all contingencies have been met before the permanent loan is closed.

A recent trend in the field of real estate finance has been to limit the liability of borrowers after all contingencies have been met, the permanent loan has been closed, and the project is operating normally. Liability can be limited by including an **exculpation,** or **nonrecourse, clause** in the permanent mortgage. Essentially, this clause limits the liability of borrowers by restricting the claim of lenders to proceeds from the sale of the real estate in the event of default. Because this relieves the developer of part of, or all, personal liability, it potentially reduces the lender's ability to recover losses in the event of default and foreclosure. This is a point that lenders and borrowers negotiate seriously. Liability limitations also place more underwriting emphasis on the quality of the property from the lender's perspective, since income produced from the property must repay the loan, and the property value must always be sufficiently high to repay the loan balance should a property become financially troubled.

If an exculpation clause is not a part of the permanent loan, the permanent lender will want to be very careful to ascertain that no material change in the financial status of the borrower has occurred since the commitment date. No lender wants to be in a position of funding a developer heading toward bankruptcy. But "material change" can present a problem because the criteria used to ascertain what constitutes a material change may differ between the interim and permanent lenders, and the permanent lender may refuse to close

the loan. In some cases, enhancements, such as letters of credit or third-party guarantees, may be required of the developer by either the interim lender or the permanent lender at the outset, in anticipation of potential problems.

Project Development Illustrated

Project Description and Project Costs

What follows is a case example of Rolling Meadows Center, a high-quality shopping center development located in an upper-income neighborhood proposed by Southfork Development Co. Southfork plans to develop, and then own and operate, Rolling Meadows for a long period of time. It plans to use both interim and permanent financing and has approached the Citadel Life Insurance Company to provide permanent financing. If Southfork planned to sell the shopping center after completion and lease-up, it might have elected to pursue a mini-perm loan. In either case, much of the underwriting analysis and contingencies that follow would be applicable. Exhibit 16–3 contains a breakdown of site size, floor-to-area ratio, parking, and anticipated construction and permanent financing. It also provides percentage breakdowns for building coverage, parking, and open space. The lender will review the percentage breakdowns to ascertain whether the density of the project development on the site is too high and whether parking is adequate. The lender will pay particular attention to the site plan and ease of traffic circulation on the site. Citadel will have access to comparative data for this project from previous project financing files and from industry statistics.[5]

EXHIBIT 16–3
Project Description for Rolling Meadows

A. Site and proposed improvements	
Site area (in acres)	9.5
Gross buildable area (GBA)	120,000 sq. ft.
Gross leasable area (GLA)	110,000 sq. ft.
Percent leasable area	91.67%
Floor area ratio (site area)	29.00%
Parking index	5 spaces/1,000 sq. ft. (GLA)
Parking spaces	550
B. Development period	12 months
C. Site plan	
Building coverage	29%
Street parking	45%
Open space/landscaping	26%
Total	100%
D. Loan information	
Construction loan	
Loan term	12 months
% of construction loan drawn in the first 4 months	75%
% of construction loan drawn in the last months	25%
Interest rate	12%
Construction loan fee	2%
Permanent loan	
Debt amortization	25 years
Term of loan	10 years
Interest rate	12%
Permanent loan fee	3%
E. Anticipated hold after completion	5 years

[5] One important source of data is the Urban Land Institute's *Dollars and Cents of Shopping Centers*.

Exhibit 16–4 breaks down development costs into land acquisition costs, off-site costs, hard costs, and soft costs. These costs are also broken down as a percentage of total cost and cost per square foot of gross building area (*GBA*).

Depending on the type of shopping center (e.g., strip, neighborhood, specialty, regional mall), lenders will want to know whether the relative breakdown of costs conforms to average breakdowns for recently developed neighborhood centers in comparable locations.

EXHIBIT 16–4
Summary of Cost Information for Rolling Meadows

		Cost	Percent of Total Cost	Cost per Sq. Ft. *GBA*
A. Land and site improvements:				
Site acquisition and closing costs		$ 2,500,000	20.9%	$20.83
On/off-site improvement costs:				
Off-site improvements	$ 250,000			
On-site improvements:				
Excavation and grading	50,000			
Sewer/water	150,000			
Paving	200,000			
Curbs/sidewalks	100,000			
Landscaping	100,000			
Total on/off-site costs		$ 850,000	7.1%	$ 7.08
B. Construction costs:				
Hard costs:				
Shell structure	$3,925,000			
HVAC	528,500			
Electrical	613,000			
Plumbing	221,580			
Project management fees	300,250			
Finish-out	1,400,600			
Graphics/signage	66,570			
Total hard costs		$ 7,055,500	58.9%	$58.80
Soft costs:				
Architect engineering	$ 147,000			
Fees and permits	24,300			
Legal fees	26,900			
Construction interest	692,416			
Construction loan fees	180,028			
Permanent loan fees	270,042			
Leasing commissions	45,300			
Direct overhead	160,000			
Indirect overhead	30,800			
Total soft costs		$ 1,576,787	13.2%	$13.14
Total project costs		$11,982,287	100.0%	$99.85
Construction Loan Request:				
Total on/off-site improvements		$ 850,000		
Total hard construction costs		7,055,500		
Soft costs		403,500		
Total costs to be financed		8,309,000		
Estimated interest carry		692,416		
Total loan amount		9,001,416		
Equity requirements		2,980,871		
Total project cost		$11,982,287		

Land costs that are too high or hard costs that are too low relative to land costs may mean that the total cost of developing an adequate mix of retail space of adequate quality may not be achievable at prevailing market rents. Similarly, common areas (difference between gross building area and gross leasable area) that are too large or too small may affect the ability to lease space and can be detrimental to profitability. The "correct" mix of location improvements, density, parking, circulation, and design is crucial to success.

In many cases, lenders will not fund any land acquisition costs or base loans as a percentage of appraised value. In other words, lenders prefer to make loans to cover improvement costs only, and the developer may be expected to contribute the land as equity. Further, lenders usually require a first lien on the land and all improvements made with the proceeds of the construction loan. They do so because loans based on appraised value alone may result in the lender advancing funds in excess of the market value of the property if the appraisal is in error. For example, if the lender agrees to lend 80 percent of the total project value and the appraisal (which you must realize is being done for a project that is still in the planning and design stages) results in an overestimate of value in the range of 130 percent of actual value upon completion, then the loan advances would equal 104 percent of actual value (80 percent of 130 percent). Further, if an overoptimistic assessment of future rental achievement caused the overestimate of project value, the developer may have difficulty servicing the mortgage debt. This difficulty obviously creates problems for the developer and for the interim lender who may be looking to a permanent lender to take out the construction loan. Recall that the take-out commitment may contain contingencies relative to leasing and rental achievement and may also contain a requirement that the final project appraised value exceed the permanent loan commitment by a specified percentage. If these provisions are not achieved, the interim lender and developer may have difficulty enforcing the take-out commitment.

We do not mean to say that lenders never consider appraised values in loan requests. Most lenders realize that the loan being requested must represent a reasonable percentage of appraised value. Reasonable percentage generally means that if the loan-to-value ratio for the proposed project is 80 percent, the lender anticipates that the improvement costs plus any other development costs that the lender is willing to fund should also be in the range of 80 percent. The funding percentage, in turn, implies that land values and other costs not funded in the loan should be in the range of 20 percent. In other words, the lender is looking for an equity contribution of 20 percent by the developer. If improvement costs were estimated to be 90 percent of value, for example, the lender may still be willing to fund only 80 percent of value. In this case, all improvement costs would not be funded. An alternative way of looking at the loan-to-appraised-value relationship is that a lender may, in our example, prefer to provide funds equal to the lower of either all improvement costs or 80 percent of project value.

Many lenders will not fund off-site improvements that are part of a loan request because other parties may have title to the land on which improvements will be made. Even if the developer has title to the off-site land, the construction lender may have difficulty acquiring satisfactory lien security on the land where the off-site improvements will be made. The ability to acquire funding of off-site costs depends on the lender's judgment as to how far in excess of the total loan amount the value of the project will be when completed.

Most lenders will fund all hard costs if they can be documented and are commensurate with the overall quality of the development. Lenders, however, vary in their willingness to fund many soft-cost items. They may not be willing to fund closing fees associated with the land acquisition, financing fees, planning and design fees, permitting fees, and or any overhead charges the developer requests as a part of the project cost. This is because these charges represent fees for services or intangibles which may be regarded as difficult to recover in the event of default or bankruptcy should a property have to be auctioned or sold to repay the construction loan. Hard costs represent outlays for tangible improvements (e.g., bricks and mortar) and are thought to be better security than outlays for intangibles, even though the latter are necessary. In most cases, however, an estimate of construction interest carry is *included* in the loan request.

Construction Loan Request

Exhibit 16–4 also contains a breakdown of the *loan request*. Note that this particular loan request does not include land cost. Also note that it does not ask for financing for all soft costs. However, Southfork is requesting funding for some off-site improvements. The total loan request is $9,001,416, which represents about 75 percent of the $11,982,287 estimate of total project cost (land plus all other outlays). Also, note in Exhibit 16–4 that the request includes construction period interest as part of the loan. This is very common in construction lending because the project will not provide any rent or cash inflow during development. Therefore, the developer will usually be allowed to borrow the interest as one additional cost of construction. An estimate of *construction period interest* is made by computing the *monthly draw rate* for construction costs to be funded by the lender over the 12-month period. This is illustrated in Exhibit 16–5.

Note in the exhibit that the draw rates shown in column (a) are calculated by determining expected monthly draws for *direct costs* ($8,309,000). Also note that the estimated interest is $692,416. This consists of interest calculated at 12% ÷ 12 months, or 1 percent per month on the cumulative loan balance shown in column (c). Interest draws are computed on the outstanding monthly loan balance and are borrowed as a part of the construction cost draws at the end of each month. The developer makes cash interest payments (column d) to the bank each month. However, because all of the interest carry is *borrowed*, it becomes part of the loan balance, and because all monthly payments made by the developer are interest only, no reduction of principal occurs. In short, this pattern is analogous to an interest-only loan, discussed in previous chapters. The reader may recall that these loans require no reduction in loan principal because payments are computed to include interest payments only. Also note that the interest payments in column (d) are exactly offset by the interest draw in column (b). Thus the net effect is as if there were no payment to the lender until the entire loan balance is repaid at the end of the construction period. This is analogous to a negative amortization loan with the loan balance increasing by the amount of interest accrued each month.

EXHIBIT 16–5
Projected Loan Repayment Schedule for Rolling Meadows Center

	Loan Draws			Payments		
	(a)	(b)	(c)	(d)	(e)	(f)
End of Month	Project Costs	Construction Interest	Loan Balance	Interest	Principal Reduction	Ending Loan Balance
0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
1	1,557,938	0	1,557,938	0	0	1,557,938
2	1,557,938	15,579	3,131,454	15,579	0	3,131,454
3	1,557,938	31,315	4,720,706	31,315	0	4,720,706
4	1,557,938	47,207	6,325,851	47,207	0	6,325,851
5	259,656	63,259	6,648,766	63,259	0	6,648,766
6	259,656	66,488	6,974,910	66,488	0	6,974,910
7	259,656	69,749	7,304,315	69,749	0	7,304,315
8	259,656	73,043	7,637,014	73,043	0	7,637,014
9	259,656	76,370	7,973,041	76,370	0	7,973,041
10	259,656	79,730	8,312,427	79,730	0	8,312,427
11	259,656	83,124	8,655,208	83,124	0	8,655,208
12	259,656	86,552	9,001,416	86,552	$9,001,416	0
Total	$8,309,000	$692,416				

In summary, Exhibit 16–5 shows that the loan balance will increase each month by the amount of the project cost draws plus interest borrowed. The total ending balance, $9,001,416, will be equal to the total construction loan amount at the end of the 12-month period. This amount will be funded by the permanent lender, thereby taking out the construction lender at that time. In most cases, the permanent loan and the interim loan commitments are made for the same amount.

Even though developers may estimate costs very carefully, the *actual* costs of development and interest carry will differ from such estimates because of uncertainties in the rate at which work will progress and because interest rates may change. Hence, it is likely that the *actual* interest draw pattern will deviate from the *estimated* pattern. Once the $9,001,416 commitment amount is reached, however, the construction lender *is not required to fund any more draws, and the permanent lender is not required to fund any more than the committed amount*. If the developer does not want to bear the risk of unanticipated interest rate changes and the possibility of interest cost overruns, she can eliminate, or at least reduce, that risk for a fee by purchasing an interest rate swap.

If the developer does not want to bear the cost of eliminating interest rate risk, she will have to provide additional funds (perhaps by attracting more partners to the venture) or find a gap lender or equity partners. If actual costs exceed estimated costs because of material and labor cost overruns, unanticipated changes in interest rates,[9] a longer-than-anticipated lease-up period because of a declining market, and so on, and if the developer cannot find other sources of equity (through a partnership or similar arrangement) or a gap loan, and if the interim lender refuses to extend additional funds, the developer may face foreclosure.

Lenders and developers also use a draw, interest, and repayment schedule similar to that shown in Exhibit 16–5 as a tool for financial control. They may use this schedule in conjunction with field surveys completed by staff engineers to verify that the total percentage of *work in place* at the end of each month corresponds to the outstanding loan balance at the end of each month. If the lender feels that total funds drawn down are in excess of construction in place, the lender will not allow further draws until offsetting improvements are made. Note that because the construction lender charges a 2 percent loan origination fee, the loan yield will be about 15.5 percent, as compared with the 12 percent rate of interest used to compute interest on the loan. This yield is calculated by finding the rate of discount that makes the present value of monthly outflows in months 1 through 12 plus the lump sum inflow also in month 12 equal to the loan fees charged at closing by the interim lender or $180,028.

A final note regarding the draw schedule has to do with lenders' use of **holdbacks**. Generally, when project developers contract with various building contractors to perform work, developers hold back a percentage (10 percent) of each progress payment made to such contractors until all work is satisfactorily completed. Holding back payments assures the developer that all work has been completed in accordance with plans and specifications. When work is completed to the developer's satisfaction, the final payment is made to the contractors. Most lenders are aware of holdback practices and will in turn hold back a percentage (10 percent) of all loan draw requests from developers. Lender holdbacks prevent developers from drawing down funds at a faster rate than they must pay to contractors. Exhibit 16–5 does not take holdbacks into account. However, you should be aware of this practice and take holdbacks into account in the draw schedule if applicable.

[9] Some developers use the interest rate futures to hedge against interest rate risk when using floating interest rate loans.

Permanent Loan Request

Upon completion of the project, Citadel Life Insurance Company will replace the construction loan with **permanent financing,** assuming that all conditions in the construction loan and all contingencies outlined in the permanent financing commitment have been met. Remember, the permanent loan terms outlined in Exhibit 16–6 were predetermined before construction began. Any additional development costs over $9,001,416 are Southfork's responsibility. For a 3 percent loan fee, Citadel Life Insurance Company will provide Southfork with a 10-year mortgage. Monthly payments will be $94,805 based on a 25-year amortization schedule at an interest rate of 12 percent.

Market Data and Tenant Mix

Exhibit 16–7 contains a breakdown of the expected tenant mix for Rolling Meadows and the space tenants are expected to occupy. For a neighborhood center, most lenders would expect at least one predevelopment lease commitment from a food chain and/or general merchandiser. Obviously, if favorable predevelopment lease commitments accompany the loan request, it is more likely that a commitment will be made. The other data in the exhibit are based on experience from U.S. data averages and with averages obtained from local market surveys. It should be stressed that exact comparability in tenant mix is not expected in each and every project submitted for review. However, past experience usually indicates that certain types of tenants are not compatible (e.g., auto parts and jewelry stores) in the same center, whereas other tenants are compatible (e.g., jewelry stores and furriers). A submission that indicates a lack of understanding regarding tenant mix may reveal developer inexperience. Further, the tenant breakdown should be realistic—if the developer projects too many "high-end" retail stores (which usually pay high rents), it may indicate overoptimism.

EXHIBIT 16–6
Summary of Permanent Loan Terms

Total loan	$9,001,416
Debt amortization	25
Term of loan	10
Interest rate	12.00%
Debt service/month	$ 94,805
Debt service/year	$1,137,661
3% permanent loan fee	$ 270,042
Yield to permanent lender	12.55%

EXHIBIT 16–7
Market Survey Data—Shopping Centers (tenant information)

Classification	Number of Stores	% of Tenants*	Sq. Ft. of *GLA*	% *GLA*	U.S. Avg.%	Local Avg.%
General merchandise	1	3.57%	4,950	4.50%	5.60%	5.20%
Food	2	7.14	37,400	34.00	30.80	36.00
Food service	1	3.57	8,800	8.00	8.80	7.00
Clothing	3	10.71	7,700	7.00	5.00	6.00
Shoes	1	3.57	1,155	1.05	1.30	0.70
Home furnishings	1	3.57	1,100	1.00	2.60	2.30
Home appliances	1	3.57	990	0.90	2.40	1.00
Building materials	1	3.57	1,320	1.20	3.40	2.00
Automotive supplies	0	0.00	0	0.00	1.70	1.50
Hobby	1	3.57	2,035	1.85	2.70	2.50
Gifts and specialty	2	7.14	2,860	2.60	2.50	2.30
Jewelry and cosmetics	1	3.57	1,650	1.50	0.70	2.00
Liquor	1	3.57	1,430	1.30	1.50	1.50
Drugs	1	3.57	9,900	9.00	8.50	8.00
Other retail	6	21.46	12,100	11.00	4.40	6.00
Personal services	2	7.14	8,910	8.10	6.50	7.00
Recreational	1	3.57	2,200	2.00	3.50	3.00
Financial	1	3.57	3,300	3.00	4.10	3.00
Offices	1	3.57	2,200	2.00	4.00	3.00
Total	28	100.00%	110,000	100.00%	100.00%	100.00%

*Rounded.

In addition to the data shown in Exhibit 16–7, the developer will have to provide more detail regarding the trade area expected to be served by the center, a competitive analysis of other centers, and proof that the addition of another center will not oversupply that market with retail space. Additional information relative to population growth, age, households, income, retail spending patterns, and so forth (not shown), in the trade area must also support the loan request. The importance of these data cannot be stressed enough.

Pro Forma Construction Costs and Cash Flow Projections

Another necessary ingredient in the submission of data to the permanent lender is a pro forma (estimate) of construction costs and net operating income. Exhibit 16–8 contains annual estimates for expenditures during the construction period for land acquisition, site improvements, hard costs, and soft costs. Total loan draws are based on the $9,001,416 loan request (including interest), for which financing is being sought, over the two-year development period. Note that the developer will require $2,950,071 from internal sources at closing to cover land acquisition and loan fees, plus an additional $30,800 to cover indirect overhead, or total equity of $2,980,871. Citadel Life Insurance Co. will review Southfork's financial statements (not shown) to determine whether it has the ability to provide such funding from internal sources.

Exhibit 16–9 details the pro forma operating statement for Rolling Meadows. The lease-up or marketing effort should result in 70 percent occupancy during the second year and 95 percent thereafter. Southfork is estimating a base rent of $15 per square foot of gross leasable area, with average increases based on leases indexed to the CPI of 6 percent per year after the first year of operation (leases are expected to have terms ranging from one to five years). An overage provision requires tenants to also pay 5 percent of gross sales in excess of a base sales level each month.[10] In a retail operation, rent is usually divided into two

EXHIBIT 16–8
Pro Forma Statement of Cash Flows—Construction Period

	Draws per Year		
	(0)	(1)	Total
Site acquisition and closing costs	$2,500,000		$ 2,500,000
Site improvements (on/off)		$ 850,000	850,000
Hard costs		7,055,500	7,055,500
Soft costs		$434,300	$434,300
Permanent loan fee	270,042		270,042
Construction loan fee	180,028		180,028
Construction interest		692,416	692,416
Total construction cash outflow	2,950,071	9,032,216	11,982,286
Less: Total draws	0	9,001,416	9,001,416
Total equity needed	$2,950,071	$ 30,800	$ 2,980,871

[10] Overages are common in retail leasing. The breakpoint is commonly determined by dividing the tenant's base rental amount (rate per square foot times rentable area) by the percentage rate negotiated between the owner and tenant. For further discussion see *Shopping Center Development Handbook Series* (Washington, DC), published by the Urban Land Institute.

EXHIBIT 16–9 Pro Forma Statement of Cash Flows—Operating Period

Cash Flows (EOP)	(2)	(3)	(4)	(5)	(6)
Income:					
Minimum rent	$1,650,000	$1,749,000	$1,853,940	$1,965,176	$2,083,087
Overage (5% of gross sales)	30,000	124,800	129,792	134,984	140,383
Tenant reimbursements					
Real estate taxes	137,500	143,000	148,720	154,669	160,856
Common area maintenance	385,000	400,400	416,416	433,073	450,396
Utilities	367,500	382,200	397,488	413,388	429,923
Insurance	33,000	34,320	35,693	37,121	38,605
Gross potential income	$2,603,000	$2,833,720	$2,982,049	$3,138,410	$3,303,249
Less: Vacancy allowance	780,900	141,686	149,102	156,920	165,162
Expected gross income	$1,822,100	$2,692,034	$2,832,947	$2,981,490	$3,138,087
Expenses:					
Management and leasing fees	$ 104,500	$ 93,690	$ 99,187	$ 105,008	$ 111,174
General and administrative	77,000	80,080	83,283	86,615	90,079
Real estate taxes	137,500	143,000	148,720	154,669	160,856
Common area maintenance	385,000	400,400	416,416	433,073	450,396
Utilities	300,300	312,312	324,804	337,797	351,309
Insurance	33,000	34,320	35,693	37,121	38,605
Other	27,500	28,600	29,744	30,934	32,171
Total expenses	$1,064,800	$1,092,402	$1,137,847	$1,185,215	$1,234,589
Net operating income	$ 757,300	$1,599,632	$1,695,099	$1,796,275	$1,903,498
Less: Debt service	1,137,661	1,137,661	1,137,661	1,137,661	1,137,661
Before-tax cash flow	$−380,361	$ 461,971	$ 557,438	$ 658,614	$ 765,837
Ratios:					
Operating expense		40.58%	40.16%	39.75%	39.34%
Debt coverage ratio		1.41	1.49	1.58	1.67
Free and clear return		13.35%	14.15%	14.99%	15.89%
Return on equity		15.50%	18.70%	22.09%	25.69%
Vacancy-collection loss		5.00%	5.00%	5.00%	5.00%
Break-even occupancy rate		78.70%	76.31%	74.01%	71.82%

components. The first is a minimum rent per square foot. The other component is called **percentage rent.** Developers frequently charge percentage rent, calculated as a percentage of the sales of a tenant in excess of a predetermined *breakpoint* or sales volume. As long as the tenant's sales are below the breakpoint, the owner receives only the minimum rent. When a tenant's sales increase above the breakpoint, the percentage rent rate is applied to the sales volume in excess of the breakpoint and is added to the minimum rent, thus increasing the total rent. In this way, should the shopping center become very successful, the owner shares in the increased revenue produced by the tenants. The percentage rent shown in Exhibit 16–9 is estimated for all tenants in Rolling Meadows.

Tenant reimbursements are also shown in Exhibit 16–9. These amounts are based on negotiations between the owner and tenants and represent the amount of operating expenses over expense stops for which the tenant is responsible (recall the discussion of such stops in Chapter 11 for office buildings). Hence, base rents, percentage rents, and expenses for which tenants are responsible over some preagreed amount (stop) all represent gross income to the owner of Rolling Meadows.

Operating expenses are also detailed in Exhibit 16–9. These amounts represent the actual expenses that must be paid to operate Rolling Meadows. They are deducted from rents,

overage, and tenant reimbursements. All leases are to be *net to the tenant,* with a direct pass-through for insurance and property taxes. Tenants will also be billed for their share of common area maintenance (parking lot, circulation space in center, etc.) and utilities. An additional premium will be added to the utility charge to provide for a replacement reserve on HVAC equipment.[11] Tenants will pay these expenses to Southfork as reimbursement. Southfork management will, in turn, pay any expenses to third parties as they become due. Southfork will also incur expenses of its own for property management, leasing commissions, and general and administrative expenses that will not be recoverable from tenants. These amounts are deducted from rents, overage, and tenant reimbursements. The projections assume that a sufficient number of leases will be signed at the end of the second year to warrant closing the permanent loan.

Pay particular attention to the ratios that appear at the bottom of Exhibit 16–9. These ratios, calculated beginning with data for year 3 when "normal" operation is anticipated, are used to evaluate the performance of the property. The permanent lender will review these and other ratios to ascertain whether they fall into acceptable underwriting ranges. We must stress again that market data supporting rents and overages, proof of estimates of operating costs from the management of comparable centers, realistic estimates of the lease-up rate, and lease terms that tenants are willing to accept in the retail market are all critical to the underwriting process.

The operating expense ratio, which is calculated by dividing total annual operating expenses by the effective gross income (*EGI*), indicates that at most 40.5 percent of *EGI* from Rolling Meadows goes into servicing operating expenses. In contrast, Rolling Meadows' debt coverage ratio, or net operating income divided by debt service, exceeds 1.41. This ratio demonstrates the property's ability to meet its debt payments. The cash returns earned on the total investment will be positive and exceed the mortgage interest rate.[12] This free and clear return is calculated by dividing net operating income by the total project costs. Return on equity, a second cash return measurement, is calculated by dividing before-tax cash flow by the total equity contributions. These returns do not include any appreciation in project value. Finally, the break-even occupancy rate approximates the level of occupancy required to service both the debt service and the operating expenses of a project. This ratio is calculated by dividing the annual debt service and operating expenses by the gross potential income. Clearly, with occupancy projected to be 95 percent, Rolling Meadows easily meets its debt service and operating expense obligations.

Assuming that the permanent lender makes the take-out commitment, the developer will incorporate the actual amount of the loan commitment into the pro forma statements and seek out a construction lender.[13] During this time, the developer will refine and update cost and market estimates and provide more detailed construction plans in order to acquire interim financing. After the permanent financing commitment is acquired, however, all changes in design, cost, predevelopment lease agreements, and so on, must be submitted to both the permanent and interim lenders for review.

[11] Note the difference in utility income to be collected from tenants and actual costs to [illegible] Southfork management. This difference is a premium earned on selling utilities to the tenants. Depending on competition for space in the retail market, the developer may or may not [illegible] negotiate this premium.

[12] Total project cost is estimated at $11,982,287. When this amount is divided [illegible] percent return on total investment results.

[13] The actual take-out commitment will contain contingencies that may affect the pro forma statements presented here. Recall that all of the statements produced thus far are part of a [illegible] to the permanent lender. Should the lender decide to fund less than the total amount [illegible] or insist on a higher lease-up requirement, among other things, those changes would have to be incorporated in the data submitted to potential interim lenders.

Feasibility, Profitability, and Risk—Additional Issues

Most of the analysis that the interim and permanent lenders conduct focuses on the pro forma statements and market data supplied with the loan requests. This is because lenders are concerned about market conditions, rents, and the ability of the project to cover expenses and debt service. Southfork is equally concerned with these issues; however, it is also interested in knowing how well this project will perform as an investment, both before and after taxes. Also, from the standpoint of assessing risk, it needs to know how sensitive the estimates provided in the pro forma statements are to various assumptions made in the analysis. Much of what follows are analytic tools for assessing project performance. These tools may be used at any time during development as market data, building costs, interest rates, and so on, change. They also may be used to ascertain the maximum price that should be paid for the land *prior to its acquisition*. To illustrate these ideas, we will use the pro forma estimates presented thus far and change them by introducing sensitivity analysis.

Profitability before and after Taxes

For Southfork to assess the profitability of the Rolling Meadows Center before and after taxes, additional assumptions regarding the number of operating periods and the appreciation rate on the property value must be made. We have assumed that a sale will occur five years after construction.

Exhibit 16–10 summarizes estimates of before-tax cash flow (*BTCF*) during the development and operating periods, based on information contained in Exhibits 16–8 and 16–9. The before-tax estimate for *NPV* comprises all negative cash flows consisting of equity requirements at closing (land acquisition and loan fees), cash equity needed during development for costs not financed (indirect overhead), and cash requirements needed during year 2, or the lease-up phase. Positive cash flows are based on operations from years 3 through 6 plus cash flow from the sale of the project in year 6 (all figures are rounded).

Exhibit 16–11 contains estimates of before-tax cash flows when Rolling Meadows Center reevaluates its investment plans and instead of owning and operating, it decides to sell to Mony Mutual Realty Advisors, which acquires projects and manages them on behalf of pension fund sponsors. We see that after paying selling expenses and repaying the mortgage loan balance to Citadel, Southfork will have $7,104,160 in cash before taxes (*BTCF*s). The sale price for the project, $16,035,003, is based on the initial total project cost, $11,982,287 (Exhibit 16–8), compounded at an appreciation rate of 6 percent per year for five years.

From Exhibit 16–10, we can calculate an estimate for *NPV* before taxes based on all before-tax cash flows expected to occur from years 1 to 6, discounted at a required before-tax rate of 21 percent. This results in a positive *NPV* of $38,884. This 21 percent required rate of return represents a 9 percent risk premium over the mortgage interest rate that Southfork management believes would be a satisfactory return on its equity after recovery of all project costs, given the risk of the Rolling Meadows project.

The *after-tax internal rate of return* for Southfork is also presented in Exhibit 16–10. To arrive at net cash flow after tax during development and in each operating year, we need additional information to take income taxes into account.

Exhibit 16–12 provides the information about depreciation and amortization of various project costs that we need to estimate taxable income. Part A in Exhibit 16–12 contains a list of costs that must be capitalized as part of the improvement and depreciated. Of total depreciable costs, we see in Part B that 90 percent are capital improvements and, therefore, subject to depreciation on a straight-line basis over 31.5 years.[14] Southfork estimates 10 percent of these costs to be tenant improvements, which are categorized as personal rather than real property. This category of improvement may be depreciated on a double-declining basis over seven years.[15] Part C contains a description of project soft costs that may be amortized. Because we assume two loans used to fund the project, we amortize loan fees over the respective terms of each loan.[16] Finally, we capitalize leasing commissions and write them off over the average of lease terms for the project.

[14] See Chapter 11 for an explanation of depreciation methods. The depreciable life of 31.5 years used in this example is not necessarily representative of the current tax law. It is for illustration only.

EXHIBIT 16–10 **Profitability Analysis for Rolling Meadows Center**

eXcel
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	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Before-Tax Cash Flows							
Equity	$−2,950,071	$ −30,800					
BTCF—operations			−380,361	$ 461,971	$ 557,438	$ 658,614	$ 765,837
BTCF—sale							7,104,160
Total *BTCF*	$−2,950,071	$ −30,800	$−380,361	$ 461,971	$ 557,438	$ 658,614	$7,869,997
BTIRR	21.33%						
BTNPV @21%	$ 38,884						
Taxable Income							
Net operating income			$ 757,300	$1,599,632	$1,695,099	$1,796,275	$1,903,498
Less:							
Interest			1,076,900	1,069,194	1,060,511	1,050,726	1,039,701
Depreciation:							
Capital improvements			256,769	256,769	256,769	256,769	256,769
Tenant improvements			256,769	183,406	131,005	93,575	77,979
Amortization:							
Leasing commissions			9,060	9,060	9,060	9,060	9,060
Construction loan fees		180,028					
Permanent loan fees			27,004	27,004	27,004	27,004	27,004
Taxable income		$−180,028	$−869,202	$ 54,199	$ 210,750	$ 359,141	$ 492,985
Tax @ 28%		$ −50,408	$−243,377	$ 15,176	$ 59,010	$ 100,559	$ 138,036
After-Tax Cash Flows							
Total *BTCF*	$−2,950,071	−30,800	$−380,361	461,971	557,438	658,614	$7,869,997
Less: Ord. Tax	0	$ −50,408	$−243,377	15,176	59,010	100,559	$ 138,036
Cap. gain tax							$1,713,304*
ATCF	$−2,950,071	$ 19,608	$−136,984	$446,795	$ 498,428	$ 558,055	$6,018,657
ATIRR	17.79%						
ATNPV @ 17%	$ 96,077						

* See Exhibit 16–11.

[15] An explanation of double-declining-balance depreciation may be found in introductory accounting texts. Switching to straight-line is also allowed and carried out in the analysis here.

[16] The permanent loan fees are assumed to be paid when the commitment is obtained. However, amortization is assumed not to begin until the loan is closed at the beginning of the third year.

EXHIBIT 16–11
Sale of Rolling Meadows Center

	Before-Tax Cash Flow
Sale price	$16,035,003
Less:	
Selling expenses	320,700
Mortgage balance	8,610,143
Before-tax cash flow on the sale	$ 7,104,160
	Gain in Year of Sale
Sale price	$16,035,003
Less:	
Selling expenses	320,700
Adjusted basis	9,595,358
Total gain on the sale	$ 6,118,945
	After-Tax Cash Flow
Before-tax cash flow on the sale	$ 7,104,160
Less: Tax on gain @ 28%	1,713,304
After-tax cash flow on the sale	$ 5,390,856

We also need after-tax cash flow in the year of *sale* (*ATCFs*) to complete the computation of the after-tax *IRR*. From Exhibit 16–11, tax in the year of sale ($1,713,304) is the difference between the estimated net selling price less the adjusted basis times the 28 percent tax rate. As noted in Chapter 11, capital gains might be taxed at a lower rate than ordinary income. In this example we assume the same tax rate is used for ordinary income and capital gains. The adjusted basis is computed as the cost of land plus all improvements, or $11,982,287, less the sum of all depreciation and amortization taken over the seven-year period.[17] The adjusted basis, or cost to be recovered from the sale of the asset prior to computing the tax on the gain, is $9,595,358. We can then estimate after-tax cash flow to be $5,390,856.

We can solve for the *ATIRR* shown in Exhibit 16–10 by setting the equity requirements at closing equal to *ATCF* in each year and in the year of sale and solving for the rate of interest that makes the after-tax *NPV* equal zero. Note that although *BTCF* is negative in year 1, after-tax cash flow is positive during that year because of the tax deductibility of loan fees. Those deductions result in a net loss, or an offset against any other active income earned by Southfork during that year. Hence, they *reduce* taxes, *save* cash, and offset negative *BTCF*. Taxes are calculated by assuming a tax rate of 28 percent,[18] and after-tax cash flows are determined and used to determine the *ATIRR*, which is 17.79 percent for Rolling Meadows. Note that this return is *not* equal to the *BTIRR* (shown in Exhibit 16–10) times 1 minus tax rate, or 21.33 percent (1 − .28 = 15.36%), because of the higher rates allowable for amortization of tenant improvements and fees (Exhibit 16–12) relative to the 31.5 year straight-line depreciation allowed for real property. Using an after-tax discount rate of 17 percent, we find that the after-tax *NPV* (*ATNPV*) is $96,077.

[17] In years prior to the 1986 Tax Reform Act, tax rates on capital gains and on ordinary income were different. Further, the tax treatment of construction period interest and property taxes and certain other fees also differed. Because of these differences, interest, taxes, and fees were capitalized from the improvement, and the unamortized balance in the year of sale was either deducted as an ordinary expense or added to the undepreciated basis. Stay informed about real estate taxation, particularly when analyzing project development, because the tax treatment of various cost categories changes frequently.

[18] We assume that Southfork is a sole proprietorship or a partnership whose owners are taxed at ordinary rates. We also assume that Southfork's owners have other passive income that they can use to offset the passive losses produced by this project (see Chapter 11 for a discussion of passive income).

EXHIBIT 16–12
Depreciation and Amortization Schedule for Rolling Meadows Center

A. Depreciable costs:			
Site improvements (on/off)		$ 850,000	
Hard costs		7,055,500	
Soft costs:			
Architect engineering	$147,000		
Fees and permits	24,300		
Legal fees	26,900		
Construction interest	692,416		
Direct overhead	160,000		
Indirect overhead	30,800		
Total soft costs		$ 1,081,416	
Total depreciable costs		$ 8,986,916	
			Depreciation Period
B. Depreciation schedule:			
Capital improvements (90% of total)		$ 8,088,225	31.5 years
Tenant improvements (10% of total)		898,692	7 years
		$ 8,986,916	
			Amortization Period
C. Amortization schedule:			
Construction loan fees		$ 180,028	1 year
Permanent loan fees		270,042	10 years
Leasing commissions		45,300	5 years
Total depreciable/amortized costs		9,482,287	
Add: Land		2,500,000	
Total project costs		$11,982,287	

	Adjusted Basis at the End of Year 6		
Item	Total Cost	Less: Accumulated Depreciation/ Amortization	Adjusted Basis
Land	$ 2,500,000	$ 0	$2,500,000
Capital improvements	8,088,225	1,283,845	6,804,379
Tenant improvements	898,692	742,734	155,958
Permanent loan fees	270,042	135,021	135,021
Leasing commissions	45,300	45,300	0
Construction loan fees	180,028	180,028	0
Total	$11,982,287	$2,386,928	$9,595,358

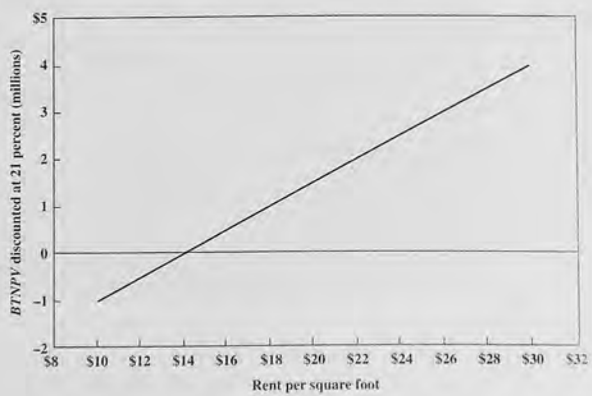
Sensitivity Analysis, Risk, and Feasibility Analysis

Based on the preceding analysis, we have concluded that if Southfork is satisfied that a 21 percent before-tax rate return on equity is adequate to undertake the Rolling Meadows Center development, it will earn a positive *NPV*. This implies that the $2.5 million land acquisition price would be warranted, given estimates of construction costs, market rents, expenses, and the appreciation rate in property value. An interesting question that could be raised at this point is, "Suppose market rents were estimated to be $12 per square foot instead of $15 and all other assumptions remained constant (quantity of space, construction costs, interest rates, appreciation rates, and operating expenses). Would the project still be feasible—would it cover all costs and provide the developer with a competitive return on equity?"

To consider this question, refer to Exhibit 16–13. This diagram represents the relationship between *BTNPV* (vertical axis) and market rents per square foot of leasable area (horizontal axis). Note that at the average rent of $15 per square foot assumed in our analysis, the *BTNPV* is slightly above zero (the discount rate is held constant at 21 percent). If, however, the market rent averaged $12 per square foot and all other assumptions remained the same, it is clear that the *NPV* would be negative. In that case, Southfork would not be interested in pursuing the development. An even more critical aspect of this analysis becomes clear if, after both loan commitments were made, construction went forward on the project and market rents then fell from $15 to $12 per square foot as the lease-up phase was under way. In this event, Southfork would be facing a negative *NPV* and would be committed to the development. If it was not able to produce more equity or to find additional investors to provide equity at that point, it would not be able to meet project expenses and debt service. At that point, the interim lender would be faced with the prospect that the permanent lender may not be compelled to honor its take-out commitment because the developer would not meet rental requirements. The interim lender would have to negotiate the interim loan terms with the developer (sometimes referred to as a *workout*), or possibly foreclose. You can now begin to see how changing market conditions can affect project risk.

Another important consideration is apparent in Exhibit 16–14, where *BTNPV* is related to land cost (horizontal axis). Recall that we estimated a slightly positive *NPV*, assuming that the land was acquired at $2.5 million. If Southfork was too optimistic and paid $3 million for the land, we can see from the diagram that the *NPV* would be negative (again, discounting at 21 percent and holding all other variables constant). On the other hand, if the land could be acquired for less than $2.5 million, the *NPV* would become more favorable. The value of this *sensitivity analysis* should be obvious at this point.[19] This analysis is

EXHIBIT 16–13
BTNPV of Rolling Meadows Center and Rents

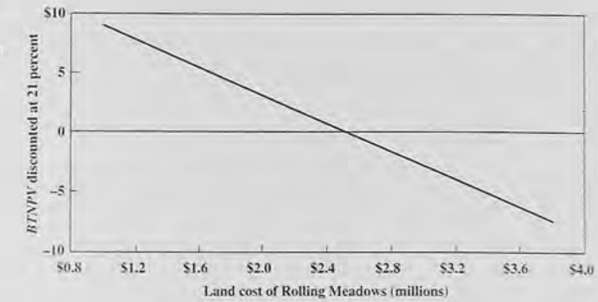


[19] The same analysis may be carried out by changing other variables, such as construction costs, interest rates, or operating expenses one at a time to assess the impact on before-tax *NPV*.

Web App

Construction loans are available from a variety of lenders, including most commercial banks. There are numerous Web sites with information available from lenders offering construction loans. Use a search engine to find a sight with information on current rates for construction loans. Summarize what the rate is and as much information as you can find about how the loan is structured.

EXHIBIT 16–14
BTNPV of Rolling Meadows Center and Land Cost



also referred to as **feasibility analysis,** or a determination of whether a project is commercially feasible at prevailing market rents, land prices, and construction and financing costs.

Conclusion

This chapter dealt with financing the development of income-producing real estate such as apartment complexes, office buildings, warehouses, and shopping centers. Development projects include many risks in addition to those we have discussed in previous chapters for existing projects. We have seen that developers of such projects face changing conditions in the national and local economies, competitive pressures from other developments, and changes in locational preferences of tenants, all of which influence the profitability of developing and operating an income-producing property. All these forces combined affect the developer's ability to acquire land, build improvements, lease space to tenants, and earn sufficient revenues to cover operating expenses and repay both a construction and a permanent mortgage loan. This chapter illustrated the mechanics of construction loans, which differ from the permanent loans we have already discussed extensively because they involve draws over the construction period. The next chapter explores land development projects and extends the concepts of the present chapter to development and financing land for subdivision.

Key Terms

build to suit, *463*
construction (interim) loan, *467*
contingencies, *472*
exculpation (nonrecourse) clause, *476*
feasibility analysis, *491*
gap financing, *473*
hard costs, *467*
holdbacks, *481*
mini-perm loan, *467, 474*
monthly draw method, *474*
percentage rent, *484*
permanent financing, *482*
seasoned property, [illegible]
soft costs, *467*
speculative/open-ended construction lending, [illegible]
standby commitments, [illegible]
triparty buy-sell agreement, *475*

Useful Web Sites

www.uli.org—The mission of the Urban Land Institute is to provide responsible leadership in the use of land in order to enhance the total environment. This site also provides current issues for financial trends in the industry.

www.bizloan.org—Good resource for information about different types of loans used for project development. Includes glossary of terms.

www.census.gov—U.S. Census Bureau Web site.

www.icsc.org—International Council of Shopping Centers Web site.

www.economy.com—Economy.com is a provider of economic data.

www.bls.gov—U.S. Department of Labor

www.bea.gov—U.S. Department of Commerce—Bureau of Economic Development

www.claritas.com—Claritas provides demographic and enhanced census data.

www.Axiometrics.com—Axiometrics is a research firm providing fundamental real estate research for the apartment sector with an emphasis on the performance of portfolios owned by the publicly traded apartment REITs.

www.econdata.net—It has around 1,000 links to socioeconomic data sources, arranged by subject and provider, pointers to the Web's premiere data collections, and its own list of the ten best sites for finding regional economic data.

www.economy.com/freelunch—Moody's Economy.com FreeLunch.com is the web's best source of free economic data. Users can quickly and easily chart and download economic data. Moody's Economy.com data services teams in Asia, Europe, and the United States update FreeLunch.com's economic data is as it is released by the primary source.

http://finance.yahoo.com—Yahoo Finance provides the subscriber with up to date information on finance. The site also features information centers in mutual funds, bill pay, banking, loans, insurance, retirement planning and taxes.

Questions

1. What are the sources of risk associated with project development?
2. What are some development strategies that many developers follow? Why do they follow such strategies?
3. How can development projects be differentiated from one another in the marketplace?
4. Describe the process of financing the construction and operation of a typical real estate development. Indicate the order in which lenders who fund project development financing are sought and why this pattern is followed.
5. What contingencies are commonly found in permanent or take-out loan commitments? Why are they used? What happens if they are not met by the developer?
6. What is a *standby commitment*? When and why is it used?
7. What is a *mini-perm* or *bullet loan*? When and why is this loan used?
8. Third-party lenders sometimes provide gap financing for project developments. Why is this lending used? How does it work?
9. A presale agreement is said to be equivalent to a take-out commitment. What will the construction lender be concerned about if the developer plans to use such an agreement in lieu of a take-out?
10. Why don't permanent lenders usually provide construction loans to developers? Do construction lenders ever provide permanent loans to developers?
11. What is the difference between the assignment of a take-out commitment to the construction lender and a triparty agreement? If neither device is used in project financing, what is the relationship between lenders in such a case?
12. What is the major concern construction lenders express about the income approach to estimating value? Why do they prefer to use the cost approach when possible? In the latter case, if the developer has owned the land for five years prior to development would the cost approach be more effective? Why or why not?
13. What do we mean by *overage* in a retail lease agreement? How might it be calculated?
14. What is *sensitivity analysis*? How might it be used in real estate development?

15. It is sometimes said that land represents "residual" value. This statement reflects the fact that improvement costs do not vary materially from one location to another whereas rents vary considerably. Hence, land values reflect changes in rents (both up and down) from location to location. Do you agree or disagree?
16. Why is the practice of "holdbacks" used? Who is involved in this practice? How does it affect construction lending?

Problems

1. Review Concept Box 16.2. The investor-developer would not be comfortable with a 7.8 percent return on cost because the "margin for error" is too risky. If construction costs are higher or rents are lower than anticipated, the project may not be feasible.
   a. Based on the fact that the project appears to have 9,360 square feet of surface area in excess of zoning requirements, the developer could make an argument to the planning department for an additional 10 units, 250 units in total, or 25 units per acre. How would this affect financial feasibility? What could be included in such an argument? Why would a public regulatory institution be interested in increasing density to 25 units per acre? Why not?
   b. Instead of (*a*), what if the developer could build a 240-unit luxury apartment complex with a cost of $83,000 per unit. What would such a project have to rent for (per square foot) to make an 8 percent return on total cost? What risk factors would the developer have to consider?
2. The CEO of Kuehner Development Co. has just come from a meeting with his marketing staff where he was given the latest market study of a proposed new shopping center, Parker Road Plaza. The study calls for a construction phase of one year and an operation phase of five years. The property is to be sold at the end of the fifth year of operation.

   Part I. *Construction Phase:*

   The marketing staff has chosen a 12-acre site for the project that they believe they can acquire for $2.25 million. The initial studies indicate that this shopping center will support a floor-to-area ratio of 36.35 percent and a 92.11 percent leasable area ratio. (This means that the gross building area [*GBA*] will be 190,000 square feet, and the gross leasable area [*GLA*] will be 175,000 square feet.)

   The head of Kuehner's construction division assures the CEO that construction can keep hard costs to $54 per square foot (*GBA*) and soft costs (excluding interest carry and all loan fees) to $4.50 per square foot (*GBA*). The division has decided to subcontract all of the site improvements at a total cost of $750,000.

   The Shawmut Bank has agreed to provide interim financing for the project. The bank will finance all of the construction costs and site improvements at an annual rate of 13 percent plus a loan commitment fee of two points. The construction division estimates that 60 percent of the total direct cost will be taken down evenly during the first six months of the construction phase. Kuehner expects to obtain permanent financing from the Acme Insurance Co. at an interest rate of 12 percent for 20 years with a 2.5 percent prepaid loan fee and a 10-year call. Kuehner is expected to make monthly loan payments.

   a. What will be the total project cost for Parker Road Plaza (excluding loan commitment fees and interest carry)? What will be the total direct costs?
   b. What will be the interest carry for the Parker Road Plaza project? What will be the total loan amount that Kuehner must borrow (including interest carry)? What will be the yield to the lender on this construction loan?
   c. What is the total project cost and how much equity must be put into the project each year during the construction phase? (Kuehner will fund both loan commitment fees from project equity.)

   Part II. *Operations and Final Sale Phase:*

   Kuehner estimates that it can lease Parker Road Plaza for $18.50 per square foot (*GLA*) base rent with a 3 percent overage on gross sales in excess of $200 per square foot (*GLA*). The company expects rents to increase by 5 percent per year during the lease period and tenant reimbursements to run $8 per square foot (*GLA*) and to increase at the same rate as rents. Kuehner expects to have the shopping center 70 percent leased during the first year of operation. After that, vacancies should average about 5 percent per year. The vacancy losses should be calculated on the entire gross potential income, which includes minimum rents, percentage rents, and tenant reimbursements. Sales, which are expected to average $210 per square foot (*GLA*) for the first year of operation, should grow at 6 percent per year. The operating expenses are expected to average $14 per square foot of *GLA* for the first year and will increase at the same rate as the rents. Kuehner will collect an additional 5 percent of *EGI* as an annual management fee. The final sales price is expected to be $18.4 million and Kuehner will incur sales expenses of 2 percent. Two schedules provide necessary information about this phase of the project: (1) the gross potential income of Parker Road Plaza for the five-year operation period; (2) the schedule of amortization and depreciation expenses for the project.

d. What cash flows would Kuehner Development Co. earn before and after taxes for Parker Road Plaza if it were operated for five years (assuming the marginal tax rate to be 28 percent for ordinary income and capital gains)? What cash flows will Kuehner realize before and after taxes from the sale of the project after five years?

e. Assuming that Kuehner's before-tax required rate of return is 16 percent, should the company develop Parker Road Plaza? Justify your answer based on *BTNPV* and *BTIRR*.

Pro Forma Operating Statement—Parker Road Plaza

Cash Flows (*EOP*)	2	3	4	5	6
Income					
Minimum rent	$3,237,500	$3,399,375	$3,569,344	$3,747,811	$3,935,201
Overage (% of gross sales)	52,500	118,650	188,769	263,095	341,881
Tenant reimbursements (per *GLA*)	1,400,000	1,470,000	1,543,500	1,620,675	1,701,709
Potential gross income	$4,690,000	$4,988,025	$5,301,613	$5,631,581	$5,978,791

Item	Amortization Period
Construction loan fees	1 year
Permanent loan fees	10 years

	Depreciation Period
Capital improvements (90% of total)	31.5 years S/L
Tenant improvements (10% of total)	7 years DDB

3. As a financial advisor for the Spain Development Co., you have been given the construction and marketing studies for the proposed Timbercreek office project. Several potential sites have been selected, but a final decision has not been made. Your manager needs to know how much she can afford to pay for the land and still manage to return 16 percent on the entire project over its lifetime.

The strategic plan calls for a construction phase of one year and an operation phase of five years, after which time the property will be sold. The marketing staff says that a 1.3-acre site will be adequate because the initial studies indicate that this site will support an office building with a gross leasable area (*GLA*) of 26,520 square feet. The gross building area (*GBA*) will be 31,200 square feet, giving a leasable ratio of 85 percent. The marketing staff further assures you that the space can be rented for $19 per square foot. The head of the construction division maintains that all direct costs (excluding interest carry and all loan fees) will be $2.4 million.

The First Street Bank will provide the construction loan for the project. The bank will finance all of the construction costs, site improvements, and interest carry at an annual rate of 13 percent plus a loan origination fee of 1.5 points. The construction division estimates that the direct cost draws will be taken down in six equal amounts commencing with the first month after close. The permanent financing for the project will come at the end of the first year from the Reliable Co. at an interest rate of 11.5 percent with a 4 percent prepaid loan fee. The loan has an eight-year term and is to be paid back monthly over a 25-year amortization schedule. No financing fees will be included in either loan amount. Spain will fund acquisition of the land with its own equity.

Spain expects tenant reimbursements for the project to be $3.25 per square foot and the office building to be 75 percent leased during the first year of operation. After that, vacancies should average about 5 percent of GPI per year. Rents, tenant reimbursement, and operating expenses are expected to increase by 3 percent per year during the lease period. The operating expenses are expected to be $9.50 per square foot. The final sales price is based on the *NOI* in the sixth year of the project (the fifth year of operation) capitalized at 9.5 percent. The project will incur sales expenses of 4 percent. Spain is concerned that it may not be able to afford to pay for the land and still earn 16 percent (before taxes) on its equity (remember that the land acquisition cost must be paid from Spain's equity).

To consider project feasibility,

a. Estimate construction draw schedule, interest carry, and total loan amount for improvements. Determine total project cost (including fees) less financing and the equity needed to fund improvements.

b. Estimate cash flows from operations and eventual sale.

c. Establish whether a positive or negative *NPV* exists by discounting equity cash inflows and outflows in (*b*).

d. What does the *NPV* mean in this case? If the asking price of the land were $195,000, would this project be feasible?

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4. Excel. Refer to the "Ch16 Const" tab in the Excel Workbook.

a. What is the yield to the lender and the investor's after tax *IRR* if 90 percent of the loan must be drawn during the first four months and 10 percent during the last 8 months?

b. Repeat (*a*) assuming 60 percent of the loan is drawn the first four months and 40 percent the last 8 months.

Chapter 17

Financing Land Development Projects

As the last chapter indicated, real estate development is a very complex process to analyze, from the standpoint of both lenders and investors. This chapter deals with **land development,** which involves the acquisition of land with the intention of constructing utilities and surface improvements, and then reselling some or all of the developed sites to project developers or, in the case of housing, home builders. As described in the previous chapter, *project development* deals with the acquisition of a specific site, and then construction of an office building, shopping center, or other property type. This chapter contains a basic description of land development and financing. However, many attributes of real estate development are common to both types of development, so to avoid redundancy we do not repeat them here. After completing both chapters, you should have a general understanding of investment financing in the development process.

In this chapter, we provide insight into the land development process and how to determine the feasibility of land development projects. We discuss how to structure development loans, how to determine terms for disbursement and repayment, and how to make profitability projections. Structuring loan agreements and repayment schedules and estimating interest carry for land development projects are detailed and complex processes.

Characterization of the Land Development Business

When generalizing about the land development process, it is useful to think of the land developer as an individual with a general development concept. Before proceeding with the development, however, there must be evidence that the project is feasible or that market acceptance of the end product (single family houses, offices, warehouses, etc.) is highly likely. This step is important even though the land developer may or may not be the developer of the final product. In other words, in the land development phase, the developer must anticipate and understand the demand for the final product (or products in the case of a mixed use land development, which may contain sites for sale to single family builders, apartment developers, and/or shopping center developers, for example). Demand for the end product obviously affects the demand for individual sites, lots, or pads within the land development. Every land acquisition decision must also be based on whether the tract of unimproved land on which the plan is to be executed is of sufficient size and contains adequate amounts of usable area to accommodate the development plan. While development plans will differ based on the general development concept, all plans include the

subdivision, or platting, of sites within a tract of land to be acquired. Decisions as to how to subdivide the larger development into lot sizes and how to price individual sites are based on expected end uses envisioned as a part of the general development concept.

In residential land development, it is common to find firms specializing in the acquisition of raw land in suburban fringe areas and developing sites for single family detached units or for multiple uses, such as combinations of single family units, multifamily apartments, and cluster housing. Based on the market segment in which the end use will likely sell, the land developer acquires land, develops a land use and traffic circulation plan, and then constructs streets, lighting, and subsurface improvements (utilities, drainage, sewer). The developer then subdivides individual sites, and sells smaller sites to builders and project developers. The developer may also retain some retail sites for later sale if the site has suitable highway frontage.

One point that must be stressed here is that land developers and builders or project developers may, or may not, be the same entities. Land developers may or may not have the expertise to undertake building construction and/or project development. These functions differ in their respective production technologies and market risks. However, a few large firms may engage in both activities. For example, where residential sites are being developed for housing in lower price ranges, the land developer may also engage in some home building. On the other hand, when land is more expensive, the land developer usually sells lots to custom home builders and engages in little, if any, home building.

In business parks and industrial development, land developers (discussed in the previous chapter) may prepare sites for sale to project developers, but they usually retain some sites for project development of their own. For example, a major single tenant may want to have a building constructed in a business park. In this case, the park developer may design and **build to suit** a structure for the tenant and enter a long-term lease arrangement. Alternatively, the developer may construct a building on a site and sell it to the tenant on a **turnkey basis.** In business and industrial park development, the land developer may also construct some building improvements on a speculative basis to attract other tenants to the park. However, these developers usually stand ready to sell sites in the park to other project developers as long as those project developers abide by required development controls. These controls usually include construction of buildings of adequate quality, maintenance, landscaping, and so on. These controls are usually specified in deed restrictions and/or provisions in an agreement governing the operation of a business park owners association.

Another observation about land development is that the industry is highly fragmented, localized, and competitive. Many land development firms usually exist in a given urban market. They enter the market for raw land by contacting landowners or land brokers and obtaining information on tracts of land available for sale. These developers then engage consultants to conduct market studies to assess the demand for end uses that would ultimately be developed and price ranges for each use. The developer then completes a preliminary land plan, estimates the land development cost, and analyzes whether the tract can be purchased and developed profitably. This process is referred to as a **feasibility study.** It should be stressed that in many cases the developer is more of a facilitator of the development process than a firm that undertakes all necessary functions in the land development process. Thus, many functions required to complete a land development project may be done by consulting firms (land planners, civil engineers, landscape architects) and contractors (roads and utility construction companies). In these instances, the developer owns the land, obtains the necessary financing, and implements the overall development plan, but may not employ a staff that is directly involved in construction or design. The developer must also interact with public sector officials in obtaining various project approvals and changes in zoning when necessary, and then market sites to project developers and/or builders.

The Land Development Process—An Overview

Exhibit 17–1 contains a general description of activities performed at various stages in the process. Generally, the process begins when a land broker who represents the owner of a tract of land available for sale contacts a developer. At this point (Stage I), the developer conducts a very preliminary investigation of the site, the condition of the market, how a tract might be developed, and at what cost. Should sufficient interest exist to pursue negotiation, the developer usually negotiates an **option agreement** with the landowner. An option usually provides that the developer has the right, but no obligation, to purchase the land for a specific price at a future date. The developer pays an option price to the landowner, which is usually applied to the purchase price of the land if the developer purchases it (exercises the option). In the event that the developer decides not to purchase the land on the expiration date, the landowner may keep the money paid for the option.

Acquisition of Land—Use of the Option Contract

The developer usually negotiates an option contract because it takes time to accomplish various tasks and activities prior to the decision to actually purchase the land. Some of these activities are shown in Stage II in the exhibit. Inasmuch as the developer's final decision to purchase depends on the information obtained from the activities indicated, the decision to purchase land obviously cannot be made quickly. Consequently, the developer would prefer to negotiate an option at the lowest price possible for the longest period of time possible in order to accomplish these tasks. Further, the developer will incur costs while carrying out the research about whether land should be purchased. The developer wants assurance that the land will not be sold while these costs are being incurred. On the other hand, if the landowner wants to sell as quickly as possible, an option with a short exercise period at the highest possible price would be preferred. While the option agreement provides the developer time to conduct research, it also ties up the land or precludes the landowner from selling it until the expiration date.[1]

Exhibit 17–1 **Land Development Process**

Stage I Initial Contact by Land Broker	Stage II Option Period	Stage III Development Period	Stage IV Sales Period
• Site inspection	• Soil studies, engineering	• Purchase land	• Implement marketing program
• Preliminary market study	• Feasibility, appraisal, and design strategy	• Close on land development loan • Begin construction of improvements	• Additional coordination with builder
• Preliminary cost estimates	• Bidding and/or negotiating with contractors subject to closing • Submit plan for public approvals, submit package for financing	• Implement financial controls • Coordinate with contractors, consultants, public sector	• Implement design controls with builders • Implement facility management and/or begin homeowner association

[1] Because all terms of sale should be included in the option contract, in many cases a contract to purchase the land may be used instead of an option agreement. The contract would be executed with a closing date that would make it equivalent to the option period. All terms, conditions, contingencies, and so on, would be negotiated and included in the sale contract at the time that the contract is executed. This approach usually eliminates contractual ambiguities between the buyer and seller that could arise if they used an option.

Consequently, the landowner may give up opportunities to sell the land during the option period with no assurance that the developer may actually close the transaction. Option periods can be very short (e.g., one month for small residential land developments) or as long as three years or more (e.g., regional shopping centers).[2]

Assuming that the developer obtains an option for an acceptable period of time and cost, some important activities must be undertaken before the expiration date, when the decision to acquire the land must be made. The site must be studied to establish how much of the surface area needs excavating and grading, and at what cost. These decisions are a function of the topography, drainage characteristics, soil condition, and subsurface characteristics. The market must be studied to estimate what the demand will be for a mix of lot sizes. (An example of a preliminary feasibility study is provided in Concept Box 17.1.) The supply of sites coming into the market in competing areas must also be considered. An estimate of the project's value upon completion of development must be made to determine whether it will be profitable or whether the market value will exceed the cost of the land plus all improvements, interest carry, and marketing costs. Improvement costs must be estimated by obtaining bids from contractors, consulting engineers, and land planners. These estimates must be based on an anticipated land development plan, which usually has to undergo several iterations before it (1) complies with the overall development concept that is intended to meet market demand and (2) meets the approval of various public agencies (city departments, planning commissions, city council, etc.). Results from all of these activities must then be interpreted and used to develop a loan submission request. Without approval from a lender, who may be asked to provide a large portion of the funds necessary to acquire the land and construct improvements, the project is not likely to go forward. (To provide very basic information on land use planning and some of the terms and concepts used when dealing with public officials, we have provided Concept Box 17.2.)

One aspect of the process depicted in Stage II of Exhibit 17–1 should become clear at this point. The response time of the developer to accomplish these functions is critical and usually requires the commitment of other firms to the developer's timetable. If the developer cannot obtain the necessary approvals from public officials or find a lender, he may lose the cost of the option plus all fees and costs incurred while trying to accomplish the activities in Stage II. If approvals and the loan commitment are not secured by the expiration date, the developer may try to negotiate an extension of the option period with the landowner. Failing that, the developer may have to raise equity from partners to acquire the land with the expectation that approvals and/or a loan will be obtained shortly after the option period expires and the land is acquired. Clearly, this approach can be risky because if the land is acquired, long delays may occur before financing and necessary approvals are obtained.

[2] Options with assignment clauses have also been used in land speculation. In these cases the prospective land buyer obtains an option from the landowner with little or no expectation of purchasing the land (although he may not indicate this). The owner of the option hopes to find another buyer to purchase the land at a price higher than the exercise price prior to the expiration of the option. If he can do so, he realizes a gain. If he cannot find a buyer, the speculator loses the option price. This practice has been referred to as *flipping* a contract. In some cases, developers with options that have lengthy expiration dates inadvertently realize gains. These gains occur when, after developers undertake feasibility studies, they realize that land values have risen. In this case, they may engage a land broker or try to find a buyer prior to the option expiration date, or they may negotiate an extension period on the option with the landowner. In some instances, landowners face situations in which a subsequent offer of a higher price is received after an option has been given to a developer. In this case, if the new bidder wants to close the transaction prior to the expiration date of the option, the landowner may try to repurchase the option from the developer and hope that the new buyer and the developer do not meet and negotiate directly.

Preliminary Feasibility Study—Land Development

Concept Box 17.1

I. Physical Characteristics

1. *Goal:* To provide a preliminary development plan and financial analysis to determine whether a large-scale residential lot development can be built in accordance with regulatory requirements and sold at market prices sufficiently high enough to justify construction costs and the cost of land acquisition.
2. *Site:* 20 acres (871,200 square feet).
3. *Asking Price:* $1,000,000.
4. *Project description:* Nonlinear, curved layout for detached, single family homes.
   a. Maximum lot density per zoning and/or deed restriction; must *average* four lots per acre, minimum lot size in the development = 6,000 sq. ft.; no maximum limits on lot size.
   b. Circulation requirement: 15% of land area for road/rights of way.
   c. Open space and/or required donation: 10% of land area.
   d. Net developable area: 75% or 653,400 sq. ft.
   e. Proposed lot mix/yield: 80 lots.
   f. Square footage by lot type, including all setbacks to building lines: Type 1, 32 standard interior @ 6,000 sq. ft. each; Type 2, 32 premium interior @ 8,000 sq. ft. each; Type 3, 6 corners @ 12,837 sq. ft. each.

II. Financial Feasibility

1. Pricing based on market study:	
Standard interior: $100,000 @ 32 lots	$3,200,000
Premium interior: $120,000 @ 32 lots	3,840,000
Corner lot: $130,000 @ 16 lots	2,080,000
Total sales revenue	$9,120,000
2. Less: Average development cost per lot (includes all circulation—roadways, drains, sewer, utility construction to property line of each lot): $70,025 @ 80 lots	$5,602,000
3. Less: Land asking price	1,000,000
4. Potential gross profit	2,518,000
5. Less: Administration, legal, commissions, advertising, etc. (12.5% of gross revenue)	1,140,000
6. Potential net profit	$1,378,000

7. Margin on gross revenue: $1,378,000 ÷ $9,120,000 = 15%
   Return on total cost: $1,378,000 ÷ $7,742,000 = 18% (rounded)
8. Conclusion: Project appears to be feasible; however, return projections do not include financing, discounting for the time schedule for construction, and the estimated time/sales rate for finished lots to builders.

Market conditions and costs can also change during this time, thereby increasing the risk of development.

Financing and Development

Assuming that the land developer successfully accomplishes all activities in Stage II, the purchase and financing of the land, the construction of utilities, and surface improvements must occur next in Stage III. As discussed earlier, the developer generally acts as a facilitator in coordinating, controlling, and paying for the construction of land improvements as funds are acquired from a lender. When financing the land acquisition and development process, a number of structures may be available to the developer; however, we will discuss three of the more common alternatives here.

Important Terms Used in Real Estate Development

Concept Box 17.2

INTRODUCTION: ZONING AND LAND USE

Many communities adopt a *land use plan* developed by the city planning staff with input from all segments of the community: residents, businesses, nonprofit institutions, etc. The plan generally identifies where all land uses will be located. These uses generally include industrial, residential, commercial (retail, office), and public land uses (parks, public buildings). Each general land use category is then *zoned* into more specific land use classifications; for example, residential zoning is usually subdivided into single family (R-1), multifamily (R-2) with special uses (assisted living-convalescent, etc.). Within these zoning classifications, further subdivisions are made (e.g., R-2 multifamily could allow high-rise, garden walk-up, mid-rise structures). Requirements regarding the number of stories, elevators, maximum number of apartment units to the acre, parking ratios (or the number of parking spaces per unit), underground/garage parking allowances, etc., are also included. These classifications give the land use plan a sense of design, size, density, and traffic flow, as well as specifying where individuals will reside and seek employment and business, educational, public, and health services. Similar subcategories are detailed for each general land use classification (office, retail, industrial, etc.). This general land use plan is usually updated every 5–10 years in consultation with the community.

IMPORTANT TERMS USED IN LAND DEVELOPMENT

In the acquisition of land for development, various "terms of art" and concepts are important and must be well understood. These terms are used by developers, public officials, construction lenders, and others to describe the type of development to be undertaken. Many of these terms are very basic and are used to consider things like how many building lots may be developed on a site after allowing for streets, utilities, setbacks, etc. These things must be understood as they may affect value. Many combinations of development patterns may also be considered to determine the most advantageous outcome for an investor. To that end, we have assembled a very basic list of terms and definitions which are contained below.

Plat—a map depicting the location of all individual tracts or lots and streets in a development. It generally evolves from a sketch to a preliminary concept, and then to a final, or approved, plat.

Assemblage—acquisition of many individual parcels of land with an intent to consolidate into one, single development tract.

Density—refers to the number of individual developable sites/lots proposed for development from a tract of land after allowing for desired lot sizes, setbacks, circulation requirements, and wetland-conservation areas/easements (if applicable).

Yield—usually refers to the area corresponding to square footage included in the number of lots expected to be developed as a percentage of the total square footage in a tract of land.

Grid and rectangular residential development—usually the most cost-effective method of land development where streets, right of ways, etc., are laid out evenly in straight lines or in a grid pattern. Surface and infrastructure costs are usually lower than the cost for curvilinear development. However, traffic flow from a grid pattern is considered less safe and not as aesthetically pleasing as a curvilinear pattern.

Cluster development—allows for unbalanced lot development within a tract of land as long as a sufficient amount of green areas or open areas are provided. When developed, the *average density* per acre for all sites developed in the entire project must meet zoning requirements.

Circulation construction requirements—street widths, curb-cuts-turning radius, ingress and egress, load/stress specifications, etc., as specified by jurisdictions in which the land is located. These requirements are necessary to accommodate general traffic flows and access by fire and emergency vehicles, etc. Construction specifications must be met before dedication of streets, rights of way, etc. (transfer of maintenance, etc., from the developer to the public sector) takes place.

Important Terms Used in Real Estate Development (concluded) — Concept Box 17.

Dedication—transfer of ownership of right of ways, streets, parks, etc., in land developments from private developers to public entities. At this point, maintenance of drainage, sewer, roads, etc., is the responsibility of the city. Property taxes from the new development are collected for these services.

Exclusionary zoning—ordinances adopted by jurisdictions resulting in certain structures/activities being *explicitly* excluded from an area or land development. Examples: exclusions of mobile homes from single family residential areas. In some cases, exclusionary zoning may be illegal. For example, if minimum lot sizes are required and are deemed to be so unreasonably large so as to exclude low-income or minority families, this type of zoning may violate discrimination laws and be deemed *implicitly* biased and exclusionary.

Adverse impact—permit denied because of a negative influence emanating from the proposed site development. This could include inadequate drainage or sewage which would affect other properties.

Buildable area—amount of land remaining on a given tract of land after all zoning requirements, slopes, wetlands, etc., are subtracted from the gross land area, leaving the area upon which structures can be built.

1. The developer may purchase the land for cash. The developer may then obtain a loan for the cost of improvements and interest carry.
2. The developer may purchase the land by making a down payment only. The seller finances all or a portion of the land sale by taking back a purchase-money mortgage from the developer. The developer then acquires a loan for improvements only. The seller of land (mortgagee) agrees to subordinate the lien represented by the purchase-money mortgage to the development loan, and the developer repays the seller's mortgage from funds as parcels are sold and after payments on the development loan are made.
3. The developer purchases the land by making a down payment and obtaining one loan based on a percentage of the appraised value of land plus improvements. The funds pay off the seller and construction improvements.

The extent to which developers use each of these techniques depends on conditions in the market for land and the price paid for the land. If the demand for developable land is strong, sellers may demand cash and may not be willing to sell "on terms" or take back purchase-money mortgages. However, during such times, lenders are generally more willing to provide funds for improvements and a part of the land acquisition price. During periods when demand is not as strong, sellers of land are more willing to finance a portion of the sale price; however, lenders are usually more cautious as uncertainty becomes more prevalent in the marketplace.[3]

Regardless of the financing technique used to acquire the land, lenders usually make loans for land improvements that allow developers to "draw down" funds in stages, usually monthly, based on the percentage of development work completed and verified by the lender. The developer uses an open-end mortgage as security for the loan. Such loans are usually made on a floating rate basis. That is, the lender usually makes the loan at 2 or 3 percent above the prime lending rate. Hence, the developer bears the risk of an interest rate

[3] It is difficult to generalize how much a lender is willing to provide to a land developer. If the developer does not own the land and is in the process of acquiring it for development, and if the lender is satisfied that the value of the land will not decline, the lender may be willing to make a land acquisition and development loan. Further, if the developer has considerable personal net worth and is personally liable on the loan, the lender may be more willing to advance a portion of the funds to acquire the land in view of the additional security behind the loan.

change during the development period. As previously indicated, the lender providing the funds for improvements will insist on obtaining first lien on the land being developed and first lien on all improvements as they are completed and as funds are disbursed.

Repayment of land development loans ultimately depends on the sale of the subdivided sites to builders or other developers. Because repayments depend on lot sales and lenders view such loans as very risky, they must accurately assess the risk of projects and the rate at which parcels will be sold in order to determine whether such loans can be repaid. Lenders closely analyze financial statements, appraisal reports, and market studies. In addition, as a development progresses, monthly inspections must be made to verify all work done before a draw can be made against a loan commitment.

As previously indicated, as the developer eventually obtains funds from the sale of individual parcels, a portion of the proceeds from each parcel sale must be used to repay loans used to make improvements and/or acquire the land. Developers and lenders usually negotiate amounts to be paid for each type of developed site in a project, which is referred to as a **release schedule.** When a developer sells a parcel and repays a lender or lenders, the developer obtains a release statement in which lenders waive all liens on the parcel to be sold. Clear title may then pass from the developer to the buyer of the parcel. Lenders use these release provisions as a control on development loans to ensure that repayment will occur as parcels are sold. Developers must also deal with risks of cost overruns, changes in market demand, and supply conditions that cause delays and increases in carrying costs (interest on loans, taxes, etc.) during this phase.

In Stage IV, the final stage, promotion, marketing, and sales to builders or project developers occur. Generally, the developer will have designed a marketing program utilizing various media (newspapers, trade publications, etc.) to advertise the development to the builders and developers that are constructing improvements based on the nature of the land being developed (homesites, office parks, etc.).

Lender Requirements in Financing Land Development

While the focus of this chapter is on financial analysis and the feasibility of land development projects, some understanding of the financing process and interaction between lender and borrower is essential. A general understanding of the documentation requirements associated with the development process will also help the reader understand the nature of the liability and performance requirements created when projects are financed and developed. Exhibit 17–2 contains a general list consisting of (A) typical requirements for a land development loan submission to the lender, (B) requirements for closing the loan if the submission is approved, and (C) the final commitment and attendant terms of financing after closing. Be aware that this is a very general list of requirements and that each land development will have unique requirements of its own. Also, during the process of trying to finance a project and close a loan, the lender will raise other questions and require additional documentation and verification that the developer will have to supply during the application period. (Some of the material in Exhibit 17–2 is relevant to the land component of project development covered in Chapter 16. It was not included in Exhibit 16–2 to avoid redundancy.)

Much of the required information listed in Exhibit 17–2 deals with (1) the capacity of third parties (such as contractors and architects) to perform, (2) verification by public sector officials that the use and density of the proposed development conforms with both appropriate zoning ordinances and the capacity of utilities on the site (the lender cannot rely on the developer to provide such information; the municipality or county must give an unambiguous statement on these issues because officials will have to provide permits to allow development to commence), and (3) verification that third parties are committed to have

Exhibit 17–2
General Loan Submission and Closing Requirements—Land Development and Closing

A. General requirements for *loan submission* package—land development
  1. Project information
    a. Project description: all details for land use plan, aerials, soil reports, platting, circulation, amenities, renderings, environmental impact statement
    b. Survey and legal description of site showing property lines, easements, utility lines
    c. Preliminary plan for improvements and specifications
    d. Project cost breakdown
    e. Identification of architect, land planner, and general contractor with bank references and/or supporting data indicating their ability to complete the project if approved
  2. Market financial data
    a. Requested loan terms: amount, rate, maturity period, proposed release schedule (to be dealt with later in chapter)
    b. Financial statements of borrowers (including bank references) and development background
    c. Feasibility study, including market comparables, appraisals, pro forma operating statement (which will be dealt with later in chapter), schedule of estimated selling prices
    d. Projected loan closing date
  3. Government and regulatory information
    a. Statement of zoning status: current zoning status and disclosure of any zoning changes required before undertaking development
    b. Ad valorem taxes: any impending change in the method of levy, any pending reappraisal, and the current status of payment
  4. Legal documentation
    a. Legal documents including corporate charters, partnership agreements (there should be no ambiguity as to the entity requesting the loan and where liability will rest)
    b. Statement of land cost and proof of ownership (deed) or impending ownership, as evidenced by an option or purchase agreement
    c. Detailed description of any deed restrictions or restrictive covenants regarding land use
    d. Subordination agreements: in the event of seller financing or debt financing used or to be used to acquire the land, evidence that such parties are willing to subordinate their liens to that of the development lender; if the land mortgages are to be repaid from advances from the development loan being requested, the exact amount should be stipulated, and the nature of any releases being obtained should be disclosed

B. General requirements for *loan closing*—land development
  1. Project information: land site plan containing platting, renderings, circulation, utility lines, landscaping, etc.
  2. Market and financial data: statement that borrowers have had no adverse impact in financial condition since the initial loan submission
  3. Government and regulatory information
    a. Copies of all permits from all relevant agencies and jurisdictions; includes building permits, approved zoning variances needed, health, water, sewer, environmental impact statement, etc.
    b. Availability of utilities: letters from appropriate municipal or county departments indicating extent of utilities available to the site. Any off-site utility extensions must be detailed and the extension cost disclosed
  4. Legal documentation
    a. Detail on contracts to be let with general contractor and all subcontractors, including size of contracts
    b. Evidence of contractor performance and payment bond

Exhibit 17–2
General Loan Submission and Closing Requirements—Land Development and Closing (concluded)

    c. Agreement from general contractor, architect, and land planner to perform for the lender in the event of developer default
    d. Evidence of all casualty, hazard, and other insurance policies naming the lender as loss payee
    e. Evidence of all liability and workman's compensation coverage needed by the developer
    f. Title insurance binder

C. Final commitment and agreements
  1. Loan commitment and terms: requirements for lender approval of draws, methods of calculating holdback requirements, prepayment options, and any extension agreement
  2. Note and mortgage or deed of trust evidencing debt and lien status of lender
  3. Borrower's personal guarantee for repayment of loan
  4. Conditional assignment agreement covering all contracts made with architects, planners, and the general contractor to be assigned to the interim lender in the event of borrower default

unforeseen risks such as are indicated by the items listed in part 4 in category B. If the developer was unable to obtain any of these verifications, it would obviously be a signal to the lender that more factual information is necessary to support the loan application.

Detailed Cost Breakdowns

The developer usually must submit detailed cost estimates and plans for constructing the improvements. The lender generally verifies the cost breakdown for accuracy in accordance with construction plans and specifications. The lender will usually require verification of all costs on a monthly basis as development work progresses and as the lender disburses funds.

General Contracts and Subcontracts

Normally, lenders prefer that developers obtain fixed-price contracts from subcontractors. The lender may require these contracts as a means of protecting against cost overruns that may occur if material or labor prices rise during development.

Labor and Material Payment Bonds and Completion Bonds

Many lenders require that contractors purchase labor and material payment bonds and **completion bonds.** The first type of bond assures the lender that any unpaid bills for labor and material will be paid by the bonding company should a contractor default. The completion bond assures the lender that the bonding company will provide funds needed to complete in the event that a contractor defaults during construction.

Title Insurance

As a condition for obtaining a land development loan, the developer generally must purchase title insurance. Such insurance assures the lender that no liens superior to its lien exist on the property when construction commences.

Holdbacks

As we discussed in the previous chapter dealing with project development, land development loans may also provide for a **holdback** of a proportion of each disbursement payable to a developer. This occurs when the developer and/or a general contractor engage a number of subcontractors and hold back a portion of the funds due under subcontracts. The developer holds back these funds to be sure that subcontractors perform all work completely before receiving final payment. Consequently, the lender holds back from the developer s that no excess funds are made available to the developer during the period the developer is holding back from subcontractors.

Extension Agreements

Because it is possible that the loan will not be paid on time due to development problems or the slow sale of parcels, the lender usually requires an **extension agreement** clause in the initial loan contract. This clause specifies that an additional charge will be made for any extra time needed to repay the loan. This arrangement amounts to gap financing or additional interim financing, and the lender usually charges an extension fee in addition to interest on the outstanding loan balance if an extension is needed. In fact, these amounts may never be collectible. Indeed, if the project encounters extreme difficulty, the lender may have to foreclose and assume ownership of the development.

Residential Land Development Illustrated

To illustrate one of the many land development scenarios that are possible, we have chosen a medium-size residential land development project. However, many of the same *general* concepts and the framework for analysis apply to business/office parks and industrial/warehouse/distribution centers. Our illustration is based on the 50-acre Grayson tract, the availability of which has been brought to the attention of Landco Development Company by a land broker. Based on the combination of the description of the tract provided by the broker, Landco's knowledge of the area, and information obtained from the owner of the tract, a summary of important facts is provided in Exhibit 17–3.

Information in Exhibit 17–3 indicates that the tract is farmland at the fringe of suburban development 15 miles north of the central business district (CBD) with good proximity to highways. The present owner has recently had the property rezoned to allow for the development of single family detached units. Most of the surface area may be developed; however, five acres consist of creek and floodplain. Current zoning provides for an *average* maximum development density of one single family detached unit per 7,500 square feet of developable surface space (gross land area, less floodplain area, less circulation such as roads, alleys, etc). The terrain appears to present little, if any, problem to constructing land improvements. The broker has indicated that the owner is willing to entertain an offer to sell the property for $2 million, and will give the developer an option to purchase it for 30 days at no cost. At the end of such time, the developer may acquire another option for an additional five months at 1 percent of the price of the land, or $20,000. Should the purchaser exercise the option to purchase the land, credit for the option price would be applied toward the purchase of the land.[4]

Inasmuch as the owner is allowing a 30-day "free look" at the property, Landco has decided to expend effort to determine if the project is feasible and whether the $2 million asking price is justified. To accomplish this, Landco must complete a preliminary development plan and conduct a market study to assess the demand for residential sites and the competitive supply conditions, both currently and in the near future. If results from the land plan and market study appear positive, information will be compiled to apply for a loan commitment and public approvals.

Market Conditions and Site Plan

As previously indicated, this illustration is intended to focus on approaches that can be used to evaluate the economic feasibility of residential land development. Estimates used to make projections for such developments are heavily based on market and cost information. While we do not provide the reader with an in-depth discussion of how to conduct market studies and how to make cost estimates, we do not mean to imply that these are minor considerations when one is deciding whether to enter into a land development project. Indeed, these studies are extremely important, and you should consult other sources of information for additional insights into this process.[5]

Exhibit 17–4 provides a brief summary of important facts that should be the objective of market and engineering studies. These studies should be carried out during the option period, before acquiring the land and applying for financing. In addition to gauging how strong builder demand for lots is before committing to purchase the land, the developer must have a clear vision of the proposed development and how it will be viewed by buyers who have the choice of acquiring homes in competing developments.

Essentially, Landco's plan is to develop cluster-type housing sites and standard and oversized creek lots. The project will also include community facilities (pool, tennis courts). Five acres of the tract are not developable because they lie in a floodplain, and to the extent that competing land development projects do not have this loss in developable land, Landco may be at a competitive disadvantage unless (1) the loss of acreage is reflected in a lower acquisition price for the tract (holding all else equal), or (2) Landco can develop the creek area into a positive, complementary feature. If lots can be developed contiguous to the creek, they may command a premium price. This may fully or partially offset the loss of developable space in the floodplain. In any event, the developer must carefully consider how much of the land is developable relative to comparable sites and their respective prices when deciding whether the development is economically feasible. In Landco's case, the issue is whether the asking price for the Grayson land ($2 million) plus development costs will be too high relative to the market value of competing homesites.

One aspect of the site plan that must be considered when investing in and financing land development is the percent of land available for lot development. For example, gross acreage in our case is 50 acres. However, the amount of land actually available for development is equal to gross land area, less floodplain area, less circulation requirements. In our example, this would be $[(50-5)\times(1-.20)]\div 50 = 72$ percent, or [illegible]

[4] In many cases, the buyer may be able to use a letter of credit in lieu of a cash option payment to the seller. This approach, if acceptable to the seller, is usually a lower-cost alternative to the buyer, who may have a more profitable use for the funds during the option period.

EXHIBIT 17–3
Data on Grayson Tract

Size of tract	50 acres
Asking price	$40,000 per acre, for a total of $2,000,000
Option	30-day "free look," $20,000 for next five months
Current zoning	Single family detached, with a maximum average development density of 1 unit per 7,500 sq. ft. of developable area
Legal status	No deed restrictions or easements are currently indicated; no encumbrances exist
Site characteristics	Creek and floodplain comprise five acres of surface area. Terrain is gently rolling and moderately treed. A creek flows through the northeast quadrant, and the floodplain is contained within a channel to the edge of a steep embankment. The soil is stable with normal percolation.
Utilities	Water, sewer, electricity, and gas, all with adequate capacity, are extended to the site
Proximity	1,500 feet of highway frontage (state highway 66), 1 mile west of U.S. Interstate 166, 15 miles north of CBD
Current use	Farmland in suburban fringe area

[5] For an illustration see John M. Clapp, *Handbook for Real Estate Market Analysis* (Englewood Cliffs, NJ: Prentice Hall, 1987).

EXHIBIT 17–4
Summary of Market Data and Development Strategy

A. Market conditions	Based on a survey of three land developments under way in the area, absorption of building sites appears to be excellent. Builder surveys indicate a strong desire to purchase sites for future development. Average lot sizes in competing developments are approximately 8,700 sq. ft.
B. Lot mix and development plan	Landco plans to utilize the creek area to enhance the development by configuring the circulation pattern to accommodate larger lot sizes on both sides of the creek. The lots for cluster-type housing units would be placed adjacent to the highway frontage as a buffer. These would be complemented with heavy landscaping. Cul-de-sacs would be utilized where possible in the interior of the development. Lot sizes would be ranging from 5,000 to 20,000 sq. ft. within the development with the average lot size being 8,712 sq. ft.
C. Deed restrictions	Private deed restrictions would be used to ensure that detached housing units with a minimum of 2,000 sq. ft. would be constructed on each lot. Restriction regarding setbacks, external finish materials (percent of brick and wood, roof composition), landscaping, fencing, and future additions to structures would continue to apply after completion of the development to ensure neighborhood quality.
D. Developable area	50 acres less 5 acres of creek and floodplain, less an additional 20% for circulation (alleys, streets, amenities, etc.) or 36 net acres. Lot yield should be 3.6 units per gross surface acre. Setbacks, lot lines, street and alley widths, and utility easements easily meet all city regulatory requirements.
E. Amenities	Clubhouse, two swimming pools, eight lighted tennis courts. A homeowners association will assume management upon completion and sell-out of development.
F. Construction of land improvements	Paving streets, curbing, water mains, hydrants, sewer, and all connections to be constructed in accordance with current city and county standards.
G. Development restrictions	Zoning allows an average of 1 unit per 7,500 sq. ft. of net developable area as the maximum density of development.

the total 50-acre tract. The lot yield in this case could be 180 lots ÷ 50 or 3.6 lots to the acre. This also means that an average of 8,712 square feet of developable land would be available per developed lot (36 acres × 43,560 square feet per acre ÷ 180 lots).

The value in knowing these relationships lies in conducting comparative analysis with competing developments. Large differences in developable land and lot yields may indicate that a development would contain a housing pattern with relatively low density or that the site has soil, terrain, or other characteristics that make a significant part of it unusable. These ratios also give us a basis to compare the *density* of housing that will be built with competing projects. For example, if Landco's estimated gross and net lot yield are greater or less than lot yields in competing developments, Landco may be over- or underdeveloping the tract relative to competing developments. A more careful analysis of market data and a competitive analysis should reveal why this is the case.

For example, if a developer overpays for a site relative to the competition, she must attempt to recapture the higher land cost with more density (higher net lot yield). However,

this strategy may not be successful because it depends on the price that builders (and eventually home buyers) are willing to pay for higher-density housing or smaller sites. Do not assume that developers always try to maximize net lot yield per acre. This approach may appear to be a more "efficient" utilization of land and provide the developer with more lots to sell, but market demand may prove that home buyers prefer larger lot sizes, wider streets and alleys (circulation), and a lower development density. Although this lower density may only be provided at higher prices, if household incomes and preferences will support the pattern, it would be a mistake to proceed with higher densities. On the other hand, if this tract were closer to the central business district, higher density might be acceptable to households that have preferences for smaller lot sizes with closer proximity to the city center. Hence, lot yield calculations should only be used as a tool to investigate why *deviations* from yields in comparable developments exist. Using them should provide a better understanding of the market segment that developers are appealing to. No absolute maximum or minimum rules apply.

Public agencies also use lot yield per acre to determine if the development adheres to zoning restrictions. As shown in Exhibit 17–4, we see that zoning provides that an *average* of one lot per 7,500 square feet of developable area is the maximum density allowed in this project. Landco projects that an *average* of 8,712 square feet per unit will be the maximum *average* density, which easily meets zoning restrictions. Notice that developers do not always design to the maximum density allowed by zoning regulations. In all cases, *market demand* and household preferences dictate what densities should be developed. As previously indicated, home buyers may prefer to pay higher prices for lower densities and corresponding increases in privacy (larger lots) and reductions in traffic and congestion. In this event, developers may take excessive risks if they attempt to increase densities, even if current zoning allows them to do so, and lower average lot prices for buyers could result.

To consider some of the market conditions Landco faces, refer to the competitive market analysis summary provided in Exhibit 17–5. For example, note that relative to Grayson, project A has about the same net development density, but it has no amenities or creek sites and it has a slightly lower average asking price per standard lot. Project B is larger in scale than Grayson, has much lower net density, larger average lot sizes, slightly greater circulation requirement (because of hilly terrain), a slightly better amenity package, and bluff sites as a special feature. Its sites are priced higher in each category. Development C is largest in scale and has no special topographic features. It has a higher development density and more amenities than the Grayson project. Landco believes, based on this competitive analysis, its price structure is justified (all other important characteristics, such as access to schools, shopping, churches, and so on, are thought to be equal).

From the above considerations, it should be apparent that estimating market demand and pricing the end product are very important. In cases where competing projects are very similar, pricing must be similar because the package of attributes being provided by each is the same. On the other hand, the more dissimilar projects are, the more variation in pricing is likely. In these cases, pricing must be based on the desirability of the relative attributes of each development. In these instances, pricing risk will be greater. Based on the estimated market prices for these lots, a preliminary estimate of the market value for the Grayson tract, *assuming all lots were completely developed and sold immediately*, would be $6,840,000.

Estimating Development Cost and Interest Carry

Landco has retained Robert Whole and Associates, an engineering firm, to estimate direct development costs based on the anticipated land plan Landco has presented to them. Exhibit 17–6 provides cost estimates. These costs are broken down into (A) land acquisition and development costs (hard and soft), and (B) operating expenses.

EXHIBIT 17–5
Competitive Market Analysis Survey: Grayson Project

	Grayson	A	B	C
Gross acres	50	40	70	100
Number of lots	180	160	210	420
Density:				
Percent developable	72%	80%	75%	80%
Lot yield	3.6	4.0	3.0	4.2
Range in sq. ft./lot	5–20,000	5–10,000	5–25,000	5–22,000
Average sq. ft./lot	8,712	8,712	10,890	8,300
Circulation requirements	20%	20%	25%	20%
Amenities:				
Pools/cabanas	2	N/A	2	2
Tennis courts	8	N/A	10	12
Exercise rooms	N/A	N/A	1	2
Clubhouse	N/A	N/A	N/A	1
Other features	Creek sites	—	Bluff sites	—
Prices:				
Cluster	$19,000	N/A	$36,000	$19,000
Standard	45,600	40,000	48,000	40,000
Creek/bluff	47,500	N/A	60,000	N/A

	Number of Parcels	Price	Total	% Total
Cluster	54	$19,000	$1,026,000	15.0
Standard	90	45,600	4,104,000	60.0
Creek	36	47,500	1,710,000	25.0
Gross project value/Grayson tract			$6,840,000	%100.0

Construction period:	6 months
Approval period:	6 months
Likely financing terms:	$1,000,000 of the land acquisition cost, 100 percent of the improvement cost (subject to appraisal and feasibility analysis). Loan draws are to be made as improvements are completed, interest is to be paid monthly.
Interest rate:	12 percent, or prime rate of 10 percent plus 2 percent with 3 points to be paid at loan closing.

Land Acquisition and Development Costs

Many direct costs—and acquisition and development costs—must be evaluated when acquiring a site for land development. Site acquisition is only one part of these costs. A developer must also evaluate the hard costs, which include site preparation and utilities installation, and the soft costs, which include site engineering, public approval fees, construction interest, and loan fees. Not all soft costs will be financed by the lender; however, to the extent that Landco is able to borrow the land acquisition and development costs, interest carry will become a significant cost of the Grayson project, as it will take several years to complete.

Operating Expenses

Other items included in Exhibit 17–6 are expenses that the developer will incur for marketing, taxes, legal, and other outlays when the project is developed and parcels are ready for sale.

Landco Development Company has approached Mid City Savings Association regarding its 50-acre Grayson tract. Mid City has reviewed the project and believes it to be viable. It has agreed to finance $1 million of the land acquisition cost, all hard costs, $700,000 of soft costs, plus the interest carry on the project. The interest rate will be tied to the prime

EXHIBIT 17–6
Grayson Project Cost Estimates

A. Land and development costs:		
Site acquisition and closing costs:		
50 acres @ $48,000 each		$2,400,000
Development costs:		
Hard costs:		
Grading/clearing	$390,000	
Paving	540,000	
Storm sewers	70,000	
Sanitary sewers	125,000	
Water	125,000	
Electricity	120,000	
Landscaping	90,000	
Other (signage, etc.)	90,000	
Amenities (pool, cabana, tennis)	390,000	
Subtotal—Hard costs		$1,940,000
Soft costs:		
Engineering	$110,000	
Direct overhead—Landco	80,000	
Public approvals, tap fees, etc.	90,000	
Miscellaneous direct costs	80,000	
Legal and accounting fees	100,000	
Contingencies	240,000	
Construction interest	451,052	
Construction loan fees (3%)	122,732	
Subtotal—Soft costs		$1,273,783
Total land, hard, and soft costs		$5,613,783
B. Operating expenses:		
Selling commissions (5%)	$342,000	
Property taxes	87,500	
General and administrative	210,000	
Marketing costs	100,000	
Total operating expenses		$ 739,500
Total project cost		$6,353,283

rate plus 2 percent. For the Grayson project, the interest rate will be 12 percent on the outstanding monthly loan balance. Landco also believes that the interest rate should remain the same during the development period.[b] As in the project development we discussed in the preceding chapter, financing interest carry as a part of a land development loan is very common, even though the developer will earn no income until much of the development is complete and lots are sold to builders. As long as the lender is convinced that the value added to the site from development exceeds the cost of the site plus the cost of improvements by more than the interest cost that will be incurred on the development loan, then making a loan that includes interest carry is feasible.

Draws and Revenue Estimates

Estimating the amount of interest carry is somewhat complicated because (1) the loan will be taken down in "**draws**," or stages, and interest will be calculated only as funds are drawn down; (2) the revenue from the sale of each type of site varies; (3) the rate of repayment of the loan depends on when parcels are actually sold; and (4) as indicated earlier, the interest rate is usually

[b] The interest rate risk may be reduced by using interest rate swaps.

tied to a floating rate and, hence, is subject to change. Exhibits 17–7, 17–8, and 17–9 show the procedures used to estimate interest carry. Exhibit 17–7A contains a breakdown of the *loan request*, and Exhibit 17–7B contains a schedule of dollar draws and draw rates for direct development costs envisioned by Landco. Recall that Exhibit 17–5 shows that although the cluster lots represent 30 percent of the sites to be developed, they will produce only 15 percent of total revenue. Cluster lots produce less revenue because the individual sites are smaller; hence, the average cost of improving those sites is lower (not shown). Standard-size sites, which make up the majority of total sites, represent 60 percent of sites and will produce 50 percent of total revenue, whereas the creek sites represent only 20 percent of the sites but will produce 25 percent of total revenue. The latter sites are larger and require more than the average cost to develop.

It might be inferred from this allocation that the project may be more profitable if more standard and creek sites were developed, which would also lower the total density of the development. However, market demand may not be high enough to sell more of these sites. The point is that the *relative demand* for each type of homesite is important in determining the configuration of sites and prices that will maximize project value. For example, creek sites also will be most expensive to develop and consequently are priced highest. Cluster sites may be the only type of site amenable to the terrain on which the development of improvements must be constructed. In other words, the mix of all sites may be necessary to maintain an acceptable level of total development density, to utilize the sites along the creek, and to maximize total project value.

EXHIBIT 17–7A
Estimate of Costs to be Funded by Loan Proceeds

Land costs financed		$1,000,000
Total hard development costs		1,940,000
Soft construction costs financed:		
Engineering	$110,000	
Direct overhead—Landco	80,000	
Public approvals, tap fees, etc.	90,000	
Miscellaneous direct costs	80,000	
Legal and accounting fees	100,000	
Contingencies	240,000	
Total soft construction costs		700,000
Total direct costs that will be financed		$3,640,000
Estimated interest carry (calculated in Exhibit 17–12)		448,109
Total loan amount		$4,088,109
Equity required:		
Total project cost		$6,353,283
− Total loan amount		4,088,109
Equity		$2,265,174

EXHIBIT 17–7B
Schedule of Estimated Monthly Cash Draws for Development Costs

Month	Amount	Rate (percent)
Closing*	$1,019,200	28.00%
1	655,200	18.00
2	655,200	18.00
3	655,200	18.00
4	218,400	6.00
5	218,400	6.00
6	218,400	6.00
Total	$3,640,000	100.00%

*$1,000,000 of land costs, plus an additional draw of $19,200 for direct costs incurred by Landco, to be funded at closing (28% of $3,640,000 = $1,019,200).

EXHIBIT 17–7C Estimated Monthly Absorption Rate after Loan Closing

Month	Cluster*	Standard†	Creek‡	Cumulative Unit Sales	Cumulative Sales Volume	Monthly Sales Revenue	Monthly Revenue Rate (percent of total)
Close	0	0	0	0	$ 0	$ 0	0.000000%
1–3	0	0	0	0	0	0	0.000000
4–6	2	2	0	12	387,600	129,200	1.888889
7–12	4	3	1	60	1,949,400	260,300	3.805556
13–18	3	6	3	132	4,788,000	473,100	6.916667
19–24	1	5	2	180	6,840,000	342,000	5.000000
Total	54	90	36	180	$6,840,000	–	100.000000%

*Price per lot = $19,000.
†Price per lot = $45,600.
‡Price per lot = $47,500.

EXHIBIT 17–8
Summary of Monthly Construction Draws and Sales Revenue

	(a) Month	(b) Construction Draw	(c) Sales Revenue (lot sales)
	Close	$1,019,200	0
	1	655,200	0
	2	655,200	0
	3	655,200	0
	4	218,400	$ 129,200
	5	218,400	129,200
	6	218,400	129,200
	7		260,300
	8		260,300
	9		260,300
	10		260,300
	11		260,300
	12		260,300
	13		473,100
	14		473,100
	15		473,100
	16		473,100
	17		473,100
	18		473,100
	19		342,000
	20		342,000
	21		342,000
	22		342,000
	23		342,000
	24		342,000
Total		$3,640,000	$6,840,000
Present value @ 12%		$3,569,554	[illegible]

EXHIBIT 17–9 **Loan Repayment Schedule Assuming Loan Payments Proportional with Lot Sales**

	Draws			Payments			
Month	(a) Construction Draw	(b) Interest	(c) Total Draw	(d) Payments Principal	(e) Interest	(f) Total Payments	(g) Ending Balance
Close 0	$1,019,200	$ 0	$1,019,200	$ 0	$ 0	$ 0	$1,019,200
1	655,200	10,192	665,392	0	10,192	10,192	1,684,592
2	655,200	16,846	672,046	0	16,846	16,846	2,356,638
3	655,200	23,566	678,766	0	23,566	23,566	3,035,404
4	218,400	30,354	248,754	78,430	30,354	108,784	3,205,728
5	218,400	32,057	250,457	78,430	32,057	110,488	3,377,755
6	218,400	33,778	252,178	78,430	33,778	112,208	3,551,502
7	0	35,515	35,515	158,014	35,515	193,529	3,429,003
8	0	34,290	34,290	158,014	34,290	192,304	3,305,279
9	0	33,053	33,053	158,014	33,053	191,067	3,180,318
10	0	31,803	31,803	158,014	31,803	189,817	3,054,108
11	0	30,541	30,541	158,014	30,541	188,555	2,926,635
12	0	29,266	29,266	158,014	29,266	187,280	2,797,887
13	0	27,979	27,979	287,193	27,979	315,172	2,538,673
14	0	25,387	25,387	287,193	25,387	312,580	2,276,866
15	0	22,769	22,769	287,193	22,769	309,962	2,012,442
16	0	20,124	20,124	287,193	20,124	307,318	1,745,373
17	0	17,454	17,454	287,193	17,454	304,647	1,475,633
18	0	14,756	14,756	287,193	14,756	301,950	1,203,196
19	0	12,032	12,032	207,610	12,032	219,642	1,007,619
20	0	10,076	10,076	207,610	10,076	217,686	810,085
21	0	8,101	8,101	207,610	8,101	215,710	610,577
22	0	6,106	6,106	207,610	6,106	213,715	409,073
23	0	4,091	4,091	207,610	4,091	211,700	205,554
24	0	2,056	2,056	207,610	2,056	209,665	0
Totals	$3,640,000	$512,191	$4,152,191	$4,152,191	$512,191	$4,664,383	

Sales and Repayment Rates

Exhibit 17–7C provides an estimated schedule of how sales of the three categories of lots will occur and how funds will be drawn down for direct development costs for the Grayson project. Landco makes its sales estimates based on information obtained from market studies of competing projects and its own recent experience with similar projects. This sales estimate is necessary because the lender is to be repaid from revenue as lot sales occur. Exhibit 17–7C shows the revenue produced from the sale of each type of lot and the number of lots to be sold per month. These monthly revenue rates are important because as a parcel is sold the lender will receive a partial repayment of the loan that corresponds to the revenue produced from each sale.

Exhibit 17–8 shows a summary of the monthly construction draws and monthly sales revenue, including the total and present value of the monthly amounts for each. We can use this information to calculate the percentage of each lot sale that needs to be paid to the lender so that the loan is repaid when the last lot is sold. (Later we will discuss accelerating the payment schedule so that the loan is repaid before the last lot is sold.) In essence, what lenders will generally do is *match* the loan repayment with the revenue produced from each parcel sale. Then, as parcels are sold, the lender *releases* the lien held on that parcel as a part of the loan security, thus clearing the way for the developer to sell to a builder.

The amount that the borrower pays the lender to obtain this release is referred to as the **release price.**

You might recall from early chapters of this book that the amount that the borrower receives on a loan (initial loan amount) is equal to the present value of the future payments, discounted at the interest rate on the loan. We can generalize this to say that the present value of the amounts the borrower receives over time (e.g., loan draws) must be equal to the present value of the future payments. In Exhibit 17–8 the two present values in the exhibit are not equal because the sales revenue includes both the amount necessary to repay the loan plus the amount that the developer will get to keep to cover his expenses and provide a return on equity invested. Therefore, if we take the ratio of the present value of the loan draws to the present value of the sales revenue we get the percent of each dollar of lot sales revenue that needs to be used to repay the loan. Using the present values in the exhibit,

$$\% \text{ of revenue to lender} = \$3{,}569{,}554/\$5{,}880{,}209 = 60.7045\%.$$

This means that whenever a lot is sold, the lender must receive 60.7045 percent of the sales revenue if the loan is to be repaid *exactly when the last lot is sold*. This can be used to determine the amount that must be repaid for each type of lot as follows:

Lot Type	Sale Price	% to Lender	Release Price
Cluster	$19,000	.607045	$11,534
Standard	45,600	.607045	27,681
Creek	47,500	.607045	28,835

The lender would normally contract for a fixed dollar amount rather than a percent of revenue to be repaid from each lot sale. This is because the lender doesn't want to be concerned about whether the developer will decide to cut the price on a lot at a later point in time in order to make a sale. More important, the lender will not want to wait until the last lot is sold to have the loan completely repaid. The lender does not want to incur the risk that a slowdown in lot sales or difficulty selling some of the lots will significantly delay loan repayment. Thus, the actual release price negotiated with the lender will normally be higher than the release prices shown above. Before we consider this, however, we will demonstrate that the release price above does repay the loan by the time the last lot is sold.

Exhibit 17–9 shows a loan repayment schedule based on the release prices calculated above. Note that, during months 1 through 3, the interest draw pattern in column (b) is based on the interest rate (12 percent) divided by 12 months, or 1 percent of the previous month's ending loan balance. Also, note that because the interest carry is *borrowed*, it is accumulated in the loan balance.[7] The ending monthly loan balance continues to increase until enough parcels are sold each month to provide a paydown of principal in excess of interest draws (month 7). However, monthly interest payments continue to be based on the preceding month's loan balance.[8]

[7] This is analogous to a negative amortization loan.

[8] We show in Exhibit 17–9 that the developer actually receives interest draws in cash (column b). Then the developer simultaneously makes a cash interest payment in the same amount (column e). Notice that the same loan balance would result if the lender provided a draw for the direct cost only (column a), *computed* interest on those draws as in column (b), added it to the loan balance (instead of actually paying out cash), reduced the loan balance as principal repayments occur (column d), and did not require cash interest payments from the developer (column e). If this pattern were followed, the ending balance would be the same and no cash disbursement for interest would have to be made by the lender or repaid by the developer. In the pattern just described, interest carry is simply being accrued in the loan balance.

Principal payments in Exhibit 17–9 are based on the projected lot sales and release prices calculated above. For example, in month 4 two cluster lots sold for $11,534 and two standard lots sold for $27,681 for a total of $78,430. Note that the ending balance is exactly zero in month 24. This proves that the loan is repaid when the last lot is sold.

Release Schedule

Regarding the expected period that the loan will be outstanding, most lenders insist that the loan be repaid *prior* to the time expected for the borrower to sell all the parcels in the development. The lender usually does not want to take the risk associated with a possible slowdown in sales in the later stages of the project. In many land developments, choice parcels are sold early and less desirable ones may remain unsold as time passes. Because some parcels may be more difficult to sell, the lender wants assurance that the developer will take this added risk. Consequently, the lender will bargain for a faster rate of loan payments, thereby making sure that the loan will be repaid before all 180 parcels are sold.

Another reason for negotiating faster repayment rates is that since Mid City will put most of the "front-end" money into the development during the first six months, it wants assurance that the loan repayment is given preference as sales proceeds are realized. Further, because the developer will realize some markup on each sale, the lender has some room to negotiate a satisfactory release schedule and still leave the developer with a reasonable amount of cash inflow.

Many land development loans set the repayment rate so that the loan is repaid when about 80 to 90 percent of total project revenue is realized. The exact schedule is negotiated based on how fast the lender wants the loan repaid, how much cash the developer must retain from each parcel sale to cover expenses not funded in the loan, and conditions in the loan market.

In Exhibit 17–10, the duration of the construction loan is estimated assuming the lender wants to be repaid when approximately 83.33 percent of project revenues, or $5.7 million, is realized. This means that the lender wants to be repaid at a rate equal to 120 percent of the rate at which monthly revenue is received (100%/83.33% = 120%). If the borrower and lender had agreed that the loan would be repaid over the entire life of the project (24 months), then 100 percent of the loan would be repaid when 100 percent of project revenues were received, as was illustrated in Exhibit 17–9. Accelerating the repayment rate by 16.67 percent means that for every $1 of sales revenue realized, the developer repays the loan by an amount 120 percent greater than would be the case if the loan were repaid over the entire life of the project. In our illustration, based on the cumulative sales revenue shown in Exhibit 17–7C, a total of 80 percent of project revenues will be received during month 21. Hence, the lender would like the loan to be repaid at that time.

EXHIBIT 17–10
Determining the Duration of the Construction Loan

				Monthly		
Month	Cluster	Standard	Creek	Cumulative Sales ($)	Sales Revenue	
4–6	6	6	0	$ 387,600	$129,200	
7–12	24	18	6	1,949,400	260,300	
13–18	18	36	18	4,788,000	473,100	
19	1	5	2	5,130,000	342,000	
20	1	5	2	5,472,000	342,000	
21	1	5	2	5,814,000	342,000	←Repaid during this month

Estimating Release Prices per Parcel Sold

We have already indicated that the lender will generally insist on a loan repayment rate in excess of the rate estimated for revenue to be earned. Indeed, in our example, we have indicated that the lender would like the loan to be repaid at 120 percent of the rate at which revenue will be received. However, as we have seen, when lenders and developers negotiate land development loans, they also usually assign a release price *to each parcel* in the development. When each parcel is sold, that release amount is paid to the lender, who then releases the lien, thereby assuring the buyer of an unencumbered title. In Exhibit 17–11, the release prices for the three types of lots in our example are calculated.[9]

Loan Request and Repayment Schedule

Exhibit 17–12 shows the revised loan schedule with the new release price. Note that the loan is now repaid in month 21 as we projected in Exhibit 17–10.[10] The exhibit indicates that total interest carry will be $448,109. This is the amount that the developer must include in his loan request. If sales were to slow down, the loan balance would increase rapidly because *actual* interest draws would increase at a faster rate than *estimated* draws. If this slowdown occurred, the interest reserve of $448,109 might be depleted. Further, if the loan balance ever reached $4,088,109, the lender would not allow further draws. The developer would have to make interest payments from other sources. This is one reason why the loan request is a low percentage of gross project value ($4,088,109/$6,840,000) = 60 percent (rounded). Indeed, most lenders prefer to keep the loan-to-value ratio for land development projects in the range of 70 percent, so they have a better chance of recovering the loan balance should the project go into default.

Project Feasibility and Profitability

From the developer's viewpoint, the economic feasibility of the project is based on whether the market value of the sites after development will exceed the acquisition cost of the land, plus direct improvement costs, plus the interest carry and any other costs not included in the loan provided by Mid City. Exhibit 17–6, discussed previously, summarizes total costs, including closing costs and other costs that Landco must pay but that will not be funded in the loan for the Grayson project. The loan fees and interest carry *are included* in the total loan amount of $4,088,109. We can now do a more detailed projection of how the project costs will be incurred over time and how income will be generated over time from lot sales.

EXHIBIT 17–11
Calculation of the Release Price per Parcel

Lot Type	Release Price before Acceleration	Acceleration Factor	Acceleration Release Price
Cluster	$11,534	1.2	$13,840
Standard	27,681	1.2	33,2[illegible]7
Creek	28,835	1.2	34,602

[9] There are alternative ways of calculating the accelerated release price. Previous editions of this text used a slightly different approach. In this edition we have simplified the approach while obtaining virtually the same answer. The point of any approach taken is simply to arrive at proposed release prices that are acceptable to both the lender and developer.

[10] The reader should keep in mind that the approach in Exhibit 17–10 was an estimate to determine when the loan would be repaid to determine what release price to use. The actual month it is repaid may differ slightly when calculated using the more detailed projections in Exhibit 17–12 that actually calculate the interest, loan balance, and so on, every month.

EXHIBIT 17–12 Accelerated Loan Repayment Schedule—Landco Development Company

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	Draws			Payments			
Month	(a) Construction Draw	(b) Interest	(c) Total Draw	(d) Principal	(e) Interest	(f) Total Payments	(g) Ending Balance
Close 0	$1,019,200	$ 0	$1,019,200	$ 0	$ 0	$ 0	$1,019,200
1	655,200	10,192	665,392	0	10,192	10,192	1,684,592
2	655,200	16,846	672,046	0	16,846	16,846	2,356,638
3	655,200	23,566	678,766	0	23,566	23,566	3,035,404
4	218,400	30,354	248,754	94,116	30,354	124,470	3,190,042
5	218,400	31,900	250,300	94,116	31,900	126,017	3,346,226
6	218,400	33,462	251,862	94,116	33,462	127,579	3,503,972
7	0	35,040	35,040	189,617	35,040	224,656	3,349,395
8	0	33,494	33,494	189,617	33,494	223,111	3,193,272
9	0	31,933	31,933	189,617	31,933	221,549	3,035,588
10	0	30,356	30,356	189,617	30,356	219,973	2,876,327
11	0	28,763	28,763	189,617	28,763	218,380	2,715,474
12	0	27,155	27,155	189,617	27,155	216,771	2,553,012
13	0	25,530	25,530	344,632	25,530	370,162	2,233,910
14	0	22,339	22,339	344,632	22,339	366,971	1,911,617
15	0	19,116	19,116	344,632	19,116	363,748	1,586,102
16	0	15,861	15,861	344,632	15,861	360,493	1,257,331
17	0	12,573	12,573	344,632	12,573	357,205	925,272
18	0	9,253	9,253	344,632	9,253	353,885	589,893
19	0	5,899	5,899	249,131	5,899	255,030	346,660
20	0	3,467	3,467	249,131	3,467	252,598	100,996
21	0	1,010	1,010	102,005	1,010	103,015	0
22	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0
Totals	$3,640,000	$448,109	$4,088,109	$4,982,630	$448,109	$5,430,739	

To investigate the developer's ability to carry this project until the loan is repaid and to establish whether the project is feasible for the developer to pursue and meet the expected return on investment, the lender must analyze a schedule of cash flows that the developer prepares. This statement should contain not only direct costs but also additional day-to-day operating expenses that the Grayson project may require. In this way, the lender can project the developer's cash position, better analyze the risk of loan default, and establish the profitability of the project. Exhibit 17–13 contains a quarterly summary of all cash inflows and outflows for Landco over the entire life of the project. The inflows are estimated based on the sales prices for each type of parcel, plus loan draws and equity required from the developer for the land purchase price and closing costs. The outflows include expenditures for direct development costs taken from the schedule of monthly draws (Exhibit 17–12). Loan repayments are taken from the schedule of loan repayments (Exhibit 17–12). Other operating expenses, including general and administrative expenses, sales commissions, and property taxes, have been estimated on a quarterly basis and included in the exhibit.

The developer will have negative cash flow during the first two quarters. Adding up these two negative cash flows results in a total of $1,648,893, which is the total equity that the developer is likely to need for the project. According to the loan repayment schedule

EXHIBIT 17–13 Developer's Cash Flow

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Quarter	Close	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflow:									
Sales		$ 0	$ 387,600	$780,900	$780,900	$1,419,300	$1,419,300	$1,026,000	$1,026,000
Construction draw	$ 1,019,200	$1,965,600	655,200	0	0	0	0	0	0
Interest draw		50,604	95,717	100,466	86,274	66,985	37,687	10,375	0
Total inflow	$ 1,019,200	$2,016,204	$1,138,517	$881,366	$867,174	$1,486,285	$1,456,987	$1,036,375	$1,026,000
Outflow:									
Land purchase	$ 2,400,000								
Closing costs	100,000								
Loan fees	122,643								
Principal		$ 0	$ 282,349	$568,850	$568,850	$1,033,896	$1,033,896	$ 600,268	$ 0
Direct costs	19,200	1,965,600	655,200	0	0	0	0	0	0
Interest costs		50,604	95,717	100,466	86,274	66,985	37,687	10,375	0
General and admin.		26,250	26,250	26,250	26,250	26,250	26,250	26,250	26,250
Property tax					43,750				43,750
Sales expense		0	19,380	39,045	39,045	70,965	70,965	51,300	51,300
Total outflow	2,641,843	2,042,454	1,078,896	734,612	764,169	1,198,096	1,168,798	688,194	121,300
Net cash flow	$(1,622,643)	$ (26,250)	$ 59,621	$146,755	$103,005	$ 288,189	$ 288,189	$ 348,182	$ 904,700

Developer's *IRR* = 16.64% (*IRR* of quarterly cash flows multiplied by 4)
NPV @15.00% = $40,056

detailed above, the developer will retain all cash flow from sale proceeds beginning in month 21 through month 24. Although some cash flow will be retained from earlier sales, clearly the developer will receive the greatest cash flow during the later quarters.

From the beginning of the development period until the 21st month, a question arises concerning the developer's ability to meet operating expenses and other cash outflow requirements not funded in the loan request from Mid City. The amount loaned to the developer covers only part of the land cost, direct costs, and interest carry. Other obligations, such as overhead and loan fees, must be paid during development. Sales commissions, property taxes, and general and administrative expenses were not funded as a part of the development loan and must also be covered from the cash retained by the developer from each parcel sale.

Exhibit 17–13 provides insight into Landco's ability to carry the cash needs of the entire project. At closing and in the first quarter Landco will have negative cash flow. However, from the second through eighth quarters, cash flow will be positive. It is during such periods that estimates concerning costs, sales, rates, and repayment conditions become crucial to both Landco and Mid City. If the time needed for development exceeds initial estimates, if actual development costs exceed estimates, or if sales do not materialize as projected, Landco's cash flow position during these months will change dramatically. Similarly, if Mid City demands a release schedule calling for loan repayments that are too high, cash flow to Landco from sales revenue would be reduced, which might jeopardize Landco's ability to carry out the project and to repay the loan. For this reason, Mid City must consider Landco's own financial resources in the event that any of these adverse factors materialize. Clearly, if Landco's cash position in this project becomes questionable, Landco will be expected to share in some of the risk by contributing working capital from its own resources to complete sale of the project successfully. To analyze Landco's ability to provide working capital, should it be necessary, Mid City will thoroughly review the company's income statement and balance sheet as well as possibly requiring additional loan security or guarantees from Landco beyond the land that serves as security for the loan.

Finally, according to Exhibit 17–13, Landco's cash flow does not materialize significantly until the later quarters of the project. This timing is in keeping with the way risk is taken during the project. Because the lender puts in front-end capital, they want assurance of a high priority in the sales proceeds as the development matures. Consequently, Landco must wait until the lender's prior claim is satisfied before it realizes a return. However, from Landco's viewpoint, its equity in the project increases as value is added to the project as actual development occurs. Hence, most of its returns are appropriately deferred to the later stages of the project.

Project *IRR* and Net Present Value

Up to this point in the analysis, we have made some rough estimates as to the economic viability of the project. Recall that we estimated that the market value of the project if it were developed and all parcels were sold today was $6,840,000, and costs were estimated to be $6,353,283, indicating that a margin between total revenues and total costs existed. Although such a margin exists, the cash inflows and outflows related to the development and subsequent sales *do not occur immediately*. Consequently, the *time value of money* must be taken into account. To do this for the Grayson project, we *estimate* that a risk premium of at least 3 percent over the borrowing rate of 12 percent, or 15 percent, would be the *minimum* before-tax return that Landco is willing to accept on its equity investment at this time.[11]

[11] An annual rate of 15 percent, compounded quarterly, is the rate of return used for discounting. This discount rate represents the required return that Landco must earn as a development company or a going concern, *net of all direct and indirect costs* associated with this project. It represents a rate of return to the owners or shareholders of the Landco company.

Web App

Land Development Today (**www.landdevelopmenttoday.com**) is an online publication dedicated to delivering news and perspectives to land development professionals, including developers, planners, surveyors, civil engineers, landscape architects, and construction professionals, enabling them to succeed in today's dynamic environment. Go to this site and find a recent article related to land development. Write an executive summary of the article.

Applying this rate to the quarterly net cash flows shown in Exhibit 17–13 results in a net present value of $41,558. This figure indicates that the project is economically feasible and meets Landco's required return.[12] Stated another way, according to the assumptions used in our analysis, Landco can pay $2.4 million for the land and still earn a positive net present value. Finally, again using the cash flows in Exhibit 17–13 we see that the *IRR* for the project is 16.64 percent. As expected, since the *NPV* was positive, this exceeds Landco's required *IRR* of 15 percent.

Entrepreneurial Profits

In the preceding section, we noted that revenues produced by the Grayson project as projected by Landco would cover all costs, and the resultant cash flows, when discounted by the required rate of return (assumed to be 15 percent before taxes in the example), would provide a positive *NPV* of about $42,000. When such estimates are made, *all costs* associated with development, *particularly general overhead costs* relating to time spent by all Landco staff, executives, and other personnel, should be included (see Exhibit 17–6). The goal of the analysis is to produce an estimate of net cash flow that can be used to evaluate whether a required before-tax return of 15 percent (net of *all* relevant costs) will be earned on the $2,262,231 of equity Landco invests in the Grayson project. This required return should be viewed as a minimum rate of return that Landco must earn to justify allocating the equity to the project.

Some professionals in the real estate field may also include in their projections an estimate for developer profit, or **entrepreneurial profit** (say 10 or 15 percent), as an additional cost of development when projecting net cash flow. Net cash flow is then discounted by a required return on equity. When doing this, one must be careful to avoid "double counting" profit by including a developer profit and discounting by a required return that includes a premium for taking development risk. We have included all costs relative to land, labor, and capital explicitly in our projections and have not included an estimate of markup or developer profit as an *additional* cost of development. Thus the 16.64 percent projected return for this project includes compensation for Landco's entrepreneurial ability to develop the project.

Sensitivity Analysis

Given the analysis just concluded, because Landco estimated a positive *NPV*, the $2.4 million land price is justified. Indeed, the analysis shows that based on the assumptions used to make projections for the project, Landco could actually pay slightly more and still earn its

[12] Because the project shows a positive net present value, Landco could pay slightly more than $2.4 million and still earn its required return. If the seller of the land, however, is satisfied with $2.4 million, Landco may be in a position to earn a higher return (assuming all projections materialize). Such a difference between what buyers and sellers are willing to pay and receive occurs because of differences in expectations concerning future development revenues, or because of differences in information (e.g., market knowledge) possessed by each party. You should now see that the exhibits presented in this chapter can be linked in a spreadsheet format, and with a computer, various "what if" scenarios or simulation analyses can be carried out.

desired return of 15 percent. However, Landco should also use sensitivity analysis to determine how sensitive this return is to lower market prices, larger development periods, cost overruns, higher interest rates, and the like, before acquiring the land. We discussed this analysis at the conclusion of the previous chapter. It applies to land development as well as to project development.

Conclusion

This chapter dealt with *land development*, which involves the acquisition of land with the intention of constructing utilities and surface improvements, and then reselling some or all of the developed sites to project developers or, in the case of housing, home builders. Our discussion of land development extends many of the concepts introduced in the previous chapter that dealt with financing development projects. After completing both chapters, you should have a good understanding of the development process, including the mechanics of construction and land development loans.

Key Terms

acquisition and development costs, *510*
build to suit, *497*
completion bonds, *505*
draws, *511*
entrepreneurial profits, *521*
extension agreements, *506*
feasibility study, *497*
holdbacks, *505*
land development, *496*
option agreement, *498*
release price, *515*
release schedule, *503*
turnkey basis, *497*

Useful Web Sites

www.landdevelopmenttoday.com/—An online publication dedicated to delivering news and perspectives to land development professionals, including developers, planners, surveyors, civil engineers, landscape architects, and construction professionals, enabling them to succeed in today's dynamic environment.

www.uli.org—The mission of the Urban Land Institute is to provide responsible leadership in the use of land in order to enhance the total environment. This site also provides current issues for financial trends in the industry.

www.bizloan.org—Good resource for information about different types of loans used for project development. Includes glossary of terms.

www.census.gov—U.S. Census Bureau Web site.

www.icsc.org—International Council of Shopping Centers Web site.

www.economy.com—Economy.com is a provider of economic data.

www.bls.gov—U.S. Department of Labor

www.bea.gov—U.S. Department of Commerce—Bureau of Economic Development

www.claritas.com—Claritas provides demographic and enhanced census data.

www.Axiometrics.com—Axiometrics is a research firm providing fundamental real estate research for the apartment sector with an emphasis on the performance of portfolios owned by the publicly traded apartment REITs.

http://www.demographia.com/—This site is a very good resource for finding relevant demographic information about different markets spread across the world. Some of the main features of this site are that it gives International housing affordability rankings, different surveys, different economic reports and different trends related to real estate. It's also a good source to find regulations and policies related to real estate.

http://www.fedstats.gov/—This site is a federal government sponsored website and it's a very good resource for finding relevant demographic information about different states of USA. This website is a gateway to statistics for more than 100 U.S. Federal agencies.

Questions

1. How might land development activities be specialized? Why is this activity different from project development discussed in the preceding chapter?
2. What is an option contract? How is it used in land acquisition? What should developers be concerned with when using such options? What contingencies may be included in a land option?

3. What are some of the physical considerations that a developer should be concerned with when purchasing land? How should such considerations be taken into account when determining the price that should be paid?
4. In land development projects, why do lenders insist on loan repayment rates in excess of sales revenue? What is a *release price*?
5. What are the unique risks of land development projects from the developer's and lender's points of view?

Problems

1. Refer to Concept Box 17.1. A *revised* market study indicates the following: pricing for standard interior lots will probably be $103,000 each, premium interior lots $118,000, and corner lots $125,000; the average development cost has been revised up to $71,000 per lot; administrative costs, etc., remain at 12.5 percent of gross revenue.
   a. Can the same 21 percent return on *total cost* continue to be maintained?
   b. If the answer in (*a*) is below the 21 percent return, what counter offer might be proposed for the land acquisition in order to retain the same percentage return on total cost shown in Box 17.1?
2. Treetop Associated Group (TAG) is seeking financing for acquisition and development of 147 homesites. The land will cost $1.5 million, and TAG estimates direct development costs to be an additional $2.7 million. City Federal Bank will make a loan covering 40 percent of the land acquisition cost, 100 percent of direct improvement cost, and interest carry at 11 percent interest with a 3 percent loan origination fee.

   TAG has decided to split the development into *two* parcel types, standard and deluxe, with the standard parcels comprising 87 of the total. Also, TAG thinks that the deluxe sites will be priced at a $2,000 premium over the standard parcel price of $36,000. Total project revenue will be $5,412,000. After making a 60 percent down payment for the land and incurring closing costs of $50,000, TAG believes that the remaining development costs will be drawn down at $600,000 a month for the first three months and $300,000 a month for the next three months. Parcel sales are expected to begin during the fourth month after closing. TAG estimates that they will sell three standard parcels and four deluxe parcels a month for the remainder of the first year, and five standards and two deluxes per month for the second year.

   The company and the bank have agreed to a repayment schedule calling for the loan to be repaid at a rate 20 percent faster than the receipt of sales revenues; that is, the loan plus interest carry per parcel will be repaid when approximately 83.33 percent of all revenues are realized. Other costs to consider include sales expense (paid quarterly at a rate of 5 percent on parcels sold during the quarter), administrative costs of $7,500 per quarter, and property taxes of $19,000 at the end of each year.

   a. What will be the release price for each type of lot?
   b. Estimate the total loan amount including interest carry for TAG.
   c. Prepare a schedule based on (*b*) and the pattern of loan draws, showing when TAG will have the loan fully repaid. What will be the total cash payments on the project loan?
   d. What will total project costs be? What percentage of total project costs are being financed?
   e. What will be the *NPV* and *IRR* of this project if TAG's before-tax required rate of return is 12 percent? (Hint: Prepare a cash flow analysis on a quarterly basis over the life of the project.)
3. Lee Development Co. has found a site that it believes will support 75 homesites. The company also believes that the land can be purchased for $225,000 while direct development costs will run an additional $775,000. The Last National Bank of Texas will underwrite 100 percent of the improvements plus the interest carry. The loan would be made at 13 percent interest with a *3 percent loan origination fee*. Lee believes that the development will sell faster with two types of parcels, standard and deluxe, with the standard parcel comprising 57 of the total parcels.

   Lee's marketing staff believes that the deluxe sites can be sold for $24,000 while the standard sites should bring $13,500. Lee estimates that the direct cost draws will be taken down in four equal amounts during months 1 to 4. Other up-front fees include closing costs of $10,000 and a 3 percent loan fee (not covered by the loan). Lee's sales staff supervisor assures him that she can generate sales activity starting in the fourth month that will result in the sale of five standard parcels per month and four deluxe parcels per month for three months. For the next six months, activity should be seven standard parcels per month and only one deluxe parcel per month. The Last National Bank wants its money out of the project early and wants Lee to agree to a release price per parcel that will result in the loan being repaid at a rate 25 percent faster than sales revenue is expected to be earned. Other costs to consider include sales expense (paid quarterly on 5 percent of the sales price of parcels sold during the quarter), administrative costs of $11,000 per quarter, and property taxes of $7,000. None of these latter items are to be funded in the loan.

a. Develop a total monthly sales schedule for Lee. What will be Lee's total revenue? How many months will it take Lee to fully repay the loan?

b. What will be the total interest carry funded in the loan amount? What will be the release price for each type of lot? Compute the loan repayment schedule. What will be Lee's total cash payments to the Last National Bank?

c. What will Lee's total equity requirement be? Should Lee undertake this project if its required return on equity is 18 percent? (Hint: Do a cash flow analysis on a quarterly basis for the life of the project.) What will be the *IRR* on the project?

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4. **Excel.** Refer to problem 3. Refer to the worksheet in the "Ch 17 Land Dev" tab in the Excel Workbook. Change the assumptions in the file to solve problem 3. Then answer the following questions.

a. Determine the release price based on a repayment schedule calling for the loan to be repaid at the following rates: 0 percent, 10 percent, and 30 percent faster than the receipt of sales revenues. (Note: the original problem assumes a rate 25 percent faster.)

b. Develop a loan schedule to demonstrate that with 0 percent acceleration the loan is paid off exactly when the last lot is sold.

c. Calculate the lender's *IRR* (effective cost of the loan) for each of the rates in part (*a*).

Chapter 18

Joint Ventures, Syndications, and Partnerships[1]

Joint Ventures

Joint ventures are formed by at least two parties with the intent of achieving a specific investment objective. Unlike many other business agreements, when the objective is achieved, the joint venture (JV) is usually terminated. While the range of possible real estate investment goals is very wide, joint ventures are formed, typically, around one or more of the following attributes:

1. *Risk sharing.* A single investor may be unwilling to undertake a real estate venture because of its size, location, capital requirements, and/or duration. However, by sharing the risk, two or more parties may be willing to undertake the venture.
2. *Combining expertise with capital.* Joint ventures are frequently formed as a way to pool equity capital from one or more sources, as well as a means of bringing parties with different expertise to the venture. For example, one joint venture partner with *development* expertise and/or the ability to manage the operations of the real estate investment may join the venture with other partners who may be willing to invest *capital* in the venture. A joint venture could also involve purchasing existing properties and operating them. In this case, one of the parties may be responsible for acquisition, leasing, and management, and the others may provide capital. In much of the discussion in this chapter we will refer to the developer/operator as the partner responsible for the development and/or the operations of the property. We refer to the *investor-partner,* or *money-partner,* as the party who contributes much of the capital.
3. *Speculative objectives.* This may involve acquisition of a large tract of undeveloped land with the expectation that it will not be ready for development for many years. Indeed, the exact nature of the use, improvements, and so forth, may be uncertain. Such a venture may not appeal to a single investor, whereas multiple investors may be interested.

[1] The authors appreciate the help of Youguo Liang, director of research for Prudential Real Estate Investors, in writing this chapter.

Organizational Forms

Participants in joint ventures may include any combination of individual investors, partnerships, corporations, or trusts. However, a joint venture in and of itself is not a legal form of organization. In order to specify capital contributions, rights, duties, profit sharing, and the like, a joint venture agreement or a business entity must be created. The choice of organizational form used to accommodate these various groups of investors could be a partnership, corporation, or trust. In this chapter, we will focus on partnerships, which are frequently the vehicle of choice in real estate joint ventures.

Profit Sharing

Because the parties to a joint venture may contribute different things, and possibly in different proportions, a partnership must be structured such that it provides economic incentives for all parties. Differences in the tax status of investors also may affect the way partnerships are structured.

A joint venture can take on a number of different partnership forms. The most common is the *limited partnership*. As is the case with all partnerships, there must be at least one general partner and any number of limited partners. Generally, in real estate, limited partners are the investors that provide most of the equity capital, while general partners are usually responsible for managing the partnership assets and may contribute a relatively small portion of the required equity capital. Limited partners are generally very restricted in the management of a joint venture and their personal liability is limited, hence, the term *limited* partnership. This will be discussed in more detail later in this chapter. When determining how a joint venture is to be structured, potential investors usually consider the following factors:

- How much initial capital will the parties contribute and how will the parties contribute additional capital if needed in the future?
- How will the parties share in the annual cash flows to be produced from operating the property?
- How will the parties share in the cash flow received from sale of the property?
- Will some of the parties receive a preferred return? Will the preferred return be paid from annual cash flows and/or from sale?
- Will taxable income (or losses) and capital gain (or loss) be shared in the same proportion that operating cash flow to be distributed?[2]
- Who will have control over the operation of the property and decisions involving capital improvements, approving leases to tenants, financing and possibly refinancing the property, and when to sell the property?

Initial Capital Contributions

As noted above, a joint venture is often motivated because one of the parties is in a position to invest capital and others may contribute expertise. An investment-partner may be a wealthy individual investor or perhaps a professional investment manager who raises funds from investors such as pension funds that want to invest in real estate but do not have the expertise to do so. The money-partner is usually more interested in diversification of investments and usually does not have the desire and/or expertise to develop or manage the properties.[3]

[2] We will see that there can be "special allocations" that result in partners having a taxable income (or loss) as well as capital gains (or losses) that differ from the proportion of cash flow that they receive.

[3] Examples of money partners could include pension funds and high-net-worth individuals who have access to capital but limited experience in sourcing, negotiating, and managing properties.

For example, the **initial capital contribution** may be distributed as follows: the money-partner may contribute 90 to 95 percent of the equity capital needed for a venture; a developer/manager may contribute the remaining 5 to 10 percent. Even though one partner may be providing the operating expertise, he is generally expected to contribute some capital in order to provide for some *alignment of financial interests* with the investment-partners. Returns to the developer/operator and the money-partner are usually "aligned" to some extent because both have some invested capital at risk in the venture. Because the developer/operator is supplying the day-to-day operational expertise, he will often receive a share of the cash flow in greater proportion to the initial investment. This usually provides further incentive for the developer/operator to make the investment successful. It should be pointed out that the developer/manager who is promoting the project may be approaching many money-partners in an attempt to find one who is interested. As such, the relationship between equity contributions, fees, and profit sharing will be competitively driven in the market for equity capital.

Sharing Cash Flow from Operations

One way to share cash flow from operating a property (*NOI* less debt service) is *in proportion* to the capital investment. For instance, if the developer contributes 10 percent of required equity, he will receive 10 percent of the cash flow. This is referred to as **noncumulative pari passu distribution** of the cash flows. However, it is more common for the money partner and operating partners to share in cash flows and property appreciation disproportionately (a common example would have the investment partners receiving a **preferred distribution** of cash flow and the developer-partner receiving a greater share in any property appreciation). For example, an investor partner may receive a **preferred return** calculated on an 8 percent yield on their initial investment. Consequently, if they invest $1 million in equity, as the property produces cash flow they would receive the *first* $80,000 (or 8 percent of $1 million). After the capital distributions are made to the investor partners, the developer/operator would *then* also receive cash equal to an 8 percent return on their initial investment *only if there are sufficient funds for distribution*. To the extent that funds are sufficient, any remaining cash flow may then be split in proportion to the initial contribution or based on some other agreed-upon percentage. For example, the remaining cash flow could be split evenly (50 percent to each party). In such cases, where the developer/operator may have invested only 5 percent of the capital but will receive an incentive of 50 percent of cash flow remaining after the initial distributions, he is said to be receiving a **promote**.

The 8 percent preferred return (used in the example) may be either cumulative or noncumulative. **Cumulative distribution** means that if total funds in any given year are insufficient to give the investor-partner his preferred yield, the liability to do so carries over to the next year. In these cases, in subsequent years, an investor would receive any funds that should have been paid in prior years before the developer/operator begins to receive any cash from current operations. It is also possible that all cumulative, preferred returns in arrears may be carried over into the next operating period with interest.

In addition to receiving a share of the net cash flow in one of the ways discussed above, the operating or development partner also may receive fees for providing these services. For example, a fee may be paid to the party overseeing the development of the project (e.g., the development fee might be 4 percent of the hard and soft costs).[4] A management fee also may be paid for overseeing the day-to-day management of the project once it is operating (e.g., the management fee might be 3.5 percent of effective gross income).[5] These fees reflect expense for services

[4] As discussed in Chapter 17, hard costs usually consist of the cost of material and labor while soft costs include outlays for architects, engineers, appraisers, legal costs, and so on.

[5] Recall that effective gross income is defined as rents collected less vacancy and collection loss.

performed and are unrelated to the amount of capital invested. Indeed, such fees would generally have to be paid to third parties if such work were outsourced by the joint venture partners.

Sharing of Cash Flow from Sale

The success of investment may not be known until the property is actually sold. At that time an assessment can be made of whether the cash flow from operations and sale was sufficient to provide an adequate return to each party. Of course, factors including market rents and income earned by the property each year as well as interim appraisals of properties may provide some guidance as to whether the investment is likely to be successful. But until the property is actually sold, cash available for final distribution will not be known with certainty.[6]

Final distributions of cash flow from sales are usually made after repayment of any debt. In general, after repayment of debt, distributions are usually made such that all parties *first* each receive an amount *equal to their initial capital investment*. Any remaining cash flow from sale is usually distributed in predetermined proportions. There may also be what is referred to as an **IRR preference.** This means that one or more investors must receive cash flow that is sufficiently high to achieve a specified *IRR* on equity invested for the entire investment period before others share in cash flows from sale. In these cases, an investor will usually receive this preference in cash flow from sale after each party has received capital equal to their initial investment. To the extent that additional cash flow remains after the partner receives the *IRR* preference, it may be split in some predetermined proportion (e.g., 50 percent to each party).

A slight variation of the *IRR* preference distribution is referred to as an **IRR lookback.** In this case, any cash flow remaining after each party has received capital equal to their initial investment will be split in a predetermined proportion, such as 50 percent to each party. However, this split may be subject to the condition that one or more partners must earn a specified *IRR* (such as 12 percent). If this is not achieved in the 50 percent split, then some of the cash that would have gone to all partners must be distributed so that partners who must earn an *IRR* lookback do so. The difference between the *IRR* lookback and the *IRR* preference is illustrated below.

Example

Investor Capital Inc. (ICI) has decided to enter into a joint venture with Property Developers Inc. (PDI) to develop and operate an office building. The project will require an initial equity investment of $50 million, with ICI investing $45 million and PDI investing the remaining $5 million.

For simplicity, we will assume that each party invests its capital and then participates in year-end cash flows from operations, which are projected as follows:

Time	Operating Cash Flows	Sale
Inception	($50,000,000)	
Year 1	$ 1,000,000	
Year 2	$ 2,000,000	
Year 3	$ 5,000,000	
Year 4	$ 6,000,000	
Year 5	$ 6,500,000	$75,000.000

[6] Refinancing may also provide a source of cash flow until the property is sold—especially if property values have risen and more can be borrowed on the refinancing than is currently owed on the property.

It is further assumed that the property will be sold at the end of year 5 and that the ne ceeds from the sale will provide $75 million to be distributed to the investors.

The joint venture partnership agreement specifies that ICI will receive a 5 percen *cumulative*, preferred return on its $45 million in equity. This means that any shortfall carried over to the next year. However, this distribution must be paid before Pro Developers Inc. receives *any* cash from operations. After ICI receives its preferred r PDI will receive a 5 percent noncumulative return on its equity capital of $5 million remaining cash flow will be split 50 percent to each party.[7] These annual returns are lated by simply multiplying the 5 percent rate by the initial equity investment.

When the property is *sold*, proceeds from sale will first be used to provide ICI capital recovery equal to its initial equity investment. Next, PDI will receive an ar equal to its initial equity investment. ICI will then receive an amount sufficient enou earn a 12 percent *IRR* on equity investment. All remaining cash proceeds are to be 50–50.

Using the above assumptions, we summarize the total cash flows available to t partners. These are shown in Exhibit 18–1.

Summary of Cash Flows Distributed in Each Operating Year

As illustrated in Exhibit 18–2, the return for ICI must be calculated first to reflect a cent preferred return, which is distributed before PDI receives any cash. Because the erty is in its lease-up phase during the first two years, our example indicates that casl is not enough to provide a 5 percent preference return for ICI. Therefore, ICI will r *all cash flow* and PDI will not receive any cash flow during years 1 and 2. During y total cash flow from operations increases to $5,000,000. Therefore, ICI will receive a cent return on its investment of $45 million, or $2,250,000, and PDI will also rec return of 5 percent on its investment of $5 million, or $250,000. The remaining casl or $2,500,000, is then split 50 percent, or $1,250,000, to each party.[8]

EXHIBIT 18–1
Total Cash Flows Produced by the JV

Year	Initial Equity Investment	Cash Flow from Operations	Cash Flow from Sale	Total Ca Flow Available t
0	$−50,000,000			$−50,000
1		$1,000,000		1,000
2		2,000,000		2,000
3		5,000,000		5,000
4		6,000,000		6,000
5		6,500,000	$75,000,000	81,500

[a] The *IRR* would be 14.81% if a single party owned the entire investment.

[7] It could be said that Property Development Inc. is receiving a "promote" of 40 percent becau they invest only 10 percent of the capital but receive 50 percent of the remaining cash flow, w 40 percent more.

[8] It should be noted that if ICI were entitled to receive a "cumulative preferred return," it woul receive $3,750,000 in year 3. This would consist of arrearages of $1,250,000 in year 1 and $2. in year 2, plus $2,250,000 due in year 3. Furthermore, the JV agreement may also be written that all amounts in arrears are increased (compounded) by 5 percent or some other specified interest each year.

EXHIBIT 18–2
Summary of Cash Flows Distributed from Operations

Year	Initial 5% Distribution	50% Share in Cash Flow Available after Initial Distribution to ICI and PDI	Total Distribution of Operating Cash Flows
A. ICI			
1	$1,000,000	$ —	$1,000,000
2	2,000,000	—	2,000,000
3	2,250,000	1,250,000	3,500,000
4	2,250,000	1,750,000	4,000,000
5	$2,250,000	2,000,000	4,250,000
B. PDI			
1	—	—	—
2	—	—	—
3	$ 250,000	$1,250,000	$1,500,000
4	250,000	1,750,000	2,000,000
5	250,000	2,000,000	2,250,000

C. Reconciliation (ICI and PDI)

Year	Cash Available for Distribution	Cash Distributed to ICI	Cash Distributed to PDI
1	$1,000,000	1,000,000	0
2	2,000,000	2,000,000	0
3	5,000,000	3,500,000	1,500,000
4	6,000,000	4,000,000	2,000,000
5	6,500,000	4,250,000	2,250,000

CASH FLOW FROM SALE

Next we calculate the cash flows that each party will receive from sale of the property. First, each party must be able to receive a return of their initial investment with Investor Capital Inc. having first priority to the capital. In this case there is sufficient capital for both parties to receive their initial investment. Second, we determine how much cash flow Investor Capital Inc. should receive to earn a 12 percent preferred *IRR*. This is illustrated in Exhibit 18-3. The cash flow of $16,801,668 was calculated as the amount needed to make the *IRR* exactly 12 percent when added to the $45 million received as return on initial investment. This is how much of the cash flow from the sale that Investor Capital Inc. will receive before remaining cash flow is split between the parties.

After solving for the amount needed to produce the preference *IRR* for ICI (see Exhibit 18–3), we now determine how much cash flow remains to be split after ICI achieves their 12 percent preferred *IRR*. We have:

Total cash flow from *sale*	$75,000,000
Return of capital to Investor Capital Inc.	−45,000,000
Return of capital to Property Developers Inc.	− 5,000,000
Preferred *IRR* to Investor Capital Inc.	−16,801,668
Remaining cash flow to be split 50–50	$ 8,198,332 or $4,099,166 to each partner

EXHIBIT 18–3
Calculating the *IRR* Preference for ICI

Year	ICI's Share of Cash Flow From Operations	ICI's Return of Initial Investment from Sale Proceeds	Additional Cash Flow from Sale to Achieve 12% Preference IRR	Total Cash Received from or Distributed to ICI
0				−$45,000,000
1	$ 1,000,000			1,000,000
2	2,000,000			2,000,000
3	3,500,000			3,500,000
4	4,000,000			4,000,000
5	4,250,000	$45,000,000	**$16,801,668**	$66,051,668
				IRR = 12%

EXHIBIT 18–4
***IRR* to Each Investor upon Termination of the Joint Venture**

Year	Investor Capital Inc.	Property Developers Inc.
0	−$45,000,000	−$5,000,000
1	1,000,000	0
2	2,000,000	0
3	3,500,000	1,500,000
4	4,000,000	2,000,000
5	$70,150,834*	$11,349,166**
IRR	13.22%	26.64%

* Year 5 operating cash flow: $4,250,000 + $45,000,000 + $16,801,668 + $4,099,166.
** Year 5 operating cash flow: $250,000 + $5,000,000 + $4,099,166.

Each party will now receive one-half of the $8,198,332 remaining cash flow from sale, or $4,099.166.

IRR to Each Joint Venture Party

After all cash flows are distributed, we can calculate the *IRR* for each partner. This is shown in Exhibit 18–4. We see that ICI will earn a 13.22 percent *IRR* and PDI will realize a 26.64 percent *IRR*. Note that ICI earns an *IRR* that is higher than their 12 percent *IRR* preference because of the additional 50 percent cash flow split received based on the final cash flow from sale. Also note that because of the "promote" received by Property Developers Inc., they will earn 26.64 percent *IRR*. (Recall that Property Developers Inc. invested only 10 percent of the initial equity capital but received 50 percent of cash flows both from operations and from sale after all preferences were paid to Investor Capital.)

It should be stressed that even though ICI earns a preferred return, because of its 50 percent split, PDI continues to have an incentive to make the investment successful. This example also illustrates the alignment of interest between PDI and ICI. Because PDI is responsible for the development and for operating the property, it has an incentive to make the investment as successful as possible. In our example, PDI earns in excess of a 26 percent return on its initial 10 percent equity contribution. ICI, which is the money-partner and a passive investor, earns a lower return, which is consistent with the lower risk exposure.

Variation on the Preferred *IRR*—"*IRR* Lookback"

As discussed previously, an alternative way of handling preferences to investors (usually the equity partner, ICI in this case) is to provide for an *IRR lookback* rather than an *IRR preference*. Recall that the *IRR* preference required an allocation of cash flow to ICI in the year of sale sufficiently great to achieve a 12 percent *IRR*. All remaining amounts would then be split 50–50 (see Exhibit 18–5).

With an *IRR* lookback, cash flows in the year of sale are split such that ICI receives a cash distribution only in an amount needed to achieve a 12 percent *IRR*. All excess cash flows are then distributed only to PDI. In the example above, this means that the additional cash flow to ICI would be limited to $66,051,493, which would provide ICI with exactly a 12 percent *IRR*. Note that in this case, PDI would receive all remaining cash flows in excess of $66,051,493 or $15,448,507. This increase in cash flow to PDI produces an *IRR* of 32.94 percent, which is higher than the 26.64 percent return based on an *IRR* preference to ICI. Although an *IRR* preference will always give the investor a return that is at least equal to or greater than what the return would be with an *IRR* lookback, there are reasons why ICI may prefer a lookback rather than a preference *IRR*. This could be the case when cash flows in the year of sale may be *lower* than expected. In this case, ICI may choose to take *less risk* by participating in *cash flows* in year of sale, emphasizing the recovery of their capital and earning a more secure, specific return *before* PDI receives *any* cash flows. Obviously, PDI would be taking more risk in this case; however, their return also may be higher (32.94 percent in Exhibit 18–5 versus 26.64 percent in Exhibit 18–4). It should be stressed, however, that if cash proceeds in the year of sale fall below the $45 million in equity contributed by ICI at commencement of the joint venture, ICI will receive *all* funds available from sale and PDI will receive nothing.

Syndications

The concept of real estate **syndication** extends generally to any group of investors who have combined their financial resources with the expertise of a real estate professional for the common purpose of carrying out a real estate project. A syndication is not an organization form per se. It may take any of the legal business forms such as a corporation, limited partnership, or general partnership.

A syndicate can be formed to acquire, develop, manage, operate, or market real estate. Syndication can be viewed as a type of financing that offers smaller investors the opportunity to invest in ventures that would otherwise be beyond their financial and management capabilities. Syndicators benefit from the fees they receive for their services and the interest they may retain in the syndicated property. Many syndication firms are in the business of acquiring, managing, and then selling real estate projects. In order to acquire property, they bring in other investors with capital that forms the equity base with which the property is acquired. Syndicators do not usually invest much of their own capital. Rather, they act more as agent-managers earning fees for acquiring, managing, and selling properties owned by the investors who have contributed capital to the syndication.

EXHIBIT 18–5
Investment Returns after 12% *IRR* Lookback to ICI upon Termination of the Joint Venture

Year	Investor Capital Inc.	Property Developers Inc.
0	−$45,000,000	−$ 5,000,000
1	1,000,000	0
2	2,000,000	0
3	3,500,000	1,500,000
4	4,000,000	2,000,000
5	$66,051,493	$15,448,507
IRR	12.00%	32.94%

Developers who need additional equity capital to undertake a project often raise funds through syndications, either directly or by using a firm that specializes in raising capital by selling interests in the syndication. The syndication may become involved during the development and construction of the project or after the building is completed and leased. In the latter case, the syndication provides a means for the developer to remove equity from the project, especially if the value of the project upon completion and lease-up is greater than the construction cost. The developer also typically receives a development fee. This strategy allows the developer to focus on developing projects, earning a development fee, retaining some ownership in the project, and going on to the next development project.

In cases where one or a small number of projects are to be syndicated, investors often choose a **limited partnership.** For a smaller project that requires a limited number of investors, the capital for the partnership will usually be raised by what is referred to as a **private offering.** Syndicators must adhere to certain regulations when offering ownership interests in partnerships to investors.

In other cases a syndicator may desire to raise a large amount of funds to acquire many properties. The particular properties to be acquired may or may not be identified when the funds are raised. If not, the offering is referred to as a **blind pool.** A blind pool offering allows the syndicator discretion over what properties are purchased, subject to broad guidelines in an offering prospectus to investors. In cases where ownership interests will be sold to investors in many states, the syndication is usually undertaken through a **public syndicate.** This type of syndication is subject to numerous state and federal regulations that are discussed later in this chapter.

The purpose of this chapter is to familiarize students with basic approaches to understanding and evaluating investment in an ownership interest in a real estate syndication. This information is important for both potential investors and developers. The investor must evaluate how the rate of return and risk for investment in a share of a syndicate compares with other investment opportunities. The developer must evaluate how the *cost* of obtaining equity funds through syndication (in terms of what the developer must give up) compares with other financing alternatives.

The focus of our discussion in this chapter will be on the analysis of a *private* offering in which a *single* property is to be acquired by a limited partnership. The emphasis is on understanding how ownership of shares in a partnership that owns the property differs from direct ownership of the property, as we have assumed in previous chapters.

Use of the Limited Partnership in Private and Public Syndicates

Limited partnerships have often been used as vehicles for raising equity capital for real estate ventures. They combine the limited liability feature of an investment in a corporation with the advantages of a general partnership, such as the ability to make special allocations of income and cash flow to the partners. An investor's liability (**limited partner**) is limited to his initial contribution plus any unpaid contributions he has agreed to make in the future. Furthermore, the responsibility for the management of the partnership rests with the **general partners,** who are frequently knowledgeable in real estate matters, thus providing the partnership with professional management.

The Tax Reform Act of 1986 removed many of the tax advantages associated with the use of limited partnerships relative to other forms of real estate ownership. For example, any tax losses resulting from investments in limited partnerships are subject to the passive activity limitation rules (see Chapter 11). These tax changes led to a significant decline in real estate syndicates' use of the limited-partnership form of ownership. It remains important to understand this ownership vehicle, however, since a large number of real estate limited partnerships still exist. Furthermore, a large number of the real estate investment trusts (REITs) formed during the early 1990s were structured so that the REIT was a general partner in a limited partnership. This structure allowed limited partners in existing syndications (including ones that were formed prior to the Tax Reform Act of 1986) to exchange their limited partnership interests for interests in the new partnership formed by the REIT as a "tax free exchange." We discuss real estate investment trusts further in Chapter 21. The point here is simply that limited partnerships continue to play an important role in real estate finance.

Private Syndication Problem Illustrated

When a syndication with other investors is undertaken, it is essential for all parties, whether they are investors or lenders, to understand the framework in which the venture will operate. What follows is an analysis of a *private* real estate syndication formed to acquire and operate the Plaza Office Building. In this syndication, 35 individuals have been approached by Dallac Investment Corporation, which has agreed to act as the sole general partner in a *limited partnership*.[9] Dallac is trying to raise sufficient equity capital to undertake the purchase and has decided to use the *limited partnership* form of organization, which will limit the liability of all partners to their agreed-upon capital contribution to the venture.

The venture to be undertaken and relevant cost and financial data are summarized in Exhibit 18–6. Dallac has obtained an option to purchase the property and has a commitment for a nonrecourse loan from Prudent Life Insurance Company. The loan requires prior approval of any change in the general partner at any time in the future.

Financial Considerations—Partnership Agreement

Exhibit 18–7 summarizes the financial aspects of the partnership agreement and the equity requirements of the general and limited partners for this example. The partnership agreement governs the business relationship among the general and limited partners and is often long and rather involved. At a minimum, partnership agreements should specify how and in what proportions the equity will be initially contributed and whether assessments will be made should a cash shortfall occur or should the improvement need substantial repair in the future. In this example, Dallac has agreed as general partner to contribute 5 percent of the required equity, with the 35 limited partners investing 95 percent.[10] There is no provision for future assessments of the limited partners. Since limited partners are not liable for future capital contributions, Dallac will have to address the issue of what happens in the event the property generates negative before-tax cash flow. Dallac could guarantee to cover negative before-tax cash flow (and will likely charge a fee for doing so), raise sufficient equity capital initially to cover future negative cash flows, arrange for additional borrowing, or reserve the right to raise new capital by admitting additional partners.

The partnership agreement should also specify how income or loss from operating the property and capital gain or loss from sale of the property should be distributed. In our example, profits, losses, and cash flow from operations will be distributed 5 percent to the general partner (Dallac) and 95 percent to the limited partners. However, gain (or loss) from sale of the property is to be allocated 10 percent to the general partner and 90 percent to the limited partners. As mentioned earlier, an important characteristic of a partnership is that all items of income and loss (including gain or loss from resale) and cash do not have to be distributed in the same proportion. This **special allocation** allows flexibility in the ability to allocate the benefits of the real estate investment between the general and limited partners. We will see that these allocations affect the rate of return to each of the partners and are, therefore, important considerations in the analysis of partnerships.

When special allocations are used to allocate items of income and cash flow in different proportions to different partners, it becomes important to know how to determine the amount of cash that should be distributed to each partner upon sale of the property. This final cash distribution must take into consideration the initial equity contribution, allocations

EXHIBIT 18–6
Plaza Office Building Acquisition Cost and Financing Summary

Cost breakdown		
Land	$ 525,000	
Improvements	3,475,000	(capitalized)
Points	60,000	(amortized over loan term)
Subtotal	$4,060,000	
Organization fee	20,000	(amortized over 5 years)
Syndication expenses	100,000	(capitalized but not depreciated)
Total funding required	$4,180,000	
Loan amount	$3,000,000	(71.77% of total funding)
Interest rate	12%	
Term	25 years	(monthly payments)
Points	$ 60,000	
Annual debt service	$ 379,161	

[9] For clarity, we will consider all 35 limited partners as a single entity. As we will discuss later in this chapter, when more than 35 investors become partners, it is generally considered a public offering.

EXHIBIT 18–7
Partnership Facts and Equity Requirements for Plaza Office Building Syndication

a. Organization: December, year 1
b. Number of partners: 1 general partner and 35 limited partners
c. Equity capital contribution: general partner, 5%; limited partners, 95%
d. Cash assessments: none
e. Cash distributions from operations: general partner, 5%; limited partners, 95%
f. Taxable income and losses from operations: general partner, 5%; limited partners, 95%
g. Allocation of gain or loss from sale: general partner, 10%; limited partners, 90%
h. Cash distributions at sale: Based on capital account balances (capital accounts will be explained in the following discussion)

Initial equity requirements	
Land and improvements	$4,000,000
Points on mortgage loan	60,000
Organization fee	20,000
Syndication fees	100,000
Total cash requirements	$4,180,000
Less mortgage financing	3,000,000
Equals equity requirements	$1,180,000
General partners (5%)	59,000
Limited partners (95%)*	$1,121,000

*As indicated earlier, it is common to allow limited partners to pay in their equity contribution over time. The general partner arranges for additional financing during this pay-in period, using the limited partners' notes as collateral. To keep this example manageable, we have not assumed such a pay-in.

[10] In this case we assume each limited partner invests an equal percentage of the cash required from each partner. In practice, however, partners could purchase different proportional interests. Also, in many syndications, the general partner may invest as little as 1 percent of the equity or no equity at all.

of cash flow during the operating years of the property, and allocations of income (or loss) from operation and sale of the property. These items are accounted for in the partner's **capital account.** The nature and importance of the capital account will be discussed in more detail later in the chapter. For now we point out that the partnership agreement specifies that the cash flow from sale of the property will be allocated according to the capital account balances at that time.

Operating Projections

Exhibit 18–8 summarizes Dallac's projections about operations. All projections in a syndication offering must be made carefully and prudently since any misrepresentation or failure to disclose all material risks of the investment may result in a lawsuit for rescission of the partnership or damages by investors, or an action by regulatory authorities.[11] Because of this scrutiny by public agencies and the potential for legal action by limited partners, many general partner–syndicators make very general projections regarding future results or provide only a description of the projects that will be invested in, along with some information on the business background of the general partner or partners.

In addition to projections for rental income, operating expenses, management fees, and the like, Dallac has also disclosed the method of depreciation to be used, the period over which loan fees and organization fees will be amortized, and when syndication fees will be deducted for federal income tax purposes. Syndication fees cannot be deducted in the year in which payment occurs; they must be capitalized and amortized over a prescribed time period established by tax regulations. These expenses are important from the investor's perspective because the cash flow requirement occurs when the expenses are paid; however, their tax influence occurs over the period of years during which amortization occurs or when the item is appropriately deductible.

Statement of Before-Tax Cash Flow (*BTCF*)

An important projection to be considered when analyzing a partnership is the statement of cash flow. In addition to the $1,121,000 investment made by limited partners in December, or the end of year 1, the statement shown in Exhibit 18–9 summarizes the before-tax

EXHIBIT 18–8
Plaza Operating and Tax Projections

Potential gross income (year 2)	$750,000
Vacancy and collection loss	5% of potential gross income
Operating expenses (year 2)	35% of effective gross income
Depreciation method	Straight line, 31.5 years*
Amortization of loan points	$60,000 over 25 years, or $2,400 annually
Amortization of organization fees	$20,000 over 5 years, or $4,000 annually
Projected growth in income	3% per year
Projected resale price after 5 years	$5,000,000
Limited partners' tax rate	28%
General partner's tax rate	28%

*Depreciable life allowed at the time this syndication is assumed to be formed. As indicated in Chapter 11, depreciation rules change frequently. Partnerships formed after 1993 would be required to use a depreciable life of 27.5 years for residential property and 39 years for nonresidential property.

[11] In the case of public offerings most states require that a prospectus be filed with the state securities and exchange commission, and such projections are carefully scrutinized before approval to offer the securities is granted. Interstate offerings must be filed with the U.S. Securities and Exchange Commission and undergo a similar examination. Review and examination of securities offerings by state or federal agencies in no way indicate approval or disapproval of the economic merits of the investment, but only that the offering substantially complies with the disclosure and other requirements for registration or exemption.

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EXHIBIT 18–9 Pro Forma Statement of Before-Tax Cash Flow for Plaza Office Building

	Year				
	(2)	(3)	(4)	(5)	(6)
Potential gross income	$750,000	$772,500	$795,675	$819,545	$844,132
Less vacancy and collection	37,500	38,625	39,784	40,977	42,207
Effective gross income	712,500	733,875	755,891	778,568	801,925
Less operating expenses	249,375	256,856	264,562	272,499	$280,674
Net operating income	463,125	477,019	491,329	506,069	521,251
Less debt service	379,161	379,161	379,161	379,161	379,161
Before-tax cash flow (*BTCF*)	$ 83,964	$ 97,858	$112,169	$126,909	$142,091
Allocation:					
General partners	5%				
Limited partners	95%				
Distribution of *BTCF*:					
General partners	$ 4,198	$ 4,893	$ 5,608	$ 6,345	$ 7,105
Limited partners	$ 79,766	$ 92,965	$106,560	$120,563	$134,986

cash inflow (*BTCF*), or cash shortfalls, expected from the operation of the Plaza Office Building.

Another important aspect of the statement of cash flow deals with the distribution of cash to partners. In year 2 the project is expected to generate $83,964 in cash for distribution. Of this amount $79,766 will be distributed to limited partners. This represents an equity dividend rate of about 7 percent.

Calculation of Net Income or Loss

To illustrate the tax effect of the projections made in Exhibit 18–8, we have constructed a statement of taxable income or loss in Exhibit 18–10 for the syndication-partnership investment in the Plaza Office Building. The exhibit shows that limited partners making a $1,121,000 (total for all partners) investment at the end of December would have a $12,502 taxable loss to report during year 2. The syndication loss is a passive loss, as discussed in Chapter 11, and subject to the passive activity loss limitation rules. In this example we assume that each of the 35 partners has sufficient passive activity income from other investments (e.g., other real estate partnership investments that now have taxable income) to use the share of the loss (11,877 ÷ 35) in year 2. Beginning in year 3 investors would have to report taxable income, which would be subject to ordinary rates of taxation at that time.

Calculation of Capital Gain from Sale

The calculation of capital gains and the resulting tax due from sale of the property is the same for a syndicated investment property sale as it is for the sale of property held by an individual. Exhibit 18–11 shows the calculation of the capital gain and its allocation to the general and limited partners pursuant to the partnership agreement, which provides that 10 percent of the gain be allocated to the general partner and 90 percent of the gain to the limited partner.

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EXHIBIT 18–10 Pro Forma Statement of Income (loss), Plaza Office Building Syndication

	Year				
	(2)	(3)	(4)	(5)	(6)
Net operating income	$ 463,125	$477,019	$491,329	$506,069	$521,251
Less					
Interest	358,910	356,342	353,448	350,187	346,512
Depreciation	110,317	110,317	110,317	110,317	110,317
Amortization					
Organization fee	4,000	4,000	4,000	4,000	4,000
Loan fee	2,400	2,400	2,400	2,400	50,400
Taxable income	$−12,502	$ 3,960	$ 21,164	$ 39,165	$ 10,022
Distribution					
General partners	5%				
Limited partners	95%				
Distribution					
General partners	$ −625	$ 198	$ 1,058	$ 1,958	$ 501
Limited partners	−11,877	$ 3,761	$ 20,106	$ 37,207	$ 9,521

EXHIBIT 18–11 Calculation of Capital Gain and Allocation to Partners

Calculation of Capital Gain from Reversion in Year 6		
Sale price		$5,000,000
Selling costs		250,000
Original cost basis	$4,100,000	
Less accumulated depreciation	551,587	
Adjusted basis		3,548,413
Total taxable gain		$1,201,587
Allocation of Gain		
General partners (10% of gain)		$ 120,159
Limited partners (90% of gain)		$1,081,428

Capital Accounts

Capital accounts represent the partners' ownership equity in partnership assets. Capital accounts are maintained by *crediting* the account for all *cash contributed* to the partnership and all *income* and *gain* allocated to each partner. The account is then *debited* for *cash distributed* to the partner plus any loss allocated to the partner. Exhibit 18–12 shows the capital account balances for the partners after accounting for the initial equity contribution, all income allocated from operating the property, all cash distributed while operating the property, and the allocation of gain from sale of the property. Thus, capital account balances include everything but cash proceeds from sale of the property because, according to the partnership agreement, the distribution of cash proceeds from sale of the property is to be based on the capital account balance.

The capital account balance at the end of year 1 is $1,121,000 for the limited partners and $59,000 for the general partner. This represents the initial equity contributions. In year

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EXHIBIT 18–12 Capital Accounts Prior to Distribution of Cash Flow from Sale

	End of Year					
	1	2	3	4	5	6
Limited Partners						
Equity	$1,121,000					
Plus income	0	$ 0	$ 3,761	$ 20,106	$ 37,207	$ 9,521
Less loss	0	−11,877	0	0	0	0
Plus gain from sale	0					1,081,428
Less cash distributed	0	−79,766	−92,965	−106,560	−120,563	−134,986
Total for year	1,121,000	−91,643	−89,204	−86,455	−83,357	955,963
Balance	$1,121,000	$1,029,357	$940,153	$853,698	$770,341	$1,726,304
General Partner						
Equity	$59,000					
Plus income	0	$ 0	$ 198	$ 1,058	$ 1,958	$ 501
Less loss	0	−625	0	0	0	0
Plus gain from sale						120,159
Less cash distributed	0	−4,198	−4,893	−5,608	−6,345	−7,105
Total for year	59,000	−4,823	−4,695	−4,550	−4,387	113,555
Balance	$59,000	$54,177	$49,482	$44,932	$40,545	$154,100

2 those balances are reduced by both the losses allocated and the cash distributed. Of course, the reason that cash is available for distribution at the same time losses are allocated is because losses are due to noncash deductions (depreciation and amortization), as discussed in Chapter 11. Note that beginning in year 3, income allocations increase capital accounts, but cash distributions reduce them. Finally, in year 6, capital accounts are increased by the gain from sale allocated to each partner. In an accounting sense, the balances in year 6 show what each partner has in the way of equity capital invested in the partnership at that time. This is important to know because cash proceeds from sale of the property will be distributed in accordance with these capital account balances. We will further discuss the importance of these capital accounts later.

Distribution of Cash from Sale of Asset

Exhibit 18–13 shows a breakdown of the cash distribution from the sale of the property. As indicated in the agreement, after selling expenses and the outstanding mortgage are paid, both the limited partners and the general partner will receive cash distributions from the sale that are equal to their capital account balances. Capital account balances for all of the partners will be exactly zero after this distribution of cash because all prior allocations of income, cash flows, and losses have been accounted for in the partners' capital accounts (see Exhibit 18–12).

Calculation of After-Tax Cash Flow and *ATIRR* on Equity

After-tax cash flows from operations and reversion can be calculated and the *ATIRR* on the investment can be determined using the preceding exhibits and an assumed marginal tax

EXHIBIT 18–13
Cash Distribution from Sale—Year 6

Sale price	$5,000,000
Less selling costs	250,000
Less mortgage balance	2,869,596
Before-tax cash flow	1,880,404
Distribution (based on capital account balances):	
General partners	154,100
Limited partners	1,726,304
Balance (should be zero)	$ 0

bracket of 28 percent. This is done in Exhibit 18–14, where the initial equity investment is a cash outflow in year 1 and before-tax cash flows plus tax savings (or less taxes due) are cash inflows. After-tax cash flows from operations and reversion result in an *ATIRR* of 13.15 percent for limited partners and 22.24 percent for the general partner. The higher return to the general partner is due to the additional allocation of gain and, consequently, additional cash flow when the property is sold. That is, the general partner was allocated 10 percent of the gain from the sale, whereas the general partner contributed 5 percent of the equity and received 5 percent of the income and cash flow during the operating years. If the allocation of gain had also been 5 percent for the general partner, then the *ATIRR* would have been exactly the same for both general and limited partners. (This return would be 13.68 percent. Of course, the general and limited partners must also be in the same tax bracket for their after-tax returns to be the same.)

Given our analysis of Dallac, you should have a general framework in mind to consider potential investments involving limited partnerships. We should stress that the Dallac case example is meant to illustrate one possible way in which an investment can be structured. Indeed, many consider the field of real estate syndication financing and partnerships one of the most complex areas of federal tax law, subject to great variations in structuring terms among partners. Hence, much study of the law and federal taxation beyond the information presented here is required to gain expertise in the area.

However, you can keep in mind a few underlying generalizations when evaluating such investments. One generalization is that syndication arrangements are subject to the same economic influences that all investments are, that is, risk and return. Any real estate investment is capable of producing only so much income, regardless of whether or not it is syndicated. When syndicated under a limited partnership, cash flows and tax items from operating and the eventual sale of assets are simply split among different parties. The promoter of the syndicate, who in many cases becomes the general partner, will offer limited partners only what is necessary under current competitive conditions to induce them to invest in the project. Such a return must be commensurate with the risk and return available to investors from comparable syndication offerings or other investment opportunities. Hence, the *ratios* used to establish contribution of equity assessments, splitting of cash flows, and so on, should be structured in such a way that given reasonable projections of income and property value, investors will earn a competitive return as measured by the procedure described in this section of the chapter.

Investors should be in a position to compare terms offered by competing syndicators given the risk and required equity investment, and to judge whether expected returns are adequate. However, keep in mind that the general partner must also earn a competitive return in order to profitably perform the economic function of syndicating. Essentially, syndicators view their role in the investment process more like that of an agent who seeks and finds properties for acquisition or development, finds equity investors, operates and manages properties during ownership by the syndication, and eventually disposes of them.

EXHIBIT 18–14 Calculation of After-Tax Cash Flow and *ATIRR*

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	End of Year					
	1	2	3	4	5	6
	General Partner					
Operation						
BTCF[*]	$ −59,000	$ 4,198	$ 4,893	$ 5,608	$ 6,345	$ 7,105
Taxable income[†]	0	−625	198	1,058	1,958	501
Taxes (28%)	0	−175	55	296	548	140
ATCF	$ −59,000	$ 4,373	$ 4,838	$ 5,312	$ 5,797	$ 6,965
Reversion						
BTCF[§]						$ 154,100
Capital gain[ß]						120,159
Taxes (28%)						33,644
ATCF						120,456
Total *ATCF*	$ −59,000	$ 4,373	$ 4,838	$ 5,312	$ 5,797	$ 127,421
ATIRR = 22.24%						
	Limited Partners					
Operation						
BTCF[*]	$−1,121,000	$ 79,766	$92,965	$106,560	$120,563	$ 134,986
Taxable income[†]		−11,877	3,761	20,106	37,207	9,521
Taxes (28%)	0	−3,326	1,053	5,630	10,418	2,666
ATCF	$−1,121,000	$ 83,092	$91,912	$100,930	$110,145	$ 132,320
Reversion						
BTCF[§]						$1,726,304
Capital gain[ß]						1,081,428
Taxes (28%)						302,800
ATCF						1,423,504
Total *ATCF*	$−1,121,000	$ 83,092	$91,912	$100,931	$110,145	$1,555,824
ATIRR = 13.15%						

*From Exhibits 18-7 and 18-9.
†From Exhibit 18-10.
§From Exhibit 18-12.
ßFrom Exhibit 18-11.

Because syndicators perform these services, they must also be reasonably assured of being compensated. Hence, they attempt to charge *fees* for all services such as finding properties for purchase, renting facilities, promoting the sale of partnership interests, and managing and accounting for the partnership investment. Investors pay these fees in addition to legal and accounting costs of organizing the partnership.

Limited partners must consider the reasonableness of syndicators' fees and partnership fees, plus the general partner's share in cash flows and appreciation in property value, when comparing syndication alternatives. The primary concern of the limited partner is whether the general partner is "carving out" too much in fees and participation in future cash flows that would make the return on investment unattractive to limited partners. On the other hand, the general partner must be assured of earning a reasonable return for the risk and time involved in promoting the investment. Further, if the syndicator is attempting to earn all compensation from fees and is not taking some equity risk in the project, it may appear to a limited partner that the syndicator–general partner really has no stake in the project and has little concern over the long-run performance of the investment. If *expertise* in the operation and management of the investment is the part of the syndication that appeals to the limited partner, then the limited partner may be more satisfied if the general partner has a stake in the profits instead of receiving fees. Clearly, many facets of reimbursement must be considered, and the partners must reach some balance. Although fees to the general partner may ultimately reduce the limited partner's rate of return, these fees represent the cost of transferring certain risks and responsibilities to the general partner. Thus, the limited partner should not expect as high a return as in a situation where he must incur these risks and costs himself.

Partnership Allocations and Substantial Economic Effect

One of the advantages of a partnership, whether a limited partnership or a general partnership between a few individuals, is the ability to allocate profit and loss to different partners in different proportions than their equity contribution. However, certain guidelines must be followed to ensure that the benefits of these allocations won't be disallowed. Syndicates typically attempt to allocate the greatest amount of tax loss from the venture as quickly as possible to the individuals (usually limited partners) who have contributed capital to the partnership. In effect, it is these tax losses that the investors have purchased. Various means, such as disproportionate allocations of specific items (such as depreciation deductions), have been used to accelerate the allocation of losses to limited partners.[12] A partner's distributive share of each item of income, gain, loss, deduction, or credit is generally determined by the partnership agreement. However, for the IRS to accept the allocations as valid, the allocations must result in what is referred to as a **substantial economic effect.** Where the allocation in the partnership agreement lacks substantial economic effect, the item that is subject to the allocation will be reallocated by the IRS according to the partner's "interest in the partnership."[13]

In determining whether an allocation had a substantial economic effect on the partners, the courts have long inquired whether the allocation was reflected by an appropriate adjustment in the partners' capital accounts. The new proposed regulations governing special allocations adopt this view and provide rules for the proper maintenance of the partners' capital accounts.[14] As we have seen, capital accounts are used for accounting purposes and reflect the economic contribution of partners to the partnership. In general, the proposed regulations provide that if (1) an allocation to a partner is reflected in her capital account and the liquidation proceeds (cash flows from sale of the property) are distributed in accordance with the capital accounts, and (2) following the distribution of the proceeds the partners are liable to the partnership (either pursuant to the partnership agreement or under state law) to restore any deficit in their capital accounts (by contributing cash to partners with positive capital account balances), the allocation has substantial economic effect and will be recognized by the IRS.

[12] For a more inclusive discussion see Richard B. Peiser, "Partnership Allocations in Real Estate Joint Ventures," *Real Estate Review* 13, no. 3.

[13] A partner's "interest in the partnership" is determined by taking into account all of the facts and circumstances, including the partner's initial investment; interest in profits, losses, and cash flow; and distributions of capital upon liquidation.

[14] Treasury Regulation Section 1.704-1.

Capital Accounts and Gain Charge-Backs

Assume A and B form a partnership where A, the limited partner, contributes $100,000 and B, the general partner, contributes no cash. The partnership secures a $400,000 (10 percent interest only) nonrecourse loan and acquires AB Apartments for $500,000. Assume that the results from the first year of operations of AB Apartments are as follows:

Gross income	$ 70,000
Less vacancy and collection loss	−4,000
Effective gross income	$ 66,000
Less operating expenses	−21,000
Net operating income	$ 45,000
Less debt service (interest only)	−40,000
Before-tax cash flow	$ 5,000

Assume that tax depreciation the first year is $50,000. This results in taxable income as follows:

Net operating income	$ 45,000
Less depreciation	50,000
Less interest cost	40,000
Taxable income	$−45,000

Now assume that the partnership agreement provides that 90 percent of all taxable income, loss, and cash flow from operations is to be allocated to A and 10 percent to B. At the end of year 1 the capital accounts of A and B would appear as follows:

Capital Accounts after First Year of Operations		
	A's Capital Account	B's Capital Account
Initial equity contribution	$ 100,000	0
Less loss allocation	−40,500	$−4,500
Less cash flow distribution	−4,500	−500
Ending balance	$ 55,000	$−5,000

Assume that AB Apartments is sold after year 1 for $550,000 with no expenses of sale. This results in a taxable gain as follows:

Sales price		$550,000
Purchase price	$500,000	
Depreciation taken	50,000	
Adjusted basis		450,000
Gain		$100,000

Cash proceeds from the sale would be as follows:

Sale price	$550,000
Less mortgage balance	400,000
Cash flow	$150,000

Now suppose that upon resale, taxable gains or losses are split 50–50 between A and B. Cash proceeds are distributed first to A in an amount equal to his original investment less any cash distributions previously received. Any remaining cash proceeds are split 50–50 between A and B. Exhibit 18–15 shows the impact this arrangement would have on the capital accounts of A and B. Notice that the *net* balance of the two capital accounts is zero (this will always be true if all items of income, cash, and so on, are properly accounted for), but A's capital account is negative and B's is positive. As mentioned above, for an allocation to have a substantial economic effect, liquidation proceeds to be distributed must reflect the disparities in the partners' capital accounts. Where A's capital account is negative and B's is positive, A has in effect recovered his investment at the expense of B. If A is not obligated to restore the deficit in his capital account (by a $17,500 cash payment to B), he may not have borne the entire economic burden equivalent to his share of the depreciation deductions, and the allocations lack substantial economic effect. Therefore, in order for the allocations to be recognized, the capital accounts of the partners must be equalized before the partners in this example can split the remaining cash 50–50. Two acceptable methods of equalizing the capital accounts are discussed below.

The first method of equalizing capital accounts is to adjust the cash distribution to the partners. This adjustment would be done by allocating $17,750 less cash from sale to A and $17,750 more to B. The accounts would now be equal. The second method would be to credit A's capital account for an additional $17,750 in *gain from sale,* thereby reducing B's share of the gain proportionally. If more gain is allocated to A, capital account balances will be zero after cash is distributed.

Exhibit 18–16 illustrates a valid partnership allocation using the second approach, or **gain charge-back** method, and shows its impact on the capital accounts of A and B.

Careful examination of the above example should make it clear that the requirement that capital account balances for both partners be zero after sale of the building is one way for the IRS to ensure that a partner who is allocated proportionately more losses for tax purposes is also either allocated more taxable gain at sale of the property or receives less cash. Otherwise, partnerships could be structured in such a way that the partners in higher tax brackets would receive most of the losses, whereas the partners in lower tax brackets would receive most of the gains! Furthermore, the partners in higher tax brackets would be willing to give up some of the cash flow in exchange for receiving the losses and not receiving the gains. The ending capital account balances would then most likely be negative for the partners in higher tax brackets and positive for partners in the lower tax bracket. While the partners may be perfectly happy with this arrangement, the government loses tax revenue. Thus, as we have emphasized, partnership agreements must provide for ending capital account balances to be zero to avoid challenge from the IRS.

EXHIBIT 18–15
Capital Accounts after Sale of Building

	A's Capital Account	B's Capital Account
Balance prior to sale	$ 55,000	$ −5,000
Return of original equity		
Less previous cash distribution	$−95,500	NA
50% of gain	50,000	50,000
50% remaining cash proceeds	−27,250	−27,250
Ending balance	$−17,750	$ 17,750

EXHIBIT 18–16
Capital Accounts after Sale of Building Using Gain Charge-Back

	A's Capital Account	B's Capital Account
Balance prior to sale	$ 55,000	$ −5,000
Return of original equity		
Less previous cash distribution	$−95,500	
Gain charge-back	35,500	
50% of remaining gain*	32,250	32,250
50% remaining cash proceeds	−27,250	27,250
Ending balance	$ 0	$ 0

*Total gain from sale is $100,000. After the gain charge-back, $65,000 remains to be distributed.

Recall that in the case of the Plaza Office Building, the gain was first allocated to the capital accounts, and then the final cash flow was based on the capital account balances. This approach ensured that the capital account balances would be zero for both partners after all allocations and distributions to partners. The partnership agreement could have been structured in other ways for Plaza Office Building and still have resulted in zero capital account balances. For example, a specified percentage of the *cash* available from sale could first be distributed to each partner—the general partners in the Plaza Office Building might receive 10 percent and the limited partners 90 percent. Then to ensure zero capital account balances, the allocation of gain could be based on the capital account balances. (In this case the capital account balances would be negative after the distribution of cash. Allocation of gain to the partners would then eliminate the negative balance.) The point is that allocations of all items of income and cash flow cannot be made without some provision for ensuring that the capital account balances are zero after all allocations and distributions are made.

Use of the Limited Partnership in Private and Public Syndicates

Limited partnerships are widely used as vehicles for raising equity capital for real estate ventures. They combine the limited-liability feature of an investment in a corporation with the advantages of a general partnership, such as the ability to make special allocations of income and cash flow to the partners. An investor's liability (limited partner) is limited to the initial contribution plus any unpaid contributions agreed to in the future. Furthermore, the responsibility for the management of the partnership rests with the general partners who are frequently knowledgeable in real estate matters, thus providing the partnership with professional management.

In establishing the limited partnership, great care must be taken that the contractual terms identify it in effect as a partnership and not as an "association" as understood by the Internal Revenue Service. An association is taxed like a corporation. The six criteria for treatment like a corporation are:

1. Business association.
2. An objective to carry on the business and divide the gains therefrom.
3. Continuity of life.
4. Centralization of management.
5. Limited liability.
6. Free transferability of interest.

A corporation must have more corporate than noncorporate characteristics to be classified as a corporation for tax purposes. Criteria 1 and 2 are common to corporations and partnerships. Therefore, a business firm generally will be treated as a partnership if two of criteria 3 through 6 are absent.

Most limited partnerships have centralized management similar to that of corporations, so differentiation normally takes place in criteria 3, 5, and 6. Under the Uniform

Partnership Act, after which most state statutes are patterned, the general partner has the power to dissolve the partnership at any time, thus denying it continuity of life. Otherwise, a terminal date may be provided in the partnership articles. The criterion of limited liability is negated by the very fact that one partner is a general partner with unlimited liability. Finally, free transferability of interests can be limited by requiring permission of the general or other limited partners to effect a change of ownership. This restriction has been deemed by the Treasury regulations as a legal curtailment of transferability of interests. By proper combination of these provisions, tax treatment as a partnership can be achieved.

Use of Corporate General Partners

The sole general partner of a limited partnership is often a corporation. The advantage of this arrangement lies in the limits on personal liability for the builder-sponsor of a project whose interest in the limited partnership is through a corporation. An incorporated general partner can also provide better continuity of management. To avoid "dummy" corporations as the sole corporate general partner, the Internal Revenue Service follows internal guidelines (called **safe harbor rules**) that impose certain ownership and minimum capital requirements. Limited partners may not own, individually or in the aggregate, more than 20 percent of the corporate stock. The net worth requirement of the corporate general partner depends on the total contributed capital of the partnership. If the contributed capital is less than \$2.5 million, the corporate general partner must have a net worth at least equal to 15 percent of the total partnership capital, but not to exceed \$250,000. Where the contributed partnership capital is \$2.5 million or more, the corporate general partner must maintain at all times a net worth of at least 10 percent of the partnership capital.

Private versus Public Syndicates

An important way to classify syndicates is as **private** and **public.** Most private offerings are issued under Regulation D of the Securities Act of 1933 so as to be exempt from the registration requirements of that act. The Securities and Exchange Commission proposed Regulation D in 1982 to simplify and expand the exemptions from federal securities registration. It exempts syndicates from the registration requirement of the Securities Act, not from the full disclosure and antifraud provisions of securities laws. But that exemption can be significant—the costs of registration essentially eliminate all but the largest syndicated offerings, so exemption from registration under certain conditions facilitates small and medium-sized offerings. Compliance with the regulation does not by itself exempt syndications under *state* securities laws; many states, however, do have similar exemption statutes. Although Regulation D codifies and expands prior exemption statutes, it also defines important concepts, including that of the **accredited investor,** which is discussed in the following section. Anyone involved in making an offering pursuant to the regulation should read and understand it thoroughly to ensure careful compliance with its provisions.

Accredited Investors—Regulation D

If the securities are sold only to accredited investors, it is not necessary to provide investors with the information otherwise required to obtain an exemption under Regulation D. Accredited investors purchasing securities are also not counted in determining the maximum number of potential purchasers that may be solicited to retain exemption from Regulation D. Also, accredited investors do not need to meet the "sophistication and experience" requirements in financial and business matters that are applicable to other investors under

the private placement exemption rule in Regulation D. General examples of criteria used to describe accredited investors include the following:

- Any director, executive officer, or general partner of the issuer of the securities being offered or sold, or a director, executive officer, or general partner of a general partner of that issuer.
- Any person who purchases at least \$150,000 of the securities being offered, where the purchaser's total purchase price does not exceed 20 percent of the purchaser's net worth at the time of sale.
- Any natural person whose individual net worth, or joint net worth with that person's spouse, at the time of purchase exceeds \$1 million.
- Any natural person who had an individual income in excess of \$200,000 in each of the two most recent years and who reasonably expects an income in excess of \$200,000 in the current year.

Private offerings are usually limited to 35 or fewer investors. A public offering, on the other hand, is characterized by rigorous compliance requirements of the federal and state securities divisions governing the sale of securities to the public. Numerous reports, brochures, prospectuses, and the like, are required to qualify an issue for sale to the public. The minimum cost for a registration with the Securities and Exchange Commission is about \$50,000 and can run as high as \$300,000 to \$500,000 for large syndications that register and sell shares in many states. Given the high cost of registering a public syndication under federal and state laws, it makes sense to have a public syndication for large transactions that raise a large amount of capital.

Certificates of participation in public syndicates have been sold in units as low as \$500, \$1,000, or \$5,000. Minimum investments in private syndicates are usually 10 times this amount. Recently, public syndicates have reduced their investment minimums in an attempt to attract Individual Retirement Account and Keogh (self-employed retirement plan) money. The result has been that instead of a few participants of substantial means and risk-taking ability, the syndicate membership may be composed of thousands of small investors. Individuals now have a chance to invest in prime real estate that would normally be beyond the reach of all but wealthy or institutional investors.

Caveats

In a large public syndication, the syndication general partners usually share very few of the risks. They may have originally bought property through another business entity and sold it to the syndicate at a profit. Through other companies that they may also own, they may receive substantial remuneration for the sale of securities to the public, management services, and so on. As the general partners, all earnings and capital gains not contracted to the limited partners accrue to their benefit. These activities may or may not be fully disclosed to potential investors. The role of general partners has been a matter of increasingly grave concern to state and federal securities sales regulators.

Regulation of Syndicates

The great flexibility of the limited partnership has led to abuses. In 1980 a statement of [illegible] or guidelines that established standards for limited partnership offerings [illegible] adopted by the North American Securities Administrators Association (NASAA). State [illegible]tration agencies, in those states where the guidelines are applicable, generally [illegible] vor upon applications that do not conform to the standards contained in the guidelines. All states except California (which in some respects has even more stringent guidelines) [illegible]

NASAA, but not all states have adopted the NASAA guidelines. However, a substantial number of states follow the guidelines, and although the guidelines are intended to *apply only to public syndicates,* many securities administrators look to them for guidance when considering requests for exemptions from registration. The guidelines address syndicates' investment policies, promoters' and managers' compensation, and investor suitability standards. It is in these areas that federal and state regulatory authorities have expressed their greatest concern.

Investment Objectives and Policies

Syndicates differ widely in the investment objectives they seek to accomplish and policies they follow to achieve them. If targeted syndicate investors are in a low tax bracket and seek current income (e.g., IRA and pension fund investors), the syndicate will acquire properties that produce the greatest cash flow. Some of these properties may be purchased for all cash. Other investors may not need current income and seek properties (such as raw land in the path of urban growth) that offer the greatest potential for future capital gain. Still other investors may emphasize investments that generate tax shelters through high depreciation and mortgage interest deductions. The targeted investors for the syndicate will dictate the investment objectives and policies of the syndicator.

In early experience with limited partnerships until the late 1960s, syndicates normally raised capital to finance identifiable parcels, which were described in the prospectus or offering circular in detail so the investor could evaluate them before investing money. Such syndicates are referred to as "specified property" syndicates. Other syndicates raise capital before identifying any or all of the properties it will eventually own. They are known as **blind pool** syndicates and should be recognized as pure venture capital funds since no property descriptions or relevant economic or financial data are available to guide the investor. Specific investment criteria (e.g., type of property and geographic location) should be disclosed in the prospectus for such a blind pool syndicate, as well as the sponsor's background, experience, and previous results, because an investment in a blind pool is essentially an investment in the syndicator's track record and reputation. Investors in such offerings should carefully scrutinize the statement of investment objectives contained in the prospectus, as well as the background and track record of the syndicator. Syndicates' investment objectives generally vary around the following partial list of attributes:

- Fully identified properties.
- Blind pool investment.
- Use of leverage.
- Period of ownership expected before assets are sold.
- Land development investments to be allowed.
- Joint ventures with developers and other investors.
- Acquisition of foreclosed properties for resale.

Promoters' and Managers' Compensation

A major area of concern for syndicate investors is promotional and management fees. Keeping these fees to reasonable levels becomes especially difficult because of the many ways in which compensation can be paid. Syndicators often charge fees for providing services such as acquiring properties for the portfolio, managing them, guaranteeing investors a minimum cash flow, selling properties, or arranging refinancing. Obviously up-front fees reduce the amount of funds available for investment in the actual real estate. Additional fees may also be charged on the "back end" out of proceeds from sale of the property.

Management fees have been based on gross assets, net assets, gross rentals, net income, and cash flow. Each method yields its own unique results depending on the fortunes of the

syndicate operation. Unfortunately, projections of results are often based on hypotheticals without valid underlying assumptions. Bad projections distort judgments of appropriate compensation and the proper method for determining it. In all instances, full disclosure of conflicts of interest of principals, as well as all direct and indirect compensation payable by the partners to promoters, general partners, underwriters, and affiliates, should be made. This disclosure should describe the time of payment and amount of compensation, and it should detail the service rendered to earn it.

As we just pointed out, fees charged by syndicators and others promoting the syndicate vary widely. Because up-front fees reduce amounts available for investment, investors should look closely at deals where more than 20 percent of the equity raised is paid out in fees. Typical up-front fees include 7 to 10 percent for sales commissions to brokers selling syndicate interests, 1 to 3 percent for legal and accounting expenses, and 5 to 15 percent for organizational and financing fees.

Investor Suitability Standards

An outstanding weakness of a limited partnership interest as an investment is its lack of liquidity or marketability. Because of the restrictions on the assignability of the capital interest, a new partner must have the consent of the existing partners to acquire and enjoy the full interest of a selling partner. Furthermore, state-imposed requirements of financial responsibility of potential investors have made it more difficult to develop a secondary market for such interests. Even an issue of certificates of beneficial interest in a limited partnership is complicated because the limited partner selling an interest becomes a securities issuer and is subject to separate registration requirements. This lack of liquidity and marketability increases the riskiness of a limited partnership investment.

Another weakness of the syndicate is that many syndications have limited appeal to any but the investor in the high tax bracket. Yields other than from a tax shelter may be negligible. The low-income investor may acquire such a syndicate interest with too little appreciation of the weak economic viability of the venture. Minimum suitability standards for investors as recommended by the NASAA guidelines include either an annual gross income of $30,000 and net worth (exclusive of home, furnishings, and automobiles) of at least $30,000 or net worth of at least $75,000. Tax-oriented offerings may require higher standards, such as being in the highest federal income tax bracket, and high-risk offerings may impose higher income and net worth standards. In any case, the prospectus should clearly present the nature of the investor's expected return in the traditional sense, as well as the potential tax savings.

Federal and State Securities Authorities

The federal and state securities laws and regulations are relevant to any real estate syndication. Disclosure requirements under the Securities Act of 1933 and the Securities Exchange Act of 1934 make up the federal basis for civil liability and criminal fraud liability for principals and their professional counsels who fail to disclose full information about a public issue. Most state laws require securities salespersons to be registered in the local jurisdiction. These laws often go beyond the federal requirements in permitting the state commissioner to disqualify a securities offering on its merits, in addition to determining the required degree of disclosure of specific facts about the issue. Neglect by the issuer to qualify the issue may permit investors to rescind the whole transaction and demand their money back. Beyond these laws are the antifraud statutes that deal with fraudulent practices in connection with securities registration. Although the degree of applicability of federal and state laws and regulations differs with the characteristics of each issue, full and accurate compliance yields the best results for both the syndicator and investors.

Conclusion

Excessive amounts of capital flowed into real estate during the late 1970s and early 1980s, especially after the Economic Recovery Tax Act of 1981 gave significant impetus to the syndication industry. Prior to the Tax Reform Act of 1986, real estate syndications were aimed at individual investors who were seeking a tax shelter. Partnership interests were often marketed by sponsors and purchased by investors based on unrealistic assumptions regarding the expected performance of the property. This was at least one of the factors that led to overbuilding during this period.

Real estate syndication has undergone dramatic changes subsequent to the TRA of 1986. Syndications are now aimed at individuals and corporations with very high net worth, institutions, pension funds, and overseas investors. Tax losses are no longer the focus. Rather, sponsors of the syndication must make realistic assumptions about the performance of the underlying real estate and offer a competitive before-tax rate of return. Syndications also have been formed to purchase troubled properties at distressed prices. These are sometimes referred to as **opportunity funds.** Although public syndications may never reach the level of activity that they did during the early 1980s, the use of partnerships remains a viable alternative to corporations as an ownership vehicle.

Although the focus of this chapter was on limited partnerships, the same concepts apply to simpler partnerships such as a general partnership that does not have limited partners. Finally, as noted in this chapter, most REITs formed in the past 10 years were structured such that the REIT is the general partner in a limited partnership that owns the properties. The limited partners are investors who exchanged their partnership interest in a syndication for a partnership interest in the limited partnership owned by the REIT. This is discussed further in Chapter 21.

Key Terms

accredited investor, *546*
blind pool, *533, 548*
capital account, *536*
cumulative distribution, *527*
gain charge-back, *544*
general partner, *533*
initial capital contribution, *527*
IRR lookback, *528*
IRR preference, *528*
joint venture, *525*
limited partner, *533*
limited partnership, *533*
noncumulative pari passu distribution, *527*
opportunity funds, *550*
preferred distribution, *527*
preferred return, *527*
private offering, *533*
private syndicate, *546*
promote, *527*
public syndicate, *533*
safe harbor rules, *546*
special allocation, *535*
substantial economic effect, *542*
syndication, *532*

Useful Web Sites

www.sppre.com—A national consulting, development management, and real estate asset management company with the sole purpose of assisting government, university, and school district officials to structure and implement public/private real estate partnerships and optimize the value of their underutilized real estate assets.

Questions

1. What is the difference between an *IRR* preference and an *IRR* lookback?
2. What is the advantage of the limited partnership ownership form for real estate syndications?
3. How can the general partner–syndicator structure the partnership to offer incentives to limited partners?
4. Why is the Internal Revenue Service concerned with how partnership agreements in real estate are structured?
5. What is the main difference between the way a partnership is taxed versus the way a corporation is taxed?
6. What are special allocations?

7. What causes the after-tax *IRR* ($ATIRR_e$) for the general partner to differ from that of the limited partner?
8. What is the significance of capital accounts? What causes the balance in a capital account to change each year?
9. How does the risk associated with investment in a partnership differ for the general partner versus a limited partner?
10. What are the different ways that the general partner is compensated?
11. Why do you think the Tax Reform Act of 1986 affected the desirability of investing in real estate syndications?
12. What concerns should an investor in a real estate syndication have regarding general partners?
13. Differentiate between public and private syndications. What is an accredited investor? Why is this distinction used?
14. How are general partners usually compensated in a syndication? What major concerns should investors consider when making an investment with a syndication?

Problems

1. ABC Fund has decided to enter into a joint venture with Newtown Development Inc. to develop and operate an office building that will require an initial investment of $100 million to cover all the development costs (hard and soft costs). There will be no debt financing for the joint venture. Each party invests its capital at the beginning of the first year and cash flow from operations is projected as follows:

Year 1	$2,000,000
Year 2	$4,000,000
Year 3	$9,000,000
Year 4	$12,000,000
Year 5	$14,000,000

It is expected that the property will be sold at the end of year 5 for $150 million.

ABC Fund will invest $45 million and Newtown Development Inc. will invest the remaining $5 million needed for the development costs. The $50 million development costs already include a developer fee to Newtown Development Inc. and the cash flow projections for each year above are net of a property management fee being paid to Newtown Development Inc.

ABC Fund will receive a 5 percent operating return that is noncumulative. That is, any shortfall is not carried over to the next year. But it is paid before Newtown Development Inc. receives any cash from operations. After ABC Fund is paid its preferred return, Newtown Development Inc. will receive a 5 percent operating return on its contributed capital. This is also noncumulative. Any remaining cash flow from operations is split 50–50 to each party.

When the property is sold, proceeds from sale will be distributed as follows:

First, repay the initial capital investment by ABC Fund.
Next, repay the initial capital investment by Newtown Development Inc.
Next, pay ABC Fund an 11 percent *IRR* preference on their investment.
Thereafter, split all proceeds 50–50.

Use the above assumptions to calculate the cash flows that each party will receive and its expected *IRR*.

2. Venture Capital Limited has formed a *private* real estate syndication to acquire and operate the Tower Office Building, with Venture acting as the general partner and 35 individual limited partners. The venture to be undertaken and relevant cost and financial data are summarized as follows:

Cost breakdown		
Land	$ 1,000,000	
Improvements	9,000,000	(capitalized)
Points	100,000	(amortized over loan term)
Subtotal	$10,100,000	
Organization fee	100,000	(amortized over 5 years)
Syndication expenses	100,000	(capitalized)
Total funding required	$10,300,000	
Financing		
Loan amount	$ 8,000,000	
Interest rate	11%	
Term	25 years	(monthly payments)
Points	$ 100,000	
Partnership facts and equity requirements		
Organization: December, year 1		
Number of partners: 1 general partner and 35 limited partners		
Equity capital contribution: General partner, 10%; limited partners, 90%		
Cash assessments: None		
Cash distributions from operations: General partner, 10%; limited partners, 90%		
Taxable income and losses from operations: General partner, 10%; limited partners, 90%		
Allocation of gain or loss from sale: General partner, 15%; limited partners, 85%		
Cash distribution at sale: Based on capital account balances		
Operating and tax projections		
Potential gross income (year 2)	$1,750,000	
Vacancy and collection loss	10% of potential gross income	
Operating expenses (year 2)	35% of effective gross income	
Depreciation method	Straight line, 31.5 years	
Projected growth in income	3% per year	
Projected resale price after 5 years	$13,500,000	
Limited partners' tax rate	28%	
General partner's tax rate	28%	
Selling expenses	5%	

a. Determine an estimated return ($ATIRR_e$) for a limited partner. (Hint: Consider all 35 limited partners as a single investor.)

b. Determine an estimated return ($ATIRR_e$) for the general partner.

c. Why do the returns differ for the general and limited partners?

3. A and B form a partnership where A, the limited partner, contributes $500,000 and B, the general partner, contributes no cash. The partnership secures a $2 million (10 percent interest only) nonrecourse loan and acquires AB Apartments for $2.5 million. Assume that the results from the first year of operations of AB Apartments are as follows:

Net operating income	$ 250,000
Less debt service (interest only)	−200,000
Before-tax cash flow	$ 50,000

Assume that tax depreciation the first year is $250,000.

The partnership agreement provides that 90 percent of all taxable income, loss, and cash flow from operations is to be allocated to A and 10 percent to B. At resale, taxable gains or losses are to be split 50–50 between A and B, and cash proceeds are distributed first to A in an amount equal to his original investment less any cash distributions previously received, and then split 50–50 between A and B.

a. What are the capital account balances for A and B after one year?

b. Assume that AB Apartments is sold after year 1 for $3 million with no expenses of sale. How much cash is available (before tax) from sale?

c. How much cash would be distributed to A and B upon sale of the property?

d. How much capital gain would be allocated to A and B upon sale of the property?

e. Calculate the capital account balances for A and B after sale.

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4. **Excel.** Refer to the "Ch18 Partner" tab in the Excel Workbook provided with the book. Suppose the split between the limited and general partner is 99 percent for the limited partner and 1 percent for the general partner for equity contributions, income, and allocation of gain. How does this change the expected return to each partner?

Chapter 19

The Secondary Mortgage Market: Pass-Through Securities

Introduction

We begin this chapter with a brief description of the evolution of the secondary market. Particular attention is paid to the need for this kind of market and identifying the major organizations that participate in it. We then describe the various types of mortgage-backed securities that have evolved in recent years and provide a framework for analyzing their investment characteristics. Although mortgage-related securities may be offered on many types of mortgage pools, we generally limit our discussion to residential mortgage-backed pools. The chapter concludes with a section on "pricing" two types of mortgage-related securities, and provides an evaluation of characteristics that differentiate these more important security types. The next chapter is a continuation of this one. It provides a detailed analysis of collateralized mortgage obligations (CMOs) and "derivative" securities. It also contains an introduction to commercial mortgage–backed securities.

Evolution of the Secondary Mortgage Market

The **secondary mortgage market,** as we know it today, evolved as a result of a combination of the following influences:

1. A need existed for a market in which specialized mortgage originators, such as mortgage banking companies, could sell mortgages and thereby replenish funds with which new loans could be originated.

2. A need also existed for a market mechanism to facilitate a geographic flow of funds. Such a market would allow lenders located in regions where the demand for housing and mortgage financing far exceeded the availability of deposits to sell mortgages to other intermediaries in regions with a surplus of savings.

3. Beginning in the late 1960s, many innovations in securitization occurred in response to the trend toward deregulation of depository-type financial institutions. Because of this trend, savers were no longer limited to traditional methods of saving, such as savings accounts and certificates of deposit. Further, with the passage of legislation giving individual retirement accounts (IRAs) favorable tax treatment, and the aging of the U.S. population increasing the flow of funds to pension accounts, the market for investable funds became much broader. Hence, mortgage lenders, with the aid of organizations specializing in underwriting and selling securities to the public and institutional investors, were faced with the challenge of attracting savings from the public in different ways so as to replenish funds for new mortgage loans. There has been a long-standing commitment on the part of the federal government to encourage home ownership and to provide support for a strong system of housing finance.

Early Buyers of Mortgage Loans

There has always been a secondary mortgage market of some type. Prior to the mid-1950s, primary mortgage originators included mortgage companies and, to a lesser extent, thrift institutions. Investors, including large life insurance companies and eastern thrifts with a surplus of funds, purchased mortgages from mortgage companies or from thrifts in regions where housing demand was great relative to funds available for lending. By purchasing mortgages, these institutional investors helped to replenish funds necessary for the housing boom during the postwar era.

One major factor enhancing the early development of the secondary market was that the federal government, through programs initiated with the Federal Housing Administration (FHA) and later the Veterans Administration (VA), protected mortgage investors from losses by providing either default insurance (FHA) or loan guarantees (VA). One outcome of these programs was a system of minimum underwriting standards for borrower qualifications, appraisals, and building specifications. Uniform administrative procedures required by the FHA and VA were followed by mortgage companies and helped to accommodate significant volumes of FHA and VA originations and facilitated servicing activities. Given (1) the availability of default insurance and loan guarantees, (2) the development of standardized loan underwriting, processing, and servicing, and (3) the availability of hazard and title insurance, investors in mortgages could acquire a large quantity of loans and expect to receive interest and principal payments with little or no risk. Administrative problems regarding defaults, late payments, and so forth, were usually handled for a fee by the servicer, making mortgage investments resemble those of a bond or fixed-income security. With funds acquired from sales of mortgages to institutional investors, originators (primarily mortgage companies) replenished funds with which they could originate new loans.

The Secondary Market after 1954

In 1954, Congress rechartered the **Federal National Mortgage Association,** now commonly known as "Fannie Mae" (FNMA), assigning it three separate and distinct activities: (1) enhancement of secondary market operations in federally insured and guaranteed mortgages, (2) management of direct loans previously made and, where necessary, liquidation of properties and mortgages acquired by default, and (3) management of special-assistance programs, including support for subsidized mortgage loan programs. Each function was carried out as though it was operated as a separate corporation.

Throughout this and earlier periods, interest rates on FHA and VA mortgages were *regulated* by those agencies. Instead of deregulating interest rates on FHA and VA mortgages, Congress, in its attempt to keep mortgage interest rates as low as possible to would-be home buyers, preferred to maintain a system under which FHA-VA interest rates would remain regulated. FNMA's role would be to raise capital by issuing debt when necessary to purchase mortgages, thereby replenishing capital to originators during periods of rising interest rates. It was thought that those mortgages would be sold at a gain when interest rates declined, thereby providing FNMA with funds to retire debt that was previously issued to acquire mortgages. FNMA was thus viewed as a vehicle that would provide liquidity to the home finance system when needed, and would assume the interest rate risk associated with its role as an intermediary between mortgage originators (primary originators of FHA and VA loans) and investors in its bonds. Ostensibly, over many periodic cycles of interest rate movements, it was hoped that FNMA would, on the average, earn a "spread" between interest earned on mortgages and interest paid on its bonds, while providing liquidity to the home finance system.[1]

FNMA's Changing Role

As market interest rates gradually increased and FHA-VA mortgage interest rates lagged, the "spread" referred to above became more problematic for FNMA to maintain. These influences prompted Congress to review the operations of FNMA and culminated in the Charter Act of 1954. Among the provisions in the act, however, was an additional provision that governmental participation in the operation of the principal secondary market facility should be gradually replaced by a private enterprise. The act included a procedure whereby FNMA would, over a period of time, be transformed into a privately owned and managed organization. By converting FNMA to a private operation rather than setting up a new one, FNMA's years of experience in the secondary market could be utilized during the transition period and eventually would concentrate the whole operation in private hands.

To provide a financial base to operate FNMA, the Charter Act also authorized issuance of nonvoting preferred and common stock for the financing of secondary market operations. The preferred stock was issued to the secretary of the treasury. Sellers of mortgages to FNMA were required to purchase FNMA stock as a condition of sale, which provided additional capital for operations and resulted in widespread ownership of FNMA. Additional funding for FNMA came from its issuance of notes and debt instruments. The act provided that, if necessary, the U.S. Treasury would be permitted to acquire up to $2.25 billion of these notes. This "backstop" was intended to provide assurance of liquidity to FNMA bond and note purchasers and a price support for such securities, should FNMA's profitability or inability to issue more of these obligations ever come into question. It also provided FNMA with a distinct advantage when borrowing in capital markets to finance its activities. FNMA could now borrow at lower rates of interest than it otherwise could have in the absence of the *Treasury backstop*.

The Government National Mortgage Association

The **Government National Mortgage Association (GNMA)** was organized as part of the Housing and Urban Development Act of 1968 to perform three principal functions: (1) management and liquidation of mortgages previously acquired by FNMA—the liquidation of the portfolio acquired from FNMA at the time of its partition comes through regular principal repayments and sales; (2) special-assistance lending in support of certain

[1] Obviously, the risk of such a strategy is that the *net* cost of bonds and notes used to raise funds over periods of rising and falling interest rates would exceed the *net* interest income from mortgages held in a portfolio. This could occur if, over several cycles, net purchases of mortgages exceeded net sales.

federal subsidized housing programs; GNMA, also known as "Ginnie Mae," is authorized to guarantee mortgages that are originated under various housing programs designed by FHA, to provide housing in areas where it cannot be provided by conventional market lending; and (3) provision of a guarantee for FHA-VA mortgage pools, which would provide a timely payment of principal and interest guarantee for mortgage-backed securities. Its operations are financed through funds from the U.S. Treasury and from public borrowing.

Mortgage-Backed Securities and the GNMA Payment Guarantee

The guarantee program provided for in 1968 was one of the most significant provisions in the development of the secondary mortgage market as we know it today. Essentially, GNMA was empowered to guarantee the timely payment of principal and interest on securities backed or secured by pools of mortgages insured by the FHA and the Farmers Home Administration (FmHA) or guaranteed by the VA. One of the problems in the secondary mortgage market prior to this time was that even though FHA-insured mortgages could be purchased by investors who received monthly payments of principal and interest (less servicing fees), investors often experienced delays in payments when borrower defaults occurred. In these cases, servicers would have to make a claim for any payments in arrears plus remittance of the loan balance from FHA or the guarantee from VA. Settlement of these claims could be time-consuming and required additional administrative effort on the part of investors.

Many investors in mortgage packages disliked this waiting period, which resulted in unpredictable cash flows and a reduction in investment yields. By providing the buyer with a guarantee of timely payment of interest and principal, GNMA was, in essence, guaranteeing monthly payments of interest and principal from amortization. The guarantee also included repayment of outstanding loan balances should mortgages be prepaid before maturity or should borrowers default. GNMA would make timely payments to the security purchaser, and then take responsibility for settling accounts with the servicer. This would relieve investors from administrative problems and delays in receiving mortgage payments. For this guarantee, the buyer was charged a guarantee fee, which provided GNMA with operating funds to perform this function.

As a result of this GNMA guarantee program, a virtual explosion in the secondary market occurred. This guarantee enabled originators of FHA and VA mortgages to pool or package mortgages and to *issue securities*, called *pass-through securities*, which were collateralized by the mortgages, and were based on the notion of investors buying an undivided security interest in a pool of mortgages with interest and principal passed through to investors as received from borrowers. These securities would be underwritten by investment banking firms and sold to investors in markets that were not reached prior to this innovation. Funds received by originators from the sales of pass-through securities would be used to originate new mortgages.

Investors were attracted to these securities because default risk on them was minimized as a result of either FHA insurance or a VA guarantee. Securities issued against such pools were viewed by investors as virtually riskless or very similar to an investment in a government security. With the added guarantee of timely payment of interest and principal by GNMA, these securities also took on the repayment characteristics of a bond, although repayment of the outstanding principal could occur at any time. Repayment could occur when a borrower defaulted, refinanced, or repaid the outstanding loan balance.[2]

[2] Repayment could also occur if a property was sold and the loan was not assumed by the buyer, or, in the event of a hazard (fire, etc.), if proceeds from hazard insurance were used to repay the mortgage rather than to reconstruct the improvement.

The Federal Home Loan Mortgage Corporation

By the early 1970s, the mortgage-backed securities market based on pools of FHA-insured and VA home mortgages was well established under the operation of FNMA and GNMA. However, no such secondary market existed for the resale of *conventional* loans originated by thrifts. These mortgages have historically accounted for the vast majority of residential loan originations. For example, conventional mortgage originations accounted for approximately 79 percent of total residential loans, while FHA and VA mortgages accounted for only 21 percent of the total. Thrifts originated the majority of conventional loans (58 percent), and mortgage companies originated the majority of FHA-VA mortgages (80 percent). Hence, finding a way to securitize conventional loans was very important if funds were to continue to flow to originators.

Periods of intermittent interest rate volatility, particularly during the mid- and late-1960s, was also causing liquidity problems that plagued thrifts.[3] This resulted in a reduction in the flow of funds to the conventional mortgage market and prompted Congress, under Title III of the Emergency Home Finance Act of 1970, to charter the **Federal Home Loan Mortgage Corporation (FHLMC),** more commonly known as "Freddie Mac." Its primary purpose was to provide a secondary market and, hence, liquidity for conventional mortgage originators just as Fannie Mae and Ginnie Mae did for originators of FHA-VA mortgages.

Initially, Freddie Mac was authorized to purchase and make commitments to purchase first lien, fixed rate conventional residential mortgage loans and participations. This bill also allowed Fannie Mae to purchase conventional mortgages, and Freddie Mac was given the authority to purchase FHA-VA loans as well. This provision would, in essence, allow both organizations to *compete* for all mortgage loans. However, the vast majority of Freddie Mac's business was, and continues to be, conventional mortgages, and FNMA continues to be the dominant purchaser of FHA-VA mortgages, although its acquisition of conventional loans now exceeds its FHA-VA acquisition volume.

Operation of the Secondary Mortgage Market

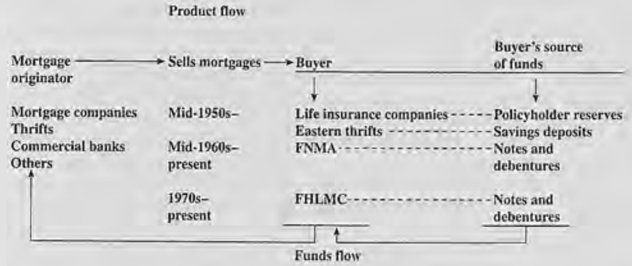
To understand how the secondary mortgage market functions, remember that the primary function of this market is to provide a mechanism for replenishing funds used by mortgage originators. This, in turn, enables them to maintain a flow of new mortgage originations during periods of rising and falling interest rates. They may accomplish this by selling mortgages directly to Fannie Mae, Freddie Mac, or other private entities. Or they may form mortgage pools and issue various securities, thereby attracting funds from investors who may not otherwise make investments directly in mortgage loans. Hence, much like any corporation raising funds for doing business, the primary goal of mortgage originators in today's market is to replenish funds by reaching broader investor markets.

Direct Sale Programs

Exhibit 19–1 illustrates the direct sale approach used by mortgage originators to replenish funds. As previously indicated, prior to the mid-1950s, the secondary market was utilized

[3] Prior to the era of interest rate deregulation (on savings deposits), the small investor would deposit funds in a thrift or bank, which would in turn originate and retain the mortgage as an investment. During this period of regulated interest rates, savers withdrew deposits and began investing directly in financial securities. This change, as well as legislation allowing individuals to open individual retirement accounts (outside of savings institutions), forced thrifts to find a way to compete for funds that they once had been able to acquire by offering savings accounts.

EXHIBIT 19–1
Funds Flow Analysis (direct purchase programs)



by mortgage companies and some thrifts who originated FHA and VA mortgages, which were in turn sold to life insurance companies and some large eastern thrifts. These institutions utilized funds obtained from policyholder reserves and savings deposits, respectively, to acquire mortgage packages. This market changed during the mid-1950s as FNMA became the predominant purchaser of FHA-VA mortgages from mortgage bankers. The FHLMC entered the market by 1970, offering savings and loan associations the opportunity to sell conventional and FHA-VA mortgages.

FNMA's current commitment program is divided into two parts: mandatory and optional. Under the mandatory commitment option, Fannie Mae is obligated to purchase a certain amount of mortgages at a certain price at a certain time, and mortgage originators are *obligated* to deliver the mortgages. Originators pay a commitment fee to Fannie Mae for the privilege of selling mortgages under the commitment program. Under the optional delivery program, originators pay Fannie Mae a fee (the amount is higher than the corresponding commitment fee under the mandatory commitment program) for the *option* to deliver their mortgages to Fannie Mae. Under the mandatory commitment program, mortgage originators will benefit if market interest rates rise, but they could lose if market interest rates fall because they could have received a higher price elsewhere. On the other hand, the optional delivery commitment program gives the mortgage originator the "right but not the obligation" to sell the mortgages to Fannie Mae. Hence, if interest rates increase, originators can sell mortgages to Fannie Mae, but if rates fall, they retain the option to sell mortgages to another party for a better price (or even to renegotiate a price with Fannie Mae). With the advent of these commitment programs, mortgage originators were able to continue to shift most interest rate risk to Fannie Mae; however, this can now only be done for a fee. The program became so successful for Fannie Mae that Freddie Mac instituted a similar program in 1970.

The Development of Mortgage-Related Security Pools

As discussed previously, in addition to direct sales of mortgages from originators to investors, many large mortgage originators found that they could place mortgages in pools and sell securities of various types, using the mortgages in these pools as collateral. With the aid of investment bankers, large originators could issue securities in small denominations which would be purchased by many more investors. Firms with smaller mortgage origination volumes could continue to sell mortgages directly to FNMA and FHLMC, who in turn would create large pools of their own and issue securities. Creation of mortgage pools for securitization has clearly changed the previous pattern of thrifts *originating and holding* mortgages in their own portfolios and mortgage companies originating and selling mortgages directly to life insurance companies or large thrifts in regions where a surplus of savings existed. As we will see, many originators are no longer willing to take the interest rate risk associated with originating loans with funds obtained from deposits and have found a way, through securitization, to raise funds and shift interest rate risk to various classes of investors who are willing to take that risk.

Many types of mortgage-related securities have been developed in recent years. The number and types of securities are continuing to increase as mortgage originators, investment bankers, and the three federally related institutions discussed thus far (FNMA, FHLMC, and GNMA) continue to innovate and reach investor markets that provide the ultimate sources for many of the funds used in new mortgage originations. In this chapter and the next, we will deal in depth with the major types of mortgage-backed securities currently in use:

1. Mortgage-backed bonds (MBBs).
2. Mortgage pass-through securities (MPTs).
3. Mortgage pay-through bonds (MPTBs).
4. Collateralized mortgage obligations (CMOs).

Mortgage-Backed Bonds

One approach to mortgage securitization that has been used by private mortgage originators such as mortgage companies, commercial banks, and savings and loans to replenish funds for new originators has been to issue **mortgage-backed bonds (MBBs).** When issuing MBBs, the issuer establishes a pool of mortgages—this pool usually includes residential mortgages, but commercial mortgages and other mortgage-related securities may also be used—and issues bonds to investors. The issuer retains ownership of the mortgages, but they are pledged as security and are usually placed in trust with a third-party trustee. This trustee makes certain that the provisions of the bond issue are adhered to on behalf of the security owners. Like corporate bonds, MBBs are usually issued with fixed-coupon rates and specific maturities.

To assure investors that the income from mortgages will be sufficient to pay interest on the bonds and to repay principal on the maturity date, the issuer usually "overcollateralizes" the bond issue. This is done by placing mortgages in the pool with outstanding loan balances in excess of the dollar amount of the securities issued. Historically, issuers have pledged from 125 percent to 240 percent in mortgage collateral in excess of the par value of securities issued. This practice is followed because some borrowers may default or fall behind in payments on mortgage loans in the pool. In this case, the overcollateralization ensures that interest payments promised to security holders will continue even though some mortgages may be in default. Further, some loans may be prepaid either before the maturity date of the mortgage or before the bond maturity date. Because mortgage-backed bonds are issued for a specified number of years, overcollateralization ensures that, as mortgages are prepaid, others will still be in the pool to replace them. Another reason for overcollateralization is that bond issues usually provide that the trustee "mark all mortgage collateral to the market." This is done periodically to make sure that the market values of mortgages used for overcollateralization are maintained at the level agreed upon at the time of issue (e.g., 125 percent or 240 percent) or at other levels agreed upon throughout the life of the bond issue. Should the market value of the mortgages in trust fall below the agreed-upon level of overcollateralization or be reduced because of an excessive number of defaults or prepayment on mortgages in the pool, the issuer must *replenish* the pool with additional mortgages of the same quality. If the issuer doesn't replenish or doesn't abide by the provisions of the security issue, the trustee may sell all collateral in the trust to protect the security owners.

Mortgage-backed bonds, like all mortgage-related securities, are usually underwritten by investment banking companies, given an investment rating by an independent bond-rating agency,[4] and sold through an underwriting syndicate.[5] The investment rating depends on (1) the quality of the mortgages in the underlying pool, which is a reflection of the types of mortgages and their loan-to-value ratios, and whether they are insured or guaranteed against default, either fully or partially; (2) the extent of geographic diversification in the mortgage security; (3) the interest rates on mortgages in the pool; (4) the likelihood that mortgages will be prepaid before maturity; (5) the extent of overcollateralization; and (6) in the case of commercial mortgages, the appraised value and debt coverage ratio.

Obviously for mortgage pools containing FHA-VA mortgages or conventional mortgages with private mortgage insurance, the risk of default losses would be lower than if such mortgages were not insured or guaranteed. In some cases, however, the issuer may include some additional types of credit enhancement from a third party as additional security against default losses to bondholders. This enhancement could be a letter of credit from a bank, based on the issuer's credit standing and deposit requirements maintained at the bank issuing the letter, or some types of surety in the form of an insurance or other agreement negotiated with a creditworthy third party for a fee. When credit enhancements are used, the investor must also evaluate the ability of the third party to perform on the guarantee or to evaluate the terms and conditions of letters of credit when provided by the issuer or third parties. The quality of the enhancement will generally affect the amount of overcollateralization required or the coupon rate offered on the bonds.

In summary, the quality and types of mortgages in the pool are the primary determinants of whether the cash flows used to pay interest on the bonds and to eventually retire them will be adequate. These characteristics will affect the ability of the issuer to meet the requirements of the bond issue and, hence, affect the risk to investors. This risk will determine the yields required by investors on such bonds and, hence, the price that the issuer will receive for them. This pricing issue is considered next.

Pricing Mortgage-Backed Bonds

To illustrate how mortgage-backed bonds are priced by issuers when negotiating with underwriters, we assume that \$200 million of MBBs will be issued against a \$300 million pool of mortgages, in denominations of \$10,000 for a period of 10 years. The bonds will carry a coupon, or interest rate, of 8 percent, payable annually,[6] based on the quality of the mortgage security in trust, the overcollateralization, and the creditworthiness of the issuer (and/or credit enhancement provided by the issuer). We assume that the securities receive a rating of Aaa or AAA.[7] To determine the *price* at which the security will be offered on the *date of issue*, we must discount the present value of the future interest payments and return of principal at the market rate of return demanded by investors (who will purchase them from underwriters). This rate is obviously a reflection of the riskiness of the bond relative to other securities and the yields on comparable securities in the marketplace.

In our example, the price of the security is determined by finding the present value of a stream of \$800 interest payments (made annually for 10 years, plus the return of \$10,000 in principal at the end of the 10th year). Assuming that the issuer, in concert with the

[4] Such agencies might be Moody's or Standard & Poor's Corporation.

[5] Prominent underwriters of mortgage-related securities have included Lehman Brothers, Morgan Stanley, and Goldman Sachs & Co.

[6] Most bonds pay interest semiannually. We are simplifying the analysis here.

[7] This is the highest rating obtainable. An explanation of the meaning and determination of ratings can be obtained from Moody's or Standard & Poor's.

underwriters, agrees that the rate of return that will be required to sell the bonds is 9 percent, then the price will be established as follows:

$$PV = \$800(PVIFA, 9\%, 10 \text{ yrs.}) + \$10{,}000(PVIF, 9\%, 10 \text{ yrs.})$$
$$= \$9{,}358$$

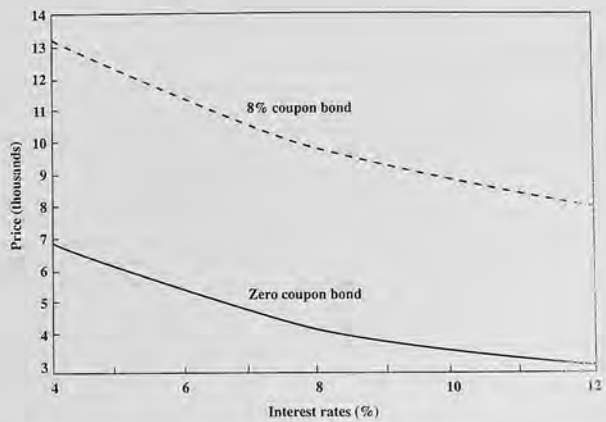
Hence, the bond would be priced at a discount of \$642, or at 93.58 percent of par value (\$10,000), resulting in a yield to maturity of 9 percent.[8] The issuer would receive \$187,160,000 from the underwriter,[9] less an underwriting fee, in exchange for the securities. On the other hand, if the yield was deemed to be 7 percent, then the present value of the bonds would be \$10,702 or they would sell at a premium of \$702 and the issuer would receive \$214,400,000. Hence, the price of the issue will depend on the relationship between the coupon rate on the bond and prevailing required rates of return. When market rates exceed the coupon rate, the price of the bond will be lower, and vice versa. Exhibit 19–2 shows the relationship between price and the market yield or rate of return at the time that the 8 percent MBB is issued. Note the inverse relationship between prices and demanded rates of return.

Subsequent Prices

The bonds referred to will be traded after they are issued and, although the prices at which they trade will no longer affect funds received by the issuer, these prices are important to investors as well as issuers who plan to make additional security offerings. For example, if we assume that two years after issue the required rate of return is again 9 percent, then the bond price would be:

$$PV = \$800(PVIFA, 9\%, 8 \text{ yrs.}) + \$10{,}000(PVIF, 9\%, 8 \text{ yrs.})$$
$$= \$9{,}447$$

EXHIBIT 19–2
Prices for an 8 Percent Coupon versus a Zero Coupon MBB at Varying Interest Rates



[8] *Yield to maturity* is a term used by bond investors that is identical to the internal rate of return. It is calculated upon whether the coupon (interest) payments are made semiannually, quarterly, and so on.

[9] We assume that the underwriter makes a firm commitment to purchase the entire offering from the originator for an agreed price. The underwriter then forms a syndicate with other underwriters, who then take the risk of reselling securities to the public and institutional investors through a network of securities dealers.

Hence, we can see that the price of the security would now be 94.47 percent of par value. The discount is now lower than at the time of issue because the remaining number of years to maturity is now 8 instead of 10. Alternatively, if the demanded return was 7 percent after two years, then the premium would be \$10,597, or a price 105.97 percent of par. Hence, the extent of premium and discount when the maturity period is 10 years is different from the pattern illustrated when the remaining maturity is 8 years. However, regardless of the remaining maturity period, when the market rate of return is 8 percent, or equal to the coupon rate, the security will always sell at par value. The student should verify this.

Zero Coupon Mortgage-Backed Bonds

In some cases, bonds issued against mortgages will carry zero coupons or will not pay any interest. These MBBs accrue interest until the principal amount is returned at maturity. To illustrate, we assume the bond in our previous example is to be issued with a zero coupon, but interest is to be accrued at 8 percent until maturity. At maturity, the *par value* of the security will be redeemed for \$10,000. If, however, at the time of issue, the rate of return demanded by investors in these securities is 8 percent, then the security will be *priced* as follows:

$$PV = \$10{,}000(PVIF, 8\%, 10 \text{ yrs.})$$
$$= \$4{,}632$$

Based on this result, the security would be priced to sell at \$4,632, or 46.32 percent of par value at maturity (\$10,000). Should market rates of interest be 7.5 percent at the time of issue, the security would be priced at \$4,852, or 48.52 percent of par. Exhibit 19–2 also shows the relationship between prices and various market rates of return for a zero coupon MBB with a 10-year maturity period at the time of issue. When compared with the 8 percent coupon bond, the price sensitivity of a zero coupon bond, as a percentage of par value, is far greater than that of the more standard bonds that pay interest currently. For example, when the required return is 4 percent, the 8 percent interest-bearing coupon bond would sell at 130 percent of par, while the zero coupon would sell at about 68 percent of par. The greater price sensitivity for zero coupon bonds relative to interest-bearing bonds occurs because all income is deferred until maturity with the zero coupon bond. Therefore, its present value will always be more sensitive to changes in interest rates than that of investments returning some cash flows during the investment period.

Marketing the Mortgage Portfolio to Market

As mentioned previously, the trustee selected to oversee that the provisions of the bond issue are carried out must ascertain periodically whether the market value of the mortgages placed in trust is equal to the agreed-upon level of overcolleralization. The pricing techniques used by the trustee to establish the market value of the pledged mortgages are very complex because (1) there are generally many different interest rates on mortgages placed in trust, (2) those mortgages will be amortizing principal, (3) many of the mortgages in the pool may be prepaid because many of them may allow the borrower to repay the outstanding loan balance at any time, and (4) some borrowers may default on loans. These latter two factors would obviously reduce the amount and number of mortgages in the pool.

To make an estimate of the value of mortgages in the pool (referred to as *marking the mortgages to market*), the trustee must value each of the mortgages in the pool by first establishing the number and outstanding balance of each mortgage in trust. Estimates must then be made of the current market yield demanded by investors for each type of mortgage based on assumptions about the period that each mortgage is expected to be outstanding (not the contract maturity period, because most mortgages on single family residential properties are prepaid as properties are sold, loans refinanced, borrowers default, etc.).[10] Hence, the valuation of the underlying security is a more complex undertaking, particularly when the prepayment patterns are considered. Many of the techniques that must be considered in evaluating such securities are also important when valuing mortgage pass-through securities.

Mortgage Pass-Through Securities

In 1968, Ginnie Mae initiated the mortgage-backed guarantee program. This program represented an attempt to create a mortgage-backed investment capable of competing with corporate and government securities for investment funds. As previously pointed out, one of the most serious objections that had to be overcome with this type of security was the issue of safety. Because mortgage-related securities would represent loans made by many individual borrowers with different income and household characteristics, an investment vehicle had to be created whereby the collateral underlying the mortgage security could be easily understood and yet be comparable to other securities.

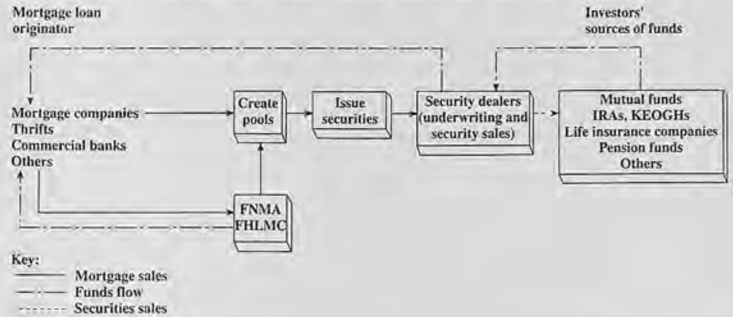
We know that mortgages are subject to default risk and interest rate risk. Although fixed interest rate mortgage securities, like corporate and government bonds, would also be subject to interest rate risk, default risk could be eliminated by FHA insurance or dramatically reduced with a VA guarantee. Another characteristic of concern to potential investors in mortgage-related securities was the predictability of the income stream. Substitute investments, such as noncallable bonds, have very predictable interest payment schedules. As pointed out previously, mortgage payments can be delayed because of a household's inability to keep payments current or because of default. To overcome this lack of timeliness in payments, Ginnie Mae guaranteed the full and timely payment of principal and interest. GNMA's position as guarantor was that of a surety, with securities carrying the GNMA guarantee having full faith and credit of the U.S. government behind them. This full faith and credit guarantee meant that GNMA could borrow without limit from the Treasury. This unique guarantee had made the GNMA security the most liquid of all secondary mortgage market securities.

Before the advent of the first mortgage-backed security, the pass-through, the only way an originator could sell a package of mortgage investments was to sell whole loans, which involved the transfer of ownership in addition to all of the investor concerns mentioned above. The mortgage pass-through overcame many of these problems. **Mortgage pass-through securities (MPTs)** are issued by a mortgage originator (e.g., mortgage company, thrift) and represent an undivided ownership interest in a pool of mortgages. The pool may consist of one or many mortgages. However, the usual minimum size of such a pool is $100 million, which could represent 1,000 or more residential mortgages. Each mortgage placed in the pool continues to be serviced by its originator or an approved servicer. A trustee is designated as the owner of the mortgages in the pool and ensures that all payments are made to individual security owners. Cash flows from the pool, which consists of principal and interest, less servicing and guarantee fees, are distributed to security holders. That is why the securities are called pass-throughs, because cash flows are "passed-through" to the investors by the mortgage servicer.

Exhibit 19–3 presents a flowchart showing how mortgage pass-through securities are originated and sold. Essentially, mortgages are originated by lenders and are pooled by them or sold to FNMA or FHLMC. If pooled by the originator, the originator will work with a securities underwriter to issue securities. These securities are then sold through

[10] Other methods of principal repayment may also be used, such as sinking fund retirements and call provisions. For a discussion see any basic text dealing with investments.

EXHIBIT 19–3 Mortgage Pass-Through Securities: Issuance and Funds Flow



security dealers to mutual funds, individuals with individual retirement accounts (IRAs), trust and pension fund administrators, life insurance companies, or even thrifts and commercial banks in geographic areas with a surplus of savings. This pattern of securitization enabled originators of mortgages to ultimately reach the relatively small investor, who could now purchase an interest in a Ginnie Mae pass-through or another pass-through security by investing in a mutual fund or buying it directly.[11]

Important Characteristics of Mortgage Pools

Exhibit 19–4 provides information on the most important types of pass-through securities that have been used. Although all pass-through securities have the same underlying structure, some major differences between them should be pointed out. These differences are extremely important to issuers when creating mortgage pools and are equally important to investors when evaluating the possibility of investing in a mortgage pass-through security as opposed to a government bond, corporate bond, or another interest-bearing security.

Not all mortgage-backed securities are alike. When you are reviewing the characteristics listed in Exhibit 19–4, pay particular attention to how the market value of a pass-through security, which is backed by an underlying pool of mortgage loans made to borrowers, will respond to general changes in market interest rates. The change in market value of a particular security depends on the characteristics of the mortgages in the underlying pool, the response of borrowers to changes in interest rates, and the changes in borrower behavior in response to changes affecting their demand for housing, employment opportunities, and other influences. Borrowers may choose to refinance or repay their loans in response to changes in interest rates. As economic conditions change, they may sell their present house to buy another or to take a job transfer to another region. In these cases, they would very likely prepay their outstanding mortgages. These factors are extremely important to investors who must evaluate the timing of the receipt of cash flows when estimating value.

Security Issuers and Guarantors

The first security type listed in Exhibit 19–4 is referred to as a GNMA pass-through, which is usually issued by mortgage companies, thrifts, commercial banks, and other organizations

[11] In addition to the pass-through process shown in Exhibit 19–3, there are a number of other programs related to this process that have evolved over time. These include the participation certificate (PC) program and the "swap" program, among others.

EXHIBIT 19–4 Selected Characteristics of Mortgage Pass-Through Securities

Issuer	Mortgage companies, thrifts, others: GNMA pass-throughs	FHLMC: participation certificates	FNMA: mortgage-backed securities
Guarantor against default on mortgages	FHA,VA, FmHA	Private mortgage insurance, FHA/VA	FHA/VA, private mortgage insurance
Types of mortgages in pool*	*FRM, GPM, MH, ARM*	*FRM, GPM, ARM, MF*, seconds	*FRM, GPM, ARM, MF*, seconds
Interest rate on mortgages in underlying pools allowed to vary?	Yes	Yes	Yes
Seasoned mortgages allowed in pools?	Yes	Yes	Yes
Nature of payment guarantee	Timely payment of P & I and prepayments	Timely payment of P & I and eventual prepayments	Timely payment of P & I and prepayments
Guarantor	GNMA and credit of U.S. government	FHLMC only	FNMA only

*Key

FRM = 1–4 single family, 30-year fixed rate mortgages.
GPM = Graduated payment mortgage.
ARM = Adjustable-rate mortgages.
CL = Construction loan mortgages.
MH = Manufactured housing mortgages.
PL = Federally financed housing project loans.
MF = Multifamily housing mortgages.
Seconds = Mortgage pools secured by second mortgages.

that originate FHA and VA mortgages. The remaining two security types, participation certificates and mortgage-backed securities, are securities issued by FHLMC and FNMA, respectively. As previously mentioned, the latter two securities are backed by pools of mortgages that are purchased from originators by FHLMC and FNMA, which, in turn, provide a timely payment guarantee. In these cases, FNMA and FHLMC act as intermediaries, purchasing smaller quantities of mortgages from many originators, and then accumulating larger pools against which they issue securities.

Default Insurance

GNMA pass-through securities are backed with FHA-VA mortgages that carry either insurance or a guarantee against default losses. When it first began, this program was limited to FHA-VA pools because private mortgage default insurance on conventional mortgages was not generally available. Even today, with the availability of private mortgage insurance, major issuers of pass-through securities usually do not mix *both* FHA-VA and conventional mortgages in the same pool because of the greater depth of FHA default insurance coverage and the VA guarantee compared with conventional default coverage. As shown in Exhibit 19–4, GNMAs still contain mortgages with FHA-VA backing, whereas FNMA and FHLMC pass-throughs may be based on separate pools of either FHA-VA backing or conventional mortgages. In their conventional mortgage-backed programs, both FNMA and FHLMC require conventional mortgages with loan-to-value ratios greater than 80 percent to carry private mortgage insurance.

Payment Patterns and Security for Mortgages in Pools

As Exhibit 19–4 indicates, most mortgage varieties may be individually pooled for a pass-through security issue. This is true for mortgages with adjustable payment patterns such as adjustable rate mortgages (ARMs); graduated payment mortgages (GPMs); mortgages secured by single family, multifamily, and mobile homes; and even second-lien

mortgages. However, the vast majority of mortgages used in the pass-through security market are fixed interest rate loans secured by mortgages on single family houses.

The rule about not mixing FHA-VA and conventional mortgages in the same pool generally applies to payment patterns and the nature of loan security and loan maturity. In other words, mortgage pools are usually grouped according to (1) payment patterns (e.g., ARMs), (2) maturity (e.g., second mortgages with 10-year terms), or (3) security (e.g., single family homes, mobile homes). The reason this is done is that investors must be able to predict the cash flow pattern that they can expect to receive in a pass-through security with some confidence. If pools contained mortgages with many different payment patterns, investors would have a more difficult time assessing the likely cash flow pattern that they could expect to receive. The payment pattern of individuals making fixed interest rate loans may vary considerably from those making ARMs, second liens, and so on. As we will see in the material on pricing securities, expected prepayment patterns dramatically affect expected yields on mortgage securities. Hence, a general rule followed thus far has been to keep mortgage pools as homogeneous as possible so that their prepayment patterns are somewhat easier for investors to assess.

Coupon Rates, Interest Rates, and Number of Seasoned Mortgages in Pools

Pass-through securities issues guaranteed by Fannie Mae and Freddie Mac have allowed for a mixture of *interest rates* on mortgages included in a pool to enable a faster accumulation of larger pools for securitization. This pattern has been followed by security issuers, who believe that the variation in cash flows caused by mixing such mortgages is not large enough to offset the lower issuance costs on very large mortgage pools (i.e., economies of scale).

When Freddie Mac began its PC pass-through program, it allowed a variation of 200 basis points (from highest to lowest) in interest rates on mortgages packaged in the same pool. Fannie Mae allowed a 200-basis-point range with its first mortgage-backed security offering in 1981. The GNMA pass-through programs provide that some pools contain mortgages with the same interest rate, while others allow a variation of 100 basis points on mortgages in the underlying pool. These ranges are subject to revision by the guarantors from time to time.[12]

The variation in interest rates on a mortgage pool may be very important for investors to consider, because in each case the *coupon rate* promised to investors purchasing securities is generally based on the *lowest* interest rate on *any* mortgage in the pool, less servicing and guarantee fees. This means that for two security issues bearing the same coupon rate, expected cash flows to investors in the pool containing mortgages with different rates will be less variable than cash flows to investors in the pool with the same interest rates. This occurs because each mortgage included in a pool with different interest rates will have a lower likelihood of prepayment than pooled mortgages with the same interest rate. This likelihood exists because mortgages with one interest rate are *all* more likely to be prepaid, should interest rates decline. This would obviously make the pattern of expected cash flows more variable.

Another important factor relating to the amount and timing of cash flows received by investors is the maturity distribution of mortgages and the extent to which "seasoned" mortgages are included in a pool. *Seasoning* is a term used to describe the age, or number of years, that a loan has been outstanding before it is placed in a pool. The scheduled maturity date for a pass-through security issue is generally the date on which the mortgage with the longest remaining maturity in the pool is scheduled to be repaid, assuming no prepayment. Each guarantor listed in Exhibit 19–4 places limitations on the number of seasoned mortgages allowed in a pool. Most GNMA-insured mortgage pools generally contain mortgages made within one year of pool formation. Fannie Mae and Freddie Mac generally allow for more variation in seasoning in pools that they guarantee. The concern over seasoning is

[12] The GNMA I pass-through program requires all mortgages in a pool to have the same interest rate.

important because the more seasoned a mortgage is, the greater the likelihood of prepayment. The likelihood that borrowers will sell houses, change job locations, and so on, increases with the length of time the mortgage has been outstanding.

On the other hand, the risk of default is usually greatest in the early years of the life of a mortgage. Hence, seasoned mortgages tend to reduce the possibility of prepayment because of default. However, to the extent seasoning reduces or increases the likelihood of prepayment, more variation in cash flows results, which makes evaluation of the security more difficult for investors. This will, in turn, affect the price investors are willing to pay for the security.

Number of Mortgages and Geographic Distribution

Other factors relating to mortgages in the underlying pool that may affect the predictability and, hence, the variability of the monthly cash flows on pass-through securities are the *number* and *geographic* distribution of mortgages in the pool.

Both of these factors may be critical when estimating the yield on a pass-through security because they influence the expected repayment of principal. Generally, the larger the dollar amount of the pool issue, the more individual mortgages will be contained in the pool; and the larger the number of mortgages in the pool, all else being equal, the more predictable the monthly cash flow. This means that the likelihood of a major change in cash flows owing to default or prepayment of one or a few individual mortgages will not significantly affect future cash flows paid to investors. Most mortgage pools underlying pass-throughs are in minimum denominations of $100 million. If the average mortgage size is about $100,000, most pools of residential mortgages will contain at least 1,000 mortgages. This may be enough to assure investors that changes in cash flows caused by a small number of mortgages are minimal.

Geographic factors are important because they may affect the likelihood of prepayment and default. Certain regions of the country may be affected more by economic downturns and resulting unemployment than others and, hence, may have higher default rates. Prepayment rates, because of mobility by borrowers due to their age and family status, may be higher in some areas than others. A mortgage pool with more geographic diversity tends to insulate investors from cash flow irregularities.

Borrower Characteristics and Loan Prepayment

Perhaps more important than any of the other explicit pool characteristics discussed in conjunction with Exhibit 19–4 are borrower characteristics, or the socioeconomic makeup of individuals who have made the mortgage loans and are the ultimate source of cash flows for the mortgage pool. These characteristics are important because (1) households prepay existing mortgage loans as they adjust their consumption of housing over time in response to changes in income, family size, and tastes; (2) like other economic entities, households respond to changes in interest rates by refinancing their loans when interest rates fall and postponing adjustments in housing consumption when interest rates rise; and (3) households may default on loan obligations because of loss of employment, divorce, and so on, and although most pools have default insurance, the mortgage balance is prepaid upon default. Therefore, changes in borrower behavior with respect to these characteristics will affect the expected cash flows on loans and expected maturities. Indeed, depending on borrower behavior, the expected maturity of a loan may vary significantly, therefore affecting the expected yield on the mortgage. Unfortunately, not much information about borrower characteristics for individual loans in an underlying mortgage pool is made available to investors in pass-through securities. Hence, even though it is an important variable affecting cash flows on mortgage securities, no reliable source of information is generally available to investors.

Nuisance Calls

Where the prepayment rate reaches the point where a diminishing number and amount of mortgages remain in the pool, say about 10 percent of the initial pool amount, the servicer may call the remainder of the securities. This call is referred to as a *nuisance* or *cleanup call* and is used when the cost of servicing begins to become large relative to servicing income.

Mortgage Pass-Through Securities: A General Approach to Pricing

As we have seen, many things influence the pricing of a mortgage pass-through security (or any mortgage-backed security). We can summarize these influences as follows:

1. *Interest rate risk*—Reductions in market value due to an unanticipated rise in interest rates. This risk is generally greatest for pools containing fixed interest rate loans.

2. *Default risk*—Losses due to borrower default. For single family loans, the likelihood of default losses is lowest for FHA-insured mortgages, slightly greater for VA-guaranteed mortgages, and generally greater for privately insured mortgages. This source of risk is also generally higher for ARMs and variable payment mortgages.

3. *Risk of delayed payment of principal and interest*—This source of risk can be evaluated in relation to the financial strength of the guarantor because the guarantee of *timely payment* is only as good as the ability of the guarantor to perform on the guarantee. GNMA is backed by the full faith and credit of the U.S. government. FNMA has a $2.25 billion commitment from the U.S. Treasury to purchase its notes and bonds, which provides some assurance that a market will be available for Fannie Mae's ability to raise funds, maintain liquidity, and make good on its timely payment guarantee. However, neither FNMA nor FHLMC has the direct backing of the U.S. government.

4. *Prepayment risk*—Loss in yield because of greater-than-anticipated loan repayments. In general, most mortgage loans are prepaid before the stated maturity date. Hence, when investing in a pass-through, an investor must estimate expected cash flows by including an assessment of the prepayment rate on loans in the underlying pools. In the case of fixed interest rate mortgage pools, the impact of prepayment on cash flows passed through to investors will vary according to the:

   a. Number of mortgages in the pool.

   b. Distribution of interest rates on such mortgages.

   c. Number of seasoned mortgages included in the pool.

   d. Geographic location of borrowers.

   e. Household (borrower) characteristics.

   f. Unanticipated events (e.g., flood, earthquake).

Although the above sources of risk are important to issuers and investors, information available on mortgage pools is usually limited to very general borrower and mortgage characteristics. Information usually available on mortgage pools is discussed in the following sections.

Pass-Through Rates, Yields, and Servicing Fee

The pass-through rate is the coupon rate of interest promised by the issuer of a pass-through security to the investor. The yield to maturity, or internal rate of return, on such a security is equal to this rate only when it is issued at par value.

The coupon rate on pass-throughs is lower than the lowest rate of interest on any mortgage in the pool. The difference between the two rates is known as the *servicing fee*. The GNMA I, which allows no variance in interest rates in the underlying pool, has a total servicing fee of .5 percent, or 50 basis points below the interest rates on all mortgages in the pool. The servicing fee is divided between the guarantor fee and the loan services fee and is calculated as a percentage of the outstanding principal balance of the pool. As an example, GNMA takes .06 percent or 6 basis points of the outstanding principal balance of the pool as its fee for guarantee of timely payment of principal and interest, while the remaining 44 basis points of the servicing fee are retained by the servicer. For mortgage pass-through securities that allow a range of interest rates on mortgages in the pool (e.g., GNMA II), the coupon rate will be set lower than the lowest mortgage rate in the pool.

Weighted Average Coupon

The **weighted average coupon** (WAC) is a measure of the homogeneity of the coupon rates on mortgages in a pool. It is calculated as the average of the underlying mortgage interest rates weighted by the dollar balance of each mortgage as of the security issue date. WACs are meaningful only for pools that allow a variance in interest rates on mortgages. In most instances, the servicing and guarantee fee can be approximated as the difference between the WAC and the pass-through coupon rate.

Stated Maturity Date of Pool

The stated maturity date of the pass-through pool is the longest maturity date for any mortgage in the pool, assuming that no prepayments occur. For example, if 75 percent of the pool contained 15-year mortgages and the remaining 25 percent contained 20-year mortgages, the stated pool maturity would be 20 years. GNMA generally imposes more restrictions on the variance in mortgage maturities allowed in pools. FNMA and FHLMC pools may contain more seasoned loans with a wider range in stated maturity dates.

Weighted Average Maturity

Because the remaining term to stated maturity of mortgages in a pool may affect the prepayment rate of mortgages and, consequently, the yield of securities issued against the pool, the concept of a **weighted average maturity** was developed. The weighted average maturity is calculated as the average remaining term of the underlying mortgages as of the pass-through issue date, with the principal balance of the mortgage as the weighting factor.

Payment Delays by Servicer

Payment delay is the time lag between the time that the homeowners make their mortgage payments and the date that the servicing agent actually pays the investors holding the pass-through securities. This delay may range from 14 to 55 days. As with other securities, the timing of cash flows is important. Delays in payments received by investors obviously reduce yields.

Pool Factor

The **pool factor** is the outstanding principal balance divided by the original pool balance. This balance changes every month as mortgages are amortized and balances prepaid. The pool factor starts out as 1 and usually declines. (However, it may increase above 1 if the pool includes mortgages that allow negative amortization.) The pool factor is used to determine the current principal balance of the pool based on the outstanding balance of all mortgages remaining in the pool at any point in time. For example, if the pool factor is .9050 and the pool initially contained mortgages with \$50,000 in balances outstanding, the current principal balance of the pool would be \$50,000 × .9050 = \$45,250. This factor is particularly important when securities are traded *after* the issue date, when subsequent buyers are considering how much to pay for a security. For example, as the pool factor becomes smaller, the remaining balances on mortgages in the pool are also becoming smaller; hence, the likelihood of prepayment becomes greater (holding all else constant).

Mortgage Pass-Through Payment Mechanics Illustrated

Exhibit 19–5 illustrates cash flow patterns that are important when evaluating mortgage pass-through securities. In this exhibit, it is assumed that \$1,000,000 of 10 percent fixed interest rate mortgages have been pooled as security for an issue of pass-through securities. The pass-through will carry a coupon, or pass-through, rate of 9.5 percent. The difference between the pooled mortgage rates and coupon rate, or .5 percent, is the servicing fee, which is assessed on the outstanding loan balances. To simplify the discussion, we have assumed that all mortgages in the pool have a maturity of 10 years and that mortgage payments, or cash flows and outflows in and out of the pool, occur annually.[13]

The cash flows passed through to individual security holders (column g) are based on annual mortgage payments for a 10 percent, 10-year mortgage on the initial pool balance of \$1,000,000, resulting in total principal and interest payments generated by the pool (column c).[14] The servicing fee of .5 percent (column e) is then assessed on the outstanding loan balance at the end of each previous period and subtracted from total principal and interest payments. This results in actual payments to be made to all investors (column f). Because

EXHIBIT 19–5 **Cash Flows from Mortgage Pass-Through Security (constant payment, fixed rate, 10-year mortgage pool, interest rate = 10 percent, prepayment assumed to be 0 percent, coupon rate = 9.5 percent rounded)**

End of Period	(a) Pool Balance	(b) P&I Payment	(c) Principal Prepayment	(d) Total Payments* (b) + (c)	(e) Guarantee and Service Fees (0.5%)†	(f) Total PMTs to Investors (d) − (e)	(g) Payment to Individual Investor (f) ÷ 40
0	\$1,000,000						(\$25,000)
1	937,255	\$162,745	\$0	\$162,745	\$5,000	\$157,745	3,944
2	868,235	162,745	0	\$162,745	4,686	158,059	3,951
3	792,313	162,745	0	\$162,745	4,341	158,404	3,960
4	708,799	162,745	0	\$162,745	3,962	158,784	3,970
5	616,933	162,745	0	\$162,745	3,544	159,201	3,980
6	515,881	162,745	0	\$162,745	3,085	159,661	3,992
7	404,724	162,745	0	\$162,745	2,579	160,166	4,004
8	282,451	162,745	0	\$162,745	2,024	160,722	4,018
9	147,950	162,745	0	\$162,745	1,412	161,333	4,033
10	0	162,745	0	\$162,745	740	162,006	4,050

A.
Value of cash flows to issuer if required rate is 9.50 percent = \$1,000,000
Value of cash flows to individual investors at 9.50 = 25,000
B.
Value of cash flows to issuer if required rate is 8.50 percent = \$1,045,219
Value of cash flows to individual investors at 8.50 = 26,130
C.
Value of cash flows to issuer if required rate is 10.50 percent = \$ 957,754
Value of cash flows to individual investors at 10.50 = 23,944

*Payments calculated on an annual basis.
†Based on pool balance at the end of the previous year.

[13] For most pass-through issues, payments are made to investors monthly.

[14] Because all mortgages in the pool are 10 percent, 10-year loans, the constant payment in column (c) is computed as one annual payment on a \$1,000,000 loan.

of the way servicing fees are calculated, payments passed through to investors (column f) are not the same from year to year, even though payments into the pool (column d) are level.[15] If no mortgages in the pool are prepaid (column c)—that is, all mortgages remain outstanding for their stated maturities—the principal balance in the pool will not reach zero until the end of the 10th year.

The amount of cash that will be received by an issuer when this type of pool is formed and securitized depends on the prevailing market rate of return that investors demand on the investment. If it is assumed that, based on the pool characteristics discussed above, the market, or desired, rate of return is *equal* to the coupon rate (9.5 percent), then the amount to be received (paid) by the issuers (investors) will be $1,000,000 (or 40 securities with a face value of $25,000 will be sold). This is based on the stream of annual cash flow payments in the exhibit, discounted at 9.5 percent. In this instance, the securities would be sold at par value, or $25,000 each.

It is rarely ever true, however, that the rate of return demanded by investors is *exactly* equal to the coupon rate on a security. As we know, market interest rates change continually; hence, it would only be coincidental that interest rates on mortgages originated at some previous time and placed in a pool would bear interest rates exactly equal to the market rate demanded by investors at the time the securities were issued. Inasmuch as the annual cash flows into the pool based on payments received by borrowers are known at the time of issue and passed through to investors, the price received by the issuer will depend on the present value of all payments received by investors, discounted at the prevailing market rate of return. As discussed earlier, the latter rate is determined by the real rate of interest, inflationary expectations, and a premium for the various sources of risk. It is also based on yields available on alternative investments. We shall see that the periods that mortgages are expected to remain outstanding is also very important in the determination of the prices that investors are willing to pay for pass-through securities.

To illustrate the effect that market interest rates have on the price of pass-through securities, note that if the stream of cash flows paid to investors (column g) in Exhibit 19–5 is discounted at a market rate of 8.5 percent, the securities will sell at a premium or $26,130 (part B), the result of discounting payments in column (g) by 8.5 percent. If market rates were to rise to 10.50 percent at the time of issue, the security prices would reflect a *discount* of $23,944 (see part C). Both of these calculations assume, however, that the expected maturity of the pass-through security is equal to the stated maturity of mortgages in the pool (10 years). Hence, the amortization of principal is assumed to occur over the full 10-year period; that is, no prepayment is assumed.

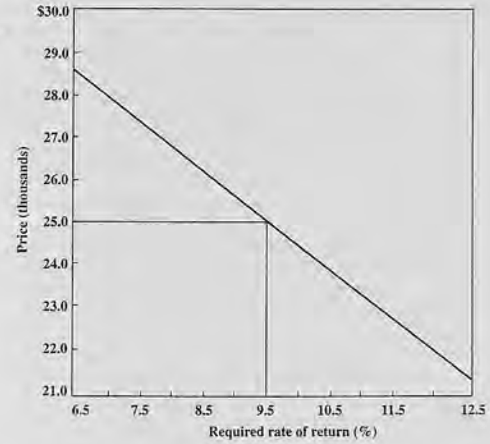
To provide some idea of the effect of the sensitivity of security prices to changes in market interest rates, Exhibit 19–6 shows the effect of rising and falling interest rates on the issue *price* of the mortgage pass-through securities in our example. (Keep in mind that the assumption regarding repayment of principal over the 10-year period remains the same.) Results show that for all rates of return desired by investors in excess of 9.5 percent, the pass-through will be issued at a discount; when required rates decrease, the security would be sold at a premium. Note that only when the required rate of return is *equal* to the promised coupon rate (9.5 percent) does the security sell at par value (an amount equal to the initial pool balance of $1,000,000, or $25,000 per security).

Prepayment Patterns and Security Prices

One problem that affects how securities are priced and is unique to the mortgage-backed securities market is the option that most borrowers have to prepay or repay the outstanding

[15] If there are any prepayments (column c), this will also cause payments passed through to investors to vary from year to year.

EXHIBIT 19–6
Relationship between Security Price and Required Rates of Return (prepayment rate assumed to be 0 percent)



mortgage balance at any time.[16] This topic is important because when investors make comparisons between pass-throughs, corporate bonds, U.S. government bonds, and various state and local bond issues, the *expected* maturity period for pass-throughs is usually more difficult to estimate relative to the other investments. For example, when corporate bonds are issued an *option to call* the outstanding principal is usually made explicit in the indenture agreement by specifying the price at which the bond may be called by the corporation each year that the bond issue is outstanding. Such options to call are usually included in the event that interest rates decline and the company wants to refinance the debt at a lower interest rate.[17]

As an alternative to call provisions, bond indentures issued by both corporations and state and local issuers may specify that a *scheduled* number of bonds will be called and retired in specific years after issue, regardless of what the current level of interest rates is at that time. This is not an option but a requirement of the indenture agreement.[18] The vast

[16] There are some exceptions and additional facts that should be mentioned that affect mortgage prepayment. FHA and VA mortgages are assembled by buyers of properties. Hence, they are not always repaid when a property is sold. Conventional mortgages may contain a due-on-sale clause, which prohibits assumptions; hence, they would be more likely to be repaid if a property is sold. Some older conventional fixed interest rate mortgages may also contain prepayment penalties, which tend to discourage early repayment. Conventional mortgages made more recently and ARMs generally do not include such penalties.

[17] To include this option in the agreement with investors, however, the issuer usually includes a schedule of premiums in excess of par value that will be paid to bondholders if the option to call is exercised by the corporation. This premium is paid because (1) the market value of the bonds will have increased if market rates have fallen and calling in the bond would deprive bondholders of an increase in market value, and (2) if investors expect to own the bonds for the entire maturity period refinancing by the company may represent an unanticipated interruption in cash flows, and bondholders would have to reinvest at lower interest rates.

[18] These retirements amount to an implicit method of amortization (e.g., a mortgage) and are usually accomplished with a sinking fund that is used (1) to call bonds as scheduled, by serial number at either a premium or par value, (2) to call a percentage of the original issue at random by serial number at either par value or a premium, or (3) to use sinking funds to enter the market and repurchase bonds at market value.

majority of U.S. government securities are issued for a stated maturity and are generally not callable. In other words, they are generally issued to run until maturity.[19]

The point is that other fixed-interest securities are generally more predictable with respect to when repayment of principal can be expected. This is not true for mortgage pass-through securities. Hence, when comparing yields on pass-throughs with other securities, there is definitely some additional uncertainty regarding the rate of repayment of principal that investors must take into account.

Prepayment Assumptions

Because some prepayments by borrowers are likely to occur over time, as outstanding balances on mortgages contained in pools are repaid, proceeds are passed through to investors in pass-through securities. Pass-throughs of mortgage balances can be zero in months when interest rates increase and accelerate rapidly when market interest rates decline. During the latter periods, many households choose to refinance. Mortgages are then paid off and removed from the pool as principal is passed through to investors.

When issuing pass-through securities, the issuer generally specifies both a coupon rate of interest (9.5 percent in our preceding example) *and* an offering price on the securities being issued. This offering price may be above or below par value. This specification is made because investors may demand a rate of return that is different from the coupon rate of 9.5 percent as market conditions vary at the time of issue. Even when no prepayments are assumed, the range in security prices may vary considerably, depending on the market rate of return demanded by investors (see Exhibit 19–6). However, because investors realize that there is also a strong likelihood that some prepayments will occur while they own these securities, issuers usually take into account some *assumed prepayment pattern* when pricing these securities. This is necessary to provide a more accurate estimate of cash flows (hence, yield to investors), rather than assuming that all borrowers will repay loans in accordance with a stated amortization schedule.

Methods that issuers use to include prepayment assumptions when pricing securities fall into four broad classes:

1. *Average maturity*. This method assumes, for example, that a pool of 10-year mortgages is scheduled to amortize principal based on a 10-year maturity, but the pool is totally paid off after some average period of time, such as the 5th year. Hence, when calculating yields or pricing securities, issuers assume that regular mortgage payments would be made for five years, and the principal due at that time would amount to a balloon payment. This method has the advantage of simplicity because an average prepayment rate is chosen to represent all mortgages in the pool. Further, choosing an average maturity has the effect of facilitating comparison with traditional bonds.

The disadvantages of this technique far outweigh its advantages. There is considerable evidence that the so-called five-year-average-life convention is not an adequate method of handling the prepayment problem and will usually result in under- or overestimation of yield. As previously explained, prepayments are the product of numerous factors, including interest rate changes and household characteristics. Hence, using an average maturity may not reflect changes underlying these characteristics.

2. *Constant rates of prepayment*. This method of handling prepayment assumes that a constant percentage of the total mortgages in the pool will be paid off every year. The advantages of the **constant prepayment assumption** are that it is simple to understand and prepayments are easy to compute. However, empirical evidence suggests that prepayments due to defaults occur more frequently early in the life of most mortgages. Hence, most constant prepayment rates tend to understate prepayment in earlier years and overstate it in later years. While this method may be preferable to an average maturity, it is also not likely to reflect underlying pool characteristics.

3. *FHA prepayment experience*. Prepayment assumptions based on empirical evidence from actual prepayment experience collected by the FHA over several decades have been suggested as a guide for making more accurate prepayment assumptions. The FHA has developed an extensive database on mortgage terminations as a part of its insurance program. This database contains the total number of mortgage terminations during a single policy year, including information on the number resulting from defaults and repayments. Many argue that prepayment assumptions could be based on this FHA "experience." For example, if slower or faster prepayment on pools of mortgages is expected because of differences in investor expectations, those rates could be adjusted to be less than 100 percent or greater than 100 percent of FHA experience, and yields could be disclosed to investors.

However, the FHA data on prepayment experience are not without shortcomings. Major problems are encountered when applying historic FHA experience to current mortgage pools because the precise causes of prepayment (e.g., changes in interest rates, borrowers' employment) over time are difficult to determine. There is no assurance that this pattern will repeat in the future; the FHA does not keep enough detailed data on each mortgage and borrower to enable a systematic investigation into the causes of prepayment behavior.

4. *The PSA prepayment model*. The **PSA prepayment model** was developed by the Public Securities Association to simplify the FHA experience prepayment model. Even though it suffers from the same shortcomings as the FHA prepayment experience, it has become an industry standard for prepayment assumptions used by most issuers of mortgage-backed securities. Simply put, the model is based on monthly prepayment rates, which vary during the life of a mortgage pool underlying the security. At present, the standard PSA prepayment rate curve (referred to as *100 percent PSA*) begins at 0.2 percent per month for the first year, and then increases by 0.2 percent each month until month 30. It then remains at 0.5 percent per month, or 6 percent per year, for the remaining stated maturity period of the pool. The model combines both FHA experience and the constant rate of repayment approach.

Because investors and issuers are aware that yields are likely to be affected by the rate of loan repayment, the PSA assumption is widely used to convey both price and yield information to investors at the time of issue. To provide prospective security buyers with additional information about the sensitivity of yields to different prepayment rates at the time of issue, a series of yield quotes based on various PSA repayment rates (e.g., 75 percent PSA, 150 percent PSA) are placed on the prospectus.

The Effects of Prepayment Illustrated

To illustrate the effects of prepayment on cash flows to investors in mortgage pass-through securities, a schedule of payments is shown in Exhibit 19–7. The rate of prepayment is assumed to be 10 percent each year based on the pool balance at the end of the preceding period. Payments in column (g) should be compared to those in Exhibit 19–6, which are based on a zero prepayment rate. However, in spite of these differences, when cash flows in column (g) of both exhibits are discounted at 9.5 percent, the present value in both cases equals $1,000,000, or $25,000 per investor. This result occurs because even though the 10 percent prepayment assumption results in more cash flows early in the life of the pool, interest is still calculated at 9.5 percent on the outstanding balance at all times. Therefore, even though the investor is receiving *principal* on the pass-through faster, interest continues on the outstanding balance at 9.5 percent. Hence, the present value of both columns (g) in Exhibits 19–6 and 19–7, when discounted at 9.5 percent, equals $25,000.

[19] A limited number of U.S. government bond issues are callable for a specified number of years prior to maturity.

EXHIBIT 19–7 **Cash Flows from Mortgage Pass-Through Security (constant payment, fixed rate, 10-year mortgage pool, interest rate = 10 percent, prepayment assumed to be 10 percent, coupon rate = 9.5 percent rounded)**

excel www.mhhe.com/bf13e

End of Period	(a) Pool Balance	(b) P&I Payment	(c) Principal Prepayment	(d) Total Payments* (b) + (c)	(e) Guarantee and Service Fees (0.5%)†	(f) Total PMTs to Investors (d) − (e)	(g) Payment to Individual Investor (f) ÷ 40
0	$1,000,000						($25,000)
1	837,255	$162,745	$100,000	$262,745	$5,000	$257,745	6,444
2	691,873	145,381	83,725	229,107	4,186	224,921	5,623
3	562,186	129,688	69,187	198,875	3,459	195,415	4,885
4	446,710	115,476	56,219	171,695	2,811	168,884	4,222
5	344,142	102,568	44,671	147,239	2,234	145,005	3,625
6	253,358	90,784	34,414	125,198	1,721	123,477	3,087
7	173,431	79,927	25,336	105,263	1,267	103,996	2,600
8	103,692	69,739	17,343	87,082	867	86,215	2,155
9	43,946	59,746	10,369	70,115	518	69,597	1,740
10	0	48,340	0	48,340	220	48,120	1,203

A.
Value of cash flows to issuer if required rate is 9.50 percent = $1,000,000
Value of cash flows to individual investors at 9.50 = 25,000
B.
Value of cash flows to issuer if required rate is 8.50 percent = $1,033,908
Value of cash flows to individual investors at 8.50 = 25,848
C.
Value of cash flows to issuer if required rate is 10.50 percent = $967,970
Value of cash flows to individual investors at 10.50 = 24,199

*Payments calculated on an annual basis.
†Based on pool balance at the end of the previous year.

EXHIBIT 19–8 **Mortgage Pass-Through Security Cash Flow Payments to Individual Investors at Various Prepayment Rates**

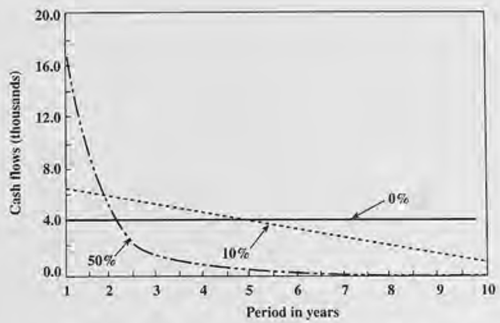


Exhibit 19–8 depicts cash flows from a pool assuming 0 percent, 10 percent, and 50 percent prepayment. Obviously, the cash flow to investors will vary dramatically, depending on the repayment rate. Also, as previously discussed, in the unlikely event that the market rate of return demanded by investors is equal to the coupon rate on the pass-through security, the security will always sell at par value, or $25,000, regardless of the prepayment rate. (Think about why this result is true.)

Security Prices and Expected Yields

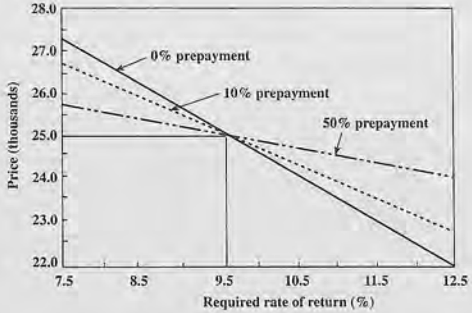
As previously pointed out, when mortgage pass-through securities are priced by the issuer (with the advice of security underwriters), some assessment of yields expected by investors *at the time of issue* must be made. Further, this yield is likely to be different from the coupon rate on securities at the time of issue. This assessment is usually made by (1) establishing the extent of the premium that investors expect in excess of current yields on government securities with maturities in the same expected maturity range, or (2) considering the current yields on other pass-throughs currently trading in the market. Establishing the premium may be difficult in the former case because of the uncertainty in repayment rates on pass-throughs. It may be difficult in the latter case because pricing of other pass-throughs assumes that the characteristics underlying both pools are the same. Nonetheless, the securities must be priced to sell to investors at the time of issue.

Let's turn back to our example. If we *assume* after considering all current market conditions and future expectations regarding repayment that the issuer decides that an expected yield of 8.5 percent will be required to successfully sell all securities to investors *and* that the prepayment rate will be 10 percent, then the security price will be equal to the present value of cash flows in column (g) of Exhibit 19–7 discounted at 8.5 percent. This yields a price of $25,848, or a premium of $848 over the $25,000 par value (see part B of Exhibit 19–7). The security is now said to be "priced at 103.39 percent of par ($25,848 ÷ $25,000) to yield 8.5 percent." However, the issuer will usually provide yield information to the investor by assuming *faster* and *slower prepayment rates*. This is accomplished by taking the offering price for the security ($25,848) and setting it equal to the expected cash flows that would occur above and below 10 percent prepayment, and then solving for the internal rate of return. Faster (or slower) rates of prepayment will cause the yield to be lower (or higher) in this example. The investor is willing to pay a premium of $848 in this example because the coupon rate is higher than the investor's required yield. But because the mortgages in the pool are likely to be prepaid sooner than expected, the investor will not benefit from the higher coupon rate for very long because of the increase in prepayments. Hence, the premium must reflect not only the relationship between the coupon rate on the security and the market yield on similar investments demanded by investors, but also the expected rate of repayment by homeowners. On the other hand, if market yields indicated that at the time of issue the security should be priced to yield 10.5 percent at 10 percent prepayment, it would be issued at a discount, or at a price of $24,199 (see part C of Exhibit 19–7). In this case, mortgages are not likely to be prepaid so quickly by homeowners; hence, the expected rate of repayment decreases and the discount paid on the security must reflect this as well as coupon rates and market yields.

Market Interest Rates and Price Behavior on Mortgage Pass-Throughs

To illustrate the very important relationships between changes in interest rates and varying rates of prepayment, Exhibit 19–9 shows that if the market rate of interest were to fall to 7.5 percent, investors having a 9.5 percent coupon rate pass-through security would expect an *increase* in its *price* because of the decline in interest rates. Further, if there were no prepayment assumed (i.e., 0 percent), the price of the pass-through would increase from $25,000 to approximately $27,500. However, if interest rates decline and the prepayment rate accelerates because more borrowers chose to refinance or pay off loans, the price will not rise to the extent that it would have if no increase in prepayments occurred. This can be seen by comparing prices at extreme rates of repayment, such as prices at 0 percent PSA (no prepayment), with prices at 50 percent for interest rates less than 9.5 percent. Note that

EXHIBIT 19–9
Mortgage Pass-Through Security Prices at Various Required Rates of Return and Prepayment Rates



even if interest rates *decline*, if the prepayment rate accelerates to 50 percent, the price at a 7.5 percent demanded yield would now be only slightly in excess of $25,000 compared with about $27,500 assuming no prepayment. On the other hand, when market interest rates are *greater* than the coupon rate, prices of mortgage pass-throughs (MPTs) will fall, and by a greater amount as repayments slow. This can also be seen by comparing prices for interest rates greater than 9.5 percent at 0 percent and 50 percent. Hence, prices of mortgage pass-throughs (MPTs) are *inversely* related to interest rates; however, they are less sensitive to declines in interest rates and more sensitive to increases in interest rates because rates of repayment are likely to accelerate as interest rates fall and slow as interest rates rise. This asymmetry affects the duration of the investment and its convexity. **Convexity** is a measure of the sensitivity of duration to changes in interest rates. For example, because prepayments may decelerate with rising interest rates, MPTs usually exhibit negative convexity resulting from an increase in duration. This limit on premiums is referred to as **price compression.** Further, as interest rates decline and prepayments accelerate, all cash flows received by investors must be reinvested at lower interest rates. This prospect is perhaps the most serious problem that investors perceive when investing in mortgage pass-through securities. It is this problem, coupled with other factors, that has given rise to collateralized mortgage obligations (CMOs), one of the mortgage-related securities that we will cover in the next chapter.

A Note on MBBs and MPTs

We have previously indicated that the trustee was required to periodically "mark the mortgage collateral to the market" to determine whether the overcollateralization requirements of bond issues were being maintained. The methodology just outlined for pricing MPTs is the methodology that a trustee would generally follow to establish the market value of the mortgage pool for an issue of mortgage-backed bonds (MBBs). Further, with MBBs, *issuers bear prepayment risk* by virtue of the overcollateralization requirement. In other words, as prepayments accelerate and mortgages are prepaid, more mortgages must be replaced in the pool. With MPTs, *security holders bear prepayment risk* because all prepayments are passed through to investors. This means that (1) MBBs should be priced to provide lower yields than MPTs because the MBB issuer bears prepayment risk, and (2) as market interest rates change, the price of MBBs will not reflect accelerated prepayment rates. As shown in Exhibit 19–9, this is not the case for MPTs. If all other terms of the MPT offering described in our examples were exactly the same for an MBB offering, the price behavior for the MBB would be represented by the 0 percent curve.

Web App

Go to the Government National Mortgage Association (Ginnie Mae) Web site (**www.ginniemae.gov**). What has the average rate been on Ginnie Mae mortgage-backed securities in recent years?

Key Terms

constant prepayment assumption, *574*
convexity, *578*
Federal Home Loan Mortgage Corporation (FHLMC), *558*
Federal National Mortgage Association (FNMA), *555*
Government National Mortgage Association (GNMA), *556*
mortgage-backed bonds (MBBs), *560*
mortgage pass-through securities (MPTs), *564*
pool factor, *570*
price compression, *578*
PSA prepayment model, *575*
secondary mortgage market, *554*
weighted average coupon, *570*
weighted average maturity, *570*

Useful Web Sites

www.fanniemae.com—Fannie Mae/Federal National Mortgage Association (privately owned) provides information about becoming a homeowner.

www.ginniemae.gov—Ginnie Mae/Government National Mortgage Association is within HUD and ensures mortgage funds are available throughout the United States, especially in rural and urban areas where it is harder to borrow money. Ginnie Mae guarantees securities backed by pools.

www.hud.gov—U.S. Department of Housing and Urban Development. Includes the Federal Housing Administration (FHA), which is now part of HUD. See www.hud.gov/offices/hsg/hsgabout.cfm for discussion of FHA.

www.freddiemac.com—Federal Home Loan Mortgage Corporation

www.va.gov—Veteran's Administration—see www.homeloans.va.gov/ for information on VA Guaranteed loans.

Questions

1. What is the secondary mortgage market? List three reasons why it is important.
2. What were the three principal activities of FNMA under its 1954 charter? What is its principal function now?
3. Name two ways that FNMA currently finances its secondary mortgage operations.
4. When did GNMA come into existence? What was its original function? What is its main function now?
5. Why was the formation of FHLMC so important?
6. What is a mortgage-related security? What are the similarities and differences between mortgage securities and corporate bonds?
7. Name the principal types of mortgage-related securities. What are the differences between them?
8. There are several ways that mortgages can be sold in the secondary market. Choose two and compare and contrast their length of distribution channel, relative ease of transaction, and efficiency as they relate to maximizing funds flow from sale.
9. What is the function of the optional delivery commitment?
10. What is a mortgage swap certificate?
11. Name five important characteristics of mortgage pools. Tell why each is important.
12. In general, would a falling rate of market interest cause the price of an MPT security to increase or decrease? Would the increase or decrease be greater if the security was issued at a discount? Would an increase in prepayment be likely or unlikely? Describe with an example.

Problems

1. Two 25-year maturity mortgage-backed bonds are issued. The first bond has a par value of $10,000 and promises to pay a 10.5 percent annual coupon, while the second is a zero coupon bond that promises to pay $10,000 (par) after 25 years including accrued interest at 10 percent. At issue, bond market investors require a 12 percent interest rate on both bonds.
   a. What is the initial price on each bond?
   b. Assume both bonds promise interest at 10.5 percent, compounded semiannually. What will be the initial price for each bond?
   c. If market interest rates fall to 9.5 percent at the end of five years, what will be the value of each bond, assuming annual payments as in (*a*) (state both as a percentage of par value and actual dollar value)?
2. The Green S & L originated a pool containing 75 ten-year fixed interest rate mortgages with an average balance of $100,000 each. All mortgages in the pool carry a coupon of 12 percent. (For simplicity, assume all mortgage payments are made *annually* at 12 percent interest.) Green would now like to sell the pool to FNMA.
   a. Assuming a constant annual prepayment rate of 10 percent (for simplicity assume that prepayments are based on the pool balance at the end of the preceding year and begin at the *end* of year 1), what is the price that Green could obtain if market interest rates were 11 percent, 12 percent, 9 percent?
   b. Assume that five years have passed since the date in (*a*). What will the pool factor be? If market interest rates were 12 percent, what price could Green obtain now?
   c. Instead of selling the pool of mortgages in (*a*), Green decides to securitize the mortgages by issuing 100 pass-through securities. The coupon rate will be 11.5 percent and the servicing and guarantee fee will be 0.5 percent. However, the current market rate of return is 10.5 percent. How much will Green obtain for this offering of MPTs? What will each purchaser pay for an MPT security, assuming the same prepayment rate as in (*a*)?
   d. Assume now that immediately after purchase in (*c*), interest rates fall to 9 percent and that the prepayment rates are expected to accelerate to 20 percent per year, beginning at the end of the first year. What will the MPT security be worth now?
3. **Excel.** Refer to the "Ch19 MPS" tab in the Excel Workbook provided with the book.
   a. Find the value of the cash flows to the issuer and to individual investors based on a required rate of return of 7.5 percent.
   b. Find the value of the cash flows to the issuer and to individual investors based on a required rate of return of 11.5 percent.

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Chapter 20

The Secondary Mortgage Market: CMOs and Derivative Securities

Introduction

Two additional securities have been introduced to securitize mortgage pools. The first is referred to as a mortgage pay-through bond (MPTB). It contains elements of mortgage-backed bonds and mortgage pass-through securities. The second security, referred to as a collateralized mortgage obligation (CMO), was developed in conjunction with investment underwriters by Freddie Mac in 1983 and adopted by Fannie Mae in 1987. These securities should be viewed as a natural outgrowth of the initial success of the mortgage-backed bond and pass-through security programs. Recall that many risks and investor concerns with purchasing whole mortgages discussed in the previous chapter were alleviated to some extent by mortgage pass-throughs. However, several key concerns with prepayment risk and reinvestment risk remained for some investors. Innovators of mortgage-backed securities believed that in addition to CMOs, new product types, called **derivative securities**, or simply "derivatives," had to be developed to address these concerns.

Mortgage Pay-Through Bonds (MPTBs)

These bonds can be best described as hybrid securities or ones containing elements of both mortgage pass-throughs and mortgage-backed bonds. Mortgage pay-through bonds (MPTBs) are issued against mortgage pools and, like MPTs, cash flows from the pool (i.e., principal and interest) are passed through to security holders. However, unlike an MPT, this security is a *bond* and not an undivided *equity* ownership interest in a mortgage pool. Like the MBB, the MPTB is a debt obligation of the issuer, who retains ownership of the mortgage pool. However, like the MPT, cash flows paid to bondholders are based on a coupon rate of interest while principal is passed through as it is received from normal amortization and prepayment of loans in the pool. Hence, an MPTB can be viewed as an MBB with the pass-through of principal and prepayment features of an MPT.

Most pay-through issues are based on residential pools and, like MBBs, will generally be overcollateralized by including (1) more mortgages in the pool than the sum of the securities issued against it or (2) additional collateral in the form of U.S. government bonds or other agency obligations. The income from this additional collateral is used as added assurance that sufficient cash flows will be available to service the bonds. Again, like MBBs, MPTBs may be issued either with a coupon rate or on a zero coupon basis.

An MPTB credit rating depends on (1) the riskiness of mortgages in the pool, (2) the extent of overcollateralization, and (3) the nature of any government-related securities constituting the excess collateral. Emphasis is placed on the extent of cash flow that will be produced by the pool, the reinvestment period that the issuer faces between receipt of principal and interest from the mortgage pool and periodic (usually semiannual) payments to bondholders, the securities making up the overcollateralization, and its relationship to promised coupon payments. All of these features are evaluated relative to prepayment risk. Because of the pass-through of amortization and prepayments, the market value of the collateral is not as important as it is with MBBs. Hence, there is usually no need to mark the collateral to the market or to provide for replenishment of collateral as long as the amount of overcollateralization is adequate. Because of the pass-through of principal, overcollateral requirements are not as great as for MBBs. Credit enhancements in the form of letters of credit and third-party guarantees or insurance are used by MPTB issuers to acquire higher credit ratings. In the absence of these enhancements, the creditworthiness of the issuer is very important because, should the mortgage pool experience a high rate of default losses and prepayments, the issuer must be looked to for satisfaction by the debt security holders.[1]

Although we do not provide a detailed analysis of MPTBs, the cash flow patterns are similar to those shown in the illustrations used for MBBs and MPTs in Chapter 19. However, contrary to the MBB, the issuer of MPTBs does not bear prepayment risk. It is borne by the investor. Hence, when MPTBs are priced, the risks that are so important when evaluating MPT prepayment patterns and reinvestment rates are equally important to MPTBs. This uncertainty regarding cash flows from prepayments has resulted in yet another security type, one that provides more protection against prepayment risk than MPTs and MPTBs, but less than that of an MBB. This security, referred to as the collateralized mortgage obligation (CMO), is the subject of the next section.

Collateralized Mortgage Obligations

To understand how **collateralized mortgage obligations (CMOs)** help to alleviate some of the reinvestment and prepayment risk for investors, we must understand the concept of a CMO and how it differs from MPTs and MPTBs. CMOs are debt instruments (like MBBs) that are issued using a pool of mortgages for collateral. In the pass-through, investors own an individual interest in the entire pool. In contrast, the issuer of a CMO offering *retains the ownership* of the mortgage pool and issues the bonds as debt against the mortgage pool. However, like the MPT and MPTB, the CMO is a pay-through security in that all amortization and prepayments flow through to investors. This means that the *security holder* continues to assume prepayment risk. However, the CMO modifies how the risk is allocated. Like both the MBB and MPTB, the difference between assets pledged as security and the amount of the debt issued against the pool constitutes the equity position of the issuer.

The major difference between CMOs and the other mortgage-backed securities is that CMOs are securities issued in multiple classes against the same pool of mortgages. These

[1] Like other mortgage-related securities, default risk can be reduced by using FHA-VA mortgages or conventional loans with private mortgage insurance.

securities may have a number of maturity classes, such as three, five, or seven years. Such maturities are chosen by the issuer to meet the investment needs of various classes of investors. By issuing multiple classes of securities, each with a different maturity, the issuer is effectively creating different securities with maturity and payment streams that are vastly different from the underlying mortgage pool.

There are several fundamental differences between CMOs and MPTs. To reduce prepayment risk (and the coincident reinvestment risk), a mechanism had to be developed for an entity other than the investor to assume this risk while retaining the basic procedure of issuing securities against a mortgage pool. This was accomplished by the *issuer* retaining the ownership of the mortgage pool and prioritizing the payment of interest and principal among the various classes of debt securities issued against the pool. This prioritization is accomplished by issuing CMOs in classes referred to as **tranches** with different stated maturity dates. To achieve the desired number and maturity of these tranches, a prioritization of interest, principal, and prepayment proceeds from the mortgage pool to bondholders is made. Based on this prioritization, some classes of CMO investors receive cash flows like investors in conventional debt securities, while other investors agree to defer cash flows to later periods. This allocation was designed to appeal to more investor groups than would be willing to invest in MPTs, but who also were willing to bear some prepayment risk at yields that would be higher than those earned on MBBs. A CMO can also be referred to as a *multiple security class, mortgage pay-through security*.

Since its inception in 1983, the CMO has evolved into an extremely complex investment alternative. Although the sequential pay structure (see Exhibit 20–1) was used extensively during the initial years of CMO offerings and did much to stimulate investor interest, high demand and rather specific investor needs have led to the creation of a wide array of tranche alternatives. By slightly modifying either the method of principal repayment or coupon calculation, investment bankers have created a multitude of unique derivative investment vehicles that dominate the current CMO market.[2]

CMOs Illustrated

Exhibit 20–1 shows provisions that a very simplified offering of a CMO security might contain. On the "asset" side of the exhibit, the pool used for the bond collateral is assumed to be either FHA, VA, or conventional mortgages with interest rates fixed at 11 percent interest over a 10-year maturity. As with pass-throughs, mortgages placed in CMO pools are generally secured by very similar kinds of real estate and have equally similar payment patterns. It is also possible to pool GNMAs or other pass-through securities for a CMO offering.[3] The latter securities can be used in a pool because they ultimately represent securities based on a pool of mortgages.

On the "liability" side of the exhibit, four classes of bonds are created with different maturities and coupon rates. The amount of CMOs issued against the $75 million pool is $72 million. The difference ($3 million) is overcollateral, which is the equity contribution made by the issuer. The need for the overcollateralization will be apparent as the structure of the CMO issue is explained. Another observation that can be made in our example is that the

[2] The term *derivative* refers to any investment with an underlying value that is dependent on another security, index, or pool of securities. For example, if an investor purchased a call option on the S&P 500 index, that option would be classified as a derivative because its price would be dependent on changes in the value of the S&P 500 index. Many derivative-type investments have been created with prices that are dependent on the changes in the cash flows from mortgages in an underlying pool. These derivatives are discussed later in this chapter.

[3] CMOs can be created based on many different mortgage pools (e.g., ARMs, GPMs) such as those discussed in the previous chapter.

EXHIBIT 20–1 Contents of a CMO Security Offering with Sequential Pay Tranches

			Estimated Maturity (years)	Coupon Rate (percent)	Amount Issued	Weight	Weighted Average Coupon (percent)
Assets:		Liabilities:					
Mortgages	$75,000,000	Class A Bonds	2–5	9.25%	$27,000,000	0.375	3.47%
(11% interest)		Class B Bonds	4–7	10.00	15,000,000	0.208	2.08
10-yr. maturity		Class Z Bonds	6–10	11.00	30,000,000	0.417	4.58
		Total bonds			72,000,000	1.000	10.14%
		Equity:			3,000,000		
Total assets	$75,000,000	Total debt and net worth			$75,000,000		

Major investors:
Class A—Thrifts, commercial banks, money market funds, corporations
Class B—Insurance companies, pension funds, trusts, international investors
Class Z—Pension funds, trusts, international investors, and hedge funds

11 percent rate to be earned on the asset pool exceeds the coupon rates promised to each class of bondholders except the Z class. The difference between the 11 percent earned on the $75 million pool, or $8,250,000, and the *weighted average rate of interest* promised to security holders, or 10.14 percent on $72,000,000, which is an interest cost of $7,297,500, represents the source of profit at about $956,400 to be earned by the issuer. This residual cash flow will represent a return on the $3 million in overcollateral, or equity, invested in the venture. The issuer earns a profit on the equity that is used for creating the security issue. Fees may also be earned for providing any credit enhancements, managing, and administering the mortgage pool.

To achieve the desired maturity pattern for the CMOs shown in Exhibit 20–1, the conditions of the issue are such that the coupon rate of interest is not paid currently on all tranches. This structure, which is one of many possible payout possibilities, is referred to as a *sequential payout tranche* structure and is used to achieve the desired maturity pattern. For example, interest is paid currently on tranches A and B, but it is not paid on tranche Z until principal on the other tranches is repaid. For securities in tranche Z, interest will be accrued and accumulated into the investment balance. To ensure that the maturity of tranche A securities is kept relatively short, all interest accrued on the portion of the security offering contributed by the tranche Z is also allocated first to the tranche A security holders as additional principal. Further, all current amortization of principal and prepayments from the *entire* mortgage pool will also be allocated *first* to tranche A. Hence, tranche A investors, representing $27 million of the CMO issue, will receive principal on all mortgages in the pool (including prepayments), plus interest that would have been paid to tranche Z until the $27 million tranche is repaid, in addition to a coupon rate of 9.25 percent on their outstanding investment balance. Their investment balance is reduced by all principal payments from the pool plus the interest not currently paid but accrued on the Z class investment balance. As to the spread in stated maturities for tranche A securities (five to nine years), it represents (*a*) the maximum number of years that it would take for class A investors to recover their principal, *assuming that no prepayments* occurred on the underlying mortgage pool, and (*b*) an *estimate* of the minimum number of years (five) that it would take them to recover their investment. Of course, this latter estimate could be longer or shorter, depending on the *actual* rate of prepayment.

Until tranche A is repaid, tranche B receives "interest only" payments. After class A is repaid, all principal allocations are made to B, and so on. As pointed out, the Z class of security holders receives no interest payments or principal payments while the A and B tranches are being repaid. Instead, interest is accrued on the $15 million invested by this class of investors and is compounded at the 10 percent coupon rate. The accrued interest is then added to the amount owed. After classes A and B are repaid, cash interest payments are made to the Z class, and all principal payments from the pool are then directed toward this class.

The $3,000,000 in extra mortgages placed in the pool, which represents *overcollateralization* or equity invested in the issue, is required for several reasons. First, in addition to the cash flow patterns described, most CMO issues promise payments to investors quarterly or semiannually; we know, however, that payments into the mortgage pool occur monthly. Because monthly mortgage payments may be reinvested by the issuer until semiannual payments are due to investors, the issuer promises a minimum rate of interest on these investable funds *in addition to* promised coupon payments and priority repayment of principal. Hence, in addition to the risk of prepayment, a reinvestment risk exists in the event that market interest rates fall dramatically. In this event, prepayments into the pool would accelerate, thereby repaying all tranches *much faster* than expected. Further, the issuer may not be able to earn the promised rate of return on interim cash flows as interest rates fall (reinvestment risk). In this event, any cash shortfall to CMO investors will be paid from the $3 million of additional mortgage collateral. Hence, as with MBBs and MPTBs, the extent of overcollateralization is an important consideration that investors must make when evaluating a CMO investment. Obviously, the greater the amount of overcollateralization, the more likely that promised coupon rates and rates on interim cash flows will be paid. However, lower risk also implies that the coupon rate and rate on reinvested funds promised to the shorter-term tranches may also be lower.

Another important consideration with these securities is whether the CMO issuer is liable beyond the $3 million of equity. Usually issued by a corporation, CMOs are debt instruments that can be made with or without recourse to the issuer. Hence, like an issue of corporate bonds, CMO security owners may have recourse against the assets of the issuing corporation should the issuer become bankrupt and not perform as promised and liability exceeds $3 million.

CMO Mechanics

Some idea of cash flow patterns from a CMO offering is given in Exhibit 20–2, in which the data from Exhibit 20–1 are used to produce cash flows. To simplify this analysis, we have assumed that payments into the pool from mortgage borrowers occur annually. Consequently, we do not consider any reinvestment of interim cash flows between receipt of mortgage payments into the pool and payment to the various tranches of securities. We begin by assuming a rate of prepayment equal to 0 percent. Essentially, the exhibit details the source and composition of cash flows into the mortgage pool backing the CMO offering. Exhibit 20–3 provides a breakdown of cash flows for the various tranches of securities. Based on the assumption that no prepayments occur, tranche A security holders would be paid (*a*) interest at 9.25 percent of $27,000,000, or $2,497,500, (*b*) all principal payments of $4,485,107 flowing into the pool (see column 4 in Exhibit 20–2), plus (*c*) the $3,300,000 in interest that would have been paid to the Z class of securities, or a total of $10,282,607 at end of the first year (see Exhibit 20–3). The cash flow pattern just described continues each year until the class A securities are repaid, which occurs at the end of the fourth year. Note again that class Z investors receive no current cash payments because interest is being accrued in that class.

Exhibit 20–3 provides a similar breakdown for class B and Z security holders. Note that class B securities receive current interest payments from years 1 to 5, but they do not

EXHIBIT 20–2
Annual Cash Flows into CMO Mortgage Pool (prepayment rate = 0 percent)

Period	(1) Total Mortgage Pool: 10-Year Term 11% Fixed Rate	(2) Principal and Interest Payments into Pool	(4) Amount Amortization Excluding Prepayments	(5) Interest	(6) Owed to Security Holders
0	$75,000,000				$72,000,000
1	70,514,893	$12,735,107	$ 4,485,107	$8,250,000	67,514,893
2	65,536,424	12,735,107	4,978,469	7,756,638	62,536,424
3	60,010,324	12,735,107	5,526,100	7,209,007	57,010,324
4	53,876,352	12,735,107	6,133,971	6,601,136	50,876,352
5	47,067,644	12,735,107	6,808,708	5,926,399	44,067,644
6	39,509,978	12,735,107	7,557,666	5,177,441	36,509,978
7	31,120,968	12,735,107	8,389,009	4,346,098	28,120,968
8	21,809,168	12,735,107	9,311,801	3,423,307	18,809,168
9	11,473,069	12,735,107	10,336,099	2,399,008	8,473,069
10	0	12,735,107	11,473,069	1,262,038	0

receive any repayment of principal until class A is repaid. They then receive current interest plus all amortization flowing into the pool and interest from the tranche Z accrual. Note that when no prepayment is assumed, the B class would have a maturity period of five years based on normal amortization of the underlying mortgage pool. Note that the Z tranche accumulates interest until year 5 when investors in this tranche begin to receive cash flow.

Exhibit 20–4 provides detail on what is referred to as the cash flow to the **residual**, or equity, position in the CMO offering. Recall in our example that the firm that issues the CMO securities had collateralized the issue by $3 million, which represents the equivalent of an equity investment in the CMO offering. Hence, the issuer is entitled to retain any excess cash flow after payments are made to all security owners, and servicing fees and so on are paid. These cash flows represent the source of any return to the residual, or equity, position. Note that the cash flows are simply the sum of all cash flows into the pool, less all cash flows paid out to all tranches according to the CMO agreement. The cash flow available to the residual equity depends on how much interest is earned on the mortgage pool relative to the amount of interest paid to the A, B, and Z security holders. In our example, cash flow residuals are received by the equity investor each year, even when the Z class of securities does not receive any cash flows.[4] Also, the $952,500 initial cash flow to the residual interest represents a very small margin (less than 1 percent) relative to the $75 million security issue. This residual cash flow includes any servicing fees that are earned by the issuer, who we assume also retains the servicing responsibility for the mortgage pool. This margin is important because, for example, if $10 million of the mortgage pool was to unexpectedly prepay immediately after the securities were issued, this large amount of prepayments would significantly reduce the interest flow into the pool. Further, these unanticipated prepayments must be reinvested to compensate for the loss in interest and to pay the class A tranche at the end of the year. Consequently, the $952,500 cash flow to the residual would have to be used to offset the difference between interest lost because of prepayment and any interest earned on interim reinvestment.

[4] Some CMO provisions may require that this payment be placed in reserve until termination of the issue. In this event, the internal rate of return shown at the bottom of the exhibit would be lower because residual cash flows would not be realized by the issuer until mortgages in the pool are completely amortized.

EXHIBIT 20–3 **Cash Flows to Class A, B, and Z Investors (prepayment rate = 0 percent)**

Tranche A (coupon rate = 9.25%; amount invested = $27,000,000)

Period	Amount Owed to Security Holder at End of Period	All Principal from Pool and Interest from Z Class	Coupon Interest	Total Payments
0	$27,000,000			
1	19,214,893	$7,785,107	$2,497,500	$10,282,607
2	10,573,424	8,641,469	1,777,378	10,418,846
3	981,394	9,592,030	978,042	10,570,072
4	0	981,394	90,779	1,072,173
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Tranche B (coupon rate = 10.00%; amount invested = $15,000,000)

Period	Amount Owed to Security Holder at End of Period	All Principal from Pool and Interest from Z Class	Coupon Interest	Total Payments
0	$15,000,000			
1	15,000,000	0	$1,500,000	$ 1,500,000
2	15,000,000	0	1,500,000	1,500,000
3	15,000,000	0	1,500,000	1,500,000
4	5,334,240	$9,665,760	1,500,000	11,165,760
5	0	5,334,240	533,424	5,867,664
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Tranche Z (coupon rate = 11.00%; amount invested = $30,000,000)

Period	Amount Owed to Security Holder at End of Period	Interest	Accrued Interest	Principal Allocation	Total Payments
0	$30,000,000				
1	33,300,000	$3,300,000	$3,300,000		
2	36,963,000	3,663,000	3,663,000		
3	41,028,930	4,065,930	4,065,930		
4	45,542,112	4,513,182	4,513,182		
5	44,067,644	5,009,632		$ 1,474,468	$ 6,484,101
6	36,509,978	4,847,441		7,557,666	12,405,107
7	28,120,968	4,016,098		8,389,009	12,405,107
8	18,809,168	3,093,307		9,311,801	12,405,107
9	8,473,069	2,069,008		10,336,099	12,405,107
10	0	932,038		8,473,069	9,405,107

The possibility of unanticipated prepayment and the potential problem with reinvesting in a period of declining interest rates (which is also likely to cause even more prepayments) should clarify why the $3 million overcollateralization is required. Further, we have assumed that the mortgages used to form the pool for the CMO issue are FHA, VA, or conventional fixed-rate mortgages. In any case, we have assumed that there is adequate insurance

EXHIBIT 20–4
Residual Cash Flows (prepayment rate = 0 percent)

Residual Equity Class ($3,000,000 invested)			
Period	Total Cash Flows into Pool	Total Payments to A, B, and Z Classes	Residual Cash Flows to Equity Class
0			($3,000,000)
1	$12,735,107	$11,782,607	952,500
2	12,735,107	11,918,846	816,261
3	12,735,107	12,070,072	665,035
4	12,735,107	12,237,933	497,174
5	12,735,107	12,351,765	383,342
6	12,735,107	12,405,107	330,000
7	12,735,107	12,405,107	330,000
8	12,735,107	12,405,107	330,000
9	12,735,107	12,405,107	330,000
10	12,735,107	9,405,107	3,330,000
Residual *IRR* 20.19%			

protection against default losses. Where there are no limited or no full guarantees against default losses (e.g., where CMOs are issued against commercial mortgages or second mortgages), the investor would have to consider the possibility of greater losses because of the impact of default on cash flows. Hence, in the latter instances we would expect to see (1) larger amounts of overcollateralization, and/or (2) pool insurance purchased by the issuer from a third party who is willing to insure investors against part or all default loss, or (3) a provision referred to as a *calamity call*, which allows the issuer to recall all securities for a specified time after issue in the event interest rates declined sharply, prepayments accelerated, and reinvestment rates were below rates promised to investors. However, if cash flows were to occur as shown in Exhibit 20–4, the issuer would earn a *BTIRR* of 20.19 percent on the $3 million in equity (servicing and other fees not removed from residual cash flows). This rate obviously exceeds the rates earned by each security class, which has a prior claim on all cash flows paid into the pool.

CMO Cash Flows and Prepayment Assumptions

Because there will always be some prepayment of principal from mortgages in an underlying pool, the expected maturity for each security class will affect profitability to the issuer. To illustrate this effect, we now assume that prepayment will occur at approximately 10 percent instead of zero as illustrated in the preceding exhibits.

Cash payments from the pool to each of the classes of security holders are shown in Exhibit 20–5. Note that in addition to normal amortization payments into the pool, prepayments are assumed to occur at 10 percent per year. As shown in Exhibit 20–6, investors in tranche A receive their promised coupon payments, $2,497,500, plus the tranche Z portion of interest in $3,300,000, plus all amortization of $4,485,107 and prepayments of $7,500,000 flowing into the pool during the first year, or a total of $17,782,607. Based on this accelerated pattern of cash flows, class A investors would now be repaid after two years. This compares with four years when no prepayment was assumed. For this reason, class A securities are sometimes referred to as the "fast pay tranche." After two years, class B investors, who receive current interest only payments, would begin receiving the interest accrued on tranche Z plus all principal from mortgages paid into the pool during the third year. Based on this pattern of cash receipts, tranche B would now be repaid after one additional year, or a total of three years from the date of issue. This compares to five years with no prepayment.

EXHIBIT 20–5 Annual Cash Flows into CMO Mortgage Pool (prepayment rate = 10 percent)

Period	(1) Mortgage Pool: 10-Year Term 11% Fixed Rate	(2) Principal and Interest Payment into Pool	(3) Assumed Prepayments* (10%)	(4) Total Amortization Excluding Prepayments	(5) Interest	(6) Amount Owed to Security Holders	(7) Total Available for Distribution (2) + (3)
0	$75,000,000					$72,000,000	
1	63,014,893	$12,735,107	$7,500,000	$4,485,107	$8,250,000	60,014,893	$20,235,107
2	52,264,447	11,380,595	6,301,489	4,448,956	6,931,638	49,264,447	17,682,084
3	42,631,009	10,156,083	5,226,445	4,406,993	5,749,089	39,631,009	15,382,527
4	34,010,368	9,046,951	4,263,101	4,357,540	4,689,411	31,010,368	13,310,052
5	26,311,218	8,039,254	3,401,037	4,298,113	3,741,141	23,311,218	11,440,291
6	19,455,296	7,119,034	2,631,122	4,224,800	2,894,234	16,455,296	9,750,156
7	13,378,894	6,270,955	1,945,530	4,130,872	2,140,083	10,378,894	8,216,484
8	8,037,865	5,474,818	1,337,889	4,003,140	1,471,678	5,037,865	6,812,708
9	3,424,664	4,693,580	803,786	3,809,415	884,165	424,664	5,497,366
10	0	3,801,377	0	3,424,664	376,713	0	3,801,377

*Based on pool balance at the end of the preceding year.

As indicated earlier, tranche Z security holders do not receive interest or principal payments until the A and B tranches are repaid. Exhibit 20–6 shows that during the first three years, interest would be accrued on the Z class by compounding the $30 million invested at 11 percent. Interest is calculated at the coupon rate (11 percent) on the accumulated investment balance, which contains $30 million plus all accrued interest. In year 3 the Z class begins to receive some payments but it is not enough to cover the interest until year 4 when all other securities have been paid off. All principal payments flowing into the pool at this point are also allocated to the Z class. The Z class, based on our prepayment assumptions, will now be repaid in the 10th year.

Finally, the issuer retains residual cash flows remaining after all cash payments are made to each tranche of securities. This residual amounts to, in essence, the spread earned by the issuer for investing equity (overcollateralization) and for managing the provisions of the CMO issue. Exhibit 20–7 shows the residual cash flows, or the difference between total payments into the pool and cash payments made to all of the investor classes (based on all preceding exhibits). Recall that these residuals are based on the assumption that the repayment rate remains at 10 percent. Obviously, these residuals would vary considerably at different rates of repayment. When the residual cash flows received over 10 years by the issuer are set equal to the $3 million in equity invested at the time of issue, a yield, or internal rate of return, of 17.25 percent results. As expected, this yield still represents a higher return than is earned on the A, B, or Z tranches. Further, this yield would obviously increase if the amount of equity used to finance the CMO issue is reduced (because of the use of financial leverage).[5]

Also note that in the case of faster prepayment, the *BTIRR* (Exhibit 20–7) will fall to 17.25 percent from the slower prepayment example (Exhibit 20–4), where the *IRR* was 20.19 percent. This occurs because the total interest collected from the pool will be lower if prepayment accelerates; therefore, the dollar spread between interest inflow and outflow becomes smaller.

[5] The reader may think of leverage in the financial structure of a CMO issue much like that of leveraging any income-producing asset with debt. Similarly, the risk assumed by the various classes of bondholders and the issuer will vary based on the amount of overcollateralization.

EXHIBIT 20–6 Cash Flows to Class A, B, and Z Investors (prepayment rate = 10 percent)

Tranche A (coupon rate = 9.25%; amount invested = $27,000,000)				
Period	Amount Owed to Security Holder at End of Period	All Principal from Pool and Interest from Z Class	Coupon Interest	Total Payments
0	$27,000,000			
1	11,714,893	$15,285,107	$2,497,500	$17,782,607
2	0	11,714,893	1,083,628	12,798,521
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Tranche B (coupon rate = 10.00%; amount invested = $15,000,000)				
Period	Amount Owed to Security Holder at End of Period	All Principal from Pool and Interest from Z Class	Coupon Interest	Total Payments
0	$15,000,000			
1	15,000,000	0	$1,500,000	$ 1,500,000
2	12,301,447	$2,698,553	1,500,000	4,198,553
3	0	12,301,447	1,230,145	13,531,592
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

Tranche Z (coupon rate = 11.00%; amount invested = $30,000,000)					
Period	Amount Owed to Security Holder at End of Period	Interest	Accrued Interest	Principal Allocation	Total Payments
0	$30,000,000				
1	33,300,000	$3,300,000	$3,300,000		
2	36,963,000	3,663,000	3,663,000		
3	39,631,009	4,065,930	2,668,009		$ 1,397,921
4	31,010,368	4,359,411		$8,620,641	12,980,052
5	23,311,218	3,411,141		7,699,150	11,110,291
6	16,455,296	2,564,234		6,855,922	9,420,156
7	10,378,894	1,810,083		6,076,402	7,886,484
8	5,037,865	1,141,678		5,341,029	6,482,708
9	424,664	554,165		4,613,201	5,167,366
10	0	46,713		424,664	471,377

CMOs: Pricing and Expected Maturities

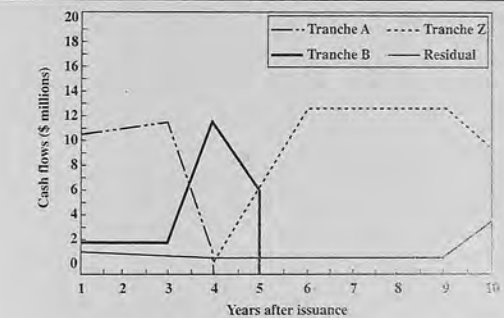
Exhibit 20–8 provides additional insights to aid in understanding how the patterns of cash flow payments to each tranche of securities vary with prepayment rates. The graph in panel A shows the expected cash flows to each class of CMO investors based on a zero percent

EXHIBIT 20–7
Residual Class Flows (prepayment rate = 10 percent)

Residual Equity Class ($3,000,000 invested)			
Period	Total Cash Flows into Pool	Total Payments to A, B, and Z Classes	Residual Cash Flows to Equity Class
0			($3,000,000)
1	$20,235,107	$19,282,607	952,500
2	17,682,084	16,997,073	685,011
3	15,382,527	14,929,513	453,014
4	13,310,052	12,980,052	330,000
5	11,440,291	11,110,291	330,000
6	9,750,156	9,420,156	330,000
7	8,216,484	7,886,484	330,000
8	6,812,708	6,482,708	330,000
9	5,497,366	5,167,366	330,000
10	3,801,377	471,377	3,330,000
Residual *IRR* 17.25%			

EXHIBIT 20–8
Annual Cash Flows to CMO Tranches and Residual Equity (prepayment rate = 0 percent)

Panel A



Panel B

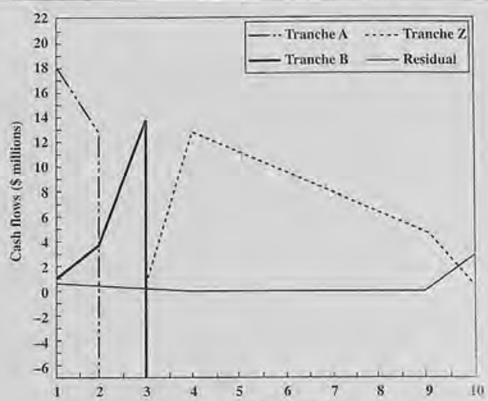
Period	Cash Flows Tranche A	Cash Flows Tranche B	Cash Flows Tranche Z	Cash Flows Residual
1	$10,282,607	$ 1,500,000	0	$ 952,500
2	10,418,846	1,500,000	0	[illegible]
3	10,570,072	1,500,000	0	[illegible]
4	1,072,173	11,165,760	0	[illegible]
5	0	5,867,664	$ 6,484,101	[illegible]
6	0	0	12,405,107	[illegible]
7	0	0	12,405,107	[illegible]
8	0	0	12,405,107	[illegible]
9	0	0	12,405,107	330,000
10	0	0	9,405,107	3,330,000

prepayment rate. In panel B, four very distinct cash flow patterns emerge. This is exactly the goal of the CMO issuer: that is, to reach different *market segments* of investors who have more specific maturity requirements than a mortgage pass-through security provides, but who may not need the exact maturity requirements that an MBB provides. As indicated, however, the CMO does not completely eliminate prepayment risk. Indeed, if mortgage interest rates declined substantially, these securities may provide investors with only slightly more prepayment protection than a pass-through security. To illustrate what cash flows and the maturity of security classes may look like, assuming a significant increase in prepayment, Exhibit 20–9 shows results assuming a 10 percent prepayment rate.

By placing a priority on the distribution of cash flows to various classes of security owners, the CMO generally provides more predictability with respect to expected maturity periods and cash flows than a mortgage pass-through. Recall that in our simplified example in Chapter 19, MPT investors could be committed for a period of up to 10 years, with substantial variation in cash flows received from period to period, depending on the repayment rate.

EXHIBIT 20–9
Annual Cash Flows to CMO Tranches and Residual Equity (prepayment rate = 10 percent)

Panel A



Panel B

Period	Cash Flows Tranche A	Cash Flows Tranche B	Cash Flows Tranche Z	Cash Flows Residual
1	$17,782,607	$ 1,500,000	0	$ 952,500
2	12,798,521	4,198,553	0	685,011
3	0	13,531,592	$ 1,397,921	453,014
4	0	0	12,980,052	330,000
5	0	0	11,110,291	330,000
6	0	0	9,420,156	330,000
7	0	0	7,886,484	330,000
8	0	0	6,482,708	330,000
9	0	0	5,167,366	330,000
10	0	0	471,377	3,330,000

CMO securities, when based on a pool of FHA, VA, or conventionally insured mortgages, should provide a yield in excess of U.S. Treasury securities with equivalent maturity classes[6] because of added cash flow uncertainty. In any case, if no significant decline in interest rates is expected by security holders, the pattern of cash flows shown in Exhibit 20–9 may be appealing to some investors who would otherwise be interested in a pass-through security. This may be particularly true for class A, or fast-pay tranche, which would compete with short-term Treasury bills and notes and may be attractive to managers of money market funds. Tranche B may be more appealing to insurance companies and pension funds, while tranche Z may be preferred by either long-term or hedge-type mutual funds. Hence, prioritization of cash flows does create the possibility of reaching a broader class of investors with more specific maturity requirements than would be the case with MPTs.[7]

To establish some idea of the sensitivity of expected *maturity* to expected rates of prepayment, Exhibit 20–10 shows the outstanding amount owed for each tranche under the repayment assumption of 0 percent PSA (panel A) and 10 percent. As expected, the balances shown for tranche A in panel A begin to amortize immediately, and tranche B amortizes in accordance with the priority allocation of cash flows. However, the amount owed to the Z class increases sharply as interest accrues (like that on a GPM mortgage). In the event that the repayment rate increases sharply (as in panel B), the amounts owed to each security class decrease significantly and all investors in the CMO offering would be repaid within 10 years.

CMO Price Behavior and Prepayment Rates

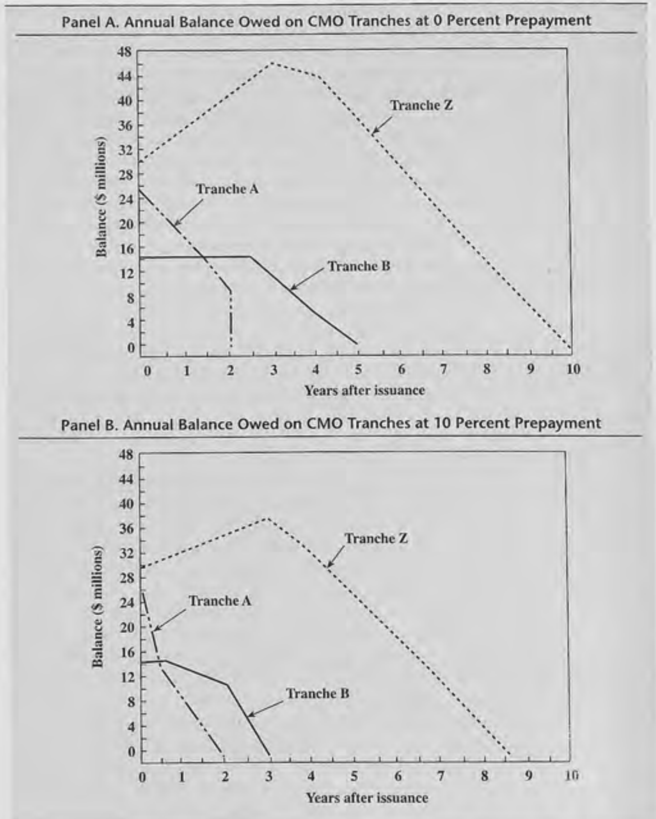
As with MPTs, CMO prices will vary with both changes in interest rates and prepayment rates. The relationship for 0 percent PSA is shown in panel A of Exhibit 20–11. An important characteristic of the prices is their relatively narrow range (vertical axis) that results from changes in demanded market rates of return (interest rates, horizontal axis) for the A and B tranches. The reason is the prioritization of cash flows, which has a "smoothing effect" on prices. However, with respect to prices for tranche Z and present value of the residual interest, these two classes exhibit more volatility in price behavior than tranches A and B. This volatility is a by-product of the market segmentation chosen for this CMO security issue.

Even when an extremely significant increase in the prepayment rate occurs, as shown in panel B of Exhibit 20–11, the range in prices tends to narrow for all tranches in the CMO issue. This can be seen by comparing the ranges in panels A and B. However, also keep in mind that the *expected maturity period* also declines significantly as rate of prepayment increases (see Exhibit 20–10). Hence, this CMO structure makes a trade-off in price stability from the Z and residual classes to the A and B tranches as the maturity period contracts for all classes. However, relative to mortgage pass-through securities, the A and B tranches of CMOs receive some additional prepayment and price protection not given to MPT security holders. Investors in MPTs would receive an increase in cash flows as the rate of prepayment increases, but not necessarily as dramatic a reduction in maturity (although the cash flows in the later years may be relatively small). Consequently, structuring a CMO offering

[6] Because the investor in a CMO is dealing with an *expected* range in maturity, that expected maturity must be used as a basis of comparison for maturities of alternative investments.

[7] The reader may have reached the conclusion that a CMO issue with its various classes of expected maturities resembles tax-exempt serial bonds, which are frequently issued by state and local municipalities. Recall that bond issues with serial and sinking fund provisions call for the retirement of specific amounts of bonds at specific time intervals. This pattern of different maturities appeals to many investor groups that have a specific need to match liabilities coming due on specific dates with an interest-bearing asset with the same maturity. The different pattern of CMO maturities does emulate such bond issue offerings in this respect. However, the use of a Z class of security and residual, or equity, interest is the truly innovative aspect of this type of offering.

EXHIBIT 20–10
Maturity of CMO Tranches at Various Prepayment Rates

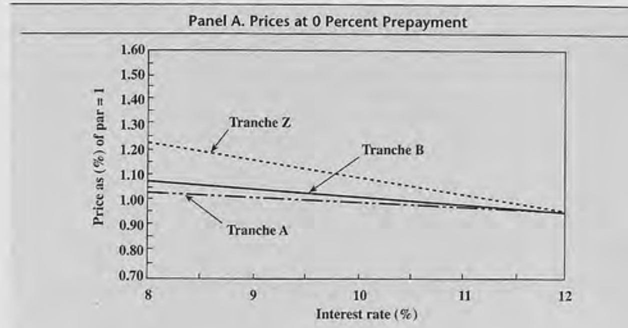


with a maturity and cash flow pattern for one Z tranche, while retaining shorter maturities for the A and B tranches, may make it possible to appeal to investors who have a preference for shorter maturities and a strong dislike for the MPT. One measure that is often used to measure the relationship between price, yield, and maturity for tranches with sequential payment and other structures is called *duration*. This measure is discussed in considerable detail in the appendix to this chapter.

CMO Tranche Variations

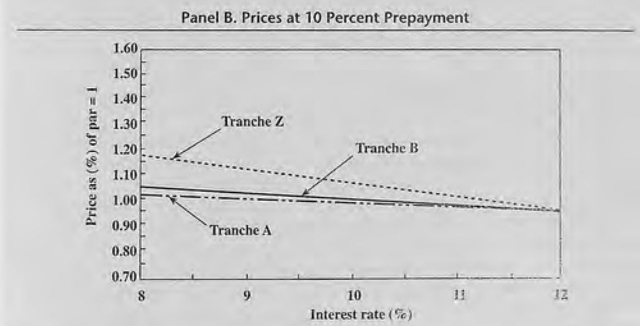
Although the preceding illustration is useful in gaining a basic understanding of the mechanics of a CMO, the elementary structure used in this example reflects only a small portion of today's CMO market. In today's market up to 20 different CMO tranches may be used to create many derivative security types from a single mortgage pool. What follows is

EXHIBIT 20–11
CMO Price Behavior in Response to Changes in Interest Rates and Prepayment Rates



Panel A.

Tranche A		Tranche B		Tranche Z	
8.25%	$27,503,902	9.0%	$15,520,627	10.0%	$32,068,383
9.25	27,000,000	10.0	15,000,000	11.0	30,000,000
10.25	26,511,478	11.0	14,502,977	12.0	28,087,320



Tranche A		Tranche B		Tranche Z	
8.25%	$27,349,396	9.0%	$15,358,856	10.0%	$31,576,326
9.25	27,000,000	10.0	15,000,000	11.0	30,000,000
10.25	26,658,723	11.0	14,653,174	12.0	28,521,768

a discussion of a select number of other classes that, because of their importance in the multiclass mortgage-backed security market, deserve further discussion.

Principal Repayment Variations

Instead of the *sequential pay tranches* used to construct the previous CMO example, issuers may use a sinking fund structure to redeem the securities' principal balance. This method of principal repayment allows issuers to create tranches with more cash flow certainty. In a sinking fund structure, two or more tranches are eligible to receive paydowns of principal on a payment date. The actual amount of payment to each depends on the sinking fund schedule for the structure and the amount of prepayments received.

Under a sinking fund structure, a **planned amortization class (PAC) tranche** offers the greatest degree of cash flow certainty. Instead of being allocated all principal repayments from the underlying pool, the PAC receives *fixed payments* over a predetermined period of time under a range of prepayment scenarios. This range, or *PAC band*, is delineated by a minimum and maximum constant payment speed under which the PAC scheduled repayment will remain unchanged. A **targeted amortization class (TAC)** schedule, on the other hand, corresponds to a single "targeted" prepayment speed (e.g., 150 percent PSA). This targeted prepayment speed is often referred to as the TAC's *pricing speed*. For either of these classes, prepayments in excess of the amounts specified in the sinking fund schedule will be applied to one or more of the non-PAC and non-TAC tranches in the structure, which are often called *companion* or *support tranches* because they are issued in tandem with PACs and TACs and absorb any significant variation in prepayments. As a consequence, when PACs and TACs are present an attempt to insulate the security holder from the prepayment risk of the underlying pool is desired. However, the prepayment risk must be transferred to the other non-PACs or non-TACs in the structure.

Coupon Variations

As shown in the earlier example, class Z tranches, also known as *accrual* or *accretion bonds*, provide for the unpaid coupon to be added to the outstanding principal balance, resulting in automatic reinvestment at the coupon rate. Since the interest that accrues on Z tranches is used to pay down principal on other tranches, the issuer can offer shorter average life securities as companions.

Derivatives Illustrated

Floating rate tranches are generally attractive to institutional investors seeking assets to match floating rate liabilities. The **floater tranche**, as it is often called, has coupon rates that adjust periodically to a fixed spread over an index. For example, if a floater's corresponding index fell from 7 percent to 6.75 percent and the tranche offered a spread of 75 basis points, the coupon rate of the floating rate tranche would adjust from 7.75 percent to 7.5 percent on its reset date. The indexes currently used in the CMO market include the **LIBOR**,[8] the 11th district cost of funds (COF), the one-year Treasury rate, and the certificate of deposit (CD) rate. Reset intervals for these tranches typically range from one to six months.

To offset the variable payout for the floating rate tranche, an *inverted floating rate tranche* is often used in the same CMO issue. The **inverse floater tranche** has a coupon interest rate that adjusts in the *opposite* direction to its index. By setting the ratio of the floating rate tranche to inverted floating rate tranche equal to one, the CMO issuer can ensure that the weighted average rate of interest for the two classes will be stabilized with respect to changes in the index.

An illustration of the floater–inverse floater structure is as follows: Assume that in our example, a portion of one tranche is subdivided into equal amounts of $10 million. Each subdivided amount is now referred to as a floater (F) and inverse floater (IF) tranche. If we

[8] LIBOR, or the London Interbank Offer Rate, is a very important deposit rate that is quoted daily among banks that do business in the Eurocurrency market. This interest rate is widely used throughout the world as an index upon which interest rates on many financial instruments are based.

assume that the F tranche is tied to LIBOR, with coupon interest on the floater portion *increasing* with increases in LIBOR and the inverse floater portion *decreasing* with declines in LIBOR, and on the day of issue LIBOR is 6 percent, then the interest allocation to each tranche within this portion of the mortgage pool on the date of issue is as follows:

Interest due to the (F) and (IF) tranches on *date of issue*, LIBOR = 6 percent.

Case 1

(F) floater $10,000,000 = .50 × .06 =	$ 600,000
(IF) inverse floater $10,000,000 = .50 × .06 =	600,000
Interest payable =	$1,200,000

If, after the issue date, LIBOR *increased* by 1 percent, the interest payable to *both* classes of investors would be:

Interest due if LIBOR increases by 1 percent to 7 percent:

Case 2

(F) floater $10,000,000 = .50 × .07 =	$ 700,000
(IF) inverse floater $10,000,000 = .50 × .05 =	500,000
Interest payable =	$1,200,000

Note that total interest payable remains at $1,200,000 and that the relative share received by (F) and (IF) investors changes in case 2. Investors in the floaters would now receive $700,000, or $100,000 more than they received in case 1. IF investors would receive $100,000 *less* than they received in case 1. Also, if LIBOR were ever to increase by 6 percent to 12 percent, the F tranche would receive *all* interest available for distribution, or $1,200,000, and IF investors would receive zero. Since IF investors cannot receive negative interest payments, this implies that a cap for F tranche investors must always be specified at the time of issue. The *maximum* cap would be equal to $1,200,000 divided by $20,000,000, or LIBOR = 12 percent. However, depending on investor demand for F and IF securities at the time of issue, caps may be set at various levels below 12 percent. Conversely, if LIBOR *declines* by 2 percent when payments are due, then IF tranche investors would receive base LIBOR of 6 percent plus 2 percent, or a total of 8 percent, and F tranche investors would receive 6 percent less 2 percent, or 4 percent. Again, interest payments must sum to $1,200,000, the total available to both investor classes. A minimum, or *floor*, must also be set for IF investors. In this case, it happens to be a 6 percent decline from base LIBOR. However, floors may also be set at other levels between base LIBOR and zero. This is essentially the purpose of the floater/inverse floater structure. If LIBOR increases, the share of interest that F tranche investors receive increases by the amount of the increase in LIBOR and the share of total interest received by IF investors declines by a like amount. When LIBOR declines, the opposite pattern applies.

Using these basic relationships, we can show how underwriters may change the above investment structure to meet whatever investor preferences are relative to prevailing market conditions. This can be done by **scaling** the ratio of the relative composition of interest to be received by the F and IF tranche investors. For example, if the F investors in the example accounted for 60 percent of the tranche and the IF investors 40 percent, then the scale of F to IF is 60 percent divided by 40 percent, or 1.5. In this case, we would have the following relationship at the time of issue:

Total interest allocation at time of issue:

(F) tranche	60%	= 12,000,000 × .06 =	$ 720,000
(IF) tranche	40%	= 8,000,000 × .06 =	480,000
	100%	= 20,000,000	$1,200,000

Note that even though the scale of F to IF has changed, total interest payable is $1,200,000. However, because the relative share that results from scaling the F and IF tranches is 1.5, if LIBOR increases by 1 percent to a level of 7 percent, we would have:

(F) tranche	60%	= 12,000,000 × .070 =	$ 840,000
(IF) tranche	40%	= 8,000,000 × .045 =	360,000
	100%	= 20,000,000	$1,200,000

Note that interest due to F tranche investors is tied directly to increases in LIBOR, which is now 6 percent plus 1 percent equals 7 percent. Therefore, F investors must now receive $840,000. However, because the total interest payment on both tranches must sum to $1,200,000, or the total available for distribution, the inverse floater tranche will earn only 4.5 percent, or the original LIBOR rate of 6 percent less the 1 percent increase in LIBOR times 1.5. The 1.5 multiple, times the inverse of the *change* from the base LIBOR, is also specified at the time of issue. Therefore, IF investors will always receive interest based on the scale of 1.5 times the inverse of the change from base LIBOR. As pointed out above, a *cap* for the maximum increase in LIBOR must also be included. The maximum cap would be an increase of 4 percent, at which point LIBOR equals 10 percent. At that level, the F tranche would receive $1,200,000 and the IF tranche would receive zero. The theoretical floor for IF investors would be the point where IF investors receive all interest available to both investor classes, or $1,200,000 divided by $8,000,000 equals 15 percent.

Returning to our example, if base LIBOR *decreased* by 4 percent from 6 percent to a level of 2 percent, we would have:

(F) tranche	60%	= 12,000,000 × .02 =	$ 240,000
(IF) tranche	40%	= 8,000,000 × .12 =	960,000
	100%		$1,200,000

In this case, the 4 percent *decline* in LIBOR from its initial 6 percent level to 2 percent would result in interest to IF tranche equal to 4 percent times 1.5, or 6 percent. When added to the base LIBOR of 6 percent, a total of 12 percent results. The total interest payment of $960,000 would now be distributed to IF tranche investors. Clearly, with a 4 percent decline from base LIBOR, the total interest payable to IF investors would increase by 100 percent from the allocation determined on the date of issue.

From this simple example, it should be clear that the ratio of F to IF can be scaled and both floors and caps can be set for specified maximum increases or decreases in LIBOR. Also, the greater the scaler used to differentiate interest payable to F and IF investors, the greater the "leverage" applied to the IF investors. Our examples show that when such leverage is applied, it increases the potential volatility (hence, risk) in cash flows to F and IF investors. In practice, the scaler that will be used depends on how much potential volatility versus return F and IF investors want to buy at the time the securities are offered for sale. Underwriters and issuers also must decide then what structure will be most marketable to investors.

Why would investors ever purchase an F or IF derivative investment in the first place? They would do so if they believe that interest rates are likely to rise or fall and if they have *liabilities* that must be paid at some future date based on interest rates that prevail on the date that these liabilities are payable. Derivatives may be purchased to protect the yield on another

portfolio of mortgage or bonds. For example, assume that an investor holds a portfolio of fixed interest rate bonds with a current market value of $1,000,000, which are being used as *collateral* for a business loan that matures in *six months* and the value of the collateral *must* remain $1,000,000 at all times. If interest rates rise, the value of the collateral will fall. In this event, the investor is required to *add* more collateral to the portfolio. Instead of buying more bonds to add to the collateral, an investor might consider purchasing a floating rate (F) tranche CMO with an expected maturity corresponding to either the maturity of the business loan or six months. This approach may be less costly than purchasing more bonds that have to be sold after six months at a gain or loss.[9]

Given the changing amounts of interest payments that are to be received, the *range in prices* for F or IF tranche securities is likely to be extremely volatile. Indeed, derivative securities generally exhibit greater price volatility, or a much greater high or low trading range, than is the case when the underlying security (e.g., mortgage) is purchased directly. Consequently, the potential for greater gains (and losses) exists for investors seeking riskier investments.

Yield Enhancement

It also should be apparent that instead of hedging, investors may want to purchase F and IF securities to enhance yields on a portfolio. For example, if an investor holds a portfolio of lower-risk investments (e.g., short-term U.S. Treasury bills), declines in interest rates will not materially affect the *value* of the portfolio because of its very-short-term nature. As these securities rapidly mature, proceeds are also being reinvested at *current, lower interest rates*. By purchasing an IF tranche CMO investment with a relatively short-term expected maturity, an investor may offset the loss in income in the base portfolio from falling interest rates by the increasing interest payment from the IF investment. Of course, the opposite effect occurs if interest rates suddenly rise.

A *super floating rate tranche* incorporates the characteristics of the standard floating rate tranche along with the scaling factor found in inverted floating rate tranches. The result is that the coupon rate on this type of security floats in the same direction as, but has much more volatility than, its associated index.

IO and PO Strips

Principal only (PO) tranches are created with a coupon set at zero, producing a "principal only" security that resembles a zero coupon bond. Payment patterns are generally slow in early years and increase over time as amortization and prepayment increase. If a CMO structure contains both a PAC (or a TAC) and a PO class, the PO is often referred to as a super PO because the prepayment risk that is directed from the PAC causes the *companion* super PO to become far more volatile than its generic counterpart.

Interest only (IO) tranches are created to allocate interest to investors that is generally high in the beginning years, and then declines over time as amortization and prepayments of underlying principal increase. These are usually issued with PO tranches and are referred to as "stripped" mortgage-backed security issues. These derivative securities have increased in importance in recent years. To illustrate IO and PO strip tranches consider the following greatly simplified example.

Exhibit 20–12 shows that the two security types are created by "stripping" interest and principal from one segment, or tranche, of the mortgage pool; hence, the terms IO strips

[9] Obviously, there are many other ways to hedge this kind of risk. An investor desiring to hedge could produce a financial futures contract on T-bills, which could also be sold short as a hedge against collateral loss. Similarly, a put option could be purchased on an interest rate futures contract against interest increases. This alternative may also be suitable if the investor is not concerned about receiving interest income in the interim. When an F or IF CMO is purchased, interest income is also received in addition to a price hedge against increases or decreases in collateral value. This may also be important to the investor

EXHIBIT 20–12
Pool Segment Used to Create IO/PO Strips

Pool characteristics: $1,000,000 mortgages
11% interest annually
10-year maturity

Panel A. Cash Flow to the IO and PO Strip Investors at 0% Prepayment Rate

Period	Beginning Balance	Interest IO/Strip	Principal PO/Strip	PO Prepayment	Ending Balance
1	$1,000,000	$110,000	$ 59,801	0	$940,199
2	940,199	103,422	66,380	0	873,819
3	873,819	96,120	73,681	0	800,138
4	800,138	88,015	81,786	0	718,351
5	718,351	79,019	90,783	0	627,569
6	627,569	69,033	100,769	0	526,800
7	526,800	57,948	111,853	0	414,946
8	414,946	45,644	124,157	0	290,789
9	290,789	31,987	137,815	0	152,974
10	152,974	16,827	152,974	0	0
			$1,000,000	0	
	PV at 11% =	$461,248	$ 538,752		

Panel B. Cash Flow to the IO and PO Strip Investors at 20% Prepayment Rate

Period	Beginning Balance	Interest IO/Strip	Principal PO/Strip	PO Prepayment	Ending Balance
1	$1,000,000	$110,000	$ 59,801	$200,000	$740,199
2	740,199	81,422	52,259	148,040	539,900
3	539,900	59,389	45,525	107,980	386,395
4	386,395	42,503	39,495	77,279	269,620
5	269,620	29,658	34,074	53,924	181,623
6	181,623	19,978	29,163	36,325	116,135
7	116,135	12,775	24,658	23,227	68,249
8	68,249	7,507	20,421	13,650	34,178
9	34,178	3,760	16,198	6,836	11,144
10	11,144	1,226	11,144	0	0
			$332,738	$667,261	
	PV at 11% =	$276,200	$222,403	$501,397	

and **PO strips.** Note that if no prepayment occurs on any of the mortgages in the pool and if investors demand an 11 percent return on each strip, which is equal to the interest rate on all mortgages in the pool, the present value (PV) of the IO strip is $461,248 while that of the PO strip is $538,752. Obviously, the sum of the two present values must equal $1,000,000 when the discount rate that investors demand equals 11 percent. In practice, this will rarely occur.

However, there are very specific risks regarding prepayment that must be taken into account when making IO and PO strip investments. As discussed many times before, in the event that interest rates decline significantly after issuance, there is a high probability that a number of mortgages in the pool will be *prepaid*. When this occurs, holders of the PO strip will receive flows from repayments sooner than expected. This unexpected increase in the rate of cash flow, coupled with the decline in interest rates, will tend to drive the price

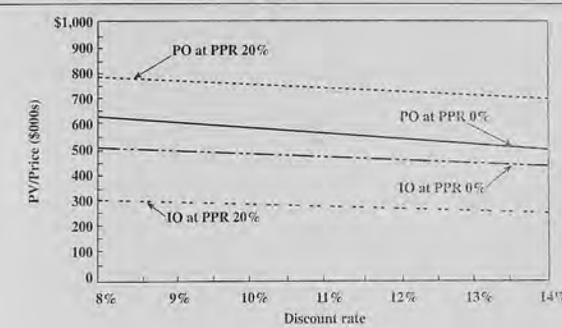
of the PO strips higher. Conversely, when prepayments increase, IO strip holders receive less cash flow as the pool gets smaller because they receive "interest only" from the pool; when mortgages are paid off, interest ceases altogether. In the limit, if *all* mortgages are paid off, the *value of the IO strip becomes zero*. Therefore, the investment return to IO strip investors consists of interest *only*. If we assume that prepayment *accelerates* from zero to 20 percent per year, the cash flow pattern of panel B in Exhibit 20–12 results. IO strip investors will receive far less cash flow; when discounted by 11 percent, the present value of those floors falls from $461,248 in panel A to $276,200 in panel B, a decline of $184,048, or about 40 percent in value. The PO strip, on the other hand, with receipt of accelerated prepayments (see PO prepayment in panel B), receives *more* cash flow much sooner. When the PO strip is discounted to present value at 11 percent, it shows an increase of 34 percent from panel A (normal amortization of $222,403 + prepayments of $501,397 = $723,806). Note that the PO strip receives the same *total* cash flow ($1,000,000) regardless of prepayment.

In Exhibit 20–13, we see the combined effects of prepayment and changing interest rates on IO and PO prices. Note that the present value of the IO strip *declines* dramatically from a 10-year normal amortization to a 20 percent prepayment throughout the range of discount rates. The PO strip, on the other hand, *increases* in value because more cash flow is recovered *sooner* than if interest rates had remained stable.

This comparison points out the *potentially volatile price behavior* of IO and PO strips. It also implies that, in practice, when investors consider IOs and POs, they must take into account or form expectations about likely future movements in mortgage interest rates (either up or down) *and* the rate of repayment from the mortgage pool (faster or slower). In

EXHIBIT 20–13
IO and PO Prices at Various Discount Rates: Prepayment Rate (PPR) at 0% and 20%

Panel A



Panel B

Discount Rate	PPR = 0% PV of IO	PPR = 20% PV of IO	PPR = 0% PV of PO	PPR = 20% PV of PO
8%	511	297	628	784
9	494	290	596	763
10	477	283	566	743
11	461	276	539	724
12	446	270	513	705
13	432	264	489	688
14	419	258	467	671

addition to investment considerations, these derivative-type investments, like the F and IF investments discussed earlier, may also be purchased when investors expect interest rate volatility to occur and choose to hedge against it.

Convexity

Another useful way to describe the present value patterns shown in panels A and B of Exhibit 20–13 is to say that the curve representing the PO strip exhibits greater **convexity** than the IO curve. This can be seen by examining the range in *PVs* when the $PPR = 0$. Note that at $PPR = 0$, the PO curve has a greater slope than the IO curve over the range of discount rates. This means that the price of the PO in our example is *more sensitive* than the IO to changes in market rates of interest (discount rates). In other words, the PO has greater price convexity. However, note that when the prepayment rate increases to 20 percent, the price of the PO *rises* because mortgages are repaid sooner. However, note that the price of the IO *declines*. The IO declines in price because interest payments *cease* on 20 percent of the mortgage portfolio. In the latter case, the prepayment rate must be taken into account when estimating prices of IOs at various discount rates. The resulting prices for IOs will show much greater sensitivity to prepayment and interest rate changes.

Residential Mortgage-Related Securities: A Summary

We now briefly summarize some of the major characteristics of the four major types of securities covered thus far. Exhibit 20–14 contains a summary of some important terms and definitions used in the mortgage-backed securities (MBS) business. Exhibit 20–15 is a classification of some of the more important aspects of these securities that should aid you in understanding cash flow and risk-bearing patterns associated with each type.

With the exception of MPTs, which represent an undivided ownership equity interest in a pool of mortgages, all other securities discussed in the chapter are actually debt. An MPT should be viewed as a stand-alone investment that is placed in trust after it is sold to investors in a securitized form. Because the mortgage pools backing the issue are usually FHA/VA or conventionally insured mortgages and a timely payment guarantee is usually provided by the issuer or GNMA, MPTs can be a stand-alone investment; that is, there is no need for overcollateralization or credit enhancements. The success of the investment is based solely on the income produced by mortgages in the pool, and the recovery of investment by investors depends on how amortization and prepayments from the mortgage pool occur. However, because of the pass-through of principal, investors bear all prepayment and reinvestment risk since they do not know exactly what cash flows will be from period to period, nor do they know when the security that they own will mature.

The debt securities listed in Exhibit 20–15 may be differentiated on the basis of (1) who bears prepayment risk and (2) the extent and type of overcollateralization or the use of credit enhancements. Issuers of MBBs bear all of this prepayment risk; hence, the extent of overcollateralization or credit enhancements for these securities must be greatest. Conversely, to the extent that the investor bears prepayment risk—or to the extent that the pass-through of principal flows directly to investors—the need for overcollateralization or credit enhancements is reduced somewhat (holding all else constant). This is true because, for example, as prepayments accelerate on MPTBs and CMOs, maturities are reduced, whereas the maturity for MBBs remains constant regardless of the prepayment rate on the underlying pool. Therefore, in anticipation of the possibility of prepayment in the latter case, the issuer will have to provide more collateral than with the other two debt securities. This means that in each case, the use of overcollateralization and credit enhancements and the extent to which the investor bears prepayment risk must all be taken into account when assessing the relative attractiveness of each security type.

EXHIBIT 20–14 Summary of Important Terms Used in the Market for CMOs and Derivative Securities*

CMO
A collateralized mortgage obligation, or CMO, is a bond or debt obligation that is backed by mortgages or mortgage-backed securities. Its cash distributions from the mortgage pool are designed to provide mortgage pass-through (MPT) and CMO investors with a broader selection of cash flows and maturities risk.

Contraction risk
When mortgage market rates fall, homeowners tend to accelerate refinancing. Contraction risk affects the price of an MBS in two ways: (1) Because of the prepayment risk on an MBS, price will not increase as much as a noncallable alternative with an equivalent maturity such as a Treasury bond. (2) As MBS investors receive prepayments of principal, they must reinvest at prevailing lower market interest rates. The combination of these two effects is referred to as contraction.

Convexity
The rate of change in the price of an investment with respect to a change in market interest rates (investor discount rates).

Derivative security
A derivative security derives its value from another security, index, or financial claim. Because the values of mortgage-backed securities (MBSs), such as MPTs and CMOs, are based on pools of mortgages, both are referred to as derivatives. There are many other derivatives, such as options, swaps, and so forth.

Duration
When prepayment rates increase (decrease) in response to declining (increasing) interest rates, the expected maturity of an MBS becomes shorter (longer) as cash flows from amortization change. The present value of such investments obviously changes, but so does the maturity. Duration is a measure of the time-weighted pattern of the receipt of cash flow and is a companion tool that helps investors rank present values on the weight and timing of the receipt of cash flows.

Extension risk
Extension risk is the opposite of contraction risk. It is the risk investors face when interest rates increase. Rising rates affect MBS investors in two ways: (1) The price of the MBS security declines like other fixed-income securities; however, because the rate of prepayment slows with rising interest rates, cash flows to the investor decline and the expected maturity increases. This causes the price of the MBS to fall more than an equivalent noncallable alternative, such as a Treasury bond. (2) As prepayment rates decline, opportunities to reinvest greater cash flows at higher interest rates are lost. The combination of these two effects, MBS price declines and lower reinvestment returns, is referred to as extension risk.

IO/PO strips
IO and PO strips occur when mortgages are split ("stripped") into two securities. IO (interest only) strip investors receive only the interest payments from the mortgage pool. PO (principal only) strip investors receive the principal payments. Declining interest rates cause the price of PO strip securities to increase because lower rates induce borrowers to refinance, thereby providing PO investors with an acceleration in cash flows. Rising interest rates are providing PO investors with an acceleration in cash flows. Rising interest rates are beneficial to IO investors because refinancing slows as homeowners prefer to keep their original mortgages. IO holders then receive interest payments for a longer time than expected, thereby increasing the cash flows over that time.

LIBOR
The London Interbank Offer Rate, LIBOR, is a widely quoted interest rate on deposit-based transactions between banks in the Eurocurrency market.

Prepayment risk
Because homeowners can choose to prepay or keep their original mortgages, MBS investors must forecast mortgage repayment rates when analyzing their investments. This is important because the timing of cash flows (i.e., investor returns) are affected by the rate of prepayment.

Tranche
Tranches are bond classes in a CMO that differ from one another either by priority of the receipt of cash flows or in some other way. The word comes from the French *trancher,* which means "to cut."

*For a review of terminology and a basic understanding of mortgage pass-throughs and derivatives, see R. S. Guttery and E. McCarthy, "Real Estate Derivative Assets: CMOs, IOs, POs and Inverse Floaters," *Real Estate Finance,* Winter 1995, pp. 18–29.

EXHIBIT 20–15
Summary of Important Investment Characteristics of Mortgage-Related Securities

	MBB	MPT*	MPTB	CMO
(a) Type of security interest acquired	Debt	Equity	Debt	Debt
(b) Number of security classes	One	One	One	Multiple
(c) Pass-through of principal	None	Direct	Direct	Prioritized
(d) Party bearing prepayment risk	Issuer	Investor	Investor	Investor
(e) Overcollateralization	Yes	No	Yes	Yes
(f) Overcollateral marked to market?	Yes	NA	No	No
(g) Credit enhancements used?	Yes	No	Yes	No
(h) Maturity period known?	Yes	No	No	No
(i) Call provisions?	Possibly	Cleanup	Possibly	Calamity and nuisance
(j) Off-balance-sheet financing possible?	No	Yes	No	Yes

*Assumed to be a GNMA/MPT, FNMA/MBS, or FHLMC/PC.

Finally, with respect to the issuer, the use of MBBs and MPTBs should be viewed as a method of debt financing. Although the securitized mortgages are placed with a trustee, they are still carried as an asset on the issuer's balance sheet while the MBBs are categorized as debt. This would also apply to CMOs unless the issuer sells the residual interest to a third party, in which case the issuer would no longer retain an ownership interest and would not have to carry the mortgage pool as an asset or the CMO securities as liabilities. As an alternative to a CMO issue the issuer could create a real estate mortgage investment conduit (REMIC) to achieve off-balance-sheet financing. With this vehicle, the issuer is selling the mortgage pool to investors and the transaction is completely off-balance-sheet financing. The issuer must only recognize a gain or loss on the sale of mortgages when they are securitized and sold.

Residential Mortgage-Related Securities: Some Closing Observations

Much of what has been discussed strongly suggests that there may exist some market segmentation among investors based on a strong preference for investments with specific maturities. This preference results from the demand by investment managers for interest-bearing assets with the same maturities as liabilities that come due at specified times (e.g., pension plan assets may be acquired with maturities that match liabilities coming due as a number of beneficiaries retire each year).

Finally, because of the different cash flow patterns that are likely to be encountered when choosing among an MBB, MPT, MPTB, or CMO, additional questions are related to receipt of cash flows and the measurement of yields that must be addressed. With an MBB, for example, a level stream of interest payments for a fixed maturity plus a lump-sum return of principal will be received, whereas an MPT may have more variable cash flows due to prepayments, and the Z tranche on a CMO issue may pay cash flows to the investor toward the end of a maturity period. If we assume that each security type was offered at the same yield,[10] should an investor consider each as equivalent? Or, if all three investments existed in a portfolio and payments were to be used to pay liabilities coming due at specific time periods, how can we assess the relationship between the maturity periods over which cash inflows will be received and the rate at which liabilities mature? The appendix to this chapter develops a measure that combines both cash flows constituting the yields *and* maturity into a measure called *duration*, which may be useful in assessing these questions.

[10] Generally, the yield on the three security types would not be the same even if backed by the same pool of securities because the issuer of an MBB bears repayment risk and the investor would earn a lower yield than with an MPT, where the investor bears that risk. A Z tranche security, such as the one demonstrated in the chapter, would yield more than an MPT because not only does that investor bear prepayment risk but interest is also accrued and paid later in the life of the security.

Commercial Mortgage-Backed Securities (CMBSs)

In this and the preceding chapter, we have dealt primarily with mortgage-related securities backed by *residential* mortgage pools. Essentially, the methods and structures used to issue *commercial* mortgage-backed securities are very similar. However, the nature of the mortgage collateral, its ability to produce income, and the risk associated with commercial mortgage pools differ from a residential pool in very important ways. These differences are elaborated and contrasted in this section.

Like residential-backed securities, most commercial mortgage-backed offerings take the form of a mortgage-backed bond, pass-through security, or a collateralized mortgage obligation. The primary distinction between residential-backed and commercial-backed pools centers around the likelihood of losses due to **default risk.** Recall that in most residential offerings, mortgages in the pool are usually FHA insured or VA guaranteed, or are conventional mortgages with private mortgage insurance. In most cases, timely payment of principal and interest is usually guaranteed by a branch of the U.S. government (GNMA) or an agency (FNMA, FHLMC). While private entities have issued many mortgage-backed bonds and mortgage pay-through bonds with no government guarantees, the dollar volume of government-backed securities has been far greater in amount.

In contrast to residential-backed issues, commercial-backed securities are secured by mortgages on income-producing properties. Tenants in these properties sign lease agreements that provide the source of income from which mortgage payments are made. Hence, the quality of properties, geographic regions in which they are located, and the creditworthiness of the tenant must play some part in assessing the risk of a commercial-backed security offering. Clearly, *if tenants default on lease payments or if the geographic market in which the property is located becomes overbuilt and rents generally decline, the income stream used to make mortgage payments will become jeopardized*. Further, because such permanent mortgage loans are made on a nonrecourse basis, the lender may look only to proceeds from the sale of the property to satisfy the loan in the event of default. A CMBS offering has certain distinctive elements (see Exhibit 20–16). First, commercial mortgage assets in the pool are likely to have short maturities (5–15 years) and they are likely to be "interest only." This means that—like a corporate or U.S. government bond—flows into the pool will consist of monthly interest only with the *full amount* of principal repaid by the borrowers at maturity. A second difference lies in the structure of the CMO securities. Two major classes of debt securities are usually offered as a part of a CMBS offering; *senior* and *subordinated* tranches. Sometimes these are referred to as the "A piece" and "B piece," respectively. In practice there will be several subclasses within each of these major classes. The distinction between the two classes is largely based on the *priority of claims* on all payments flowing into the pool, with the **senior tranche** receiving highest priority and the **subordinated tranche** coming second. As before, any cash flow remaining after paying the senior and subordinated tranche is received by residual- or equity-class shareholders. In this example we would say that the senior tranche is subordinated by 30 percent because the subordinate tranche is 30 percent of the securities. This means that there can be up to 30 percent loss in value of the mortgage pool before the senior tranche will incur any losses.

Another important aspect of these securities concerns repayment of principal. Repayments of residential loans are *expected* to occur long before most mortgages reach maturity, as homeowners sell properties to pay off existing loans and buy new homes as they change

EXHIBIT 20–16
Simplified Example of a Commercial Mortgage-Backed Security (CMO) Offering

Pool Characteristics: $10,000,000 mortgages, 10% interest rate, 5-year maturity				
Assets		Liabilities		
Commercial		Senior securities:	Coupon	
mortgages	$10,000,000	Class A bonds	8%	$ 6,000,000
		Subordinated securities:		
		Class B bonds	10%	3,000,000
		Total		9,000,000
		Net worth (residual)		1,000,000
Total	$10,000,000	Total		$10,000,000

employment, refinance, and so on. This is not likely to be true of commercial mortgages. Little or no principal payments or prepayments are likely to flow into the CMBS pool because of **lockouts** that prevent prepayment for a specified number of years. As a result, a *major* focus of CMBS–CMO investors centers on the likelihood of borrowers making full repayment of principal when mortgages mature.

Commercial mortgages often have a "balloon payment" that is due before the loan is fully amortized. When the balloon payment is due, there must be a source to refund or refinance the properties serving as security for the mortgages. This source may be the original lender who agrees to refinance, or "roll over," the mortgage at maturity. In this case, funds from refinancing are used to repay existing loans in the pool, and recovery of principal will flow through to commercial investors in the CMBS pool. The risk that borrowers can refinance their properties when the balloon payment is due may be significant for commercial real estate loans because *at the time of refunding, property markets may be poor, interest rates high*, and so on. As a result, original lenders may choose not to refinance loans at all or to refinance them only at a reduced loan amount. As a result, borrowers may not be able to fully repay loans or they may be able to refinance only a portion of the loan balance. This will pose problems for commercial mortgage-backed security holders who are expecting to be repaid when the underlying mortgages mature. If this happens, CMO investors may have to wait for the trustee administering the pool to foreclose, negotiate loan extensions, and so forth, as most commercial mortgages in the pool will be nonrecourse mortgages against both the borrower and lender-issuer. The risk that borrowers won't be able to refinance their properties when the loan matures is called **extension risk.** If the borrower defaults and foreclosure results, the property may eventually be sold and the proceeds used to repay the loan balance. A deficiency results if the value of the property is *less* than the loan balance. In this event, some CMO investors are not likely to recover all principal due at maturity, resulting in a loss. Therefore, considerable investor focus is centered on the *likelihood of borrower default* resulting in a full or partial loss in cash flows when the commercial mortgage matures.

Exhibit 20–17 illustrates the distribution of cash flows and potential risk associated with the CMBS offering shown in Exhibit 20–16. In panel A, cash inflows consisting of interest only are distributed first to the senior tranche, which is due 8 percent interest and accounts for 60 percent of the offering. The subordinated tranche than receives interest at a rate of 10 percent on its segment, or 30 percent of the offering. The remainder goes to the residual class, which contributed $1,000,000, or 10 percent of the offering. If no default occurs, investors in each security class receive cash flows as promised, plus recovery of the initial investment in year 5 when underlying mortgages mature and borrowers repay outstanding balances.

Panel B of Exhibit 20–17 illustrates what happens to the cash flow patterns if default and foreclosure occur when mortgages mature and the sale of properties brings only 80 percent

EXHIBIT 20–17
Cash Flows to CMBS Security Holders

Panel A. No Default or Mortgage Prepayment

End of Period	Cash Inflow to Pool	Senior	Subordinated	Residual
1	$ 1,000,000	$ 480,000	$ 300,000	$ 220,000
2	1,000,000	480,000	300,000	220,000
3	1,000,000	480,000	300,000	220,000
4	1,000,000	480,000	300,000	220,000
5	11,000,000	6,480,000	3,300,000	1,220,000
	IRR =	8%	10%	22%

Panel B. Default Occurs at Maturity and Sale of Property is 80% of Outstanding Loan Balance

End of Period	Cash Inflow to Pool	Senior	Subordinated	Residual
1	$1,000,000	$ 480,000	$ 300,000	$220,000
2	1,000,000	480,000	300,000	220,000
3	1,000,000	480,000	300,000	220,000
4	1,000,000	480,000	300,000	220,000
5	9,000,000	6,480,000	2,520,000	-0-
	IRR =	8%	5.33%	−4.92%

of the total loan balances due at the end of year 5. Note that cash flows into the pool in year 5 total $9,000,000, or $1,000,000 in interest only plus $8,000,000, or 80 percent of the principal amount due at that time. From this cash flow, the senior tranche receives its full amount of interest, or $480,000 plus $6,000,000 on the total initial investment. However, the subordinated tranche investors receive interest due of $300,000 plus only $2,220,000 in loan repayments. This represents a $780,000 loss to subordinated investors because of default. Residual investors lose all their initial investment of $1,000,000. Based on these distributions, the internal rate of return earned by senior tranche investors remains at 8 percent; however, the *IRR* declines from 10 percent to 5.33 percent for the subordinated tranche investors. The residual class does not recover its investment; its return falls from a projected 22 percent (see panel A) to −4.92 percent.

Exhibit 20–17 illustrates the basic mechanics of a CMBS offering. Because of the potential for default loss, residual investors obviously take the greatest risk while the subordinated tranche investors stand to lose their investment next. For this reason, the subordinated tranche is usually referred to as the **first loss position** among the bond investors. It should be obvious that the size of investment made by each security class and its priority in cash distributions relative to the likelihood of default are the critical variables that must be assessed by investors when evaluating a CMBS offering.

Because of the importance of default risk, the source for many mortgages used in forming mortgage pools comes from insurance companies and commercial banks that have previously originated loans on commercial (and multifamily) properties. These loans are usually seasoned and have a payment record spanning a number of years. This is useful information for potential investors. As the market value of these loans increases during periods of declining interest rates, many lenders want to sell them. However, the very thin secondary market for such individual loans, which tend to be relatively large in amount and are not standardized in terms of loan provisions, makes finding buyers difficult. Hence, by placing these mortgages in a pool and issuing securities against them, the lender may issue securities in smaller denominations which are ultimately sold to many investors, thereby converting the mortgages to cash and realizing gains because of lower interest rates. Other motivations for lenders to securitize may be simply to obtain more funds for operating requirements by converting previously originated loans.

The security for a commercial-backed mortgage pool, therefore, can range from one mortgage on a very large mixed use, multitenant property to a group of smaller income-producing properties on which mortgages have been made by a lender. In general, however, securities are issued based on mortgage pools owned by one lender. Further, properties serving as collateral for the mortgages are generally the same type (i.e., either office buildings or retail) and are geographically diverse.

Rating Commercial Mortgage-Backed Securities

Most security offerings backed by commercial mortgages are rated by independent credit rating firms. However, because of the nature of mortgage collateral in the pool, the criteria used for rating differ dramatically from those used in rating residential pools. Where the securities being rated are based on the credit standing of the issuer and do not contain guarantees or insurance from third parties, the cash flows expected to be earned on each mortgaged property in the pool are usually subjected to a worst-case scenario regarding rents, vacancy allowances, operating expenses, and so on, and a judgment about the property's ability to cover debt service is made. This is particularly important when only one or a few mortgages will make up the pool. Where several mortgages are in a pool, more emphasis is placed on the past underwriting record of the lender. In other words, losses due to defaults from previous loan originations (unrelated to the mortgage pool) are given serious consideration. To provide the worst-case scenario, data specific to the local market area are used as input to the cash flow projections. Generally, rating agencies will only give the senior tranche, or A piece, an investment-grade rating (e.g., AAA, AA, or A). The subordinated tranches will have a lower rating (BBB to B) or remain "unrated," which means that they are not investment-grade quality and therefore cannot be purchased by many pension and trust funds. Exhibit 20–18 illustrates the likely ratings for classes (bonds) with different levels of subordination. The exhibit also shows the LTV and DSCR for each security.

For a commercial-backed offering to be successful, the issuer may have to provide enough credit enhancement to the investor to reduce default risk to an acceptable level. These enhancements may include one or more of the following types of support.

1. *Issuer of third-party guarantees.* These may include (*a*) a guarantee of timely payment and/or (*b*) a guarantee of payments to the security holder in the event of a cash flow shortfall from the mortgage pool jeopardizing promised coupon payments, and/or (*c*) a guarantee of repayment of principal to the security holder. Such guarantees may be limited, and they may be provided in part by the issuer with a third-party guarantee for any losses in excess of some specified limit. In any case, the ability of the issuer or third party to perform on the guarantee must be considered by the investor.

2. *Surety bonds and letters of credit.* These are provided by banks and insurance companies for a fee and may be used to guarantee interest and principal payments. In this case, the third-party guarantor is assuming default risk. These guarantees may be made in addition to the guarantee provided in (1). The amount of the guarantee may also vary.

3. *Advance payment agreements.* These are timely payment guarantees made by the issuer and may be limited to a specified number of payments after default.

4. *Loan substitutions and repurchase agreements.* Some commercial-backed issues may provide that the issuer will substitute a defective mortgage with one of better quality, or that issuers stand ready to repurchase any nonperforming mortgages.

5. *Lease assignments.* This provision simply provides that the property owner will assign lease payments directly to the mortgage lender who, in turn, makes payments to the security holder (instead of loan payments being made first to a property manager, or owner, and then to the lender). In this way, the probability that cash flow would not be received by security holders is reduced should the property owner or manager ever become threatened with the possibility of bankruptcy.

6. *Overcollateralization.* As discussed previously, overcollateralization amounts to a lender providing a mortgage pool with a dollar value in excess of the value of securities being used against the pool. By doing this, more income flows into the pool from the larger amount of mortgages relative to required coupon payments to investors. Defaults would have to be approximately equal to the amount of overcollateralization before investors would suffer losses. The extent of overcollateralization necessary in commercial-backed issues is usually based on a desired debt coverage ratio (i.e., the number of mortgages needed to provide an adequate amount of income relative to the interest payment) to investors in the pool.

7. *Cross-collateralization and cross-default provision.* When a pool of mortgages is used for a security issue, the lender may be able to provide a blanket mortgage or cross-collateralization agreement for all mortgages in the pool. This can occur if the lender has made loans to one developer or investor. A cross-collateralization agreement provides that all properties serving as collateral for individual loans will serve to collateralize the entire debt as represented by the blanket mortgage. Hence, in the event that one mortgage defaults, the lender may accelerate prepayments on all mortgages that are a part of the agreement. This means that any loss on one mortgage in a pool because of default may be made up by the security provided by the properties, which may have appreciated in value and are now a part of the blanket mortgage security. By also accelerating on the notes secured by the appreciated properties, the owner-borrower will generally find a way (e.g., second lien, syndication) to raise additional equity and make up any payments on a defaulted loan rather than lose all of the properties.[11] Thus, a blanket mortgage or cross-collateralization agreement is usually beneficial to mortgage-backed security holders.

Perhaps the most important impediment to growth in this market is the refinancing risk associated with mortgages when the maturity date is reached. Contrary to the residential

EXHIBIT 20–18
CMBS General Bond Risk Considerations

Rating	Subordination	DSCR*	LTV†	Price
AAA	30%	2.00	52.50%	102
AA	24%	1.84	57.00%	101
A	18%	1.71	61.50%	100
BBB	11%	1.57	66.75%	98
BB	6%	1.49	70.50%	75
B	3%	1.44	72.75%	65
NR	0%	1.40	75.00%	35

Premium → Discount

Source: Diagram created by Mr. Josh Marston, Mass Financial Services, and provided by Charter Research

*Dept service coverage ratio.

†Loan to value ration.

[11] Cross-collateralization is used by lenders when dealing with developers who pledge previously developed properties as security to obtain financing for new developments. They do this to reduce cash equity in new developments. Lenders may also insist on this additional security because most permanent mortgages are made on a nonrecourse basis; hence, lenders must look to the real estate pledged as security for loans in the event of default.

market where there are frequent sales and refinancing is available (1) as households sell and purchase new homes and (2) default risk is minimized by the FHA or private insurance, this is not true in the commercial mortgage market. As a result, when a commercial mortgage matures and refinancing is not readily available, investors in the mortgage pool may have to extend financing beyond the original maturity date.

In the event that a third party provides a letter of credit or other guarantee of principal and interest on the mortgage pool, the ability of the third party to perform is more important than the mortgages in the underlying pool because default risk shifts from the issuer to the third party. Hence, the security holder will be more concerned with the creditworthiness of the insurer or guarantor.

Collateralized Debt Obligations (CDOs)

Collateralized debt obligations (CDOs) have been introduced in recent years to provide more flexibility in the types of collateral that may be included in the pool for securities backed by debt. Commercial mortgage-backed securities (CMBSs), discussed earlier in this chapter, use commercial mortgages as collateral. However, CDOs use a much broader range of collateral such as debt issued by real estate investment trusts (REITs) and other kinds of debt that would be considered too risky to include in collateral for a CMBS. Including riskier debt from several different mortgages in a CDO provides diversification for investors willing to invest in this higher-risk debt. That is, the mortgage assets of the CDO include a diversified mix of different types of debt, which will be elaborated on below. Different classes of securities are then issued by the CDO in the same way that securities are issued by a CMBS (A class, B class, etc.) with a similar payment principal and default priority structure, as we have discussed previously.

Riskier second mortgages are sometimes included in CDOs but it is more common to include subordinate debt by creating and selling junior portions of first mortgages. The subordinated position of the secured mortgage is structured by requiring it to assume the first loss position for the entire mortgage loan. For example, the holder of the first mortgage might carve out what is referred to as an **A note** and a **B note,** both secured by the first mortgage. The B note is subordinate to the A note, which means that it absorbs any losses before the A note is allocated any losses. The riskier B note is often put in a CDO, whereas the A note secured by the same mortgage would be included as collateral for a lower-risk CMBS.

Other collateral for a CDO may include the lower rated bonds from a CMBS. For example, as discussed earlier in the chapter, a CMBS may be issued which includes Class A and Class B securities. Rather than sell the Class B CMBS securities directly to investors, the Class B securities can be sold to the issuer of a CDO that includes the Class B securities along with other types of mortgages as collateral for the CDO.

Another type of debt that might be included in a CDO is a **mezzanine loan**. A mezzanine loan bridges the gap between the first mortgage debt on the property and the equity investment. It is similar to a second mortgage; however, it is not secured by a mortgage on the property. Rather, it is secured by the investor's equity in the property. This means that in the event of default, rather than following the normal foreclosure procedure, the mezzanine lender would exercise a conversion option that gives the lender an equity interest in the property. The mezzanine lender also would normally have an intercreditor agreement with the first-mortgage lender to have the right to take over the first mortgage in the event of default. The first-mortgage lender is willing to enter into this agreement because it provides another party to look to for payment on the first mortgage. The combination of being able to convert from debt to equity and having the intercreditor agreement usually gives the mezzanine lender more rapid and total control of the property. This is because equity in the corporation or partnership is personal property; thus, ownership can be obtained through a legal process that is not as lengthy as foreclosure on a mortgage in default.

Finally, a CDO may also include **preferred equity** as one of the assets. Preferred equity is an equity interest in the property but has debtlike characteristics because it has a superior claim on cash flows produced by the property relative to the **"common,"** or **residual, equity** investors. For example, the preferred equity may receive an 8 percent preferred return on equity invested, which means that preferred investors receive an 8 percent return on their investment before the common equity investors receive any distribution of cash flow. This return may be cumulative, which means that if the preferred investors do not receive their 8 percent return in a given year, any shortfall carries over to succeeding years and must be paid before the regular equity holders receive any cash distributions. After payment of the preferred return, the remaining cash flows are often split between the preferred equity investors and the residual equity investors. Thus, preferred equity is somewhat analogous to mortgages with participations, discussed in previous chapters. By combining preferred equity from several different properties along with the other types of debt discussed above, a well-diversified asset structure for the CDO can be created. This makes it possible for the A class securities issued by a CDO to receive good credit ratings (e.g., AAA or AA) by the rating agencies even though the individual debt investments in the pool are riskier than mortgages that may be included in a typical CMBS pool.

Managed CDO

More recent structures of CDOs, referred to as **managed CDOs**, provide even more flexibility to the issuer of the CDO. In managed CDOs the issuer may (1) substitute collateral backing the CDO and (2) reinvest the principal payments received on mortgages. Substitution of collateral may occur when one or more mortgages in the pool is repaid. The CDO may provide that funds from the repayment be reinvested in a mortgage of similar quality. Reinvestment of principal may apply when monthly payments are received from borrowers, and rather than paying principal to investors in the CDO securities, the issuer may reinvest the principal into other mortgages. This allows the CDO issuer to find opportunities to make additional investments after the initial issuance of the CDO that may be more profitable for the CDO investors, who would not have to reinvest principal payments distributed to them. Managed CDOs may provide for a wide variety of reinvestment possibilities, such as construction and development loans.

Exhibit 20–19 illustrates the structure of a CDO using the various debt instruments discussed above. A $500 million property has a $400 million first-mortgage loan from a commercial investment bank and $100 million of equity. The investment bank carves out a $300 million A note and a $100 million B note from the $400 million mortgage loan. The equity in the property consists of $25 million of mezzanine debt, $25 million of preferred equity, and $50 million of common equity. (Recall that the mezzanine debt is a claim that may be converted to equity and is not secured by the mortgage.)

The $300 million A note is put into a CMBS that has an A class and a subordinate B class. The B class of the CMBS, the B note carved out of the mortgage, the mezzanine debt, and the preferred equity may all be contributed as collateral for a CDO. The CDO would then issue its own securities (e.g., A class, B class, and C class). For simplicity, only three classes of securities are shown in the exhibit. In reality there would typically be additional classes of securities with different ratings. Exhibit 20–20 shows a typical CDO capital structure.

It should be clear that the use of various types of mortgage-related securities as a source of debt capital for commercial real estate is rapidly evolving. This is providing increasing flexibility to issuers of the securities and investment and diversification opportunities for investors.

EXHIBIT 20–19 Illustration of CDO Structure

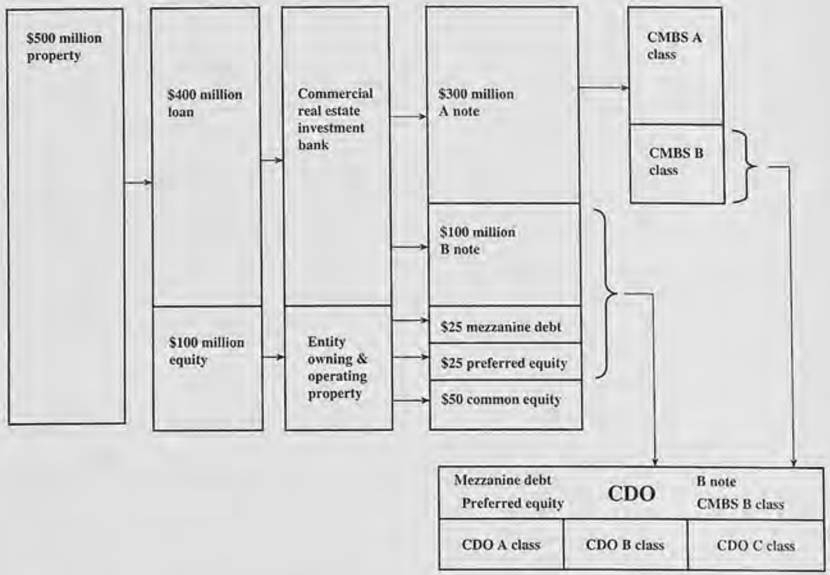


EXHIBIT 20–20 Typical CDO Capital Structure

Investor Class	Amount($)	Rating	Annual Return (%)	Annual Return
Class A	$ 75,000,000	AAA	5.60%	4.20
Class B	3,000,000	AA	5.84	0.18
Class C	4,000,000	BBB	6.84	0.27
Class D	7,000,000	BB	7.70	0.54
Class E	2,000,000	B	8.72	0.17
Total debt	91,000,000			5.36
Equity	9,000,000	Not rated	15.00	1.35
Service and transactional charges				0.85
Total capital raised	$ 100,000,000			7.56

Mortgage-Related Securities and REMICs

Prior to the creation of CMOs, most mortgage-related securities would have been issued as mortgage-backed bonds or mortgage pass-through securities. The federal tax treatment of these securities is relatively straightforward. For MBBs and MPTs, a grantor

trust is generally utilized on which mortgages are usually placed under the administration of a trustee who oversees the provision of the trust agreement on behalf of security owners. While such provisions may have varied, if federal income tax regulations defining a qualified trust are met, the trust avoids taxation, and interest that flows through to investors is taxed only at the investor level. The primary conditions that such a trust has to meet are that (1) it have a limited life, (2) it be self-liquidating, and (3) it needs no substantive amount of management after the assets are placed in trust. In essence, to avoid classification as an association doing business as a corporation and thus becoming subject to taxation, investment income from the trust has to be passive in nature. Hence, for MBBs and MPTs, the payment of principal and interest from a pool of mortgages under the maintenance of a trustee would generally be sufficient to avoid tax at the entity level. This means that only interest received by investors (or beneficiaries of the trust) would be taxed.

When CMOs were first offered, the IRS ruled mortgage-backed securities with multiple tranches and an equity or residual ownership interest retained by an issuer were too similar to a corporation retaining control of the vehicle used to raise funds. In effect, the issuing entity could use a CMO offering as financing for a business purpose, as opposed to creating a passive investment entity. Further, it required more active management than a pass-through offering. This would be particularly true with respect to selecting securities when reinvesting interim cash flows between the date of receipt from the mortgage pool and disbursement to CMO security holders. Hence, the IRS took the position that if a mortgage-related security offering had more than one class of securities issued against a pool, it ran the risk of being classified as a corporation for tax purposes, resulting in double taxation of income, at both the entity and investor levels. If this tax treatment were applied, CMOs could obviously not compete effectively with MPTs and MBBs, the income from which was generally taxable only at the individual level.

As part of the Tax Reform Act of 1986, Congress passed legislation creating real estate mortgage investment conduits (REMICs, pronounced "remmicks"). This legislation provided regulations that, if adhered to, allowed mortgage-backed offerings with multiple security classes to be issued without the risk of taxation at the entity level. The intent of the legislation was to provide the issuer some flexibility in managing a mortgage pool and its income while retaining the basic passive character of the trust and the flow of income to security holders.

Regulatory Provisions

Generally, a REMIC is considered to be a tax entity (not necessarily a legal form of organization such as a corporation or partnership) that can be created by simply selecting a REMIC tax status and maintaining separate records relative to the mortgage pool and the management of funds related to the pool. A corporation, partnership, trust, or association may also elect REMIC status. To retain REMIC status, very stringent rules must be followed by the issuer. For example, substantially all assets must consist of "qualified mortgages," foreclosure property, cash flow investments, and a qualified reserve fund.

1. Qualified mortgages generally include any mortgages secured directly or indirectly by an interest (full or partial) in real estate (residential, commercial, and all other real estate). This definition is very broad and encompasses virtually all first mortgages, participations, seconds, other pass-through securities, and so on. Mortgages must be placed in the pool prior to its creation or within three months thereafter. New mortgages may not be acquired or sold by the REMIC after its creation; however, the REMIC is allowed to substitute new mortgages for defective mortgages up to two years after its creation.

2. Foreclosure property may include real estate, the title to which is retained only by virtue of defaults of a mortgage in the pool.

3. Additional investments are limited to short-term, passive, interest-bearing assets that may be used to reinvest interim cash flows received from mortgages but not yet paid out to investors (e.g., T-bills or guaranteed investment contracts, or GICs).

4. A qualified reserve fund may contain longer-term investments, the income from which may be used to pay expenses for managing the REMIC pool because it may be used as added assurance to investors against losses from defaults on mortgages in the pool. These reserves may take the form of passive investments, letters of credit, mortgage pool insurance, and other forms of credit enhancement. This fund is generally more important for commercial mortgage-backed securities or other mortgages that are not backed by the FHA, VA, or private mortgage default insurance.

REMICs: Other Considerations

Because of the pass-through nature of a REMIC, owners of residual interests (usually the issuers) may avoid including REMIC assets, liabilities, and residual interests in REMICs and may avoid taxes at the entity level. Also, if regulations pertaining to REMICs are followed, the owner of the residual interests does not have to participate in balance-sheet reporting to the public because REMICs are intended to be more like a passive, stand-alone entity. In theory, creation of a REMIC is akin to a sale of assets from an origination to the REMIC with a gain or loss on sale realized by the seller and subject to taxation either immediately or over the life of the REMIC.

As such, the seller no longer carries the assets or liabilities created by the REMIC on its balance sheet. However, if the seller chooses not to recognize gain or loss when the sale of assets to the REMIC occurs, the value of the residual interest owned in the REMIC as an asset will be reported. Generally, this off-balance-sheet accounting treatment has been allowed on issues of mortgage-related securities only if the residual interest was sold or transferred by the issuer to a third party.

In summary, by providing for REMICs, Congress has created a tax-exempt conduit through which CMOs may be issued. This allows for the creation of mortgage-backed securities with multiple maturity classes and other investment choices that would not be available with mortgage pass-through securities. This should provide more choices to more investors and broaden the participation in mortgage-related securities.

Conclusion

The explosion in the market for mortgage-backed securities (MBSs) has led to some of the most significant capital market innovations in recent history. This market began with relatively simple mortgage pass-through securities in which mortgages were pooled, securities were issued, and investors received a pro rata share of principal and interest less servicing fees. Investor concerns over unanticipated cash flow due to borrower prepayment prompted investment bankers and underwriters to innovate and develop the collateralized mortgage obligation (CMO). Rather than simply "passing through" cash flow, the new CMO structure provided for debt securities secured by a mortgage pool. Cash flows were prioritized according to different security classes. Investors in CMOs usually receive a coupon rate of interest and select a priority for the receipt of cash flow from amortization and prepayments on mortgages in the pool. The latter allocation effectively allows investment bankers to pool longer-term mortgages with higher interest rates as security for debt securities that range from short-term, lower interest rate securities to longer-term, higher interest rate securities. More investors can be reached in this structure, with its greater variety of securities, than in a simple pass-through structure. More-recent innovations in this market include stripped securities and inverse floaters. These "derivatives" are intended to broaden the market even further as well as to offer investors the opportunity to hedge and manage interest rate risk.

Web App

The Government National Mortgage Association (Ginnie mae) Web site (www.ginniemae.gov) has prospectuses for current REMIC offerings. Obtain a prospectus for a REMIC and summarize the offering in terms of the number of classes of securities and the rates being offered.

Key Terms

A note, *610*
B note, *610*
collateralized debt obligation (CDO), 610
collateralized mortgage obligations (CMO), *582*
common (residual) equity, *611*
convexity, *602*
default risk, *605*
derivative securities, *581*
extension risk, *606*
first loss position, *607*
floater tranche, *596*
inverse floater tranche, *596*
IO strips, *599*
LIBOR, *596*
lockouts, *606*
managed CDOs, *611*
mezzanine loan, *610*
planned amortization class (PAC) tranche, *596*
PO strips, *600*
preferred equity, *611*
residual, *586*
scaling, *597*
senior tranche, *605*
subordinated tranche, *605*
targeted amortization class (TAC), *596*
tranches, *583*

Useful Web Sites

www.freddiemac.com—Freddie Mac/Federal Home Loan Mortgage Association works to stabilize the nation's mortgage markets for homeowners and affordable rental housing by ensuring there is a continuous flow of funds to mortgage lenders. Freddie Mac purchases mortgages from lenders and provides families with even more affordable mortgage financing. This site offers single and multifamily info as well as business tools.

www.frbservices.org—The Federal Reserves System Financial Services Web site provides transaction capabilities and service information.

www.investinginbonds.org/info/igcmo/overview.htm—Information about investing in CMOs from the Bond Market Association.

www.fanniemae.com—Fannie Mae/Federal National Mortgage Association (privately owned) provides information about becoming a homeowner.

www.ginniemae.gov—Ginnie Mae/Government National Mortgage Association is within HUD and ensures mortgage funds are available throughout the United States, especially in rural and urban areas where it is harder to borrow money. Ginnie Mae guarantees securities backed by pools.

www.hud.gov—U.S. Department of Housing and Urban Development. Includes the Federal Housing Administration (FHA), which is now part of HUD.
See **www.hud.gov/offices/hsg/hsgabout.cfm** for discussion of FHA.

www.va.gov—Department of Veteran Affairs—see **www.homeloans.va.gov/** for information on VA Guaranteed loans.

www.nasdbondinfo.com—This Web site contains transaction information on investment grade, non-investment grade and convertible corporate bonds as reported to NASD TRACE (Trade Reporting and Compliance Engine). In addition, basic descriptive information and credit ratings on individual corporate bonds are available. The transaction data is updated and available on a real-time basis, except for certain transactions in new issues and large transactions [illegible] in less active high-yield bonds.

http://www.intex.com/—Intex.com provides information about the [illegible] in Real Estate Derivative markets, it also provides softwares to estimate cash flows [illegible] modeling.

Questions

1. What is a mortgage pay-through bond (MPTB)? How does it resemble a mortgage-backed bond (MBB)? How does it differ?
2. Are the overcollateralization requirements the same for mortgage pay-through bonds as for the mortgage-backed bonds?
3. Name two different ways that MPTBs can be overcollateralized.
4. What is a CMO? Explain why a CMO has been called as much of a marketing innovation as a financial innovation.
5. What is meant by a derivative investment?
6. Name the four major classes of mortgage-related securities. As an issuer, explain the reasons for choosing one type over another.
7. What is the major difference between a CMO and the other types of mortgage-related securities?
8. Why are CMOs overcollateralized?
9. What is the purpose of the accrual tranche? Could a CMO exist without a Z class? What would be the difference between the CMO with and without the accrual class?
10. Which tranches in a CMO issue are least subject to price variances related to changes in market interest rates? Why?
11. What is the primary distinction between mortgage-related securities backed by residential mortgages and those backed by commercial mortgages?
12. Name the major types of credit enhancement used for commercial-backed mortgage securities.
13. What is a "floater"/"inverse-floater" tranche in a CMO offering?
14. What is the role of the "scaler" in structuring an F and IF structure?
15. Why would anyone want to purchase an F or IF derivative type of investment?
16. What are IO and PO strips? Which tends to be more volatile in price? Why?
17. In what ways is a CMBS structure different from a CMO backed by residential mortgages? Why is default F risk in a CMBS offering given more attention?
18. How do CDOs differ from CMBSs?

Problems

1. The MZ Mortgage Company is issuing a CMO with three tranches. The A tranche will consist of \$40.5 million with a coupon of 8.25 percent. The B tranche will be issued with a coupon of 9.0 percent and a principal of \$22.5 million. The Z tranche will carry a coupon of 10.0 percent with a principal of \$45 million. The mortgages backing the security issue were originated at a fixed rate of 10 percent with a maturity of 10 years (annual payments). The issue will be overcollateralized by \$4.5 million, and issuer will receive all net cash flows after priority payments are made to each class of securities. Priority payments will be made to the class A tranche and will include the promised coupon, all amortization from the mortgage pool, and interest that will be accrued to the Z class until the principal of \$40.5 million due to the A tranche is repaid. The B class securities receive interest-only payments until the A class is repaid, and then receive priority payments of amortization and accrued interest. The Z class will accrue interest at 10 percent until both A and B classes are repaid. It will receive current interest and principal payments at that time.
   a. What will be the weighted average coupon (WAC) on the CMO when issued?
   b. What will be the maturity of each tranche assuming no prepayment of mortgages in the pool?
   c. What will be the WAC at the end of year 3? year 4? year 8?
   d. If class A, B, and Z investors demand an 8.5 percent, 9.5 percent, and 9.75 percent yield to maturity, respectively, at the time of issue, what price should MZ Mortgage Company ask for each security? How much will the company receive as proceeds from the CMO issue?
   e. What are the residual cash flows to MZ? What rate of return will be earned on the equity overcollateralization?
   f. Optional. Assume that the mortgages in the underlying pool prepay at the rate of 10 percent per year. How will your answers in (*b*)–(*e*) change?

   g. Optional. Assume that immediately after the securities are issued in case (*f*), the price of all securities suddenly trades up by 10 percent over the issue price. What will the yield to maturity be for each security?
2. An investor is considering the purchase of either an IO or PO strip from a CMO offering. The portion of the mortgage pool backing this tranche consists of \$1,000,000 in mortgages with a remaining maturity of 10 years and an 8 percent interest rate.
   a. Assuming annual payments and a zero prepayment rate, prepare a schedule showing the IO and PO cash flows that would be payable to investors in this tranche. If the interest rate demanded by investors on this investment is also 8 percent, what would be the prices of the IO and PO strips?
   b. If interest rates *increased* to 10 percent and prepayments remained at a zero rate, how would the price of the IO and PO strips change? Which security, the IO or PO, exhibits the greatest price change from (*a*)? Why?
   c. Investor interest rates now *decline* to 6 percent. What is the price of the IO? PO? Prepayments now increase to a rate of 20 percent per year because mortgage borrowers in the pool begin to refinance at lower interest rates. What would prices for the IO and PO be now? (Assume that the 20 percent prepayment received at the end of each year is based on the outstanding loan balances at the end of the preceding year.) Which security, the IO or PO, exhibits the greatest change in price when compared to (*a*) and (*b*) above? Why? What does this pattern suggest about the relative risk of each security?
3. An issuer is trying to structure a floating rate tranche in a CMO offering. The tranche will be backed by mortgages with an 8 percent interest rate and a current balance of \$2,000,000. Interest payable to investors in the floating rate securities (F) and inverse floater securities (IF) will be based on an initial, or base, market rate of 8 percent. Investors in the F portion of the tranche will benefit to the extent of any *increases* from the base rate of interest and IF investors will benefit to the extent of any *decreases* from the base rate.
   a. Assuming that the F and IF portions of the tranche are equal (50 percent each), what will the share of interest be for each class of investors on the day of issue? A maximum cap must be set on increases in the base rate of interest for the F investors. What would such a cap be? What would be the floor for the IF portion of the offering?
   b. Assume that the IF buyers prefer a leveraged offering. If the terms in (*a*) were altered to a ratio of 60 percent to F investors and 40 percent to IF investors, what would the interest allocation be on the day of issue? What would the cap and floor be?
   c. Compare the terms in (*a*) and (*b*). Assume now that a 2 percent *increase* from the base rate of 8 percent occurs immediately after the CMO offering. What happens to the cash distributions to the F and IF investors? Assume that a 2 percent *decrease* from the base rate occurs. What happens to cash distributions? Which class of investors experiences more volatility in cash flow and, therefore, price volatility? Why?
4. **Excel.** Refer to the "Ch20 CMO" tab in the Excel Workbook provided with the book. What is the return on the residual class for prepayment rates of 15 percent, 20 percent, 25 percent, and 30 percent?
5. **Excel.** Refer to the "Ch20 Floater" tab in the Excel Workbook provided with the book. Assume that \$15,000,000 in floaters is issued and \$5,000,000 in inverse floaters. How does this change the returns for the inverse floater when LIBOR is 2 percent, 4 percent, and 6 percent?

www.mhhe.com/bf13e

6. **Excel.** Refer to the "CH20 IO_PO" tab in the Excel Workbook provided with the book. What is the return on the IO and PO at prepayment rates of 25 percent and 30 percent?
7. **Excel.** Refer to the "Ch20 CMBs" tab in the Excel Workbook provided with the book. Suppose there is default at maturity and the property sells for 90 percent of the loan balance. What are the returns to the subordinate tranche and residual?

Appendix

Duration—An Additional Consideration in Yield Measurement

We have presented many examples of mortgage-related or derivative securities. Recall that most mortgage-backed bonds (MBBs) are very much like corporate bonds in that they promise a coupon rate of interest and repayment of principal at maturity. Mortgage pass-throughs (MPTs) also promise an interest payment; however, principal is also passed through to the investor from the mortgage pool as it is received from borrowers. Hence, repayment of principal is received over the life of the MPT security. Collateralized mortgage obligations (CMOs) differ from both of the above securities. They promise a coupon rate of interest but also promise priority to some tranches of securities concerning receipt of interest and principal payments as they are made into the pool. Interest on some tranches may be deferred and distributed after repayment of principal on other tranches with a higher priority.

The very different patterns of cash flows on the securities just described raise significant problems when investors are comparing yields. These problems come about because if the yield to maturity (*IRR*) is the tool used to measure return on investment, it is possible for the investments to have the same yield but drastically different cash flow patterns. How should two securities with the same yield but different cash flows be compared? Should the magnitude and timing of each cash flow be taken into account as an additional consideration when comparing the investments?

One measure that has been developed to aid in the analysis is *duration*. Recall that it is a measure that takes into account *both* size of cash flows and timing of receipt. Specifically, it is a measure of the *weighted-average* time required before all principal and interest are received on an investment.

Duration (D) is defined mathematically as:

$$D = \sum_{t=1}^{n} w_t(t)$$

where t is the time period in which a payment is received, n is the total number of periods during which payments will be received, and w is a weight representing the annual proportion of the investment's present value received each year. If we assume that security A has a current price of $10,000 and a coupon of 10 percent, that its maturity is five years and interest only is to be paid to investors annually, the yield to maturity, or *IRR*, would be calculated for the investment as follows:

$$\$10{,}000 = \$1{,}000(PVIFA, ?\%, 5 \text{ yrs}) +$$
$$= \$10{,}000(PVIF, ?\%, 5 \text{ yrs})$$

Substituting an estimated interest rate of 10 percent, we have:

$$= \$1{,}000(3.790787) + \$10{,}000(.620921)$$
$$= \$10{,}000$$

Hence, we know that the yield to maturity on the bond is 10 percent.

Alternatively, if we assume that investment B is also priced at $10,000, and that five payments of principal and interest equal to $2,637.97 are to be received annually at the end of each year for five years, the yield to maturity would also be 10 percent. This can be seen as follows:

$$\$10{,}000 = \$2{,}637.97(PVIFA, ?\%, 5 \text{ yrs})$$
$$= \$2{,}637.97(3.790787)$$
$$= \$10{,}000$$

Hence, by construction, both yields are 10 percent. However, when cash flows are compared, they differ dramatically. Duration provides us with a measure that can be used to determine the weighted-average time to full recovery of principal and interest payments. More specifically, for a required rate of return (i), the weight (w) for each period (t) is computed as:

$$w_t = t\left[\frac{\frac{R_t}{(1+i)^t}}{PV}\right] \text{ where } PV = \sum_{t=1}^{n}\frac{R_t}{(1+i)^t}$$

Given the above defined terms, we calculate duration for any asset (j) as:

$$D_j = (1)\left[\frac{\frac{R_t}{(1+i)^1}}{PV}\right] + (2)\left[\frac{\frac{R_2}{(1+i)^2}}{PV}\right] + \dots (n)\left[\frac{\frac{R_n}{(1+i)^n}}{PV}\right]$$

Note in this equation that the proportion that each cash flow received in each period (R_t) bears to the present value (or price) of the investment is calculated and multiplied by the year in the sequence during which each cash flow is received.

In our example, we would have for investment A:

$$D_A = (1)\left[\frac{\frac{1{,}000}{(1+.10)^1}}{10{,}000}\right] + (2)\left[\frac{\frac{1{,}000}{(1+.10)^2}}{10{,}000}\right] + (3)\left[\frac{\frac{1{,}000}{(1+.10)^3}}{10{,}000}\right] + (4)\left[\frac{\frac{1{,}000}{(1+.10)^4}}{10{,}000}\right] + (5)\left[\frac{\frac{\$11{,}000}{(1+.10)^5}}{10{,}000}\right]$$

$$= .0909 + .1653 + .2254 + .2732 + 3.4151$$
$$= 4.170 \text{ years}$$

For investment B we have:

$$D_B = (1)\left[\frac{\frac{2{,}367.97}{(1+.10)^1}}{10{,}000}\right] + (2)\left[\frac{\frac{2{,}367.97}{(1+.10)^2}}{10{,}000}\right] + (3)\left[\frac{\frac{2{,}367.97}{(1+.10)^3}}{10{,}000}\right] + (4)\left[\frac{\frac{2{,}367.97}{(1+.10)^4}}{10{,}000}\right] + (5)\left[\frac{\frac{2{,}367.97}{(1+.10)^5}}{10{,}000}\right]$$

$$= .2398 + .4360 + .5946 + .7207 + .8190$$
$$= 2.810 \text{ years}$$

From the preceding calculations, we can see that the duration (D) for investment B is lower than the duration for investment A. This implies that although the yields and maturities on the two investments are identical, the weighted-average number of years required to realize total cash flows from investment B is far less than that for A. Hence, depending on the likelihood of better reinvestment opportunities as cash flows are received each year, the investor may choose investment B over A. For example, if the yield curve is expected to take on a more steep, positive slope, the larger cash flows from investment B may be viewed as more favorable, as it may be possible to reinvest them at higher rates of interest.

Duration is also a measure of the extent to which different investments expose investors to interest rate risk. For example, if interest rates were to increase suddenly, it is clear that the price of investment A, with its longer duration, is likely to decline by a greater amount than that of B. For example, if interest rates suddenly increased to 15 percent, the likely percentage change in the prices of the two securities can be approximated as follows:

$$\text{\% decline in price of investment} = -D\left(\frac{\Delta i}{1+i_t}\right) \text{ when } \Delta i > 0 \text{ and}$$
$$D\left(\frac{\Delta i}{1+i_t}\right) \text{ when } \Delta i < 0.$$

In our example for A we have:

$$\text{\% decline} = -4.170\left(\frac{.05}{1.10}\right)$$
$$= -.1895, \text{ or an 18.95\% decline in price to \$8,105}$$

For B we have:

$$\text{\% decline} = -2.180\left(\frac{.05}{1.10}\right)$$
$$= -.0991, \text{ or a 9.91\% decline in price to \$9,009}$$

Other applications of duration may involve a portfolio, or pool, of assets and liabilities where each component of the portfolio may have different cash flow patterns and the same or different maturities. When assessing exposure to interest rate risk, duration provides a better measure of risk exposure than reliance on a simple weighted-average maturity for assets and liabilities because it takes into account the magnitude and timing of cash flows. To illustrate, if investment A represented an asset and B represented a liability even though the maturities for both investments are equal (five years) and there was an interest rate change to 15 percent, the market value of our asset A ($8,105) would be less than that of liability B ($9,009). Depending on the circumstances, this imbalance could cause serious problems for a portfolio manager of an investment fund or an asset-liability manager of a financial institution. Hence, in addition to making yield comparisons, duration may provide an alternative approach to matching assets and liabilities that fluctuate in value when interest rates change.

Effective Duration

When dealing in the world of mortgage pools and derivative investments, the notion of *effective duration* is used. Because prepayment rates are estimated when analyzing these investments, the above, or standard, measure of duration is modified to take into account various rates of prepayments on cash flows. The standard duration formula detailed above is modified to take account of changes in cash flow (faster or slower repayment at various interest rates). An estimate of duration is made for a range of various assumptions regarding prepayment and is referred to as "effective" duration.

Problem

A–1. The Provincial Insurance Company has the choice of investing $100,000 in either a mortgage bond with annual payments based on a 10-year amortization schedule with a maturity of five years at 10 percent or a 5-year corporate bond with annual interest payments and a final principal payment also yielding 10 percent.

a. Find the duration of each instrument if they are issued at par.

b. If the market rate of interest on each bond fell from 10 percent to 7 percent and the durations found in part (*a*) remained constant, what would be the new price for each bond?

Chapter 21

Real Estate Investment Trusts (REITs)

Introduction

The concept of the real estate investment trust goes back to the 1880s. In the early years, trusts were not taxed if trust income was distributed to beneficiaries. In the 1930s, however, a Supreme Court decision required all passive investment vehicles that were centrally organized and managed like corporations to be taxed as corporations. This included real estate investment trusts.

Stock and bond investment companies, also affected by the same Supreme Court decision, promptly secured legislation (in 1936) that exempted regulated investment companies, including mutual funds, from federal taxation. At this time, real estate trusts were not organized to press for equal consideration, and the trust did not develop into importance as a legal form for investing in real estate.

After World War II, however, the need for large sums of real estate equity and mortgage funds renewed interest in more extensive use of the **real estate investment trust**, which also became known as the **REIT** (pronounced "reet"), and a campaign was begun to achieve for the REIT special tax considerations comparable to those accorded mutual funds. In 1960, Congress passed the necessary legislation.

Legal Requirements

A real estate investment trust is basically a creation of the Internal Revenue Code. It is a real estate company or trust that has elected to qualify under certain tax provisions to become a pass-through entity that distributes to its shareholders substantially all of its earnings in addition to any capital gains generated from the sale or disposition of its properties. In accordance with the tax provisions under which it was established, the real estate investment trust does not pay taxes on its earnings, but the distributed earnings do represent dividend income to its shareholders and are taxed accordingly. Similarly, any distributed capital gains are taxed at the shareholder's applicable tax rate.

Effective January 1, 1961, special income tax benefits were accorded a new type of investment institution by an amendment to the Internal Revenue Code (Sections 856–858). Under this amendment, a real estate investment trust meeting prescribed requirements during the taxable year may be treated simply as a conduit with respect to the income distributed to beneficiaries of the trust. Thus, the unincorporated trust or association ordinarily taxed as a corporation is not taxed on distributed taxable income when it qualifies for the special tax benefits. Only the beneficiaries pay the tax on the distributed income. To qualify as a real estate investment trust for tax purposes, the trust must satisfy the following requirements:

Asset Requirements

- At least 75 percent of the value of a REIT's assets must consist of real estate assets, cash, and government securities.
- Not more than 5 percent of the value of the assets may consist of the securities of any one issuer if the securities are not includable under the 75 percent test.
- A REIT may not hold more than 10 percent of the outstanding voting securities of any one issuer if those securities are not includable under the 75 percent test.
- Not more than 20 percent of its assets can consist of stocks in taxable REIT subsidiaries.

Income Requirements

- At least 95 percent of the entity's gross income must be derived from dividends, interest, rents, or gains from the sale of certain assets.
- At least 75 percent of gross income must be derived from rents, interest on obligations secured by mortgages, gains from the sale of certain assets, or income attributable to investments in other REITs.

Distribution Requirements

- Distributions to shareholders must equal or exceed the sum of 90 percent of REIT taxable income.

Stock and Ownership Requirements

- Be taxable as a corporation.
- Be managed by a board of directors or trustees.
- Have shares that are fully transferable.
- Shares in a REIT must be transferable and must be held by a minimum of 100 persons.
- No more than 50 percent of REIT shares may be held by five or fewer individuals during the last half of a taxable year.

Prior to 1986, a management activity restriction existed to ensure the passive nature of REITs. Trustees, directors, or employees of a REIT were not permitted to actively engage in managing or operating REIT property, rendering services to tenants of REIT property, or collecting rents from tenants. These functions are generally performed by an independent contractor. In 1986, the Tax Reform Act relaxed the management limitations, allowing REITs to render normal and customary maintenance and other services for tenants, eliminating the need for an outside independent contractor for property-related functions like property management. The result of this change is that REIT managers now have the ability to internalize these functions, creating vertically integrated operating companies and fundamentally altering the REIT vehicle.

In the pre-1986 era, many REITs were organized or sponsored by a financial institution, such as an insurance company, a commercial bank, or a mortgage banker. The sponsoring institution also served as an advisor to the REIT, either directly or through an affiliate. Responsibility was delegated to the advisor for managing the operations of the REIT, including management of the REIT's assets and liabilities. Following the 1986 Tax Act, the REIT became a more attractive vehicle for real estate developers who had not been interested in a passive investment vehicle. Real estate developers and operators have become the dominant sponsors of REITs, particularly for larger companies.

There were two landmark initial public offerings that helped to shape the modern REIT industry. The first was the 1991 Kimco Realty offering, which was the first offering of a modern vertically integrated REIT, providing its own property and asset management. Although some existing REITs adapted following the 1986 Act, Kimco Realty was the first significant REIT initial public offering designed to be internally managed and advised. The second significant offering was the Taubman Realty offering, which launched the public **umbrella partnership REIT,** or UPREIT.

An **UPREIT** is a REIT that owns a controlling interest in a limited partnership that owns the real estate, as opposed to a traditional structure in which the REIT directly owns the real estate. This structure was created in 1992 as a tax-deferred mechanism through which real estate developers and other real estate owners could transfer their properties to the REIT form of ownership. Since the transfer is an exchange of one partnership interest for another, it is not a taxable event. These partnership interests, known as operating partnership units, or OP units, are generally convertible into shares of the REIT, offering voting rights and dividend payments matching those of the REIT shares.

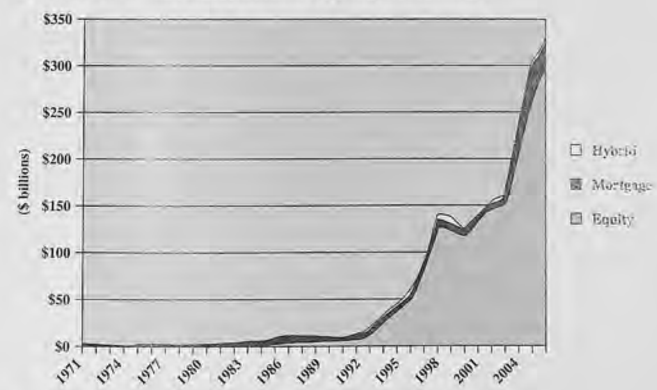
In 1992, traditional real estate capital sources were largely absent from the market, creating a credit crunch. In these conditions, the "modern" REIT structure featuring active management and tax deferred exchanges of assets was attractive to owners and investors alike. The result was massive growth in REIT equity market capitalization, as shown in Exhibit 21–1.

The vast majority of today's equity REITs are self-advised, vertically integrated operating companies. They actively manage their portfolios in an effort to grow their cash flow and their portfolios, a fundamentally different entity from the earlier "passive" REIT. The industry continues to change in response to real estate market dynamics and investor preferences.

Tax Treatment

One area of importance in accounting for REITs is the treatment of depreciation for financial reporting and the determination of taxable income. For example, a REIT may use an accelerated method of depreciation in its determination of taxable income, but when

EXHIBIT 21–1 Market Capitalization of Publicly Traded REITs



Source: Data from www.nareit.org.

determining income available for dividends it is required to use a 40-year asset life. The use of inconsistent methods of income calculation sometimes results in shareholders receiving dividends in excess of the REIT's calculated taxable income. However, to the extent that the distribution represents a return on investment, these dividends will be taxed as ordinary income. In May 2003, the U.S. Congress passed the Jobs and Growth Tax Relief Reconciliation Act, which cut income tax rates on most dividends to a 15 percent maximum. Because REITs do not generally pay corporate taxes, the majority of REIT dividends continue to be taxed as ordinary income at prevailing tax rates. Any additional amounts distributed, such as those representing depreciation, will be considered a return of original capital and thus will simply reduce the shareholder's tax basis. REITS report the breakdown of their distribution annually on Form 1099 and investors may choose to hold specific REITs in taxable or nontaxable accounts based on the breakdown of their distribution.

Violation Penalties and Status Termination

In the event that an entity fails to qualify as a REIT or voluntarily revokes its REIT status, the entity's election to be taxed as a REIT terminates for that and subsequent years. Once this termination has occurred, the entity cannot make a new election to be taxed as a REIT until five years after the termination date. However, if the entity's REIT status was terminated as a result of a failure to satisfy the qualifying requirements, the entity may reelect REIT status within the five-year time period if it can prove to the IRS that its failure to qualify was due to reasonable cause and not willful neglect. In October 2004, a corporate tax reform bill was signed into law which provided the IRS with the ability to impose monetary penalties in lieu of loss of REIT status for reasonable-cause violations.

Taxable REIT Subsidiaries

In 1999, the REIT Modernization Act (RMA) was signed into law. The RMA contained several provisions designed to allow REITs to compete more effectively with other owners of commercial real estate. Prior to the RMA, there were restrictions that prohibited REITs from providing services to tenants beyond those "usual and customary" to their industry. For example, an office REIT might lease furniture to tenants. A shopping center REIT might offer its own credit card to customers. If REITs provided services beyond "usual and customary," the income from the property where the services were provided was treated as not being qualifying real estate income. As the real estate industry continues to evolve, "usual and customary" has become more difficult to define and monitoring compliance became very expensive. Given the risk associated with large amounts of nonqualifying income (possible loss of REIT status), some REITs were reluctant to provide services, limiting their ability to complete.

The RMA also provided for the establishment of the taxable REIT subsidiary (TRS) that can be 100 percent owned by a REIT. Under the new law, a TRS can provide services to REIT tenants and others, pay any associated income tax, and pass the income up to the REIT as qualifying income. Taxable REIT subsidiaries were designed to replace a previous structure under which REITs owned partial interests in non-REIT C-corporations. Those C-corporation structures had significant conflicts of interest. The TRS structure eliminated many of those conflicts. The RMA also provided for limitations on debt and rental payments between the REIT and the TRS and a 100 percent excise tax on any transaction between the TRS and an affiliated REIT not negotiated as an arm's-length transaction.

Types of Trusts

The three principal types of publicly traded real estate trusts are *equity trusts, mortgage trusts,* and *hybrid trusts.* There are also REITs that are not listed on an exchange or traded

over the counter, which are generally called "private" REITs. The equity trust was prevalent in an early period, but during the mid-1970s, the mortgage trust became more important. More recently, the equity trust has again grown in importance and is now the dominant REIT type by both number and market capitalization figures.

The difference between assets held by the equity trust and those held by the mortgage trust is fairly obvious. The equity trust acquires property interests, while the mortgage trust purchases mortgage obligations and thus becomes a creditor with mortgage liens given priority to equity holders. Over time, more heterogeneous investment policies have developed which combine the advantages of both types of trusts to suit specific investment objectives. Such combinations are called *hybrid trusts.*

Equity Trusts

Most REITs specialize by property type; some specialize by geographic location. Others specialize by both property type and location. Not all REITs specialize; some diversify by both property type and geographic location. Specialization implies a concentration of effort to create a comparative advantage. REITs and analysts generally use the term *specialization* to cover a fairly broad range of concentration. In reality, specialization is a matter of degree. The extent to which a REIT is specialized impacts the risks associated with ownership of the REIT. Therefore, it is important to determine how specialized an individual REIT is in comparison with other REITs, in order to assess relative risks. For purposes of description, equity trusts have generally been broken down by property type specialization. The National Association of Real Estate Investment Trusts (NAREIT) divides Equity REITS into the following property types:

1. **Industrial/Office.** These REITs are further subdivided into those that own industrial, office, or a mix of office and industrial properties. Some analysts further segregate these REITs by property location (i.e., whether they are in central business district [CBD] or suburban locations).
2. **Retail.** These REITs are further subdivided into those that own strip centers, regional malls, outlet centers, and free-standing retail properties.
3. **Residential.** These REITs are further subdivided into those that own multifamily apartments and manufactured home communities. Some analysts further segregate those REITs that own student and military housing.
4. **Diversified.** REITs that own a variety of property types.
5. **Lodging/Resorts.** REITS that primarily own hotels, motels, and resorts.
6. **Health Care.** These REITs specialize in owning hospitals and related health care facilities that are leased back to private health care providers who operate such facilities. This is a highly specialized form of REIT and one which many do not consider to be a "true, real estate-backed" security.
7. **Self-Storage.** These REITs specialize in ownership of self-storage facilities.
8. **Specialty.** These REITs specialize in numerous types of properties, including prisons, theaters, golf courses, cellular towers, and timberland. Specialty REITs have been a rapidly evolving segment of the industry.

The distribution of REIT ownership by property type changes over time. In September 1991, residential properties accounted for more than half of all total publicly traded REIT real estate investments, followed by office, retail, health care, industrial, hotels, and other properties. By mid-year 2003, industrial/office REITs represented the largest sector at just over one-quarter of the total, followed by retail, residential, diversified, lodging/resorts, health care, self-storage, and specialty properties. Concept Box 21.1 lists the largest U.S. REITs as of December 2005.

[T]wenty-five Largest U.S. REITs by Market Capitalization, as of December 31, 2005

Concept Box

Company	Sector	Market Capitalization ($ thousands)
1. Simon Property Group	Retail	16,938.8
2. Equity Office Properties Trust	Office	12,332.6
3. Vornado Realty Trust	Diversified	11,715.5
4. ProLogis Trust	Industrial	11,328.2
5. Equity Residential	Apartment	11,233.1
6. General Growth Properties	Retail	11,162.7
7. Archstone-Smith Trust	Apartment	8,880.3
8. Public Storage Inc.	Storage	8,773.9
9. Boston Properties	Office	8,340.3
10. Kimco Realty Corp.	Retail	7,281.1
11. Host Marriott Corp.	Hotel	6,679.5
12. Plum Creek Timber Co.	Specialty	6,626.2
13. AvalonBay Communities	Apartment	6,490.7
14. Developers Diversified Realty	Retail	5,098.7
15. Duke Realty Corp.	Diversified	4,773.7
16. AMB Property Corp.	Industrial	4,201.9
17. Macerich Company	Retail	3,970.8
18. Liberty Property Trust	Diversified	3,781.2
19. Regency Centers Corp.	Retail	3,588.3
20. Apartment Investment & Mgmt.	Apartment	3,584.3
21. Trizec Properties	Office	3,531.1
22. Health Care Property Investors	Health care	3,472.7
23. Weingarten Realty Investors	Retail	3,376.7
24. Ventas Inc.	Health care	3,291.2
25. United Dominion Realty Trust	Apartment	3,215.6

Source: NAREIT.

REITs may also be categorized by other variables, including duration of the trust, or finite-life versus nonfinite-life REITs. A finite-life (or self-liquidating) REIT is undertaken with the goal of disposing of its assets and distributing all proceeds to shareholders by a specified date. These REITs were instituted in response to the criticism of many investors that the prices of REIT shares tended to behave more like shares of common stock; that is, they were based on current and expected future earnings instead of the underlying real estate value of the REIT. Hence, by the establishment of a terminal distribution date, it is argued that REIT share prices would more closely match asset values because investors could make better estimates of the terminal value of the underlying properties. This, it is argued, is not the case with nonfinite-life REITs, which reinvest any sale and financing proceeds in new or existing properties and tend to operate more like a going concern, as opposed to an investment conduit. One potential problem with finite-life REITs has to do with general market conditions at the time the REIT plans to dispose of assets. If interest rates are high and occupancies and rents are low, the timing of such disposition activity may not be good and distribution dates may have to be extended. Most new REITs are nonfinite-life REITs, and several existing finite-life REITs amended their articles of incorporation to become nonfinite-life REITs.

The Investment Appeal of Equity Trusts

The equity-oriented real estate investment trust has provided investors with opportunities (1) to invest funds in a diversified portfolio of real estate under professional management

and (2) to own equity shares that trade on organized exchanges, thus providing more liquidity than if a property were acquired outright. Because the individual investor has the opportunity to pool his or her resources with those of persons of like interests, funds are assembled to permit purchase of buildings, shopping centers, and land in whatever proportion seems to offer the most attractive returns. Investments must be approved and management activities reviewed by a board of trustees who are accountable to shareholders and are ordinarily well qualified to make such decisions. The trust certificate is usually readily salable in the over-the-counter market or on major stock exchanges. The tax exemption feature of REITs places the small shareholder in a tax position similar to that of an individual real estate operator making the same investment. Investments in REITs may also be made through mutual funds specializing in REIT securities. There are also a number of real estate and REIT exchange-traded funds (ETFs) and closed-end funds.

The REIT market is continually evolving as new investment alternatives emerge and mature. One of the most prominent recent developments has been the emergence of international REIT investments. Capital flows have increased substantially as investors explore and invest in global real estate opportunities in an effort to diversify their portfolios. International REIT investment has occurred in two major ways: via cross-border investment in U.S. and foreign REITs and via existing U.S. REITs that are building international portfolios. It is now relatively easy for investors to find alternative mechanisms that allow them to get exposure to international real estate.

The introduction of REITs and similar vehicles in markets such as Japan, France, Australia, and Singapore has eased the flow of capital in and out of international markets. REIT or REIT-like structures are also planned for the United Kingdom and other major international markets. Because real estate is fixed in place, investing across markets offers the opportunity to secure significant diversification benefits. REIT and real estate ownership structures vary across countries, so there is considerable potential that these structural differences, combined with varying national economic cycles, will produce relatively low cross-correlations among global real estate markets. In an increasingly global capital market, U.S. and foreign REITs are adapting to changing conditions to offer competitive investment products, much like other industry sectors. See Concept Box 21.2 for an overview of international REITs.

Caveats

As described above, when an equity REIT is created, existing properties or projects to be developed will be acquired as investments. In addition, during the life of the REIT, management fees, advisory fees, and commissions will be paid to affiliates and other parties doing business with the trust. Typically, a real estate owner working with an investment banker can form a REIT that is capitalized through a public securities offering. The REIT may then use the funds it has raised to acquire the owner's properties. The prices that prevail in these transactions are generally not based on arm's-length negotiations and there is generally no appraisal or other independent indication of value.

Obviously, the formation transactions and the close association of REITs with other real estate organizations or individuals who sponsor them can create potential conflicts of interest or conflicts. These conflicts can come in several forms, including preferential treatment given to properties owned by management but not owned by REIT investors, and so on. Investors have reacted harshly to REITs perceived as "holding out" properties of exceptional value and have forced management to make provision for the REIT to acquire all noncontributed properties. Other conflicts include managers negotiating an excessive price for their contributed real estate operating companies, including third-party management contracts. The UPREIT form adds more potential conflicts, including the fact that OP units holders, often the managers, have a different tax position relative to contributed properties, and a sale or refinancing of properties they contributed may be taxable. A number of safeguards attempt

The real estate investment trust (REIT) system was born in the United States in 1960 and REIT markets later opened in the Netherlands, Australia, and Puerto Rico. The Japanese REIT market was launched on the TSE in March 2001, making Japan the thirteenth country in the world to launch a REIT market.

After the Japanese REIT market was launched, REIT structures were introduced in South Korea, Hong Kong, Taiwan, and other Asian countries. Later, in Europe, France launched a system in 2003 and the UK and Norway are presently considering the introduction of a similar system.

This chapter focuses on REITs, which have become the dominant fund real estate securitization product in the world today. The following is a summary of overseas REIT structures that are currently being used and analyses of characteristics, common areas, and differences of the respective systems.

This chapter presents overseas REITs from the eight countries of America (REIT), Canada (C-REIT), the Netherlands (FBI), Belgium (SICAFI), France (SIIC), Australia (LPT), Singapore (S-REIT), and South Korea (K-REIT). The Comparative Table of REIT Systems that presents a direct comparison between the various systems also includes Japan (J-REIT), Malaysia (PTF), Hong Kong (H-REIT), and Turkey (REIC).

For ease of comparison between the world's primary REITs, the figure below has organized the REIT comparison by the 10 categories of (1) Date established, (2) Legal system, (3) Fund format, (4) REIT requirements, (5) Asset and income requirements, (6) Liability limitations (liability ratio), (7) Dividend requirements, (8) REIT taxation, (9) Source taxation of overseas stockholders, and (10) Market data.

The structures of REITs are largely dependent on the tax law of each country as it is essential for REITs to serve as non-taxable conduits for tax purposes and that there be no double taxation at the REIT level and investor level specifically for the REIT investment. REITs can be broadly categorized into those systems that are purely based on the taxation system such as in America and the Netherlands and those countries that base them on an investment trust law where real estate investments have been incorporated into collective investment structures and the taxation system.

Although REITs are based on either the American structure (tax) or Australian structure (trust law), most countries base their structure on the closed-end Australian style that uses a trust as the vehicle to collect the investors' investments and is externally managed by an asset management company. However, there is a clear trend toward the American style of external management rather than internal management, and from just being engaged in passive investment rental real estate to also include development properties.

There are many methods for securing the pass-through nature of the investment entity, the most popular being either pay-through or pass-through. The most common method employed is pay-through: this allows paid dividends to be deducted as expenses. Each country has established different requirements for being recognized as a REIT including dividend requirements, various organizational requirements, asset and income requirements, and liability limitations. A structure is recognized as a REIT when the organizational requirements are met. These include minimum capital amounts, minimum number of stockholders, public placement requirements, listing requirements, asset and income requirements such as the content and ratio of owned assets, investor restrictions' business content, and limits on debt ratios. Almost all of the countries require a certain level of dividend to be paid as a minimum dividend requirement.

The capital gains from selling the real estate are handled very differently between countries. There are countries that make the capital gains tax free, others that make them tax free if reinvested, others that do not include them in dividend requirements, and others that tax the capital gains by including them in ordinary income.

Comparison of REIT Systems

	1	2	3	4	5	6	7	8	9	10	11	12
Country	United States	Canada	Netherlands	Belgium	France	Australia	Japan	Singapore	Korea	Malaysia	Hong Kong	Turkey
System	Real Estate Investment Trusts (REIT)	Real Estate Investment Trusts (C-REIT)	Fiscale Beleggingsinstelling (FBI)	Société d'Investissement à Capital Fixe Immobilière (SICAFI)	Société d'Investissements Immobiliers Cotées (SIIC)	Listed Property Trust (LPT)	Real Estate Investment Trust (J-REIT)	S-REIT	K-REIT (Ordinary REIT, CR-REIT)	Property Trust Funds (PTF)	H-REIT	Real Estate Investment Company (REIC)
1 Data Established	1960	1993	1969	1995	2003	1971	2000	1999	2001	1986	2003	1985
2 Legal System												
2-(1) Tax law	Internal Revenue Code (IRC)	Income Tax Law	Corporation Tax Law	Income Tax Law	Income Tax Law, tax bulletins	Income Tax Law	Corporation Tax Law	Income Tax Act, individual bulletins	Corporation Tax Law	Income Tax Act	Income Tax Law	Income Tax Law
2-(2) Related laws	Corporate law of each state, Trust Law, Securities Act of 1933: Securities and Exchange Act of 1934	Trust law of each province and securities law of each province	Act on the Supervision of Collective Investment Schemes	Act of December 4, 1990, Royal Decree of April 10, 1995	2003 Budget Law	Corporate Act, MIA Law	Investment Trusts and Investment Corporations Law, Securities and Exchange Law	Securities and Futures Act 2001, Guidelines for Property Funds	Real Estate Investment Company Law	Securities Commission Act 1993, Guidelines on Property Trust Funds	Securities and Futures Ordinance, Code on Real Estate Investment Trusts	Capital Market Law, communiques
2-(3) Stock exchange	New York (NYSE), American, NASDAQ	Toronto (TSX)	Euronext Amsterdam	Euronext Brussels	Euronext Paris	Australia (ASX)	Tokyo (TSE)	Singapore (SGX)	Korea	Kuala Lumpur (KSE)	Hong Kong	Istanbul (ISE)
2-(4) Competent regulatory authorities	Securities and Exchange Commission	Securities and Exchange Commission of each province	Netherlands Authority for the Financial Markets (AFM)	Banking, Finance and Insurance Commission (BFIC)	Financial Market Authority (AMF)	Australian Securities and Investments Commission (ASIC)	Financial Services Agency	Monetary Authority of Singapore (MAS)	Ministry of Construction and Transportation, Financial Supervisory Commission (CR)	Securities Commission (SC)	Securities and Futures Commission (SFC)	Capital Markets Board (CMB)
2-(5) Collective Investment Scheme	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
3 Fund Format												
3-(1) Listed/Unlisted	Both	Both	Both	Only listed	Only listed	Both	Both	Both	Both	Both	Only Listed	Only Listed
3-(2) Closed-end/Open-end	Closed-end	Both types exist	Closed-end	Closed-end	Closed-end	Closed-end	Both (Only closed-end exists)	Closed-end	Closed-end	Closed-end	Closed-end	Closed-end
3-(3) Externally managed/ Internally managed	Both (most internally managed)	Large internally managed, small externally managed	Both	Both	Internally managed	Externally managed	Externally managed	Externally managed	Internally managed (general), externally managed (CR)	Externally managed	Externally managed	Internally managed
3-(4) Fund vehicle	Corporation, Trust	Corporation, Trust	Corporation, Trust	Corporation, etc	Corporation	Trust	Corporation, Trust	Corporation, Trust	Corporation	Trust	Trust	Corporation
4 REIT Requirements												
4-(1) Organizational requirements	Not financial institution or insurance company: taxed as domestic company: managed by more than one officer or trustee	Canada resident unit trust, business objective is limited to the acquisition, ownership, maintenance, renovation and management of real estate	Approval from AFM	Permission from the Belgian BFIC; after initial registration, 30% or more of stocks with voting rights must be publicly placed within one year	Main business objective is the acquisition and construction of rental property (including direct and indirect ownership of other corporations with the same objectives)	Register with ASIC: managed by external management company (RE)	Investment corporation registered with Financial Services Agency; investment corporation that satisfies the following "Minimum number of stockholders" or "Public offering requirements"	Management by management company approved by MAS; the management company must be a listed firm established in Singapore	At establishment, the stockholders shall own at least 10% of stocks (limit of 30%)	Management company must be a listed firm established in Malaysia: management company shall be a subsidiary of a financial institution or subsidiary of a developer	Management company must be certified by SFC	Use the "real estate investment trust" trade name: stockholders must have a certain income and satisfy asset ownership requirements, must not be involved in business, industry and agriculture outside of legally allowed transactions: must not be involved in capital market activities other than for managing its own portfolio, must not be involved in construction activities
4-(2) Minimum paid-in capital			BV 180,000 euros, NV 450,000 euros	1.2 million euros	15 million euros		100 million yen		50 billion won	100 million ringgit		1 trillion Turkish lira
4-(3) Minimum number of stockholders	100	150					Ownership by more than 50 individuals or qualified institutional investor			1,250 (each stockholder must own at least 1,000 stocks)		
4-(4) Public offering requirements				Public offering of 30% or more of stocks with voting rights			On establishment, publicly offered and total amount of at least 100 million yen		Public offering of at least 30% on establishment (general)	Public offering of at least 25%		Publicly place 49% or more
4-(5) Specific stockholder shareholder ownership regulations (including foreign ownership)	5 people or less must not hold more than 50%	Foreign ownership up to 49%	Specific foreign stockholders cannot hold more than 25% directly or indirectly; retail investor must not hold more than 25% of BI stocks				3 or lower stockholders may not own more than 50% of the total stock value: More than 50% of stock must be placed domestically (written in bylaws)		Specific stockholders limited to 10% ownership of stocks (general)	Foreign ownership of up to 30%		

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to protect investors against the problems of such conflicts, including the provision in the articles of incorporation of most REITs that a *majority* of the trustees or directors may not be affiliated with the sponsors of a REIT. Some REITs also engage independent appraisers to determine whether the purchase prices of properties acquired from the sponsors are at fair market value and that "fees paid to the REIT's management and advisory companies are reasonable." Many REITs are "self-advised" and avoid many of these conflicts by not using external advisors. Self-advised REITs will disclose and identify specific managers, their responsibilities, compensation, and so on, thereby providing information that investors can use when evaluating the shares. Additional safeguards have been put in place via the Sarbanes-Oxley regulations regarding disclosures by publicly traded companies.

Private REITs

Although most REITs trade on one of the established securities markets, there is no requirement that REITs be publicly traded. REITs that are not listed on an exchange or traded over-the-counter are called private REITs. Technically, in many cases these REITs are actually public companies, but are not listed.

The National Association of Real Estate Investment Trusts (NAREIT) classifies three typical types of private REITs as follows: (1) REITs targeted to institutional investors that take large financial positions, (2) REITs syndicated to investors as part of a package offered by a financial consultant, (3) "incubator" REITs that are funded by venture capitalists with the expectation that the REIT will develop a sufficient track record to launch a public offering in the future.

While there are some prominent REITs that are targeted to institutional investors or formed as an incubator, REITs syndicated to investors have experienced rapid growth and have become a major factor in property markets. The four major companies offering public unlisted REITs targeted to individual investors expected to raise approximately $8.5 billion in new equity in 2003 alone. They have become major players in prominent markets, largely in response to their need to invest this new capital.

Unlisted REITs typically sell subscriptions of shares through financial planners to investors at a fixed price. Some portion of that initial price is paid out to the financial planner as a "marketing" fee, and some portion of that price is paid to the unlisted REIT's advisor. The remaining funds are then used to purchase assets that fit within the unlisted REITs stated investment policy. In most cases, the fees are well in excess of 10 percent, leaving less than 90 cents on the dollar to be invested in properties.

Critics suggest that unlisted REITs are very expensive and illiquid compared to listed REITs. Proponents suggest that unlisted REITs are not subject to short-term market price volatility and that there are generally provisions in their prospectus that lead to liquidity. Generally, unlisted REITs have "list or liquidate" provisions under which the REIT must liquidate the assets and return the net proceeds of the liquidation if the stocks are not listed by a particular date. This adds additional risk to these investments in that these companies may be forced to liquidate at a very disadvantageous point in time.

There are significant differences among listed and unlisted REITs. Investors and their advisors should be familiar with these differences and incorporate all associated risks in making investment decisions or recommendations.

Importance of FFO (Funds from Operations)

FFO stands for **funds from operations,** which most analysts consider the REIT equivalent of earnings in industrial stocks. FFO is used by analysts and investors as a measure of the cash flow available to the REIT for distributions (dividends) to shareholders. Most investors are familiar with the use of earnings per share in this capacity. However, for REITs, earnings are not the best measure of cash flow, largely due to the element of depreciation.

Because REITs own real estate assets that are subject to large depreciation allowances, the reader should be aware of the difference between REIT earnings per share (EPS) and funds from operations (FFO) per share. The distinction between the two can be best made with a simple example:

	REIT Income Statement	REIT FFO
Rent	$100	$100
−Operating expenses	40	40
Net operating income	60	60
−Depreciation	40	—
+Gains on sale of property	20	—
Net income	40	—
Cash flow	—	60
EPS	$ 4	—
FFO per share	—	$ 6

Assuming that the REIT above has 10 shares of stock outstanding, its earnings per share (EPS) would be reported as $4.00 per share. However, its funds from operations (FFO) per share would be $6.00. *Generally Accepted Accounting Practices* (GAAP) provide for depreciation of assets over time as their useful life is expended. Depreciation is assumed to occur in a predictable fashion and the time periods and rates of depreciation for different types of assets are well established. Most people are familiar with the concept and logic of depreciation based on their experiences with automobiles and other durable goods. As these goods get older, their mechanical parts break down and function less efficiently, decreasing their value. Real estate values tend to rise and fall over time based more on market conditions than physical conditions, although physical conditions can and do play a role in value. The result is that GAAP earnings calculations that use historical cost depreciation do not provide an accurate or meaningful picture of REIT financial performance.

The National Association of Real Estate Investment Trusts (NAREIT) recognized this problem and has worked to develop and promulgate FFO as a more representative measure of REIT performance. In 1991, NAREIT adopted a definition of FFO that was refined slightly in 2002 as follows:

> *Fund from operations* means net income (computed in accordance with generally accepted accounting principles), excluding gains (or losses) from sales of property, plus depreciation and amortization, and after adjustments for unconsolidated partnerships and joint ventures. Adjustments for unconsolidated partnerships and joint ventures will be calculated to reflect funds from operations on the same basis.

The definition was well accepted in the industry and FFO has become a standard measure of REIT performance. FFO provided analysts and investors with an "apples to apples" measure for comparing performance among REITs. NAREIT suggests that the adoption of the FFO measure made it easier for investors to understand REIT operations. They claim that increased understanding facilitated the growth in REITs as an ownership form, a claim that has some merit.

As REITs grew, FFO and its reporting emerged as an important issue. The definition adopted by NAREIT was, of necessity, rather broad. It left considerable room for interpretation. During the IPO boom in 1992 and 1993, REIT initial pricing was generally couched in terms of a **dividend yield** supported (at least in theory) by a projected FFO. The value of management's ownership position was a function of the initial price, so there was a strong incentive to project FFO at maximum levels. By mid-1993, the page of the prospectus dealing with the projected FFO had become known as the "magic page." The implication was that FFO was being created to support overly aggressive initial pricing.

Many analysts and investors have gone beyond the FFO to look at adjusted funds from operations (AFFO), funds available for distribution (FAD), or cash available for distribution (CAD). AFFO, FAD, and CAD are largely interchangeable, with different analysts using the term they prefer. The major difference between FFO and these supplementals relates to the issue of capital improvements, particularly ongoing capital improvements. To understand the difference, consider a multifamily apartment building. There are several major expenditures, such as painting and replacement of carpets, that have to be made on a recurring basis. For example, carpeting may be replaced every five years, and painting redone every three years. Accounting policies vary from REIT to REIT on how to handle these expenses. The most conservative treatment is to classify these as expenses, counting against the current year's income. Others choose to classify them as capital improvements, capitalizing them on the balance sheet and amortizing them over time. In the latter case, the amount spent for capital expenditures will not affect FFO because amortization is added back to EPS when calculating FFO. Thus, although either treatment is valid, the variation causes difficulty in comparing income and expense figures across REITs. NAREIT has encouraged REITs to provide supplemental disclosure to FFO in several areas, including capital improvements, straight-line rents, and results of discontinued operations.

REIT Expansion and Growth

Because of the requirement that 90 percent of earnings be paid out as dividends, REITs have limited opportunities to retain earnings or cash flow to acquire additional real estate assets. Stated another way, REITs have very little free cash flow. Consequently, most REITs must plan for expansion by reserving the right to issue additional stock at some future time. This is referred to as a secondary, or follow-on, stock offering to raise more equity capital, which may in turn be used to acquire additional real estate assets. Analysts may view eventual issuance of these shares as a potential source of *dilution* of future earnings. The general tendency in the industry is to evaluate the use of funds from follow-on offerings to determine if they will generate an increase in cash flow that more than offsets the dilution. In the industry, this is referred to as an *accretive* transaction. This is particularly important when looking at the period just after additional shares are issued and before additional cash flow is realized from the newly acquired assets. Furthermore, any interim problems with developing, leasing, managing, and renovating the new real estate assets could require time to correct and thus serve as a potential drag on earnings. The dilution of earnings from issuing additional shares might also have a depressing effect on the stock price of the REIT, through the impact on the dividend.

REITs also make use of significant amounts of debt financing, including individual property mortgages, mortgage pools, secured debt, unsecured debt, and corporate lines of credit. Many REITs have been assigned investment ratings by the various ratings agencies, and use multiple sources of debt capital for growth. Proceeds from debt financing may be used to finance additional asset acquisitions. In some cases, lines of credit or unsecured debt financing can be used as an interim source of funds until long-term mortgage financing or a supplemental stock offering can be accomplished. In any event, because REITs are "asset-intensive" entities with a considerable restriction on earnings retention, their ability to finance any future expansion must be planned with great care. The advent of the UPREIT structure has provided another mechanism for incremental growth. Unlike many manufacturing and service corporations that add to capacity incrementally, REIT expansions are likely to involve large asset acquisitions. How these acquisitions are financed can affect earnings for considerable periods of time.

There are five ways in which a REIT can grow income and increase funds from operations, thus securing its dividend and making dividend increases possible. These five methods are (1) growing income from existing properties, (2) growing income through acquisitions, (3) growing income through development, (4) growing income through provision of services, and (5) financial engineering. The relative balance among these areas is a strategic decision, as are the mechanisms for operations within the areas.

Growing Income from Existing Properties

The most obvious method for growing income in an existing portfolio is increasing occupancy by renting more space. The second is by raising rents. Obviously, the two are intrinsically related and both are dependent on the supply and demand conditions in the market. Redevelopment offers a third alternative. Redevelopment primarily refers to remodeling of space to meet changing tenant needs. This can result in income growth because it results in either more aesthetically appealing space or space that is more suitable for prospective tenants, both of which can result in higher rents. Redevelopment may address other physical problems, such as the lack of an elevator in a three-story office building. Expansion can increase income by providing more physical space for rental purposes and is fairly common in retail facilities, where an anchor tenant may expand, or outlying parcels may be developed to generate additional rental income. Office and industrial REITs, particularly those that specialize in industrial/office parks, often hold substantial amounts of land in close proximity to their existing parks. This land, which is usually permitted and approved, is simply held in anticipation of growing demand for space. Where the demand does not emerge, the property can be sold and the assets reallocated to more productive areas. Another means of growing income is in altering the market segments addressed. A mall might shift to a fashion focus, essentially developing a retenanting focus. Marketing and policies may also change, as is the case in eliminating a no-pets policy at an apartment community. REITs may also grow net income by controlling expenses. For example, many apartment REITs have provided sub-metering at the individual apartment level, transferring utility costs and associated volatility directly to tenants.

Growing Income through Acquisitions

There are two methods of growing the portfolio through acquisitions. These two methods are (1) purchasing properties with cash at positive spreads, utilizing the arbitrage between cost of capital and the yield of the property, and (2) swapping shares in the REIT or operating partnership units for interests in properties, taking advantage of the tax and form benefits. Positive spread acquisitions are fairly common in periods when REITs are trading at low cap rates relative to the underlying real estate, but more difficult to achieve as REIT yields come closer to or exceed the cap rates on the underlying properties. Another way of looking at this is in terms of **net asset value (NAV).** Net asset value is the net "market value" of all a company's assets, including but not limited to its properties, after subtracting all its liabilities and obligations. When a REIT is trading above NAV, it is more likely to find attractive spreads than when it is trading below NAV. When yields (prices) are very close, it may not be wise to acquire properties in this fashion because of the costs associated with securing capital.

Swapping shares in the REIT or operating partnership units for interests in properties has the advantage of a minimal cash requirement. As a general rule, operating partnership swaps are the more attractive of the two options because of the potential for tax timing. Existing shareholders can benefit because the swaps are generally done at favorable cap rates, with the owners of the acquired property willing to accept a discount for their properties in exchange for liquidity. In some cases, these swaps also include other business enterprises or personnel that are beneficial to the acquiring REIT. For example, an existing REIT with limited development capacity might work out a swap with a private company in the REIT IPO pipeline that has development capacity. The acquiring REIT gets the benefits associated with a larger portfolio and a set of skills that it did not have before the transaction. The owners of the acquired properties satisfy some of their goals that led to the consideration of going public, without incurring the substantial costs associated with the legal process of becoming a REIT.

Growing Income through Development

REITs may also choose to grow their income through development of properties. Risk is generally higher than in redevelopment or acquisition, but can be mitigated. For example, the risks associated with build-to-suit development of properties subject to long-term net leases with quality credit tenants are considerably lower than those associated with speculative development. In either case, thorough market analysis is an absolute necessity. Development offers an opportunity to secure entrepreneurial profits and increase funds from operations significantly. However, the returns are offset by a series of risks. There are always risks of construction delays, cost overruns, and lease-up problems. In the market, many investors are extremely concerned with quarterly performance, a focus where it probably does not make a great deal of sense to invest in a long-term asset like real estate, but which can influence pricing. As acquisition opportunities decline, REITs may shift to a development orientation. In some cases, the REITs have a long and distinguished development history and are capitalizing on in-house expertise. In other cases, the REIT does not have the expertise in-house and is forced to acquire it through acquisition of operating companies or through hiring. A third alternative is to develop a relationship with an existing developer and act as the take-out on their construction projects.

Growing Income through Provision of Services

REITs may also derive a portion of their income from provision of services to related and unrelated third parties. The income from these activities varies substantially across REITs, with some companies deriving a significant portion of their income from these activities, while others do not produce any external income. These services may include property management, development, licensing agreements, or provision of other real estate–related services to related parties and unrelated third parties. In many cases, REITs enter into joint-venture arrangements with institutional investors under which the REIT owns a minority interest in a joint venture that owns a portfolio of properties. The REIT acts as the property and asset manager for the joint venture and is generally compensated at competitive market rates for its efforts. REITs may also provide real estate–related services to unrelated third parties, for which it receives competitive market rates. Increasingly, REITs are marketing telecommunication, financial, and other services to their tenants and their tenant's customer base. The result is that REITs have an opportunity to leverage off their real estate expertise and human capital to generate additional earnings, often through taxable REIT subsidiaries.

Financial Engineering

A fourth alternative is to grow the funds from operations through financial engineering. Financial engineering includes a variety of accounting treatments and uses of leverage that tend to magnify the funds from operations, which many view as the best short-term measure of the REIT's income-producing ability. Financial engineering also includes the ability to secure favorable rates, financing terms, and sources of capital. These factors can influence the long-term cost of capital for the REIT. Essentially, the idea is that REIT management can manipulate the capital structure in order to maximize distributions. The following text outlines some of the risks and rewards of various financial engineering alternatives.

Accounting treatments can be used to magnify funds from operation (FFO). Since REITs have tended to trade at some multiple of funds from operations, magnifying funds from operations often results in higher stock prices. The risk is that the REIT will be unable to meet its shareholders, expectations based on magnified FFO numbers. The shareholders may view these magnified numbers as indicative of future growth and expect corresponding increases in dividends. REITs that fail to meet FFO projections or sustain high growth levels have been treated harshly by investors.

As an example of the influence of accounting treatments, some recurring expense items can be either expensed or capitalized. In some property types, particularly multifamily residential properties, recurring expenses are cyclical, impacting the REITs, ability to distribute funds on a regular basis. REITs vary as to their treatment of these expenses, making comparisons among REITs difficult. As a result, many analysts have moved to **cash available for distribution (CAD)**, as discussed earlier. Cash available for distribution treats recurring expenses as expenses rather than capital items, providing a more conservative estimate of the potential stream of income available for dividend purposes. The problem is that CAD calculation is not standardized, and the information necessary for standardization is often not available.

REITs can also use leverage to magnify FFO in the short term. One way is for the REIT to use short-term variable-rate loans to acquire properties. The rates on this type of loan are lower than those that can be obtained for long-term fixed rate debt, so the rate of return on the investment is higher, at least in the short run. Higher return on the investment leads to higher FFO and dividends, which in an ideal situation will lead to an increased multiple, making it feasible to replace the debt with attractively priced equity. Unfortunately, the higher rates of return are accompanied by greater risks and the leverage can reverse, magnifying losses and moving prices in the other direction. The result can be an inability to replace debt with equity and a need to refinance at a less-than-opportune time. This refinancing risk needs to be evaluated and priced.

REITs can also alter payout ratios. The payout ratio is the percentage of FFO, or alternatively CAD, that is used to pay out the dividend. The payout ratio is an important indicator of the financial flexibility of an organization and its ability to maintain its dividend. As an example, consider two REITs. REIT 1 has FFO of $1.00 per share and pays a dividend of $0.85, resulting in a payout ratio of 85 percent. REIT 2 has FFO of $0.93 and a dividend of $0.85, resulting in a payout ratio of 91.4 percent. If both REITs were subject to a $0.10 per share drop in income, then the resulting payout ratios at the same dividend rate would be 94.4 percent and 102.4 percent, respectively. While REIT 1 can maintain its dividend without dipping into cash reserves, REIT 2 is required to dip into cash reserves, essentially giving the shareholders their money back. While this type of distribution can be maintained for short periods under unusual circumstances, it cannot be maintained indefinitely without hampering growth prospects.

Important Issues in Accounting and Financial Disclosure: Equity REITs[1]

When analyzing financial statements, one must understand that REITs, like other economic entities, have considerable latitude when accounting for their operations. This section covers some issues and interpretations that REIT investors should bear in mind when performing a financial analysis based on financial statements and other documents. These issues are widely covered in various industry reports provided by investment bankers and

[1] The authors thank Eric Hemel and Neil Barsky for providing them with the report, "Do You Believe in Magic? Understanding a REIT IPO's Pro Forma Funds from Operation" (Morgan Stanley U.S. *Investment Research*, January 24, 1994).

other REIT market analysts. The following presents some of the basic issues and explains their significance in evaluating REITs and their financial statements.

Tenant Improvements and Free Rents: Effects on FFO

When markets are soft and vacancies are above normal, tenants may be induced by owners to sign leases with free rent or improvements provided by REIT management. This possibility is important to understanding REIT revenue, particularly where leases are long-term. Occupancy and revenues are obviously important items when reporting income for industrial, office, and retail properties. Occupancy rates can be raised and rental revenues increased by providing important concessions to tenants, often in the form of tenant improvements. Generally, new commercial tenants must always incur some costs to reconfigure the space and make it suitable for their operations. Landlord allowances for some tenant improvements are a common practice in much of the real estate industry, but concessions could be a concern if they are very large relative to what other owners are offering. Tenant improvements paid by the landlord are often capitalized and then depreciated. Thus, the cash flows for tenant improvements are not included in FFO calculations because FFO represents earnings before depreciation. Therefore, the investor should be aware that this cash outflow may be occurring currently but accounted for in depreciation expense *over time*. Investors should also pay particularly close attention to any notes to FFO estimates that include "signed leases scheduled to commence." This may indicate that the REIT is currently including the effect of leases not taking effect until a future date.

One way investors can evaluate the implications of new leases is to determine the "cost" per square foot and the extent that tenant improvements and free rent are included in the leases. This determination may be particularly important when the REIT is about to go public with an initial public offering (IPO). For example, suppose that tenant improvement costs averaged $7 per square foot of newly leased space during the three years before the IPO. However, the company spent $20 per square foot *in the year* prior to the IPO. The additional amounts spent on tenant improvements could suggest that the company was preparing for the impending IPO by attempting to boost its occupancy rates and nominal rent levels to make itself more attractive to investors. Many companies do not explicitly disclose the cost per square foot of tenant improvements, but they may disclose enough information about historical leasing activity and aggregate tenant improvement levels so that investors can make their own estimates.

Leasing Commissions and Related Costs

A number of REITs pay outside leasing brokers a commission to solicit tenants. These commissions are usually paid in cash, and the cost is capitalized over the life of the lease. These costs are included in depreciation and amortization expense. Because investors traditionally measure REIT profitability according to funds from operations (earnings before depreciation and amortization), any deferred leasing costs may be overlooked. There is no single, accepted standard for disclosing deferred leasing costs. Many REITs do their own leasing and pay their employee-brokers salaries or commissions, or both. These REITs may then either expense or capitalize and defer the costs. The deferral of leasing costs raises two issues: (1) Leasing costs are an ongoing source of operating expense; omitting them as an operating expense reduces expenses and increases FFO. (2) In rare instances, brokers are paid commissions over the life of the leases instead of up front. In that case, investors in a REIT that is about to embark on an IPO will be paying commissions incurred on leases signed *prior* to the IPO; this means that the REIT may have to pay out cash in the future for leases signed in previous periods.

Use of Straight-Line Rents

Another accounting issue arises when a REIT relies on long-term leases with rent increases contractually stipulated over the life of the lease. This is rarely a factor in apartment companies, which usually have year-to-year or month-to-month leases, but it can be important for REITs with long-term leases, and this includes virtually every category of commercial and industrial property.

To understand the potential problem, consider a simple solution in which a tenant signs a 10-year lease with step-ups: The lease is $8 per square foot in years 1 through 3, $10 per square foot in years 4 through 7, and $12 per square foot in years 8 through 10. If revenue recognition is based on "straight-line" reporting, the rent will be averaged over the full lease term, which in this case is $10 per square foot. Thus, rental revenues in year 1 are counted as $10 even though the actual cash flow is $8. Since FFO is calculated as earnings before depreciation, a pro forma FFO may use $10 instead of the actual $8, unless the assumptions underlying the pro forma calculation clearly specify otherwise. Obviously, the FFO estimate will be lower than the actual revenue in the later years of the lease, when $12 of cash flow exceeds the $10 average. However, in an IPO, considerable attention is given to the initial or near-term estimates of FFO. In this case, investors may want to bend the straight line of the rental stream. Management should provide clear guidance to investors about the cash flow without the straight-line rent adjustment in year 1. In this way, investors can better assess the dividend-paying ability of the REIT and accurately evaluate the company on the basis of potential cash flow growth resulting from contractual rent adjustments well into the future. This is one of the primary reasons that many analysts have moved to estimating adjusted FFO, CAD, and other supplemental measures of cash flow as previously discussed.

FFO and Income from Managing Other Properties

As noted previously, a number of REITs receive third-party management income, or income in exchange for managing other properties not owned by the REIT. While third-party management income may provide additional earnings, its associated revenue stream is likely to vary more than the underlying rental income from REIT-owned properties because many management contracts may be cancelable by third-party owners on short notice. Moreover, other events might affect this source of income: Other properties managed by the REIT may be sold, or the management of REIT-owned properties could suffer if the REIT gives too much attention to managing third-party properties. As a result, many REIT security analysts assign a lower multiple to the portion of FFO produced by management income. Investors should always be aware of any fee based on other sources of income that the REIT reports because a large portion of these fees may be short-term. The character of the third-party relationship is also important, in that the REIT's managers may have a partnership interest that effectively locks in the contracts. It is important to understand the nature of third-party management contracts and other sources of income. Additionally, some sources of income may not constitute income from real properties and may jeopardize the REIT's tax status if in excess of allowable levels. Taxable REIT subsidiaries were designed and implemented largely to "clean" the income from these activities.

Types of Mortgage Debt and Other Obligations

When one examines a REIT investment, it is important to consider the terms of the company's mortgage debt. Mortgages may be either short- or long-term, floating rate or fixed and nonamortizing or amortizing. As a practical matter, most REITS do not amortize much of their debt. The result is a continual return to the debt market to replace maturing debt. By using short-term, floating-rate debt, the REIT borrower may enjoy a lower mortgage rate in exchange for assuming some portion of the risk of inflation and increasing interest rates. The use of a short-term floating rate may be favorable in the near term because of low interest charges, but it exposes the REIT to significantly greater risk. The REIT can hedge this risk through the use of interest rate "caps" or "swaps," the extent and cost of which should be disclosed to shareholders.

Existence of Ground Leases

As the name suggests, ground leases encumber the land underneath buildings. They are typically made for long periods of time, sometimes up to 99 years. Ground leases tend to be "net" leases, which means the tenant pays for all costs associated with operating the building, including utilities, taxes, renovations, and so on. The landowner, or "fee" owner, plays no operating role other than to collect land rents from the building owner or operator. At the time the lease expires, the landowner owns residual rights to all buildings and improvements situated on the land.

Two basic arrangements of ground leases are likely to apply to REITs. First, the REIT *owns buildings subject to* a ground lease owned by another party. The REIT may have a potential advantage if the ground-lease payments are *fixed*. In this event, the REIT is using the equivalence of leverage because, if the cash flow from the building rental income continues to grow relative to the fixed ground lease payments, a higher return on equity will be achieved. The universal disadvantage of the ground lease is that the REIT will give up ownership of the buildings at the time of lease expiration or it must renegotiate the lease prior to its expiration. In their valuation process, investors should heavily discount the cash flow from any buildings on a ground lease with an approaching expiration date. In addition, some ground leases may call for the lessor to participate in revenue growth. This is similar to a participating debt and may be negative from a REIT investor's perspective. Obviously, the terms and conditions of all ground leases should probably be renegotiated *long before* the lease term expires.

The second case applies to a REIT that *owns a ground lease* that it has acquired from the landowner. Ground leases are allowable investments for REITs, which simply put the REIT between the landowner, who retains all rights of reversion, and the building owner. This arrangement is known as "spread investing," where the REIT takes the risk of collecting a stream of rents from the building owner and pays a lower and perhaps fixed payment to the landowner. Ground leasing to third parties, depending on their credit, can be a safe and reliable way to assure an income stream.

Some ground leases are important and complex enough to warrant detailed financial analysis. Many *retail* REITs, for example, own shopping malls subject to ground leases. In this case, lessors and landowners usually enjoy a substantial share of the cash flow once certain retail revenue thresholds are exceeded, but payments to the ground lease may reduce the ultimate growth prospects of the REIT.

Lease Renewal Options and REIT Rent Growth

Investors should review the lease rollover schedules of REITs. This is particularly important for REITs that concentrate in sectors with long-term leases: regional malls, industrial properties, and offices. Most initial public offerings for these REITs should disclose the average rent of recently expired leases as well as the new rents. Following the initial public offerings, most REITS disclose a schedule of aggregate annual lease expirations in the supplemental materials to their financial statements. This, combined with notes and management discussion, should enable investors to determine how many new leases are being made at or below previous rents and how much or how little growth is occurring from lease rollovers.

Expected lease rollovers should be examined to determine the amount of space subject to *renewal options* and the range of rent levels at which those options are set. Rents could be far below the prevailing rents at the time of lease expiration. Investors should also question the likelihood that some tenants will elect not to renew their leases. This may occur because tenants find that the existing space is inadequate for their expanding operations, or for any one of a number of reasons. Therefore, investors must consider the probability that the space will be leased to new tenants, and how long it will take and how much it will cost a REIT (lease commissions and finish-out) to attract new tenants.

Occupancy Numbers: Leased Space or Occupied Space?

When discussing occupancy numbers, nearly all REITs use the term *occupied space* in notes to financial statements and operating results. Like other disclosure issues, this at first appears innocuous, but on closer examination it opens the way for potential distortion. Occupied space quantifies the space for which tenants are now paying rent. *Leased space* includes all space for which leases are signed, even if the lease does not go into effect for another 6 to 12 months. The amount of leased space is often several percentage points higher than occupied space. Investors who compare occupied space in one REIT against leased space in another may be using two different—and noncomparable—methods of counting occupancy. For example, one REIT may report space as occupied that is currently leased but that has been, or is about to be, vacated by tenants, while another may report that space as vacant. There is also variation by property sector, largely due to difference in structure and length of leases. To be conservative, REITs should either not claim credit for occupied space that it has reason to believe will be vacant in the immediate future or disclose the impending vacancy.

Retail REITs and Sales per Square Foot

There is no standard way to measure retail sales per square foot of a small store. Several methods of calculation have evolved, but investors should beware of the implications of each. For example, one method excludes sales per square foot from "in-line stores in regional malls." Another method uses "mall store sales" but excludes sales of "large space users" where space is used less intensively or where a portion of the total space is owned by the tenant or governed by a highly restricted operating agreement. The problem with both definitions is that total retail sales and sales per square foot in a mall are affected by excluding large space users. Even though many large space users may own their space in a mall or have a very strict operating agreement that gives them considerable control over their space, investors are in a sense paying for the lease portfolio or tenant roster and "sales power" of all tenants. A better approach may be to report total sales per square foot rather than to exclude large space users. Some REITs separate anchor tenant sales from in-line tenant sales.

One legitimate defense of excluding large space users from financial statements is that many older malls have large variety-type stores that bring down average sales per square foot. Lease rollovers may provide the mall with significant opportunities for sales and revenue growth, particularly if the leases of variety-type stores are about to expire. Consequently, the more inclusive definition of sales per square foot may tend to understate the long-term sales potential of a mall.

A third definition of sales per square foot is based on "mall store tenants that reported 12 months of sales for the operating period." This definition may exclude tenants that reported less than 12 months of sales, possibly because of bankruptcy or deliberate lease terminations. This measure may suffer from "tenant survivorship bias," or the counting of only those tenants that survived and the exclusion of those that did not. The excluded tenants probably experienced lower sales per square foot than their healthier counterparts; if included, they would have pulled down the average. Alternatively, the measure leaves off sales of seasonal "kiosk" or "cart" operators that sell goods in common areas during holidays and other periods of heavy demand. These operators can contribute significantly to income, as they typically have percentage rent provisions in their leases, and income can be highly variable.

Additional Costs of Being a Public Company

REITs typically have to purchase insurance for directors and officers, pay directors' fees, pay for listings on the stock exchanges, and file annual and quarterly reports with the Securities and Exchange Commission. While these costs are usually included in general and administrative costs, the actual amounts may be considerably more than a REIT initially estimated.

A major recent development is the Sarbanes-Oxley law of 2002, the congressional act designed to prevent financial scandals like those at Enron and WorldCom. The law amended the regulatory provisions of the Securities Commission Act of 1934. The Securities Exchange Commission (SEC) is the principal governing body charged with making the rules to enforce the Sarbanes-Oxley changes. Sarbanes-Oxley set forth or revised several standards for corporate boards of publicly traded companies and required rule making by the national stock exchanges to impose additional standards. Parts of the law have taken effect already, like rules for audit committees, reporting supplemental financial information, and auditor independence. Other parts will be phased in over the course of the year, like including accelerated filing requirements for periodic reports. The final standards for still other parts of the law dealing with additional disclosure requirements are still being written. The cost of complying with the regulations enacted so far does not vary proportionally with the size of the company, so the reality is that smaller REITs face a disproportionate burden in meeting the requirements. Some smaller REITs that merged with other companies or which been taken private subsequent to the act cited the act as one of the reasons it felt a business combination or sale was necessary.

The Investment Appeal of Mortgage REITs

The mortgage real estate investment trust is unlike the equity trust in that it does not own the real property. Rather, it owns mortgage paper secured by the underlying real property. Income generated by the mortgage paper is affected by the interest rate on the mortgage note, the discount (or premium) at which the obligation is acquired, and the amount of funds outstanding on the loans. Trust expenses applicable against this income are the interest paid for the funds to make payments on loans, management company costs, and other lesser expenses incident to the operations of this kind of investment company.

During the late 1960s and early 1970s, the mortgage trust was used as a source of loans, particularly for construction and development that were beyond the legal or policy limits of the highly regulated banks, savings and loans, insurance companies, or other real estate–oriented financing institutions. Because their lending policies were relatively unregulated and because they had access to public securities markets, mortgage trusts were in a position to fill a void in the real estate financing market. Even though their cost for short-term borrowed funds was relatively high, there was always the reasonable expectation that the trust could make construction or development loans at rates 3.5 to 4 percent higher than rates available from other lending sources. The spread between borrowing costs and loan income thus held the promise of increasing earnings on the shareholders' equity as the loan portfolio grew. This earnings growth would support further sales of shares in the trust at higher prices, and so on. Following this pattern, the expansion of mortgage trusts during the early 1970s was spectacular.

However, during 1974 a general economic recession set in, and the prime bank lending rate rose to unprecedented heights. Because of the unanticipated rise in their cost of funds, many mortgage trusts were forced into an operating loss position because they were not able to pass on a sufficient amount of these higher costs to borrowers. Further, many advance mortgage commitments had already been made at lower rates with inadequate flexibility for upward rate adjustments. During this period of rising interest rates, many developers were unable to sell completed units or could not complete projects because of rapidly inflating construction costs. Consequently, they were thrown into default on their construction loans. The share values of mortgage trusts fell dramatically, thus reducing the possibilities for further stock offerings as a source of funds.

Because of loan default expectations, the commercial paper market also dried up for trusts and forced them to rely almost exclusively on bank credit lines. As the defaults continued to

increase during 1975, many large commercial banks were forced to extend the maturities on notes taken pursuant to these credit lines, which had usually been extended by banks as a group under a revolving credit agreement. The extensions were granted to avoid the cumulative impact on the total financial system if the trusts were forced to undertake mass foreclosures during a serious business recession. When credit became so tight that commercial bank lines could no longer be reasonably renewed, a number of bank sponsors took large blocks of mortgages out of the trust portfolios and put them into their own loan and liquidation accounts to reduce trust debts. These actions had an impact on overall commercial bank liquidity and removed the mortgage trusts generally from the construction and development loan markets as a supplier of funds for the foreseeable future. As a practical matter, many mortgage REITs invested in commercial mortgage-backed securities (CMBS) of pools of residential mortgages rather than whole loans. Increasingly, mortgage REITs are engaging in more diversified investment, including mezzanine loans and construction loans.

Caveats

As was the case with equity REITs, the potential for a conflict of interest exists when sponsors and affiliates of mortgage REITs (e.g., mortgage companies, thrifts, commercial banks) are also originators of mortgage loans. In these instances, there may be incentives to sell the submarginal loans of REITs while charging fees for servicing them. As indicated earlier, the rules governing the appointment of nonaffiliated trustees and the use of outside appraisers must also be followed in the creation and operation of mortgage REITs. Additionally, CMBS portfolios often contain fairly high risk tranches, known as "B" pieces, that offer significantly higher risks and returns than other tranches. Mortgage REITs, under pressure to grow income, have been prime buyers of "B" pieces. Investors should review a mortgage REIT's investment policy and the quality of its loans as carefully as an equity REIT's properties. Many mortgage REITs focus much of their attention on managing interest rate risk. Essentially, they are purchasing long-lived assets using short-term financing. As a result, income streams can be very volatile, particularly relative to equity REITs.

Financial Analysis of an Equity REIT Illustrated

What follows is an analysis of an equity REIT that a prospective investor or shareholder might make. The financial statement for Midwestern America Property Trust is provided in Exhibit 21–2. Midwestern America (MA) owns and manages approximately five million square feet of suburban office, office-warehouse, and specialty office/distribution space, which it has assembled over the years in three Midwestern states. The cost basis for these assets is $300 million; the REIT has made or assumed mortgages totaling $80 million as part of financing its asset acquisitions. Midwestern America's stock is currently trading at $75 per share, making its current market value worth $375 million.

When you analyze an equity REIT, two key financial relationships must be understood: (1) the judgment of investment performance and risk and (2) the comparison of Midwestern America with other equity REITs. Referring to Exhibit 21–2, we see that MA earned $13,600,000 in net income, or $2.72 per share, during the past year. However, additional data (see Exhibit 21–3) indicate that other interesting and important relationships must be understood. As is always the case with real estate investment, considerable emphasis is given to *cash flow*. For example, section II of Exhibit 21–3 includes additional performance measures. **Net income from operations** is analogous to net operating income (*NOI*), which has been discussed at length in earlier chapters. It represents the operating cash flow exclusive of interest, and was $7.00 per share for the past year. The second measure, funds from operations (FFO), is analogous to net cash flow per share. As you may recall, it is derived by adding all noncash expense items to net income (loss). Noncash accounting charges generally include depreciation and amortization. Most industry analysts rely heavily on FFO when

EXHIBIT 21–2 Financial Statement Midwestern America Property Trust

Panel A. Operating Statement Summary

Net revenue	$70,000,000
Less:	
Operating expenses	30,000,000
Depreciation and amortization	15,000,000
General and administrative expenses	4,000,000
Management expense	1,000,000
Income from operations	$20,000,000
Less:	
Interest expense	6,400,000
Net income (loss)	$13,600,000
Net income (loss) per share	$ 2.72

Panel B. Balance Sheet Summary

Assets			Liabilities	
Cash		$ 500,000	Short term	$ 2,000,000
Rents receivable		1,500,000	Mortgage debt	80,000,000
Properties @ cost	$300,000,000		Total	$ 82,000,000
Less: Acc. depr.	130,000,000		Shareholders' equity	90,000,000
Properties—net		170,000,000		
Net assets		$172,000,000	Total liabilities and equity	$172,000,000

making judgments and comparisons among REITs. We can see that the FFO per share for MA was $5.72 during the past year versus **earnings per share (EPS)** of $2.72. The difference in this simplified example is due to the $15 million depreciation allowance.

One REIT regulation previously detailed indicates that 90 percent of net income must be paid out as dividends. Therefore, another very important relationship shown in section III is the dividend payment per share. In our example, the payment of $4.00 per share meets the 90 percent requirement, but this amount is also greater than the earnings per share; thus, MA paid dividends of $4.00 per share even though EPS was only $2.72. This can occur because FFO, or *cash flow* per share, was $5.72, which exceeded earnings per share. Indeed, MA could have paid dividends of $5.72 per share even though it was required to pay only 90 percent of $2.72, or only $2.45 per share. By paying a $4.00 dividend, Midwestern America met the 90 percent of earnings requirement and retained cash of $1.72 per share for operations and acquisitions of new assets.

The difference between REIT earnings and dividends has a very important effect on the taxes that shareholders pay. Tax regulations provide that even though investors in Midwestern America receive $4.00 per share, only $2.72 of earnings are reported as a taxable dividend. The remaining $1.28 is treated as **recovery of capital (ROC)** and serves to reduce the cost basis of the stock acquired by the investor. For example, if a share of MA stock was purchased for $75 prior to the dividend declaration date, the investor would reduce the investment basis of the stock by $1.28, from $75.00 to $73.72. When the stock is eventually sold, the investor would then calculate any gain or loss based on the sale price, less $73.72, or the reduced basis of the stock. If the stock has been owned for one year or more and results in a gain, it would be taxed at the prevailing capital gains tax rate. This also means that if there is a difference between ordinary and capital gains tax rates, the investor saves taxes in the amount of $1.28 times the difference in the two tax rates. Consequently, this treatment allows investors to receive a portion of the dividend ($1.28) "tax free" until the stock is sold

EXHIBIT 21–3 Summary Indicators of Financial Performance: Midwestern America Property Trust

I. General Summary:

Properties: 5 million sq. ft.	Mortgage debt: $80,000,000
Original cost: $300 million	Avg. interest 8%, 10-yr. maturity
Depreciated cost: $170 million	Number of common shares: 5 million

II. Profit Summary:	$ Amount	Per Share
Earnings per share (*EPS*)[1]	13,600,000	$ 2.72
Income from operations plus depreciation and amortization (*NOI per share*)[2]	35,000,000	$ 7.00
Funds from operations (*FFO per share*)[3]	28,600,000	$ 5.72
III. Other Important Financial Data:		
Market price per share of common stock		$75.00
Dividend per share		$ 4.00
Shareholder recovery of capital (*ROC per share*)[4]		$ 1.28
Cash retention per share (*CRPS*)[5]		$ 1.72
Earnings yield[6]		3.62%
FFO yield[7]		7.62%
Dividend yield[8]		5.33%
Current earnings multiple[9]		27.6x
Current *FFO* multiple[10]		13.1x
Net assets per share (*NAPS*)[11]		$34.00
Equity or book value per share (*BVPS*)[12]		$18.00

IV. Explanation and Calculations:

[1]*EPS*: Net income $13,600,000/5,000,000 shares outstanding
[2]*NOI*: Income from operations plus depreciation and amortization ($20,000,000 + $15,000,000)/5,000,000 shares outstanding
[3]*FFO*: Net Income + Depreciation & Amortization ($13,600,000 + $15,000,000)/5,000,000 shares outstanding
[4]*ROC*: Dividend per share − *EPS* = $4.00 − $2.72 = $1.28
[5]*CRPS*: *FFO* − Dividend per share $5.72 − $4.00 = $1.72
[6]*EPS*/Market Price per share = $2.72/$75 = 3.62%
[7]*FFO*/Market Price per share = $5.72/$75 = 7.62%
[8]Dividend per share/Market price per share = $4.00/$75 = 5.33%
[9]Current price per share/*EPS* = $75/$2.72 = 27.6x
[10]Current price per share/*FFO* = $75/$5.72 = 13.1x
[11]*NAPS*: Net assets $172,000,000/5,000,000
[12]*BVPS*: (Assets − Liabilities)/shares = $90,000,000/5,000,000

or the REIT is liquidated. At that point, if the investor has owned the stock long enough to qualify for capital gains treatment and capital gains tax rates are lower than tax on ordinary income, the investor will also save taxes.

When REITs report operating losses, none of the losses can be passed through to investors. Instead, losses must be carried forward to offset income in future periods. The passive loss limitation provision does not materially affect REITs because their losses cannot be passed through to investors. REIT dividends are considered to be *portfolio income* and thus do not qualify as passive income to offset passive losses.

With respect to capital gains from the sale of property, REITs may either (1) retain the gain and defer its distribution to shareholders, in which case the gain is taxed at the appropriate corporate capital gains rate, or (2) distribute the gain as a dividend to shareholders. In the latter case, the REIT is not taxed on the distributed gain; however, the REIT is required to designate such dividends as a capital gain distribution to shareholders, who must

Web App

Go to the NAREIT Web site (**www.nareit.org**) and find the most recent value of the NAREIT Index for Equity REITs. Then go to the Web site for any REIT and find the following information: Full Company Name, Stock Symbol, Exchange, Property type, Portfolio composition (number of properties, units or square feet, and major markets), Current Price, Current Dividend, and Current Yield. Finally, go to the Dividend Discount Model site and value the REIT you selected using an appropriate discount rate. (One way to select a discount rate is to see what the expected return is for REIT indices on the site.)

recognize it as a capital gain in their individual taxes. Capital losses cannot be passed through to individual investors, but must be carried forward by the REIT and offset against any future capital gains.

Also important in section III of Exhibit 21–3 is cash flow retention, or the difference between FFO per share and dividends per share, which amounts to $1.72. Midwestern America may have retained this amount as a cash reserve or to acquire properties during the past year. As pointed out, MA could have paid this amount as a dividend and been taxed at ordinary income rates. However, because it was not paid currently, the cash flow retention is converted eventually into a capital gain if the *price* of MA stock responds favorably to management's decision to retain and invest these funds instead of paying dividends. Unlike corporations that may choose not to pay any dividends and retain all earnings for future expansion, MA must pay at least 95 percent of $2.72, or $2.58 per share. In other words, MA has far less discretion than corporations with respect to paying a minimum dividend—a major difference between REITs and corporate entities, which affects REIT dividend reinvestment and expansion policy in very important ways.

Conclusion

The resurgence of real estate investment trusts (REITs) in the early 1990s is another indication of the extent that real estate has become "securitized." Compared with traditional methods of investing, real estate–backed securities appear to be gaining in importance because of their marketability, the public accountability of management, and numerous other reasons. REITs, which provide a structure similar to that of mutual funds for common stock investors, allow investors to participate in a portfolio of properties that may be geographically diversified and professionally managed. Further, REITs are usually tax-exempt and must pass through as dividends to investors most of the cash flow produced from managing the portfolio. Accounting practices for depreciation and amortization and the resultant effects on net income may allow a portion of the tax on REIT dividends to be deferred. Today the market value of REITs exceeds $140 billion, and many of the premier real estate operators in the United States are operating within the REIT format, so market research and analysis for individual REITs and the industry are widely available from investment banks and other investment firms.

Key Terms

book value per share, *643*
cash available for distribution (CAD), *635*
dividend yield, *631*
earnings multiple, *643*
earnings per share (EPS), *642*
earnings yield, *643*
FFO multiple, *643*
FFO yield, *643*
funds from operations (FFO), *630*
net asset value (NAV), *633*
net income from operations, *641*
real estate investment trust (REIT), *621*
recovery of capital (ROC), *642*
umbrella partnership REIT (UPREIT), *623*

Useful Web Sites

www.nareit.org—National Association of Real Estate Investment Trusts is a national trade association for real estate companies. It provides programs, statistics, publications, and research, as well as information about REITs and REIT investing.

www.reitnet.com—Real Estate Investment Trusts Net provides access to essential decision-making tools needed to critically and objectively evaluate real estate investment options. This site gives REIT valuation and locates market reports and profiles.

www.DividendDiscountModel.com—Can be used to estimate the value of any publicly traded security, including REITs, based on the present value of projected dividends. Expected returns for REIT indices included on the site.

www.investinreits.com—This site provides all the tools to learn about real estate investment trusts (REITs) and publicly traded real estate companies. InvestinREITs.com is sponsored by the National Association of Real Estate Investment Trusts(r) (NAREIT).

www.nareit.com—NAREIT is the representative voice for U.S. REITs and publicly traded real estate companies worldwide. Members are real estate investment trusts (REITs) and other businesses that own, operate, and finance income-producing real estate, as well as those firms and individuals who advise, study, and service these businesses.

www.investopedia.com—It gives complete, unbiased, and easy-to-understand educational guide to investing and personal finance. The site has the biggest financial dictionary on the Web, hundreds of articles and tutorials, and an investing simulator where you can practice managing a portfolio without putting your money at risk.

www.riskgrades.com—RiskGrade™ Measure is an open and transparent benchmark to measure the risk of the world's financial assets.

http://www.snl.com/dna/reit/—This Web site provides fundamental financial data on more than 230 REITs, REOCS, and homebuilders. It gives detailed, descriptive property data, cost and performance data, and property mapping. It also is a good source for analyst coverage, FFO estimates, proprietary AFFO, and NAV consensus estimates.

http://www.realestateportfolio.com—This Web site is sponsored by the National Association of Real Estate Investment Trusts. It's a good source for finding latest trends, developments related to real estate investments, and about different REITs spread across the globe.

http://www.reitcafe.com/REITcafe.html—This Web site is a sponsor supported Web site providing numerous podcast programs focused on the REIT industry, consensus NAV estimates, REIT company conference calls in podcast format, and up-to-the-minute news on the industry. All of its content can be accessed free of charge.

Questions

1. What are the general requirements regarding income, investments, and dividends with which a REIT must comply to maintain its tax-exempt status?
2. What are the three principal types of REITs?
3. List and characterize equity REITs based on their property types.
4. What is the difference between earnings per share (EPS), funds from operations (FFO), adjusted funds from operations (AFFO), and dividends per share?
5. Explain how an investor in an equity REIT may receive a current dividend, part of which may be tax-deferred.
6. What are some important lease provisions which investors should be aware of when analyzing the financial statements of REITs?
7. What is a mortgage REIT?

Problems

1. You have been presented with the following set of financial statements for National Property Trust, a REIT that is about to make an initial stock offering to the public. This REIT specializes in the acquisition and management of warehouses. Your firm, Blue Street Advisors, is an investment

management company that is considering the purchase of National Property Trust shares. You have been asked to prepare a financial analysis of the REIT. National believes that it should pay a dividend of at least $3.00 per share to be comparable with other REITs at this time. However, it is not sure whether this amount will be sufficient.

National Property Trust

Panel A. Operating Statement Summary

Net revenue	$100,000,000
Less:	
Operating expenses	40,000,000
Depreciation and amortization	22,000,000
General and administrative expenses	6,000,000
Management expense	3,000,000
Income from operations	29,000,000
Less:	
Interest expense*	6,400,000
Net income (loss)	$ 22,600,000

*At 8% interest only.

Panel B. Balance Sheet Summary

Assets	
Cash	$ 1,500,000
Rents receivable	2,500,000
Properties @ cost	750,000,000
Less: Accumulated depreciation	450,000,000
Properties—net	300,000,000
Total net assets	$304,000,000
Liabilities	
Short term	$ 12,000,000
Mortgage debt*	80,000,000
Total	92,000,000
Shareholder equity†	212,000,000
Total liabilities and equity	$304,000,000

*At 8% interest only.
†10,000,000 shares outstanding.

a. Develop a set of financial ratios that will provide Blue Street Advisors with useful information in the evaluation and comparison of National Property Trust with other REITs.

b. Your research also indicates that the shares of comparable REITs specializing in warehouse acquisitions in the same regions are selling at dividend yields in the range of 8 percent. Price multiples for these REITs are about 12 × current FFO. What price range does this suggest for National shares? What would you expect National's dividend and cash retention policy to be in order to recommend its purchase?

2. Robust Properties is planning to go public by creating a REIT that will offer 1 million shares of stock. It is currently trying to develop a pro forma set of financial statements. Robust is faced with a number of questions about its handling of some accounting and financial disclosure issues.

Robust Properties

I. Major Financial Information:	
a. Assets—properties (actual cost)	$100,000,000
b. Depreciable basis—buildings only	$80,000,000
c. Useful life	40 years
d. Operating expenses	38% of rents
e. Management expenses—3rd parties	5% of rents
f. General and administrative expenses	3% of rents
g. Mortgage @ 8% interest only, 10 yrs.	$30,000,000
h. Financing fees	$900,000
II. Lease Information:	
a. Average lease term	5 years
b. Leasable space	1,000,000sf.
c. Base rents (year 1)	$15 psf.
d. Escalation factor—rents per year	5%
e. Lease commissions	4% of yr 1 rent
f. Tenant improvements	$10 psf.

The management of Robust Properties has asked you to prepare preliminary pro forma financials for the next *three years*. Specifically, you should have (1) a *beginning* balance sheet, (2) operating statements for each of the next three years, and (3) all relevant financial ratios for year 1 results only. Robust will pay all financing fees, tenant improvements, and lease commissions upon commencing operations. It would like to pay a minimum dividend of $4.00 per share.

In preparing your pro forma operating statements, Robust wants you to consider the effects of reporting in the following two ways:

a. What would EPS, FFO, and ROC be under both approaches? How should Robust think about its accounting policy?

Approach	(1)	(2)
Lease commissions	Amortize, 5 years	Expense in year 1
Finance fees	Amortize, 10 years	Expense in year 1
Tenant improvements	Depreciate, 40 years	Depr. over 5-year lease term
Buildings	Depreciate, 40 years	Depr., 40 years

Chapter 22

Real Estate Investment Performance and Portfolio Considerations

Introduction

Thus far, our discussion of risk and required rates of return has stressed a methodology or an approach that should be used when evaluating a specific project or mortgage financing alternative. In this chapter, we provide some insight into the measurement of return and risk for various real estate investment vehicles and investment portfolios.

We will apply concepts and methodologies based on financial theory and demonstrate possible applications to real estate investments. The use of many of these applications is gaining in importance to institutional investors, such as life insurance companies, investment advisors, consultants to pension funds, bank trust departments, and other entities that manage portfolios with real estate assets. Portfolio managers must be able to measure the performance of real estate assets and be able to compare it to the performance of stocks, bonds, and other investments. Also, many portfolio managers are interested in knowing how well investment portfolios perform when real estate investments are *combined* with other securities.

The Nature of Real Estate Investment Data

When measuring the investment performance of something as broadly defined as real estate, one must keep many things in mind. Ideally, to measure real estate investment performance, we would like to have data on prices for all investment property transactions—ranging from hotels to warehouses to apartment units—taking place in the economy, a detailed description of the land, improvements, and cash flows produced by these properties. We would also like to have data on repeated sales of the same properties over time. We could then calculate various measures of return on investment over time. Unfortunately, such a data series,

or even an adequate sample of transactions in the many areas of real estate, is not available because the market is one in which the price for a relatively nonhomogeneous asset is negotiated between two parties. Generally, this price does not have to be disclosed to any public or private agency. Hence, unlike securities markets, there is no centralized collection of real estate transactions and operating income data.[1]

Because of these limitations, current attempts to measure real estate investment performance are based on limited data that are made available from a few select sources. The available data may not be representative of (1) the many types of properties, (2) the many geographic areas in which commercial real estate is located, or (3) the frequency of transactions indicative of real estate investment activity in the economy as a whole. Consequently, you must be careful when making generalizations about real estate performance.

Sources of Data Used for Real Estate Performance Measurement

In this section, we provide information on two sources of real estate data that are used to a limited extent when measuring real estate investment performance. We also consider investment returns from data that are available on common stocks, corporate bonds, and government securities. Exhibit 22–1 summarizes the data available for these investments. We rely on two sources for real estate returns in this chapter. The first is security prices as represented by REIT shares. The second data source is based on estimates of value of individual properties owned by pension plan sponsors. Note that the primary differences in these data is that one source is based on real estate–backed securities and the other is based on estimates of individual properties.

REIT Data: Security Prices

One of the two sources of data used to produce investment returns on real estate in this chapter is based on REITs. The **NAREIT** (National Association of Real Estate Investment Trusts) REIT Share Price **Index** is a monthly index based on ending market prices for shares owned by REIT investors. Data for this series are available beginning with January 1972 and include all REITs actively traded on the New York and American Stock Exchanges as well as the Nasdaq National Market System.[2]

The data used in this chapter are based on only those REITs that *own* real estate, or equity REITs. NAREIT compiles a monthly index for equity REITs based on month-end prices and dividends on securities owned by investors in each equity REIT contained in the index. Hence, the prices of REIT shares are determined by how successful investors believe the trustees of an individual REIT will be in finding properties at favorable prices, managing them, and then selling them. While equity REIT share prices certainly reflect investors' perceptions of the quality, diversity, and risk of real estate assets owned, investors are also evaluating the effectiveness of trustees in their valuation of equity REIT securities. Further when purchasing shares, investors do not give up as much liquidity as they would if they acquired and managed real estate assets directly, because a continuous auction market (e.g., NYSE) exists in which shares are traded. Thus, investing in an equity REIT may be less risky than investing directly in real estate.

[1] In some states, actual transaction prices must be disclosed to property tax assessors. However, other data relating to property characteristics and operating cash flows are generally not available.

[2] Obtained from various publications of the National Association of Real Estate Investment Trusts, Washington, DC.

Hybrid and Mortgage REITs

A mortgage REIT investment return series and a hybrid REIT return series are also shown in Exhibit 22–1. The mortgage REIT index is based on security prices of shares outstanding in REITs that specialize in acquiring various types of mortgage loans on many types of properties. Hence, when investing in a mortgage REIT, an investor is buying equity shares in an entity whose assets are primarily mortgage loans. Hybrid REITs operate by buying real estate *and* by acquiring mortgages on both commercial and residential real estate.

EXHIBIT 22–1
Common Sources of Data Used for Measuring Investment Performance

Real Estate–Equity Returns	Description of Data
NAREIT—Equity REIT Share Price Index and Dividend Yield Series	Monthly index computed based on share prices of REITs that own and manage real estate assets. Security prices used in the index are obtained from the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Security Dealers Automated Quotation (Nasdaq) system. Divided data are collected by NAREIT. Properties owned may be levered or unlevered. Index values are available from 1972 to the present.
NAREIT—Mortgage REIT Share Price Index and Dividend Yield Series	Monthly index computed on share price data of REITs that make primarily commercial real estate loans (construction, development, and permanent) although some make or purchase residential loans (both multifamily and single family). Prices obtained from NYSE, AMEX, and Nasdaq market system. Dividend data are collected by NAREIT. Monthly index data available from 1972 to the present.
NAREIT—Hybrid REIT Index	Monthly index compiled by NAREIT from share prices and dividends for REITs that (1) own properties and (2) make mortgage loans. Sources of data are the same as for equity and mortgage REITs. Index values are available from 1972 to the present.
NCREIF Property Index—National Council of Real Estate Investment Fiduciaries	NCREIF members contribute data based on about 5,000 properties with an aggregate market value of about $200 billion that are owned by pension fund plan sponsors through investment managers. An index is calculated quarterly and data consist of (1) net operating income and (2) beginning- and end-of-quarter appraised values for all properties. Actual sale prices are used, as available. Quarterly index values are available from 1978 to the present.
Common stocks—Standard & Poor's (S&P) 500	Daily index based on common stock prices for the 500 corporations with the highest market value of common stock outstanding. Data available from the financial press. Dividend data compiled by Wilshire and Associates and included in a monthly and annual total return index by Ibbotson Associates, Chicago. Daily index data available from 1926 to the present.
Corporate bonds—Salomon Brothers High-Grade Corporate Bond Index	Monthly index based on high-grade, long-term (20-year) bond prices. Interest based on bond coupons and total returns (interest, beginning, and ending index values) compiled by Ibbotson Associates, Chicago. Daily index available from 1926 to the present.
Government securities	U.S. Treasury bills and bonds. Price data obtained from *The Wall Street Journal*. A monthly total return series compiled by Ibbotson Associates, Chicago. Daily index data available from 1926 to the present.

NCREIF Property Index: Property Values

The NCREIF Property Index measures the historic performance of income-producing properties either (1) acquired by open-end or commingled investment funds that sell investment units owned by qualified pension and profit-sharing trusts, or (2) acquired by investment advisors and managed on separate account bases. The data incorporated in the **NCREIF Index** are voluntarily contributed and based on the performance of properties managed by members of the National Council of Real Estate Investment Fiduciaries (NCREIF).[3] Quarterly rates of return are calculated for all properties included in the index and are based on two distinct components of return: (1) net operating income and (2) the quarterly change in property market value (appreciation or depreciation). The NCREIF Index contains data on five major property categories: apartment complexes, office buildings, industrial (warehouses, office/showrooms/research and development facilities), retail properties (including regional, community, and neighborhood shopping centers as well as freestanding store buildings), and hotels. Property values are based on either appraised values or, for properties that are sold, net sales proceeds, which are entered as the final market value in the quarter in which the property is sold. The index returns represent an aggregate of individual property returns calculated quarterly before deduction of investment advisory fees. The quarterly series is calculated by summing the increase or decrease in the value of each property plus its net operating income for the quarter. To obtain changes in value, *quarterly appraisals* are made, and when sales occur, actual transaction prices negotiated by the buyer and seller are a part of the index.

Data Sources for Other Investments

In contrast to the scarcity of real estate return data, data on financial assets are plentiful and easily obtainable. In this chapter, we will also develop measures of investment performance for common stocks from the Standard & Poor's 500 Index of Common Stocks (S&P 500), U.S. Treasury bills (T-bills), longer-term U.S. Treasury bonds, and long-term corporate bonds contained in the Salomon Brothers Index of Corporate Bonds. These indexes (see Exhibit 22–1) are generally computed daily, weekly, monthly, quarterly, and annually and are published regularly in the financial press.

Cumulative Investment Return Patterns

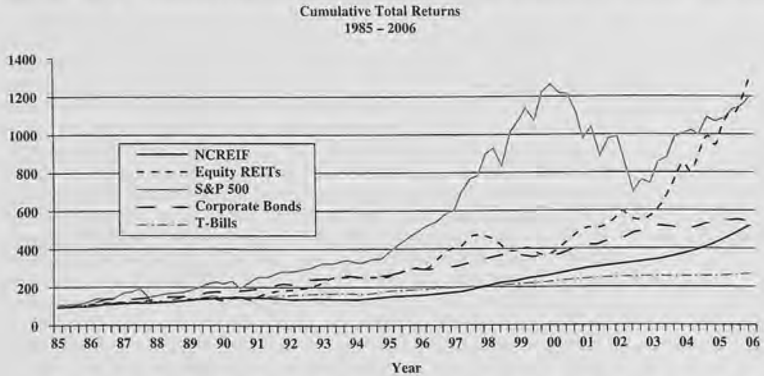
A series of historic total return indexes (see Exhibit 22–2) have been developed to begin the discussion of real estate equity investment performance. We have included three equity indexes: the S&P 500, EREIT (equity REITs), and NCREIF Property Index. Debt securities are represented by indexes for T-bills and corporate bonds (for sources see Exhibit 22–1). These indexes are cumulative total returns based on quarterly data for each security: Each series is indexed at 100 beginning in 1985 (1Q) and is compiled through 2006 (1Q) and includes reinvestment of dividends, income, or interest as appropriate.[4]

The patterns indicate that $100 invested from the end of 1985 through 2006 would have produced the greatest total return (based on quarterly price changes and reinvestment of all dividends, interest, or income) if it had been invested in securities comprising the S&P 500 index. Total return rankings of the other indexes were as follows: Equity REITs, Corporate Bond Index, NCREIF Index, and T-bills. We stress, however, that although these return

[3] See the *NCREIF Real Estate Performance Report*, various issues, published by National Council of Real Estate Fiduciaries (Chicago), www.NCREIF.org.

[4] Dividends are included for the S&P 500 and EREITs. Net operating income is included in the NCREIF Index. Interest is included in the corporate bond index. T-bills include price changes only as no interest is paid on these instruments. They are bought and sold at discounts to maturity.

EXHIBIT 22–2 **Cumulative Total Returns REITs, S&P 500, NCREIF, Bonds, and T-Bill Indices, 1985–2006**



patterns are informative, it should not be implied that each investment is equivalent in *risk*. When we attempt to compare different securities, cumulative return data must be broken down into an appropriate time series so that various measures of volatility can be calculated to provide some idea about the relative risk of each security. It should be stressed that when we analyze investments, returns provide us with only one-half of the information that we need. Information on the risk characteristics of investment are equally important.

Computing Holding Period Returns

While the cumulative total returns shown in Exhibit 22–2 are useful information, additional insight into the risk-return characteristics of each security can be obtained by examining returns over shorter time periods. The most fundamental unit of measure used by portfolio managers to measure investment returns for individual securities, or a class of securities in a portfolio, is the **holding period return *(HPR)*.** This is generally defined as follows:

$$HPR = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$$

where P_t is the end-of-period price for the asset, or value of an index for an investment, or index representing a class of investments, whose performance is being assessed; P_{t-1} is the beginning-of-period value; and D represents any dividends or other cash payouts that may have occurred during the period over which the *HPR* is being measured.

An example of how holding period returns are calculated for a hypothetical security index is demonstrated in Exhibit 22–3. The first quarter's return was calculated by subtracting the end-of-period value and dividing by the beginning-of-period value. The arithmetic mean, variance, standard deviation, and coefficient of variation have also been calculated. These measures will be used in our discussion of risk later in the chapter. The *HPR* for the first quarter in the series was 13.49 percent. The mean *HPR*, or $\overline{HPR}$, of all quarterly returns in the series was 1.09 percent.

An alternative way of considering these return data is to calculate the **geometric mean return.** This return is calculated by finding the *n*th root of the product of each

EXHIBIT 22–3
Sample Computation of Holding Period Returns (*HPRs*) and Related Statistics: Hypothetical Security

eXcel
www.mhhe.com/bf13e

Period Ending	Index	*HPR*	$HPR - \overline{HPR}$	$(HPR - \overline{HPR})^2$
Quarter				
1	673.7	—	—	—
2	764.6	0.1349	0.1240	0.0154
3	787.6	0.0301	0.0192	0.0004
4	803.6	0.0203	0.0094	0.0001
5	802.5	−0.0014	−0.0123	0.0002
6	886.3	0.1044	0.0935	0.0087
7	890.6	0.0049	−0.0061	0.0000
8	855.3	−0.0396	−0.0505	0.0026
9	773.1	−0.0961	−0.1070	0.0115
10	844.3	0.0921	0.0812	0.0066
11	867.8	0.0278	0.0169	0.0003
12	878.5	0.0123	0.0014	0.0000
13	874.4	−0.0047	−0.0156	0.0002
14	895.6	0.0242	0.0133	0.0002
15	948.5	0.0591	0.0482	0.0023
16	982.6	0.0360	0.0250	0.0006
17	952.5	−0.0306	−0.0415	0.0017
18	914.5	−0.0399	−0.0508	0.0026
19	911.8	−0.0030	−0.0139	0.0002
20	780.7	−0.1438	−0.1547	0.0239
21	804.9	0.0310	0.0201	0.0004
		Σ0.2181		Σ0.0779

1st quarter $HPR = (764.6 - 673.7) \div 673.7 = 0.1349$
Mean $HPR = \overline{HPR} = \Sigma HPR \div n = 0.2181/20 = 0.0109$
Variance $= \sigma^2 = \Sigma\,(HPR - \overline{HPR})^2 \div n = 0.0779/20 = 0.0039$
Standard deviation $= \sigma = \sqrt{\sigma^2} = \sqrt{.0039} = 0.0624$
Coefficient of variation $= 0.0624 \div 0.0109 = 5.7219$
Geometric mean return $= \sqrt[n]{(1 + HPR_1)(1 + HPR_2)\cdots(1 + HPR_n)} - 1 = .0089$

quarterly *HPR* in series multiplied together, minus 1 (see bottom of exhibit). The geometric mean return was equal to .13 percent, a measure of the quarterly *compounded* rate of return that an investor would have earned on $1 invested in the index during the period.

Although the values of the arithmetic mean and geometric mean are sometimes very close, this will not always be the case, particularly if values in the series rise and fall sharply or the series is longer than the sample shown in the exhibit. There is a distinct conceptual difference between the arithmetic and geometric mean returns. The geometric mean is used by portfolio managers when considering the performance of an investment and is expressed as a compound rate of interest from the beginning to the end of a specific period of time. **Arithmetic mean returns** are simple averages (not compounded) and are widely used in statistical studies spanning very long periods of time.[5]

[5] The geometric mean is considered superior to the arithmetic mean when the past performance of an investment is being considered for a specified period of time, say, from the date of purchase until the present time, or for an investment portfolio where funds are flowing in and out and the investment base is changing. For example, suppose the price of a security is 100, 110, 100 at the end of each of three consecutive years. The *HPR*s are 10 percent and − 9.09 percent. The arithmetic mean is .45 percent; however, the geometric mean is zero. The latter result occurs because the beginning and ending security prices are equal. This return better represents the performance of a security from the time of purchase until the present. Arithmetic mean returns are used in statistical studies where some inference about the future is based on averages of past performance. In these cases, an entire series of returns may be used to justify a long-term future decision and no specific time interval is considered any more important than another.

EXHIBIT 22–4
Summary Statistics of Performance Measures for Selected Investment Alternatives

	CPI	Corp Bond	S&P 500	T Bills	NCREIF	EREIT
Arithmetic mean	0.76%	2.06%	3.39%	1.20%	2.01%	3.39%
Standard deviation	0.60%	2.62%	8.01%	0.50%	1.62%	6.95%
Coefficient of variation	0.79	1.27	2.36	0.42	0.81	2.05
Geometric mean	0.76%	2.02%	3.07%	1.20%	2.00%	3.16%

Exhibit 22–4 contains summary statistics for various investments that we have chosen to include in the chapter. Note that for each of the return series, we have calculated quarterly arithmetic mean and geometric mean returns and related statistics. The exhibit also includes data for the Consumer Price Index (CPI).

Comparing Investment Returns

We can now begin to compare total returns for the various investment categories contained in Exhibit 22–4. A number of patterns should be apparent from the data. The geometric mean returns (also called time weighted returns by many portfolio managers) show that from 1985 to 2006, stocks constituting the Standard and Poor's 500 Index (S&P 500) produced quarterly returns of 3.07 percent. Equity REIT (NAREIT) returns were 3.16 percent, which were slightly better than the S&P 500. Returns for corporate bonds were 2.02 percent, followed by returns on the NCREIF Index, which were 2.00 percent, and T-bills (1.20 percent).

HPRs and Inflation

All returns shown in Exhibit 22–4 may also be compared with the quarterly rate of inflation, as represented by the CPI, which was .76 percent. The comparison with the CPI provides some insight into whether returns from each investment category exceeded the rate of inflation (thereby earning *real* returns).

Comparing Risk Premiums

In addition to returns, risk premiums may be calculated for each investment class relative to T-bills. Risk premiums may also be calculated for each investment relative to all other investments. For example, during the 1985–2006 period, EREITs earned an average *risk premium* of 1.96 percent per quarter, in excess of T-bills (3.16% − 1.20%). T-bills are generally used to represent a riskless investment; hence, T-bill returns provide a measure of a risk-free return. Investors in EREITs would also have earned a premium of 1.14 percent relative to returns on corporate bonds (3.16% − 2.02%). When compared to the NCREIF Index, which provided returns of 2.00 percent compounded quarterly, EREIT returns were higher by 1.16 percent. We should recall, however, that the NCREIF Index is compiled on an *unleveraged* basis; that is, the properties in the index were purchased on an all-cash basis, or "free and clear" of debt. Hence, a more appropriate comparison for the NCREIF Property Index would be relative to equity REITs that purchase properties on an all-cash basis, or unleveraged basis, because EREIT returns include the effects of leverage, while the NCREIF Index does not. Hence, EREITs are more risky. Therefore, holding all else constant, a premium should be earned on EREIT shares relative to returns based on the NCREIF Index.

Risk, Return, and Performance Measurement

While comparing investment returns is an important starting point in evaluating investment performance, it represents only one part of the analysis. We know from material presented

earlier that investments that produce higher returns usually exhibit greater price volatility and are generally *riskier* than investments that produce lower returns. In cases involving *individual real estate* investments, such risks may be a function of the type of property, its location, design, lease structure, and so on. Those attributes, and the attendant risks associated with those attributes, can be thought of as a type of *business risk*.

Another source of risk occurs when real estate investments are leveraged. In these cases, default risk is present. Finally, because of the relative difficulty and time required to sell property, liquidity risk is certainly present. As we know, when these three major sources of risk are compared among properties or among alternative investments, when more risk is taken by investors, a risk premium, or higher investment return, should be earned by investors who bear that additional risk. One way of considering this risk-return relationship is to compute risk premiums, as we did above. A subjective assessment can then be made about whether risk premiums earned on riskier assets are adequate relative to the additional risk taken. An investor may then judge whether the premium earned on EREITs is sufficient to compensate for their added risk taken if EREITs are purchased instead of corporate bonds.

Another way of looking at the risk-return relationship is to think about the way in which business, default, and liquidity risks affect the pattern of returns that investors expect to earn. Over time, returns (dividends and price changes) on investments with more of these risks present are likely to exhibit more *variation* than investments with fewer of these risks. Recalling our earlier discussions on investment risk, we would expect a property with more risk to provide higher, but more variable, investment returns than a property with less risk. The point is that greater variability in market prices and cash flows can be thought of as commensurate with increased risk because an investor owning a risky asset with a highly variable price pattern (up and down) faces having to sell it for a more unpredictable price than a less risky asset. *The assumption that variability in asset returns represents risk and that premiums over what could be earned on a riskless investment represent the price of risk is the foundation for modern finance theory.* It is also a premise that must be understood if the techniques for risk-adjusting returns that are described below are to be used.

Risk-Adjusted Returns: Basic Elements

Given that the combined effects of the sources of risk described above will be reflected in the variability in investment returns, one way of taking into account investment risk when evaluating performance is to consider the variability of returns. The variability of holding period returns for specific assets or classes of assets enables one to make a better comparison among investments exhibiting different risk.

One approach that may be used to consider risk and returns is to compute the **coefficient of variation** of the returns. This is defined as the standard deviation of returns divided by the mean return (this can be based on either the arithmetic or geometric mean returns for a given investment or investment index). This concept is sometimes referred to as a *risk-to-reward ratio* and is intended to relate total risk, as represented by the standard deviation, to the mean return with the idea of determining how much return an investor could expect to earn relative to the total risk taken if the investment was made. For example, if an investor holds a portfolio containing securities with a mean return of 2 percent and a standard deviation of 3 percent, the coefficient of variation is 1.5. This may be interpreted as taking 1.5 units of risk for every unit of return that is earned.[6]

[6] This calculation also assumes that the risk premium, or return, is proportional to the risk taken on all investments by all investors. This assumption clearly *does not hold* for all investors, some of whom are more risk-averse than others. Even for the same investor, risk aversion cannot be considered for individual assets independently of one another. Rather, risk must be assessed in terms of the additional risk assumed relative to the total portfolio of assets owned. More will be said about this later.

An interesting comparison may now be made between the investment performance of EREITs and the NCREIF Index. Recall from Exhibit 22–4 that the NCREIF Index produced a lower mean return compared with EREITs. However, when mean returns for both investment categories are risk-adjusted, the NCREIF Index appears to have outperformed the EREIT index on a risk-adjusted basis. When the coefficients of variation for EREITs and the NCREIF Index are compared, the NCREIF had better *risk-adjusted return* than the EREITs.

It has already been pointed out that the NCREIF Index (1) does not include the effect of leverage in investment returns, and (2) property values used to compute the NCREIF Index are based largely on quarterly appraisals plus a relatively small number of actual sale transactions. Using appraisals may have a smoothing effect on returns and reduce variability. If property appraisals (1) differ significantly from actual market values and (2) affect the variation in the index, then the NCREIF Index may not be representative of true real estate returns or volatility in those returns. For example, results in Exhibit 22–4 for EREITs indicate that the mean return was 3.39 percent and the standard deviation of returns was 6.95 percent, resulting in a coefficient of variation of 2.05. This compares to a mean return of 2.01 percent for the NCREIF Index and a coefficient of variation of .81. These results indicate a material difference in both return and risk for the two indexes. This difference may also be due to considerable differences in the types of properties (e.g., office, retail, apartment), in the geographic distribution of their locations (e.g., north, south, east, or west and suburban or urban sites), and in the investment strategies employed by investment managers (e.g., investing in raw land in predevelopment stages or in fully leased properties only). Such differences may affect the relative risk of investments in each index. Further, equity REIT shares are bought and sold in an *auction* market with continuous trading, whereas the individual properties that make up the NCREIF Index are bought and sold in a much more limited, *negotiated* market between parties. Premiums for liquidity and transaction costs when making such comparisons are really not well understood, nor have such premiums been isolated in research studies. Finally, the definition of income used in calculating the holding period returns for both indexes may not be exactly comparable because of advisory and other management fees that are deducted from REIT income, but not for properties in the NCREIF Index. More research must be done before the nature of risk and return for investments made in REIT shares versus direct investment in real estate, as represented by the NCREIF Index, is well understood.

Elements of Portfolio Theory

The preceding section dealt with one approach that may be used to compare investments by considering the investment's mean return (we used the geometric) and the standard deviation of those returns. The standard deviation was used as a measure of risk when making comparisons among investments. In addition, investors must consider the extent to which the acquisition of an investment affects the risk and return of a *portfolio* of assets. This question is very important because of the interaction between returns when investments are *combined* in a portfolio. This interaction may cause the variance of return on a portfolio to be less than the average of the individual investments. When investors add to an existing portfolio it is important to understand how the acquisition of new assets may *impact* the return and risk of the entire portfolio.

Building a portfolio by considering the return and standard deviation of returns for *individual* investments will not always ensure that an optimum portfolio will be obtained. Indeed, any new asset that is being considered as an addition to a portfolio should be judged on the grounds of "efficiency," that is, whether its addition to an existing portfolio will

EXHIBIT 22–5 Computation of the Mean *HPR* and Standard Deviation for a Hypothetical Portfolio Containing Stocks *i* and *j* in Equal Proportions

	Stock i HPR	Stock j HPR	$HPR_p = .5(HPR_i) + .5(HPR_j)$	$(HPR_p - \overline{HPR}_p)$	$(HPR_p - \overline{HPR})^2$
Quarter					
1	0.1350	0.1407	0.1379	0.1145	0.0131
2	0.0301	0.0591	0.0446	0.0212	0.0004
3	0.0202	−0.0697	−0.0247	−0.0481	0.0023
4	−0.0013	0.0540	0.0264	0.0030	0.0000
5	0.1044	0.2133	0.1588	0.1354	0.0183
6	0.0048	0.0514	0.0281	0.0047	0.0000
7	−0.0396	0.0662	0.0133	−0.0101	0.0001
8	−0.0961	−0.2263	−0.1612	−0.1846	0.0341
9	0.0921	0.0587	0.0754	0.0520	0.0027
10	0.0279	0.0660	0.0469	0.0235	0.0006
11	0.0123	0.0039	0.0081	−0.0153	0.0002
12	−0.0047	0.0310	0.0132	−0.0102	0.0001
13	0.0242	0.0703	0.0472	0.0238	0.0006
14	0.0591	0.0880	0.0735	0.0501	0.0025
15	0.0360	0.1065	0.0713	0.0478	0.0023
16	−0.0307	0.0205	−0.0051	−0.0285	0.0008
17	−0.0399	−0.0302	−0.0351	−0.0585	0.0034
18	−0.0029	0.0629	0.0300	0.0066	0.0000
19	−0.1438	−0.1378	−0.1408	−0.1642	0.0270
20	0.0310	0.0895	0.0603	0.0369	0.0014
$n = 20$	0.2181	0.7180	0.4681		0.1100

Stock *i* holding period return $\overline{HPR}_i = 0.2181 \div 20 = 0.0109$

Stock *i* variance $= \sigma^2_i = 0.0779 \div 20 = 0.0039$

Stock *i* standard deviation $= \sigma_i = \sqrt{\sigma_i^2} = 0.0624$

Stock *j* holding period return $\overline{HPR}_j = 0.7180 \div 20 = 0.0359$

Stock *j* variance $= \sigma_j^2 = 0.1741 \div 20 = 0.0087$

Stock *j* standard deviation $= \sigma_j = \sqrt{\sigma_j^2} = 0.0933$

Portfolio$_p$ holding period return $\overline{HPR}_p = 0.4681 \div 20 = 0.0234$

Portfolio variance $= \sigma_p^2 = (HPR_p - \overline{HPR}_p)^2 \div n = 01100/20 = 0.0055$

Portfolio standard deviation $= \sigma_p = \sqrt{\sigma_p^2} = 0.0742$

increase expected portfolio returns while maintaining, or lowering, portfolio risk. Alternatively, an investor may also judge whether the portfolio efficiency of an asset will lower portfolio risk while maintaining or increasing the expected portfolio return.[7]

To illustrate how the interaction between investment returns occurs, we consider the data in Exhibit 22–5. Returns in column 1 are calculated on quarterly *HPR*s for stock *i*, abbreviated as HPR_i. Returns in column 2 are the quarterly returns computed for stock *j* over the same time period. The statistics presented at the bottom of the exhibit indicate that the quarterly mean return for stock *j* was 3.59 percent and the standard deviation was 9.33 percent. The mean return for stock *i* was 1.09 percent, and the standard deviation of the return was 6.24 percent (calculations not shown). Obviously, risk and returns for these two investments

[7] The basis for modern portfolio theory was developed by Harry Markowitz, "Portfolio Selection," *Journal of Finance* 7, no. 1 (March 1952), pp. 77–91.

are very different. Stock j produced both a higher mean return and higher standard deviation (risk) when compared with the returns from stock i. Assuming that an investor was holding a portfolio *composed only* of stock j at the beginning of the investment period, the question to answer is, how would the addition of another investment (as represented by real estate stock i) affect the quarterly mean *portfolio* return and its standard deviation? Would the investor have been better off adding real estate securities to this portfolio?

Calculating Portfolio Returns

To demonstrate an approach that may be used to answer these questions, we will assume that both stocks i and j were *weighted equally* in one portfolio at the beginning of the period. We will then compute the mean return and standard deviation for the *combined portfolio* (see Exhibit 22–5). The mean return for the portfolio, $\overline{HPR_p}$, is calculated as:

$$\begin{aligned}\overline{HPR_p} &= W_i(\overline{HPR_i}) + W_j(\overline{HPR_j})\\ &= .5(.0109) + .5(.0359)\\ &= .0055 + .0179\\ &= .0234\end{aligned}$$

where W represents the weights that securities i and j represent as a proportion of the total value of the portfolio (i.e., $W_i + W_j = 1.0$). Based on this calculation, we see that the *portfolio* return would have been 2.34 percent quarterly, which is less than what would have been earned on stock j alone. However, we cannot really conclude much from this result until we consider how portfolio *risk* may have been affected when the two investments were combined.

Portfolio Risk

To consider how total portfolio risk would have been affected by the *addition* of stock i to an existing portfolio of continuing stock i and j only, the standard deviation of the *new portfolio* returns is calculated (see Exhibit 22–5). Those results indicate that the portfolio standard deviation is 7.42 percent, which is far less than the standard deviation of stock j, which was 9.33 percent.

However, it is important to note that unlike the mean *HPR* for the portfolio, the *standard deviation of portfolio returns* for the two indexes is not equal to the simple weighted average of the individual standard deviations of the two indexes; that is, [(.5)(6.24%)] + [(.5)(9.33%)] does *not* equal the standard deviation of the portfolio returns. This is because when the returns of the two assets are combined, a greater-than-proportionate reduction in the variance in portfolio returns is achieved. In other words, there is *interaction* between the two returns in the sense that the pattern, or direction of movement, in each of the individual *HPR*s is not the same in each period.[8] Indeed, in some quarters, the *HPR*s for EREITs are positive and the *HPR*s for the stocks are negative. Hence, when combined in one portfolio, the returns on the portfolio are less volatile than the individual assets. The nature of this interaction is important to understand when measuring the risk of an investment portfolio because it demonstrates whether a portfolio investor will benefit from diversification.

[8] As shown in Exhibit 22–5, the portfolio standard deviation can be calculated each time weights for stocks change. Another method of computation for the two-security case can be made by simply changing the weights W_E and W_S for stocks E and S in the following equation: $[(W_E)^2(S_E)^2 + (W_S)^2(S_S)^2 + 2(W_S)(W_E)(S_S)(S_E)_{\rho SE}]1^{1/2}$ = portfolio standard deviation, where W = weight of security types E, S (all WS must total 1), S = standard deviation of security, and ρ_{SE} is the coefficient of correlation between S and E. Exhibit 22–6 shows the calculations for the standard deviation for each security as well as the correlation between the securities.

EXHIBIT 22–6 Computation of Covariance for Stocks i and j

Period Ending	HPR Stock i	HPR Stock j	$HPR_i - \overline{HPR_i}$	$HPR_j - \overline{HPR_j}$	$(HPR_i - \overline{HPR_i}) \times (HPR_j - \overline{HPR_j})$	Stock i $(HPR_i - \overline{HPR_i})^2$	Stock j $(HPR_j - \overline{HPR_j})^2$
Quarter							
1	0.1350	0.1407	0.1241	0.1048	0.0130	0.0154	0.0110
2	0.0301	0.0591	0.0192	0.0232	0.0004	0.0004	0.0005
3	0.0202	−0.0697	0.0093	−0.1056	−0.0010	0.0001	0.0111
4	−0.0013	0.0540	−0.0122	0.0181	−0.0002	0.0001	0.0003
5	0.1044	0.2133	0.0935	0.1774	0.0166	0.0087	0.0315
6	0.0048	0.0514	−0.0061	0.0155	−0.0001	0.0000	0.0002
7	−0.0396	0.0662	−0.0505	0.0303	−0.0015	0.0026	0.0009
8	−0.0961	−0.2263	−0.1070	−0.2622	0.0281	0.0115	0.0687
9	0.0921	0.0587	0.0812	0.0228	0.0019	0.0066	0.0005
10	0.0279	0.0660	0.0170	0.0300	0.0005	0.0003	0.0009
11	0.0123	0.0039	0.0014	−0.0320	−0.0000	0.0000	0.0010
12	−0.0047	0.0310	−0.0156	−0.0049	0.0001	0.0002	0.0000
13	0.0242	0.0703	0.0133	0.0344	0.0005	0.0002	0.0012
14	0.0591	0.0880	0.0482	0.0521	0.0025	0.0023	0.0027
15	0.0360	0.1065	0.0251	0.0706	0.0018	0.0006	0.0050
16	−0.0307	0.0205	−0.0416	−0.0154	0.0006	0.0017	0.0002
17	−0.0399	−0.0302	−0.0508	−0.0661	0.0034	0.0026	0.0044
18	−0.0029	0.0629	−0.0138	0.0270	−0.0004	0.0002	0.0007
19	−0.1438	−0.1378	−0.1547	−0.1737	0.0269	0.0239	0.0302
20	0.0310	0.0895	0.0201	0.0536	0.0011	0.0004	0.0029
n = 20	0.2181	0.7180			0.0940	0.0779	0.1741

$$\begin{aligned}COV_{ij} &= \Sigma[HPR_i - \overline{HPR_i}][HPR_j - \overline{HPR_j}] \div n\\ &= 0.0940 \div 20\\ &= 0.0047\end{aligned}$$

Correlation between stocks i and j

$= [COV_{ij}] \div [\sigma_i\, \sigma_j] = 0.8070$

Covariance and Correlation of Returns: Key Statistical Relationships

One important aspect of individual investment returns to consider is how the return on a prospective new asset will vary with returns on an existing portfolio. Clearly, if the asset is producing returns that move up and down in a pattern that is very *similar* to movements in portfolio returns, the inclusion of that asset in the portfolio will not reduce total variation (*risk*) by very much. This pattern, when considered with the mean of portfolio returns and mean return of the prospective asset, will give us an indication of how efficient the acquisition of an asset will be when combined with another asset or with an existing portfolio. Two statistics provide a numerical measure of the extent to which returns tend to either move together, in opposite directions, or have no relationship to one another. These statistics are the *covariance* and *correlation* between the two return series.

The **covariance** between returns on two assets is an *absolute* measure of the extent to which two data series (*HPR*s) move together over time. It is calculated for our example in Exhibit 22–6. Essentially, the covariance is computed for two investments by first finding the deviation of each investment's *HPR* from its mean ($\overline{HPR}$). These deviations for each security in each period are then multiplied and summed. The summed deviations are divided by the number of observations in each series. The result is the *covariance* or statistic that provides an *absolute* measure of the extent to which returns between two securities move together. In our example, the covariance between i and j is .47 percent.

Because the covariance was positive, the returns on the two securities tended to move *together,* or in the same direction, during the period over which we made the calculation. Hence, we have *positive covariance* between the two stocks. It is also possible to have *negative covariance,* indicating that returns tend to move in opposite directions. While the covariance measure is useful, it is somewhat difficult to interpret because it is an *absolute* measure of the relationship between returns. We would expect that very large covariance values may indicate a very strong relationship (either positive or negative) between investment returns. However, the covariance statistic can take on values ranging from $+\infty$ to $-\infty$, and, as a result, it is difficult to know when a covariance value is "large" or "small." Because of this problem, we need a method to gauge the importance of the statistic on a *relative* scale of importance. The coefficient of **correlation** (ρ) is used to obtain this *relative* measure or the extent to which one set of numbers moves in the same or opposite direction with another series. The formula for the correlation statistic ρ is:

$$\rho_{ij} = COV_{ij} \div (\sigma_i \sigma_j)$$

In our example we have:

$$\rho_{ij} = .0047 \div (.0624)(.0933)$$
$$= .8070$$

The correlation statistic may only range between +1 and −1; therefore, it is a much easier way to interpret the extent to which returns are related. For example, as the coefficient of correlation approaches +1, two series are said to move very closely together, or be highly correlated. Hence, given a change in one of the series, there is a high likelihood of a change in the other series in the same direction.[9] Conversely, as the coefficient approaches −1, the series are negatively correlated because they move in exactly opposite directions. Hence, given a change in one series, the other would be expected to move in the opposite direction. If the correlation coefficient is close to zero, the implication is that no relationship exists between the two series. In our example, a correlation coefficient of .8070 indicates a strong positive correlation between stocks i and j over the period considered because the coefficient is equal to .8070, has a positive sign, and is much closer to +1.0 than it is to zero.[10]

What are some other important relationships at this point? It should be clear that if two investments are *highly positively correlated,* the reduction in the variance in portfolio returns (hence, risk) is likely to be smaller than if there is no correlation or negative correlation because, in the latter case, the distribution of two returns will be either unrelated or negatively related, and the interaction between returns will not be reinforced. If returns were negatively correlated, they would be offsetting and the sum of the deviations from the portfolio mean would be smaller after the security is added; hence, the standard deviation of portfolio returns would be lower (i.e., lower risk). Consequently, it should be stressed that anytime the correlation between returns on two assets is less than +1, *some* reduction in risk (standard deviation) may be obtained by combining investments, as opposed to holding one investment

[9] Obviously there would have to be an underlying cause-and-effect relationship between the two series to make an assertion that any past relationship can be used to predict a future relationship.

[10] When the coefficient of correlation has a value greater than .5, the association between two series is considered high. There are also statistical tests of significance that enable us to say with more confidence whether two series are correlated or whether the correlation statistic calculated between the series resulted from an unrepresentative sample taken from the underlying distribution of returns. For a discussion of correlation, normal distribution assumptions, and related statistics, see a standard college textbook on elementary statistics.

(or one portfolio) with higher standard deviation than the prospective investment. However, the potential for risk reduction is much greater as the correlation approaches −1.

Based on the foregoing analysis, it should be clear why the standard deviation of portfolio returns in our example is not equal to a simple, weighted average of the standard deviation of the two individual investment returns. Further, if variation in security returns is a reasonable representation of risk to investors, then it should become apparent that there may be some benefit, in the form of risk reduction, by *diversifying* an investment portfolio to include assets with returns that are negatively correlated, or assets with returns showing little or no correlation. Of course, the other critical dimension that has to be considered is how the *mean return* of the portfolio will be affected when the individual securities are combined. For example, if two securities have the *same* positive mean returns and these returns are perfectly, negatively correlated (e.g., −1), then it may be inferred that an investor can earn a positive portfolio return with zero risk if both investments are purchased (the standard deviation of the combined returns is zero). The possibility that this will ever occur is slight, however, because the likelihood of finding perfectly negatively correlated (−1) securities is small. However, many investments with returns that are negatively correlated, uncorrelated, or less than perfectly positively correlated may be candidates for addition to a portfolio on the grounds of efficiency outlined above. These basic elements of portfolio analysis should make the reader aware of a framework that may be used to consider many questions regarding risk and returns.

Portfolio Weighting: Trading Off Risk and Return

In our hypothetical example, we have seen that adding stock i to a portfolio containing stock j would have reduced portfolio risk (standard deviation) by a lesser amount (percent) than the reduction in portfolio mean return. This implies that a portfolio containing both stocks (indexes) would not have been more efficient than a portfolio containing only one stock. However, in our computations, we assumed that *both assets were equally weighted.* Could a more optimal portfolio, that is, one containing some other combination of stocks that would have either increased returns relative to an increase in risk or maintained returns while decreasing risk, been attained by *varying the weight (proportion) of the two securities in the portfolio?* To answer this question, we first consider the *sample* of NCREIF and S&P 500 returns from Exhibit 22–4, or those returns that comprised the *period* 1985–2006. The arithmetic quarterly mean *HPR* for the S&P 500 index was 3.39 percent with a standard deviation of 8.01 percent, and the *HPR* for NCREIF was 2.01 percent with a standard deviation of 1.62 percent. The correlation between both return series was −.0302 (see Exhibit 22–7).[11] Because the correlation coefficient was less than 1, some reduction in risk would have been possible by combining the two assets.

EXHIBIT 22–7
Correlation Matrix for Selected Assets: Quarterly Returns, 1978–2006

	1978–2006					
	CPI	Bonds	S&P 500	T-Bills	NCREIF	REITs
CPI	1					
Bonds	−0.2123	1				
S&P 500	−0.1288	0.1767	1			
T-Bills	0.5364	0.1570	0.0251	1		
NCREIF	0.2619	−0.1616	−0.0302	0.2974	1	
REITs	−0.0752	0.2922	0.5338	−0.0405	0.0299	1

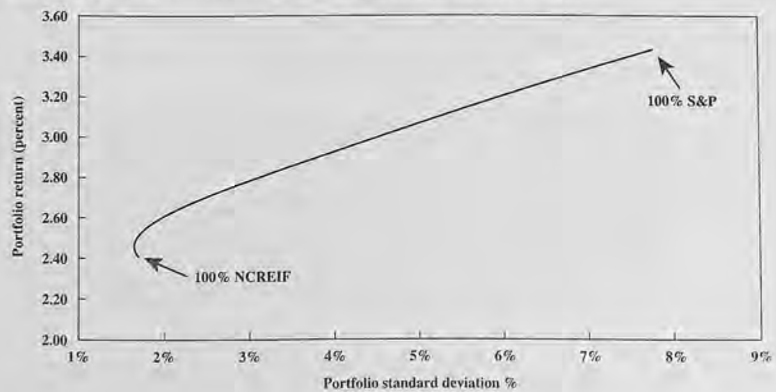
[11] The correlations are calculated over a longer time period to capture the long-run correlation between the different assets.

Second, we want to understand the importance of weighting securities in a portfolio. To determine the optimal *weighting, all combinations* of both assets must be considered. In our example, the weight of each security was changed in increments of 10 percent, and the mean portfolio return and standard deviation were calculated for each weighting. The result is shown in Exhibit 22–8. The diagram shows all values lying between the two extreme cases, that is, the case where the portfolio would be composed entirely of S&P 500 stocks and no NCREIF properties (100 percent in the exhibit) and the case where the portfolio would be composed of 100 percent NCREIF properties and no S&P shares (0 percent in the exhibit). Hence, the curve in the exhibit shows the *trade-off* between return and risk for the portfolio as the two asset classes are combined in varying proportions.

Note that even though the NCREIF Index had a lower mean *HPR* during this period, when compared with the S&P index (see Exhibit 22–4), diversification benefits may be realized by *combining* assets as opposed to holding only S&P 500 or NCREIF properties. This is illustrated in Exhibit 22–8.

In Exhibit 22–8, note that having a portfolio of 100 percent NCREIF has a lower return but greater risk than holding some S&P with NCREIF. This results from the diversification benefits of including both stocks (S&P) and properties (NCREIF) in a portfolio. The portion of the curve with a positive slope (returns increase as risk increases) is known as the *efficient frontier*. It represents the most efficient combination of securities that provides investors with maximum portfolio returns as portfolio risk increases. Returns below the efficient frontier (or in the interior of the ellipse) are *inferior* because there is always a better combination of securities that will increase returns for a given level of risk. Investors will choose the combination of securities along the efficient frontier in accordance with their willingness to take risk. Investors who are risk-averse would tend to hold a mix with more properties (NCREIF) in this example. Less risk-averse investors would tend to weigh stocks (S&P) more heavily in their portfolio. Holding all stocks (100 percent S&P) has the greatest expected return but also the greatest risk.

EXHIBIT 22–8 **Portfolio Returns of NCREIF and S&P 500 Stocks, 1978–2006**



Real Estate Returns, Other Investments, and the Potential for Portfolio Diversification

From the preceding analysis, it should be clear that there are many different assets that have the potential to be combined efficiently in a portfolio that will provide an optimal risk-return relationship for investors. Clearly, our example consisting of only NCREIFs and S&P 500 assets shows this potential. However, many other assets can be considered by investors when selecting assets. One of the key relationships that indicate the potential for combining assets in a portfolio is the correlation between asset returns. Exhibit 22–7 is a *correlation matrix*, or table, that contains the coefficient of correlation for returns on all securities listed in Exhibit 22–4. The purpose of calculating these coefficients is to consider how various *investment vehicles* might be combined efficiently with various other assets when building a portfolio.

We can gain some insight into the question of whether portfolios containing certain securities would be more efficient if *real estate investment vehicles* were added. We will focus on this more narrow question, because to consider the question of what *the* optimum portfolio *should* contain would have to include an examination of the risk and returns for the global, or worldwide, set of securities and assets that are available to investors. Such a portfolio might contain bonds, stock, real estate, gold, jewelry, coins, stamps, and virtually any asset that can be owned by investors. Based on mean standard deviation of returns and covariance between returns, investors would hold portfolios containing the optimum combination of available investments. An efficient frontier, such as the one shown in our two-investment case in Exhibit 22–8, would also exist for this larger, diversified "market portfolio." If all investors made decisions based on whether or not the ratio of risk to return for the total portfolio would be improved, all investor portfolios would tend to be diversified and efficient. Returns on any additional investments would be evaluated on the basis of any incremental increases or decreases in total portfolio risk, and the risk premium paid by investors for these securities would reflect that incremental risk. In short, risk premiums for investments would be determined on the basis of the expected addition or reduction in portfolio risk and all investments would be priced in accordance with that relationship.[12]

In this section, we consider the question of portfolio performance, diversification, and real estate. Portfolio managers have seriously considered real estate as an investment class for only about 20 years. Only in recent years has equity ownership in real estate become widely available in a "securitized" form such as a REIT share or in ownership "units" in open- and closed-ended commingled investment funds. Also, regulatory restrictions governing pension funds have been relaxed to include real estate as an acceptable investment. However, many institutions, which heretofore considered only government securities, corporate bonds, and common stocks, have shown increasing interest in real estate.

We now consider the question of whether real estate investments are likely to provide **diversification benefits** to investors with portfolios consisting of some government securities, stocks, and bonds. In other words, we begin with some assumptions about the nature of existing investment portfolios. We then consider whether these portfolios could have benefited from diversifying by acquiring real estate investments over the period 1985–2006.

Portfolio Diversification: EREITs and Other Investments

Looking again at Exhibit 22–7, we can see what the historical (or ex-post) correlation in quarterly returns was for each investment relative to all others for the period 1978–2006.

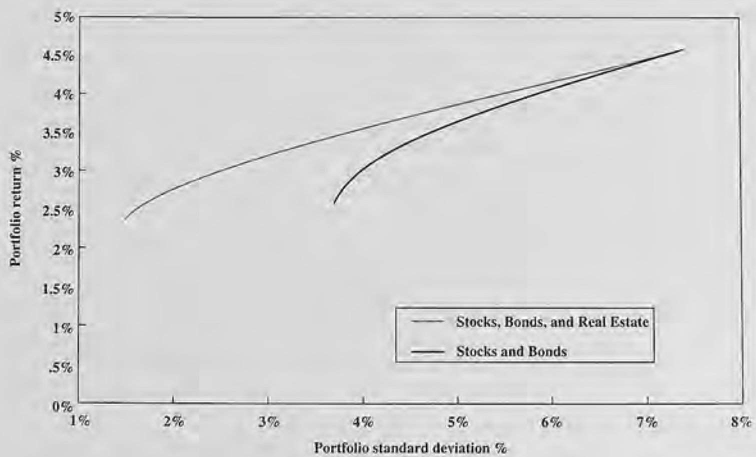
[12] For additional information regarding capital market theory and efficient markets, see Z. Bodie, A. Kane, and A. Marcus, *Investments,* 2nd ed. (Homewood, IL., Richard D. Irwin, 1994).

Focusing our attention on equity investments in real estate, we note, for example, that returns on EREITs tended to be positively correlated with common stocks (.5338) and corporate bonds (.2922) and a negative correlation of (.0405) with T-bills. This relationship suggests that because EREITs have less-than-perfect correlation with the S&P 500 and corporate bonds and the correlation coefficient between both EREITs and T-bills is very low, there is a good chance that if this real estate investment were combined in a portfolio containing common stock, bonds, and T-bills, diversification benefits could be achieved. Furthermore, NCREIF has a negative coefficient with the S&P 500 (−.0302) and bonds (−.1616) although it has a positive correlation with T-bills (.2974). This suggests that adding direct investment in properties may provide more diversification benefits than just adding REITs.

To illustrate the diversification benefits of adding equity real estate to a portfolio of stocks and bonds, we will use the mean (arithmetic) returns from Exhibit 22–4 and the correlations from Exhibit 22–7.[13] Exhibit 22–9 shows two efficient frontiers. The lower frontier consists of only stocks (S&P 500) and bonds. The upper frontier includes stocks, bonds, and private real estate investments (NCREIF Index). Note that the frontier that includes real estate has higher returns at each level of risk (standard deviation). The only exception is the highest risk/highest return portfolio, which in both cases consists entirely of stocks. Including private real estate with stocks and bonds also provides a wider spectrum of risk-return combinations at the lower end of the frontier (i.e., where there is less return but lower levels of risk).

It should be noted that these results are based on historical returns over a specific time period and may not be indicative of future performance. Investors make investment decisions based on future or expected risks and returns. This example has used ex-post, or past,

EXHIBIT 22–9 Efficient Frontiers



[13] In practice we might use expected future returns rather than historical returns for this type of analysis. We use historic returns to illustrate the diversification benefits based on what was actually achieved for each asset.

returns to illustrate concepts. There is no assurance that these results will be repeated in the future. In practice, investors often use historic correlations as was done in this example unless there is evidence that there has been a significant change in the correlation between different assets. Similarly, historic standard deviations for securities are used unless there is a reason to believe that the underlying risk of the asset has changed. But expected future rather than historic returns are used for each asset. Historic returns are only used as one indication of what might be realistic to expect in the future.

We also used the NCREIF Index as an indication of the return and risk (standard deviation) for private real estate. The NCREIF Index has a very low mean return and standard deviation of returns. As noted in the beginning of this chapter, this index may not fully capture the true variability in returns for private real estate because it is based on appraised values rather than transaction prices. Some have argued that the use of appraised values may reduce or "smooth" the variation in returns. This does not mean that the estimates of value are erroneous. Rather, the appraisal process is such that sudden shifts in the market as reflected in a few transactions are not fully captured in appraised values until the change in market conditions can be sufficiently confirmed by additional market evidence. Thus, indices based on appraised values may not fully capture quarterly changes in property values in an index like the NCREIF Index.

Public versus Private Real Estate Investments

We saw previously that the performance of private real estate as reflected in the NCREIF Index and the performance of REITs as reflected in the NAREIT Index were quite different in terms of historic returns, standard deviations, and correlations with other assets. For example, the standard deviation of the NAREIT Index is higher than that of the NCREIF Index. One explanation for this might be that the NCREIF Index does not capture all of the variability of returns because it is based on appraised values, as discussed earlier. An alternative explanation, however, is that when real estate is owned by publicly traded REITs, it takes on more of the risk of public markets in general. As we saw in Exhibit 22–7, REITs have a much higher correlation with the S&P 500 than NCREIF. Also, we saw that the NCREIF Index has a relatively high correlation with the CPI, indicating that it may be an inflation hedge, whereas the NAREIT Index has a slightly negative correlation with the CPI.

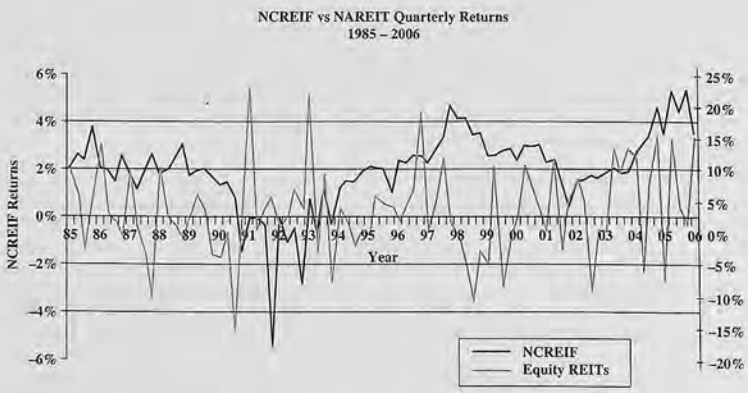
There is likely to be truth in both arguments—that appraisals reduce the variance of the true returns in the NCREIF Index but publicly traded REITs take on additional variance because they trade in more active markets that are influenced more by short-term flows of capital into and out of the stock market. To see what the difference in variability is between NCREIF and NAREIT, we have plotted the historic returns for each in Exhibit 22–10. Note that in order to better compare the returns over time, we have used a different scale for the NCREIF returns (−6% to +6%) than for NAREIT returns (−20% to +25%). The NAREIT Index clearly has more volatility in its returns than the NCREIF Index and the two indices perform quite differently during many time periods.

Although some people argue about which index is a better indication of the performance of equity real estate, it is quite possible that the conclusion should be that both private real estate investments (represented by the NCREIF Index) and public real estate investments (represented by the NAREIT Index) could play a role in a portfolio. Both provide diversification benefits to a pure stock and bond portfolio, and there are advantages and disadvantages of each as an investment alternative. For example, REITs are more liquid than private real estate but the investor does not have control over decisions as to when to sell individual properties as he or she would by owning properties instead of shares of stock. The purpose of this chapter is not to suggest which type of investment is better for a particular investor, but rather to illustrate what tools an investor can use to evaluate the role of either one or both ways of including equity real estate in a portfolio.

Web App

Go to the Web site for the National Council of Real Estate Investment Fiduciaries (www.NCREIF.org). Find the quarterly returns for the nation during the past year. (See data—NPI Returns on the Web site.) What is the recent trend in the returns for real estate? How does this compare with the trend in returns for stocks based on the S&P 500 or Dow Jones Industrial Average?

EXHIBIT 22–10 NCREIF versus NAREIT (REITs) Quarterly Returns, 1985–2006



Real Estate Performance and Inflation

One final comparison of interest to portfolio managers is the relationship between real estate performance and *inflation*. More specifically, did real estate returns exceed the rate of inflation? To provide some insight into this question, we recall our earlier comparisons between the EREIT and NCREIF indexes and the CPI. In all cases, the real estate indexes exceeded the rate of growth in the CPI. This implies that at least for the period 1985–2006, real estate investments, as represented by the data used in Exhibit 22–4, exceeded the rate of inflation and produced real investment returns. Another question of importance is whether real estate returns are *correlated* with inflation. If we use the correlation matrix in Exhibit 22–7, it would appear that according to the NCREIF Index and the CPI, it is. However, the same comparison with EREITs indicates that it is not. In this context it is important to realize that a *positive* correlation with inflation is desirable because it indicates that the asset is an inflation hedge. That is, if inflation increases, then returns also increase, which preserves the real rate of return.

Diversification by Property Type and Location

We have seen that when individual properties are combined in a portfolio, the risk of the portfolio is reduced when the properties are not correlated. Therefore, investors want to find properties that are not highly correlated with each other. This is often done by investing in different property types and different locations. Different property types are affected

by different economic fundamentals that affect the demand for space in that property type, as we have learned in earlier chapters. Similarly, properties in different locations are affected by different economic fundamentals affecting the economic base of the area. Exhibit 22–11 shows the returns for office, retail, industrial, and apartment properties from 1979 through 2006. Although the business cycle and certain economic events (such as the real estate recession of the early 1990s) tend to affect all properties, there are certainly times when one property type is doing better than another and they are not perfectly correlated. For example, retail had the lowest returns in the early 1980s, it had the highest returns during the latter part of the 1980s, the lowest return in the late 1990s, and then the highest return again in the early 2000s. Portfolio risk is reduced by investing across all four property types.

Exhibit 22–12 shows the performance of five selected MSAs. We see that different metropolitan areas behaved differently over time. For example, Boston was the best performer during some time periods and the worst during others. Diversifying across the different MSAs reduces overall portfolio risk.

Global Diversification

In recent years there has been an increasing interest among investors, especially large institutional investors, to invest on a global basis. There are several reasons for this. First, the number of investment opportunities around the globe is increasing. We saw in the last chapter that many countries have adopted REIT structures similar to what we have in the United States. These countries are also developing commercial mortgage-backed securities (CMBS) and other instruments that make it easier to invest in these countries. Exhibit 22–13 shows a breakdown of the global real estate securities market, and Exhibit 22–14 shows the countries with the largest commercial real estate markets and the size of the market.

Second, indices measuring the historic returns for commercial real estate are being developed in other countries that allow investors to have a benchmark for the performance of real estate in those countries like we have with the NCREIF index in the United States. For example the Association for Real Estate Securitization (ARES) in Japan recently introduced the first index of the performance of real estate in Tokyo based on the same methodology as the NCREIF index.

EXHIBIT 22–11 NCREIF Returns by Property Type

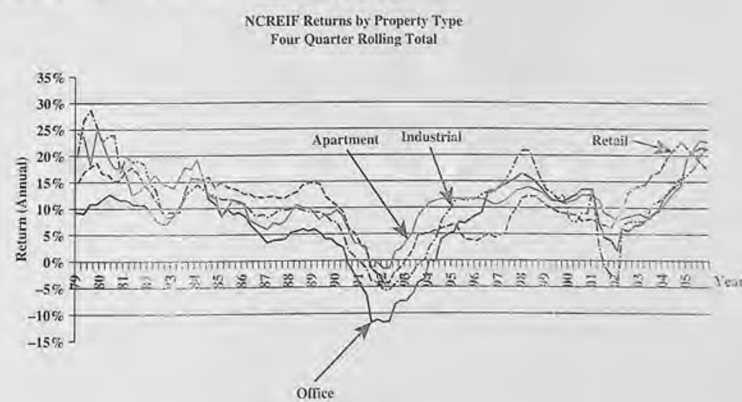


EXHIBIT 22–12 NCREIF Returns by Selected MSA

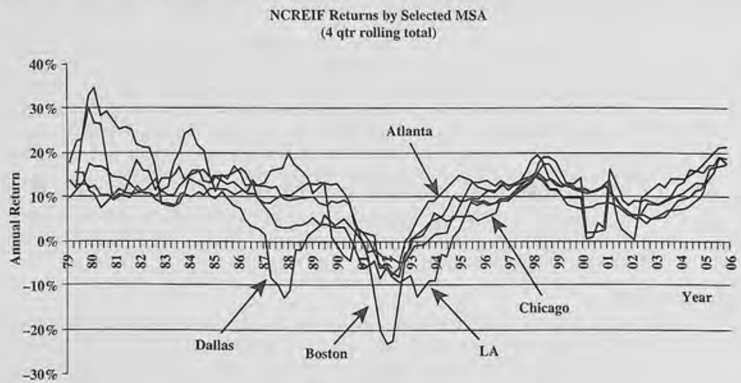
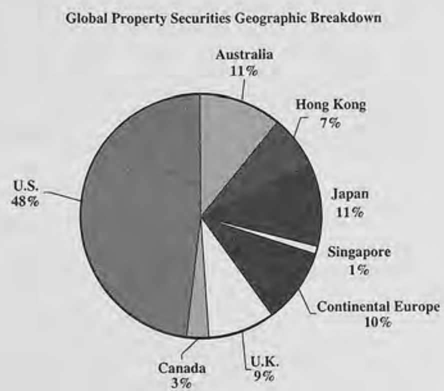


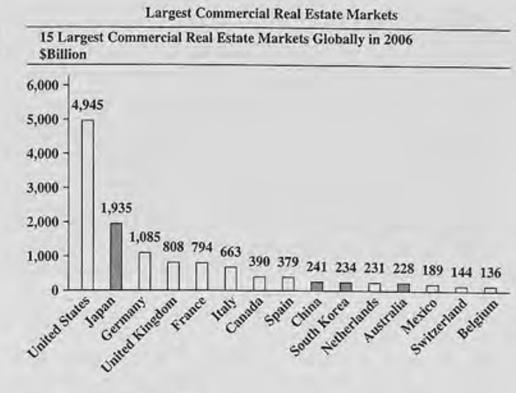
EXHIBIT 22–13
Global Property Securities



Source: FTSE EPRA/NAREIT Global Index as of 12/31/2005

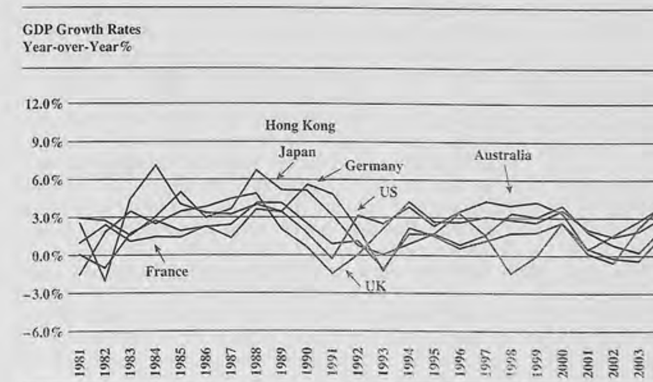
A third reason for investing globally is that there are diversification benefits that result from including real estate from other countries in a portfolio. We have seen that there are diversification benefits of including real estate in a portfolio with stocks and bonds because real estate is not highly correlated with stocks and bonds. We have also seen that there are benefits from diversifying by property type and geographic area. Similarly, it should not be surprising that there are diversification benefits from investing in different countries. Exhibit 22–15 shows the performance of real estate in several countries based on

EXHIBIT 22–14
Largest Commercial Real Estate Markets



Source: Prudential Real Estate Investors.

EXHIBIT 22–15
GDP Growth Rates for Different Global Cities



Source: Morgan Stanley.

GDP growth rates. (Because indices of the returns were not available historically for all of the countries, gross revenue growth was used, which was available.)

We see that there are differences in the performance of real estate in different global cities. This suggests that there are low correlations between the returns of the real estate in the cities, which leads to diversification benefits. Exhibit 22–16 shows the correlations between the revenue growth rates for the different global cities. Note that New York, Washington, DC, and San Francisco all have negative correlations with Tokyo, suggesting a lot of diversification benefits for U.S. investors by including Tokyo real estate in their portfolio. Similarly, there are negative correlations between these U.S. cities and Hong Kong.

EXHIBIT 22–16
Correlations of Gross Revenue Growth in Global Cities

Correlations of Property Gross Revenue Growth 1990 to 2004

City	NYC	Wash DC	San Fran	London	Paris	Frankfurt	Tokyo	Hong Kong	Sydney
New York	1.00	0.92	0.72	0.94	0.54	0.26	(0.59)	(0.54)	0.84
Wash DC		1.00	0.46	0.82	0.45	0.04	(0.63)	(0.64)	0.78
San Fran			1.00	0.69	0.29	0.24	(0.43)	(0.13)	0.57
London				1.00	0.68	0.39	(0.39)	(0.51)	0.91
Paris					1.00	0.78	0.33	(0.47)	0.52
Frankfurt						1.00	0.49	(0.20)	0.19
Tokyo							1.00	0.10	(0.44)
Hong Kong								1.00	(0.57)
Sydney									1.00

Even where the correlations are not negative, such as between the U.S. cities and London, Paris, and Sydney, there are still diversification benefits, and portfolio risk can be reduced if the expected returns in these countries are favorable.

Risks of Global Investment

We have found that there are many reasons to consider investing on a global basis. However, this approach carries with it certain risks that are not necessarily reflected in the measures of portfolio risk we have discussed in this chapter. First, there is currency risk because exchange rates may change in a way that makes the dollar worth less relative to the currency of the country where the investment is located. As cash flows from operating and eventual sale of the property are converted back to dollars, there could be a loss because of an unfavorable change in exchange rates. Second, although indices and information sources are developing in many countries, the data may not be as reliable in all cases or as extensive as in the United States. This adds risk because investors may be acting on incomplete information. Third, there are different tax laws and property rights to deal with when investing globally. This can add additional legal risks. Fourth, there could be political instability in the country, which may increase risk because of uncertainty as to how the political situation will affect attitudes about foreign investment in the country. Fifth, there are the obvious communication barriers and cultural differences. To try to mitigate many of these risks, U.S. investors often try to find a joint venture partner based in the country where they want to invest. It can be a challenge to find the right partner, but doing so can significantly reduce the risks and allow the expertise and financial resources of the U.S. investor to be combined with the local-country operating knowledge of the local joint venture partner, who knows the culture, language, and legal considerations specific to that country. Global investment is likely to continue to grow as there are increasing opportunities to invest in developing countries with attractive returns and diversification benefits for U.S. investors.

Use of Derivatives to Hedge Portfolio Risk

In recent years we have seen the introduction of derivatives based on the NCREIF Property Index, discussed previously in this chapter. Derivatives allow investors to take a position in real estate or hedge a position without actually buying or selling properties. They receive or pay a return based on the performance of the NCREIF property index or an index based on one of the property types shown earlier in the chapter.

Derivatives can be used as a way to enter the real estate market for the first time. An investor might purchase a derivative that has a return based on the NCREIF Property Index. This would be a "long" position in the index. At the same time, another investor, who feels overexposed to the commercial real estate market, may decide to "sell," or "short," the index rather than sell individual properties, which they may want to continue to own and manage. This reduces real estate risk exposure without needing to sell the properties. This especially makes sense if the investor expects to earn above-average returns on the properties currently owned.

Another important use of derivatives is to adjust exposure to different property types. We have seen that there are benefits of diversifying across property types. An investor may feel overexposed to a particular property type and underexposed to another. For example, the investor may believe she has too much retail and not enough office properties. She could enter into a swap where the parties agree to pay returns on retail properties and receive returns on office properties, with both returns based on the performance of the respective NCREIF Property Index. They would be "short" the retail index and "long" the office index. Again, this allows them to adjust the risk of the portfolio without selling any properties.

Example—Swap Office for Retail

ABC Investors decided to enter into a derivative transaction on January 1, 2000, that would swap office returns for retail returns. That is, they would *pay* the return on the NCREIF office index but receive the returns on the NCREIF retail index. The term of the contract is five years terminating December 31, 2004. What return would the investor have earned on this strategy?[14]

Retail returns outperformed office returns over this particular five-year period. The NCREIF office index increased at an 8.15 percent average annual return. Over the same period the retail index increased at an average annual return of 13.67 percent. Thus, the investor who swapped office for retail would have earned an average annual return of 13.67 percent while paying 8.15 percent for a net return of 5.52 percent.

Note that the investor is not taking the risk of the returns on real estate as reflected by the NCREIF Index in this case. The investor is taking the risk related to the *relative* performance of retail versus office—in this case betting that retail will outperform office. If the investor had been overexposed to office and underexposed to retail, then they would earn a return that was closer to the NCREIF return by using this strategy and hedge his portfolio risk.

Concept Box 22.1 summarizes the types of derivatives based on the NCREIF Index that are available through Credit Suisse, which was the first investment bank in the United States to offer derivatives for commercial real estate based on an index. This market is certain to grow in the United States and in other countries because derivatives provide an important tool for adjusting portfolio risk and helping to make the real estate market more efficient.

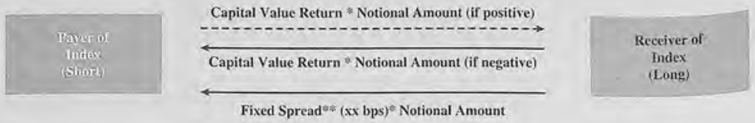
[14] For simplicity we assume that at the time the investor enters into the swap, the expected return on office and retail was the same. In practice there my be a difference in expected return which would require the investor who swaps for a property type with a higher expected return to pay a fixed amount to adjust for the difference in expected returns. Similarly, if the investor is swapping for a property type that would have a lower expected return, they would receive a payment to adjust for this difference.

NCREIF Index Derivatives Concept Box 22.1

NCREIF Index Derivatives Issued by Credit Suisse

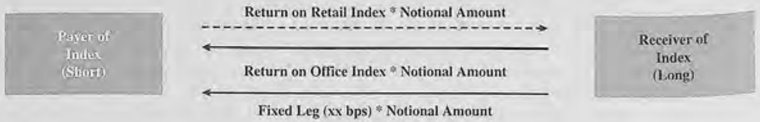
1. Price Return Swap: A swap transaction where an investor receives (or pays) the quarterly capital value return component published by NCREIF and in return pays (or receives) a fixed spread.

Quarterly Settlement Flow Funds



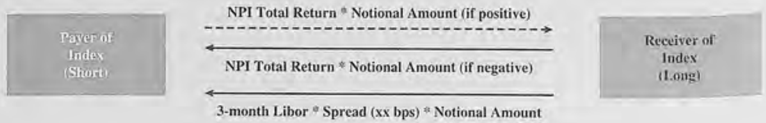
2. Property Type Swap: A swap transaction in which an investor receives the total return for one property type and pays total return on a different property type for the same notional amount. Depending on the property type swap that is entered into, an investor will either pay or receive a fixed spread as part of such property type swap.

Quarterly Settlement Flow Funds (ex. Retail/Office Swap)



3. Total Return Swap: A swap transaction where an investor receives (or pays) the quarterly total return published by NCREIF and in return pays (or receives) 3-month Libor plus spread.

Quarterly Settlement Flow Funds



- Depending on market conditions, it is possible that fixed spread will be flat or negative (i.e., payer of index would pay a fixed spread in order to pay index).
- Trades are notional based and the only upfront cost to enter trades is margin requirements necessary to manage counterparty risk.

Conclusion

This chapter has introduced the measurement of investment performance and the basic elements of portfolio theory. We have also dealt with the question of whether real estate investments tend to provide diversification benefits to portfolios that have traditionally consisted of government securities, common stocks, and corporate bonds.

We have stressed that the nature of real estate investment return data is very limited and may not be representative of a broad measure of real estate returns. Further, some of the data are based on a group of properties owned by investment advisors. In this case, an index is calculated on reported net operating income and appraised property values with very few actual transaction prices.

Results from the portfolio simulations conducted and reported in the last part of the chapter indicate that there appeared to be significant gains available from portfolio diversification into real estate during the period 1985–2006 based on these limited data sets. In all simulations, real estate increased portfolio efficiency. Of course, these results are based on historical data from a limited sample of real estate investments and may not be indicative of future results or apply generally to all real estate investments.

Key Terms

arithmetic mean returns, *653*
coefficient of variation, *655*
correlation, *660*
covariance, *659*
diversification benefits, *663*
geometric mean return, *652*
holding period return (*HPR*), *652*
NAREIT Index, *649*
NCREIF Index, *651*

Useful Web Sites

www.ncreif.com—The National Council of Real Estate Investment Fiduciaries (NCREIF) is an association of institutional real estate professionals who share a common interest in their industry. This site provides real estate information standards, indices, membership, and resource information.

www.allegiancecapital.com/—A site designed for institutional investors and high-net-worth individuals. Provides information on various investment alternatives.

www.wilshire.com—Wilshire Associates produces a number of indices including a real estate index.

www.realestateportfolio.com/—Real Estate Portfolio contains comprehensive coverage and analysis of specific market issues and trends, sector analysis, company and executive profiles, and statistical data and forecasts pertaining to the publicly traded real estate industry.

http://www.demographia.com/—This site is a very good resource for finding relevant demographic information about different markets spread across the world. Some of the main features of this site are that it gives international housing affordability rankings, different surveys, different economic reports, and different trends related to real estate. It's also a good source to find regulations and policies related to real estate.

http://www.realtyrates.com/—This Web site is a good resource for real estate investment and development news, trends, analytics, and market research reports. It also provides survey reports that include national mortgage term and interest rates, financial indicators, and demographic information for seven core commercial property types. Some of the content provided by this website is not free.

http://www.snl.com/dna/reit/—This Web site provides fundamental financial data on more than 230 REITs, REOCS, and homebuilders. It gives detailed, descriptive property data, cost and performance data, and property mapping. It also is a good source for analyst coverage, FFO estimates, proprietary AFFO, and NAV consensus estimates.

Questions

1. What are some of the difficulties in obtaining data to measure real estate investment performance?
2. What are the distinguishing characteristics between REIT data and the NCREIF Property Index?
3. What is the difference between arithmetic and geometric mean returns?
4. What statistical concept do many portfolio managers use to represent risk when considering investment performance?
5. When NCREIF returns and REIT returns are compared, NCREIF returns exhibit a much lower pattern of variation. Why might this be the case?
6. Mean returns for portfolios are calculated by taking the weighted average of the mean returns for each investment in the portfolio. Why won't this approach work to calculate the standard deviation of portfolio returns?

7. What is the difference between covariance and correlation? Why are these concepts so important in portfolio analysis?
8. Results reported in the chapter showed that by including either REITs or the NCREIF Index in a portfolio containing S&P 500 securities, corporate bonds, and T-bills, diversification benefits resulted. Why was this true? Did those benefits come about for the same reason for each category of real estate investment?
9. Results presented in the chapter are based on historical data. Of what use are these results to a portfolio manager who may be making an investment decision today? Elaborate.
10. Why should an investor consider investing globally?
11. What are the risks of global investment?
12. How can a derivative security be used to hedge portfolio risk?

Problems

1. As an investment advisor for MREAF (Momentum Real Estate Advisory Fund), you are about to make a presentation to the portfolio manager of the ET&T pension fund. You would like to show what would have happened had ET&T made an investment in MREAF during the last 13 quarters. The ET&T manager has provided you with historical data on the performance of its portfolio, which is made up entirely of common stock. Historical data for the ET&T portfolio and the MREAF fund are as follows:

	ET&T Common Stock Fund		MREAF Real Estate Fund	
Period Ending	Unit Value	Quarterly Dividend	Unit Value	Quarterly Dividend
Quarter				
1	$ 701.00	$ 8.28	$ 70.00	$2.17
2	752.50	8.11	80.05	2.14
3	850.52	10.30	90.80	2.01
4	953.75	9.81	100.50	2.01
5	1,047.57	12.05	99.14	1.87
6	1,221.70	14.17	95.50	1.81
7	1,443.90	17.18	93.77	1.79
8	1,263.31	14.91	80.31	1.54
9	1,258.56	13.84	77.34	1.49
10	1,526.72	18.32	76.53	1.44
11	1,616.81	19.73	78.42	1.51
12	1,624.08	19.98	79.01	1.53
13	1,560.25	18.88	81.75	1.55

a. Calculate the quarterly *HPR* for each investment.

b. Calculate the arithmetic mean *HPR*, the standard deviation of the *HPRs*, and the geometric mean for each fund. Which fund contained more risk per unit of return?

c. Was there any correlation between returns on the ET&T fund and MREAF?

d. Would a portfolio that contained equal amounts of ET&T securities and MREAF have provided any investment diversification? Why?

e. (Optional) Assume each investment could have been combined in a portfolio with weights ranging from 0 percent to 100 percent. What pattern of risk and return would result if each investment were added (deleted) in increments of 10 percent (remember that the sum of the two proportions must always sum to 100 percent)? What combination of securities would have constituted the "efficient frontier" (if any)?

f. If the manager of ET&T is considering making an investment in MREAF, of what use is this analysis?

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www.mhhe.com/bf13e

2. **Excel.** Refer to the "Ch21_Frontier" tab in the Excel Workbook provided with the book. Suppose the correlation between NCREIF and the S&P 500 is −20 percent. How does this change the standard deviation of the portfolio when 50 percent of the portfolio is allocated to each investment?

Index

Words in **bold** indicate key words; locators with n indicate notes.

A

M

(Useful Websites continued from inside front cover)

www.irs.gov The IRS website can be useful to find information on the taxation of real estate income property.

www.ccim.com/magazine Certified Commercial Investment Manager's Commercial Investment Real Estate magazine website.

www.homeresearcher.com The "articles" link on the site provides several articles related to financing alternatives and leverage.

www.century21.com/learn This area of the Century 21 website has several articles related to different loan alternatives and concepts such as negative amortization.

www.ecologeris.com Site has a searchable environmental risk database for Canada.

www.eiainc.org An environmental risk insurance company.

www.environmental-center.com Good information on different types of environmental risk and brownfields developments.

www.ieausa.com Investment Equities Associates

www.doc.gov/eda Economic Development Administration

www.corenetglobal.org Corporate Real Estate Network/CoreNet Global

www.naiop.org/ National Association of Industrial and Office Properties

www.equiscorp.com Company that focuses on managing corporate real estate.

www.uli.org Urban Land Institute

www.bizloan.org Good resource for information about different types of loans used for project development. Includes glossary of terms.

www.Axiometrics.com Axiometrics is a research firm providing fundamental real estate research for the apartment sector.

www.landdevelopmenttoday.com An online publication dedicated to delivering news and perspectives to land development professionals, including developers, planners, surveyors, civil engineers, landscape architects, and construction professionals, enabling them to succeed in today's dynamic environment.

www.census.gov U.S. Census Bureau website.

www.icsc.org International Council of Shopping Centers website.

www.economy.com Economy.com is a provider of economic data.

www.bls.gov U.S. Department of Labor

www.bea.gov U.S. Department of Commerce—Bureau of Economic Development

www.claritas.com Claritas provides demographic and enhanced census data.

www.sppre.com A national consulting, development management, and real estate asset management company with the sole purpose of assisting government, university, and school district officials to structure and implement public/private real estate partnerships and optimize the value of their underutilized real estate assets.

www.ginniemae.gov Ginnie Mae/Government National Mortgage Association is within HUD and ensures mortgage funds are available throughout the United States.

www.frbservices.org The Federal Reserves System Financial Services website provides transaction capabilities and service information.

www.investinginbonds.org Information about investing in CMOs from the Bond Market Association.

www.nareit.org National Association of Real Estate Investment Trusts

www.reitnet.com Real Estate Investment Trusts Net

www.DividendDiscountModel.com Can be used to estimate the value of any publicly traded security including REITs based on the present value of projected dividends. Expected returns for REIT indices included on the site.

www.allegiancecapital.com A site designed for institutional investors and high net worth individuals. Provides information on various investment alternatives.

www.wilshire.com Wilshire Associates produces a number of indices including a real estate index.

www.investorwords.com An investing glossary.

www.fiabci.com The International Real Estate Federation

www.china-window.com Information about the real estate market in China.

www.epra.com European Public Real Estate Association

www.riskgrades.com Measures the risk of the world's financial assets.

www.naea.co.uk/ The National Association of Estate Agents

www.realestate-tokyo.com Offers information on the real estate in the Tokyo, Japan area.

www.crea.ca The Canadian Real Estate Association

www.cbre.com/global/research Provides US office and industrial vacancy reports.

www.economy.com/freelunch A good source of free economic data.

www.nasdbondinfo.com Contains transaction information as reported to NASD.

www.intex.com Analytical Solutions for Structured Finance

www.investopedia.com An educational guide to investing and personal finance.

Rigorous yet practical, ***Real Estate Finance and Investments*** has been the leading real estate textbook for over 25 years, consistently setting the standard in the real estate finance and investments market. The 13th edition continues to provide students with the tools they need to understand and analyze real estate markets and the investment alternatives available to both debt and equity investors.

» **NEW TOPICS** introduced in the 13th edition include both residential and commercial derivatives; newer types of mortgages such as ARMs, hybrid, and "interest only" mortgages; and subprime and home equity loans.

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» **EXTENSIVE USE OF EXCEL SPREADSHEETS** helps students perform analysis and solve problems.

» **ARGUS** is software that allows for complicated lease analysis using up to three leases. The end-of-chapter problems for various chapters require the use of ARGUS, which is available on the book's Web site.

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