Globalization and the State: Volume 1

International Institutions, Finance, the Theory of the State and International Trade

Carlos M. Peláez and
Carlos A. Peláez

Globalization and the State: Volume I

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THE GLOBAL RECESSION RISK
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INTERNATIONAL FINANCIAL ARCHITECTURE
G7, IMF, BIS, Debtors and Creditors

GOVERNMENT INTERVENTION IN GLOBALIZATION

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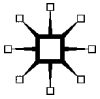

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To Magnolia and Penelope

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Contents

List of Tables

List of Diagrams

List of Abbreviations

A	Annuity
ADB	Asian Development Bank
ADR	American Depositary Receipt
AUM	Assets under management
BACE	Bayesian averaging of classical estimates
BCBS	Basel Committee on Banking Supervision
BCL	Barth, Caprio and Levine
BEA	Bureau of Economic Analysis
BIS	Bank for International Settlements
BLS	Bureau of Labor Statistics
BMA	Bayesian model averaging
BOE	Bank of England
BOJ	Bank of Japan
CA	Current account
CAD	Current account deficit
CDO	Collateralized debt obligation
CDS	Credit default swap
DDR	Doha Development Round
DI	Debt intolerance
DM	Default mode
DSB	Dispute Settlement Body
DUP	Directly unproductive profit-seeking activities
EBITDA	Earnings before interest, taxes, depreciation and amortization
EC	European Commission
ECB	European Central Bank
ECOSOC	Economic and Social Council
EDF	Expected default frequency
EIB	European Investment Bank
EL	Expected loss
EMC	Emerging market countries
EMU	European Monetary Union
ESCB	European System of Central Banks
EU	European Union
EUC	European Union Council
FDI	Foreign direct investment
FDIC	Federal Deposit Insurance Corporation
FOHF	Fund of hedge funds
FOMC	Federal Open Market Committee
FRB	Federal Reserve Banks
FRBNY	Federal Reserve Bank of New York

FRBO	Federal Reserve Board
FRS	Federal Reserve System
FSA	Financial Services Authority
FSAP	Financial Sector Assessment Program
GATT	General Agreement on Tariffs and Trade
GATS	General Agreement on Trade in Services
GE	General equilibrium
GPG	Global public good
G7	Group of Seven
G8	Group of Eight
G10	Group of Ten
G24	Group of Twenty Four
G30	Group of Thirty
HF	Hedge fund
HICP	Harmonized index of consumer prices
HIPC	Highly indebted poor countries
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEFP	International economic and financial policy
IEI	International economic integration
IFA	International financial architecture
IFC	International Finance Corporation
IFI	International financial institutions
ILO	International Labor Organization
IMES	Institute of Monetary and Economic Studies
IMF	International Monetary Fund
IMFC	International Monetary and Financial Committee
IO	International organizations
IPO	Initial public offering
IPR	Intellectual property rights
IRA	Individual retirement account
ISI	Import substitution industrialization
IT	Information technology
ITO	International Trade Organization
LAC	Latin American and Caribbean
LBO	Leveraged buyout
LGD	Loss given default
LSE	London Stock Exchange
LTCM	Long Term Capital Management
LTFV	Less than fair value
M&A	Mergers and acquisitions
MBO	Management buyout
MD	Millennium Declaration
MDB	Multilateral development banks

MDG	Millennium Development Goals
MFN	Most-favored nation
MGI	McKinsey Global Institute
MPC	Monetary Policy Committee
MSC	Management system costs
MTM	Mark to market
MTMM	Medium-term macroeconometric model
NAFTA	North American Free Trade Area
NCB	National central banks
NCUA	National Credit Union Administration
NCUSIF	National Credit Union Share Insurance Fund
NIAE	Newly industrialized Asian economies
NIE	New institutional economics
NPL	Nonperforming loan
NYC	New York City
NYS	New York State
NYSBD	New York State Banking Department
OCC	Office of the Comptroller of the Currency
OECD	Organization for Economic Co-operation and Development
OFHEO	Office of Federal Housing Enterprise Oversight
OLS	Ordinary least squares
OS	Original sin
OTC	Over the counter
OTS	Office of Thrift Supervision
PE	Private equity
PI	Prediction intervals
PPP	Purchasing power parity
PSC	Price system costs
PTA	Preferential trade agreement
PWGFM	President's Working Group on Financial Management
RMG	Risk Management Group
ROSC	Reports on observance of standards and codes
RSRA	Reverse sale and repurchase agreement
RTA	Regional trade agreement
SDR	Special drawing rights
SDRT	Social discount rate
SEC	Securities and Exchange Commission
SEO	Seasoned equity offering
SLHC	Savings and loans holding companies
SOE	State-owned enterprises
SME	Small and medium enterprises
SPE	Special purpose entity
SRA	Sale and repurchase agreement
TAA	Trade adjustment assistance
TF	Thomson Financial

TFP	Total factor productivity
TNC	Transnational corporation
TPG	Texas Pacific Group
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TSUS	Tariff Schedule of the US
UL	Unexpected loss
UN	United Nations
USITC	US International Trade Commission
VaR	Value at risk
VAR	Vector autoregressive
VC	Venture capitalists
VER	Voluntary export restraints
WB	World Bank
WC	Washington Consensus
WTO	World Trade Organization

Acknowledgments

This is the sixth book around this subject that we have published over a decade. It is the expanded, advanced form of *Government Intervention in Globalization*. We are very grateful to Taiba Batool, Economics Editor of Palgrave Macmillan, for the encouragement of the project and for important improvements. Two perceptive reviewers of Palgrave Macmillan also contributed extremely valuable suggestions. We are most grateful to Alec Dubber at Palgrave Macmillan for steering the manuscript to publication. Geetha Naren at Integra Software Services revised the manuscript with highly useful suggestions and competent typesetting for final publication.

We began work on this project already during the publication of *The Global Recession Risk* by Palgrave under the highly valuable guidance of Amanda Hamilton. Hard times undermine international cooperation, accentuating the damage of economic and employment losses. Currently, we are working on another volume on the regulatory wars of finance that are already beginning.

We are grateful to many friends who helped us in this effort. A partial list includes Professor Antonio Delfim Netto, Ambassador Richard T. Mccormack, Senator Heráclito Fortes, Professor Paulo Yokota and Eduardo Mendez. Magnolia Maciel Peláez, DDS, reviewed the manuscript providing many suggestions deriving from her long experience in health regulation.

Our intention is providing a comprehensive source for the reader to acquire tools with which to analyze and develop own views on what may be the most important current event, government intervention in national affairs.

In writing this book we remembered dear friends and colleagues who helped and motivated in the interest on scholarly work and international affairs, Clay and Rondo Cameron and Otilia and Nicholas Georgescu-Roegen. We are solely responsible for the shortcomings and errors in this work.

Carlos M. Peláez and Carlos A. Peláez
Atlantic City and New York City

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Introduction, Scope and Content

International economic and financial policy (IEFP) consists of the analysis of the policy measures of the governments of individual countries to influence their external trade, investment, intellectual property rights (IPR) and migration. In addition, IEFP consists of the governance and policies of international financial institutions (IFI), which are the International Monetary Fund (IMF), the World Bank (WB), the Bank for International Settlements (BIS) and the multilateral development banks (MDB). The MDBs include the Inter-American Development Bank (IADB), the Asian Development Bank (ADB) and the European Investment Bank (EIB). The ministers of finance and heads of central banks of the Group of Seven (G7) industrialized countries – the United States, Japan, the United Kingdom, France, Germany, Italy and Canada – shape the policies of the IFIs (Peláez and Peláez 2005, 63–100). IEFP is also processed through other international organizations (IO) such as the United Nations (UN), the World Trade Organization (WTO) and the International Labor Organization (ILO).

There have been multiple episodes in the known history of international economic integration (IEI). The process of IEI consists of increasing cross-border flows of goods, services, capital, technology, ideas and sometimes labor. This process is persistently labeled globalization such that the word is used interchangeably with IEI. Thus, in this book globalization is synonymous with IEI. In broad literature, important social and political factors of globalization are related to civil society, culture, ethnicity, gender and political development and organization. The focus of this book abstracts only the less complex process embodied in the concept of IEI. In reality, the social process, in the tradition of Schumpeter, is a far more complex indivisible whole of which only the economic and financial aspects are considered in this book.

Technology has been a main driver together with population growth of the waves of IEI. There are natural and jurisdictional barriers to globalization. The international diffusion of technology reduces the costs of cross-border flows. The development of the new institutional economics (NIE) departs from the seminal contribution by Coase (1937) on the significant size and pervasiveness of transaction costs. IEI is frustrated by transaction costs that include such things as discovering business in another country, negotiating the contract, drafting the

legally binding contract, arranging international finance, enforcing the contract and organizing the international production chain and distribution.

The technological revolution has given a new face and dynamic impulse to IEI by geographically fragmenting the production chain in multiple tasks. An earlier volume (Peláez and Peláez 2007) is an example. It was written and researched in the United States but it also consists of professional experience of trading financial instruments and derivatives in global markets. Research benefited from the electronic and physical resources of the libraries at Columbia University, the University of Pennsylvania and the IFIs, IOs, MDBs and multiple research institutions. The project proposal was transmitted electronically in a Word file by e-mail from the United States for evaluation by the publisher in the United Kingdom. The final electronic manuscript was sent for copyediting and typesetting from the United Kingdom to Malaysia, returned by e-mail and international courier to the authors in the United States that returned it to the copy editors in Malaysia. The final typeset proof was sent by the copy editors in Malaysia as a PDF file to the publisher in the United Kingdom. The printer in the United Kingdom used the PDF file to print the volume. A network of distribution by the publisher in over 70 countries and global digital marketing makes it available to the reader. This geographical assignment of multiple tasks in the production chain is the essence of the difference in the current IEI that is facilitated by technology. There are multiple transaction costs in the agreements of the publisher with authors, copy editors, typesetters, printers and booksellers. There is a similar process in most current economic production chains and transactions. In a way, as Friedman (2005a, b, 1999) argues, the world is flat or flattening.

The origin of globalization as IEFP is showing in relief the essentially political nature of the process. Growth in cross-border economic flows can be affected by political decisions to legally authorize them and the subsequent crucial implementation by regulators and supervisors. China was always ready, and its population likely willing, for integration in the world economy. However, China remained isolated until the leaders of the country decided to increase its share in world trade, investment and technology as a vehicle to increasing its living standards. Brazil decided to maintain its economy relatively closed in the initial period after World War II, following a model divergent with the successful export promotion of Asia. In contrast with China, the pressure of world IEI contributed to a change toward greater openness in many countries.

The coercive power of the state to intervene in markets is a key determinant of the existence of globalization, its speed and nature. This effort focuses on IEFP by systematically relating it to theories of the state developed by economists. It is self-contained in that the theories of the state are systematically surveyed and specifically applied to the issues of IEFP. If an argument in critique or defense of globalization (as IEI) is not explicitly based on a theory of state intervention, it is almost always possible to relate it to a specific approach of the theory of the state. What an individual argues about globalization is ultimately an argument of the preference for a specific view on the intervention of the state in the economy. Globalization is merely a different name for IEFP.

The first four chapters of the book provide a foundation of essential background on the world economy. Chapter 1 provides an analysis of research by the World Bank (2007a) in an exercise of projecting globalization to 2030. The main objective of this exercise is to trace the distortions that may occur and the policy responses that are required. The dimensions of the world economy, about $44 trillion of output in 2005, mask the significant differences among countries. Most of this output is concentrated in a few wealthy countries while the rest of the world struggles in various degrees of need. The theory and measurement of economic growth is partially surveyed in the balance of that chapter because it is needed to background the subsequent analysis of whether IEI promotes or not economic growth.

There are arguments that the G7 and the Group of 10 (G10) excessively dominate the governance and policy of the IFIs through the periodic meetings of finance ministers and heads of central banks of the G7. The process of the international financial architecture (IFA) can be traced to the meetings of the G7, as argued by Peláez and Peláez (2005, 63–100). Chapter 2 provides the specific analysis and background of the IFIs. An important issue covered in Chapter 10 is the reliance by the wealthier countries on soft law by means of international standards and codes. The standard setting institutions, such as the Basel Committee on Banking Supervision (BCBS) in the case of the capital requirements of Basel II, generate this soft law.

The WTO now has almost all countries of the world as members. It engages in multilateral negotiations of trade rules and provides the resolution of complaints of these agreements. The WTO is a late implementation of the design of economists after World War II of an International Trade Organization (ITO). The central banks determine monetary policy and thus influence the world economy and the process of IEI. The Federal Reserve Board (FRBO) of the US Federal Reserve System (FRS) sets the policy rate, fed funds rate, which affects international financial intermediation and exchange rates. The European Central Bank (ECB) uses its policy rate to influence money markets in the countries of the European Monetary Union (EMU). The Bank of Japan (BOJ) is the central bank of the second largest economy in the world. The Bank of England (BOE) is a unique institution with a widely imitated process of central bank independence and inflation targeting. The entire framework of regulation in the United Kingdom through a single Financial Services Authority (FSA) is extremely important to the argument of the loss of competitiveness by the financial sector of the United States, with an independent BOE. The current system of resolution of international crises consists of individual actions by the major central banks of the world. It is experiencing the severe stress test of the credit contraction following the collapse of real estate values in the United States.

The UN has multiple roles in the analysis and measurement of foreign direct investment (FDI) and is playing a critical role in global public goods (GPG) such as the amelioration of climate change. The UN has also engaged in the Millennium Development Goals (MDG) to reduce poverty and improve living standards in developing countries. The International Monetary and Financial Committee (IMFC) of the IMF is a forum of 20 key countries in the world economy. The

Group of 24 (G24) analyzes and proposes measures on behalf of developing countries. The Washington Consensus (WC) is an alleged policy of the IFIs and the G7 for forcing "neoliberal" economic policy. There is active controversy on the desirability of the current governance of IOs, which according to some analysts does not adequately represent the weaker constituencies.

There are private institutions that play an important role in IEI, which is the subject of Chapter 3. The regulation of these institutions is an important issue in IEFP. Essential data on commercial banks are provided in this chapter but analysis of banks recurs in detail in Chapter 5 in sections on imperfect information and banking regulation, and in Volume II in Chapter 3 on financial globalization, in Chapter 4 on bank capital requirements and in Chapter 11 on the response of central banks to the credit contraction. A separate section focuses on the legal framework of operation of mergers and acquisitions (M&A) and corresponding data and activity on M&As and underwriting by investment banks. Restructuring and consolidation of companies and industries are partly a consequence of the technological change of production chains and its geographical impact. A major part of the critique of private institutions centers on hedge funds (HF). A section provides the analytical background of HFs, proposals for regulation and available data. Private equity (PE) has been a key player in the largest deals in M&As and the subject is analyzed in terms of the available information. China is opening to PE and is investing $3 billion of its reserves in a PE company, the Blackstone Group. The market for initial public offerings (IPO) is critical for the exit into the public market by the investors in a private company. There is an alleged exodus of IPOs from New York to other markets, in particular the London Stock Exchange (LSE). IPOs have also been the subject of significant analytical effort by academics. The chapter provides the analytical and empirical background to understand the framework of private institutions through which IEFP is processed.

An important technological development is the application of risk management techniques to financial instruments. The growth and diversification of international financial instruments is analyzed and documented in Chapter 4. The first sections consist of an introduction to risk management – the value at risk (VaR) standard of the industry, the progress in credit risk models and stress tests. The balance of the chapter focuses on analyzing the quantitative dimensions and growth of world trade, financial flows, foreign exchange, FDI, equities, securities and derivatives. The chapter complements the previous chapter with analysis of the instruments used by private institutions.

There is no unique theory of the state by social scientists. There are multiple approaches, which are surveyed in Chapter 5. It is not possible to understand IEFP or what is referred as globalization without mastering these approaches to state intervention. There is a unique point of departure in the proposition by Smith (1776, 477) that "every individual intends only his own gain and he is in this, as in so many other cases, led by an invisible hand to promote an end which was not part of his intention." It took economists almost two centuries to specify the assumptions and prove the two fundamental theorems of welfare economics. These theorems were proved by Arrow (1951) and Debreu (1951) and

complemented with the proof of the existence of a competitive equilibrium by Arrow and Debreu (1954). The first fundamental theorem is the counterpart in contemporary economics of the Adam Smith statement that individuals promoting their self-interest promote the social good. Technically, it states that Walrasian equilibrium allocations are Pareto optimal. The second theorem states that it is possible to make lump-sum transfers of income such that every Pareto-optimal allocation can become Walrasian equilibrium. In other words, free markets result in the best outcome for society in that it is not possible to improve the efficiency of allocation of resources and the satisfaction of consumers.

The theory of second best shows that after the relaxation of one marginal condition for the first-best equilibrium it is quite difficult to determine theoretically and empirically how to attain the second-best outcome. The complexity of general equilibrium (GE) models led to the creation of the field of applied welfare economics, also known as cost/benefit analysis and project evaluation, to answer practical questions posed to economists about such things as whether to build a bridge and how to finance it. Cost/benefit analysis is widely used in evaluating market failures. A strong case for intervention is provided by the public interest view originating in Pigou (1932). In cases of market power by producers or externalities there is a case for taxes or subsidies to attain the optimum outcome that would not be realized by free markets. The theory is extended by the analysis of public goods, which provides for government intervention in goods that are needed but would not be provided by the private sector. The relaxation of the assumption that markets operate with perfect information leads to new arguments for intervention by the government, especially in financial markets. A reaction to these theories is the proposition of government failure: the government has equally imperfect information in correcting market failures.

The work by Coase (1937, 1960) introduced the concept of transaction costs, which are quite high and lead to new ways of analysis. The NIE initially builds on transactions costs and subsequently provides an alternative interpretation of the role of the state. The economic theory of regulation initially focused on capture of the regulatory process for the self-interest of the regulated industries. Subsequently, the private interest view extends the theory of regulation, showing the disparity of intended and actual results of regulation. Theories of rent-seeking explore how the private sector invests in obtaining protection against competition by means of regulation. In the last 10 years, there has been active global research on a modification of the private interest view that combines monitoring by the market through disclosure and enforcement of regulation.

The foundation in Chapter 5 on the theory of the state provides the principles with which to understand the analysis and proposals on IEFP in the balance of the book. Chapter 6 provides the analysis of international trade of goods and services. It begins with the classical analysis of the static gains from international trade. A subsequent section analyzes distortions and whether to correct them with trade policy or domestic regulation. There is significant controversy on the benefits of trade openness. The success of economists in convincing each other of the benefits of free trade contrasts with their failure to convince politicians and a significant

part of the public. There are efforts in political economy to explain this important paradox. Antidumping and safeguards are used in US trade policy to restrict trade and are almost universally condemned by economists. A major part of the debate on IEFP centers on the impact of trade opening on employment and wages. The arguments and evidence on these critical issues are discussed in separate sections. The issue of offshoring of jobs, as for example, an information technology (IT) programmer doing in Bangalore the job of a US national, is the subject of increasing academic, press and policy analysis and concern. Another protectionist argument centers on the inclusion of labor and environmental standards in trade agreements.

Volume II contains the remainder of this book. There is a conclusion and a list of references at the end of each volume.

1
Globalization, the World Economy and Growth

Introduction

According to Wolf (2005, 14), globalization is "the integration of economic activities, across borders, through markets." The process is dynamic in the direction of increasing integration. The effects of economic events in one part of the world affect economic affairs in other parts of the world. The definition of the subject matter of this volume is IEI: the increasing cross-border flows of goods, services, capital, technology, ideas and humans. The subject matter is actually IEFP and institutions and has always existed in economics. In fact, the literature is united by the analysis of how the state intervenes in the international affairs of nations and through international institutions and organizations on the affairs of the entire world. In turn, economic change influences IEFP.

The first section provides the dimensions of the world economy, on the order of more than $44 trillion in 2005. It also analyzes the interesting exercise by the World Bank (WB) on the future globalization until 2030. That exercise motivates the analysis of policies of individual countries and the need for collective action through international institutions and organizations. The final section deals with the available knowledge on the factors that determine the economic growth of nations. The prime goal of IEI is to promote economic growth and prosperity in the form of increasing living standards. Some conclusions are summarized at the end of the chapter.

Dimensions of the world economy

There are two subjects in this section. The WB has projected globalization for the next quarter of a century. This is a vital and unique exercise in discussing policy. Economic forecasts are subject to significant uncertainty. However, the consideration of various scenarios traces different approaches to economic policy that can be of significant usefulness. The second subsection provides the quantitative dimension of the world economy, showing in relief the differences in income levels among regions and countries.

The future of globalization

According to the SVP and Chief Economist of the World Bank (2007a, viii), François Bourguignon, the objective of the scenarios of the global economy until 2030 is to provide a framework for analysis of the benefits and pressures of globalization. The central scenario is built around higher and lower projections. Numbers in reality may fall above or below those of the scenarios, as it is true of all economic forecasts. The view of the future provides the alternative choices that policy makers encounter in the current management of globalization. Policy makers in individual nations must take decisions on globalization that will affect their long-term competitiveness and welfare. The task of international policy makers is to find the routes for constructive interaction of nations. The objective function is to attain sustained growth that is widely shared and does not irreparably damage the environment.

The details of the central scenario of the World Bank (2007a) are shown in Table 1.1. Population growth will be an important driver of growth of the world economy, increasing from about 6.5 billion currently to 8 billion in 2030, at the average growth rate of 0.83 percent per year. Most of this growth, 97 percent, will concentrate in developing countries. There will likely be decline of population in

Table 1.1 The central scenario of the World Bank

World population	2006	2030	Average growth rate
	6.5 billion	8.0 billion	0.83 percent per year
World labor force	3 billion	4.1 billion	1.26 percent per year
	2005	2030	Average growth rate
World output	$35 trillion	$72 trillion	2.9 percent per year
Low income countries			4.2 percent per year
High income countries			2.5 percent per year
Growth of per capita income for developing countries			
	1980–2005		2.1 percent per year
	2006–2030		3.1 percent per year
Per capita income of developing countries			
	2006	$4,800	
	2030	$11,000	
People in poverty below $1 per day			
	2006	1.1 billion	
	2030	550 million	
Developing countries with population of 100 million and GDP of more than $100 billion			
	2006	6	
	2030	10	
Growth in world trade 2006–2030: 200 percent, about 4.5 percent per year			
Middle class in developing countries:			
	2006	400 million	
	2030	1.2 billion	

Source: World Bank (2007a, xii–xvi).

Europe and Japan. India will likely surpass China as the most populous country in the world. The world labor force will likely increase faster than population, from about 3 billion currently to 4.1 billion in 2030, approximately at 1.26 percent per year on average.

Continuing technological progress and integration will drive the rate of growth, increasing world output from $35 trillion in 2005 to $75 trillion in 2030, holding constant prices and exchange rates. The growth rate of world GDP will be about 2.9 percent per year, much higher in low-income countries at 4.2 percent per year, than in high-income countries at 2.5 percent per year. The growth of per capita income of developing countries was 2.1 percent per year on average in 1980–2005 and is likely to accelerate to 3.1 percent per year in 2006–30. The per capita income of developing countries will increase from about $4800 in 2006 to around $11,000 in 2030.

The population of the world in poverty, living with less than $1 per day, will likely decline from 1.1 billion in 2006 to 550 million in 2030. The club of developing countries with population in excess of 100 million and GDP of at least $100 billion will increase from 6 in 2006 to 10 in 2030. The central scenario projects world trade will grow by 200 percent, at the average yearly rate of 4.5 percent per year. Because growth of world trade will exceed growth of GDP, the ratio of trade to GDP is likely to increase in most countries. The middle class will likely increase in developing countries from 400 million in 2006 to about 1.2 billion in 2030.

Economic historians have related the current struggle against globalization to similar episodes in other times. The qualifications of stresses by the World Bank (2007a) in its central scenario discussed below resemble the findings of economic historians. The causes for concern of the future globalization in the finding of the World Bank (2007a) are as follows:

- *Widening gap in earnings of skilled relative to unskilled labor*. Capital investments and technology tend to increase the demand for skilled labor, raising the earnings differential relative to unskilled workers. According to the World Bank (2007a, xvii–xviii), income distribution is likely to widen in two-thirds of all countries. Corrective social policy may be required.
- *Costs of dislocation for unskilled labor*. Increasing integration in products and services markets with populous countries, such as China and India, will create adjustment costs in various disadvantaged groups. Social safety net programs may be required to alleviate costs and tension.
- *Capitalizing on globalization*. The policy agenda, according to Eichengreen (2002a), must be agile in exploiting the opportunities that become available with globalization.
- *Global collective action*. The environment, disease control, international security and international economic crises will require increasing cooperation among countries.

The world economy

The combined output of the world in 2005 is measured by the WB at $44.6 trillion. The various chapters below provide quantitative evidence on the cross-border movements of trade, services and capital together with their rates of growth.

Table 1.2 summarizes indicators of output, output per capita, population, population growth, life expectancy and percentage of the population enrolled in

Table 1.2 World GDP, GNI per capita, population, life expectancy and schooling 2005

	GDP $B	GNI per Capita $	Population Millions	Growth % py	Life expectancy Years	School primary (%)
World	44,645	7,011	6,437	1.2	68	
High income	34,687	35,264	1,010	0.7	79	94.2
EMU	9,984	32,098	314	0.6	80	98.9
USA	12,416	43,560	296	1	78	92.4
Canada	1,114	32,590	32	1	80	
UK	2,198	37,740	60	0.7	79	98.7
Germany	2,794	34,870	82	–0.1	79	
France	2,126	34,600	61	0.6	80	98.9
Italy	1,762	30,250	58	0.7	80	98.8
Japan	4,534	38,950	128	0	82	99.9
Switzerland	367	55,320	7	0.6	81	93.9
Sweden	358	40,910	9	0.4	81	98.6
Spain	1,124	25,250	43	1.7	81	99.4
S Korea	787	15,840	48	0.4	78	99.4
Singapore	117	27,580	4	2.4	80	
Malaysia	130	4,970	25	1.8	74	93.2
Thailand	177	2,720	64	0.8	71	
Russia	763	4,460	143	–0.5	65	91.5
Czech Rep	124	11,220	10	0.3	76	
LAC	2,461	4,045	551	1.3	72	94.9
Argentina	183	4,470	39	1	75	98.8
Brazil	796	3,550	186	1.3	71	92.9
Mexico	768	7,310	103	1	75	97.8
Chile	115	5,870	16	1.1	78	
East Asia Pacific	3,040	1,630	1,885	0.9	71	93.4
China	2,234	1,740	1,304	0.6	72	
Taiwan	346	16,250	23	0.4	76	
India	806	730	1,095	1.4	64	89.7
Middle East NA	625	2,198	306	1.8	70	90.3
Israel	123	18,850	7	1.8	80	97.6
Egypt	89	1,260	74	1.9	71	95.4
Saudi Arabia	309	12,510	23	2.6	73	77.9
Kuwait	81	30,630	2.5	3	78	86.5
HIPC	223	380	554	2.3	49	
LDC	306	382	751	2.3	52	71.9
Low income	1,416	585	2,352	1.8	59	78
Low/Middle income	9,969	1,753	5,426	1.3	65	
Middle income	8,553	2,647	3,074	0.9	70	

Source: World Bank (2007b).

primary education. The population of the world in 2005 is estimated at 6.4 billion. Chapter 2 of Volume II provides the quantitative dimensions and analysis of global poverty and inequality. An intuitive approach is provided by the data in Table 1.2. In 2005, the high-income countries show combined output of $34.7 trillion, or about 78 percent of world output. The population of these high-income countries is about 1 billion or around 16 percent of world population.

The level of per capita income is a measure of the well-being of the citizens of a country subject, of course, to the pattern of income distribution. In 2005, the per capita income of the high-income countries was $35,264 per person, about five times higher than that the average per capita income for the world of $7,011. The WB calculates measures of per capita income allowing for differentials in the cost of living and exchange rates or what is termed as purchasing power parity (PPP). The PPP per capita income for developing countries shows a smaller differential than the one in Table 1.2.

The last rows of Table 1.2 vividly show the conditions of relative poverty of most of the population of the world. The highly indebted poor countries (HIPC) have a combined population of 554 billion or about 9 percent of world population but have output of only $223 billion or about 0.5 percent of world output. The income per capita of the HIPC is $380, which is equivalent to around $32 per month. The measurement and analysis of poverty and inequality presented in Chapter 2 of Volume II is far more complex than this intuitive reading. The combined low- and middle-income countries have a population of 5426 billion or 84 percent of world population but their combined output is $9.9 trillion or 22 percent of the total, most of which, $8.5 trillion or 86 percent, is generated in the middle-income countries.

Factors of economic growth

The conventional theory of economic growth is the neoclassical model of Solow (1956). In this model, technology is determined exogenously. Growth theory develops other models in which technology is determined endogenously. There has been significant effort to uncover the relationship of various factors with economic growth using cross-country data. Education attainment has significant correlation with economic growth. There are efforts, such as by Rodrik (2003), to establish the relationship between the high-level principles of conventional economics, which include definition, protection and enforcement of property rights and sound fiscal and monetary policy, and optimum institutions for allocation and growth. The NIE develops an approach based on institutional development that emphasizes the high-level principles. It is difficult to establish these principles in research on individual countries.

The basic version of neoclassical growth theory was provided by Solow (1956). There is a distinction between model and theory, according to Solow (2000, 349). The objective of the theory is an ultimate and fundamental explanation. The model intends to isolate the essential elements and does not pretend to provide a final explanation. There is a fine line distinguishing theory and model. Economic

growth consists of the growth of potential output. The objective is to focus on the trend of growth that is influenced by factors of supply, isolating it from the influences that typically originate in demand conditions. The models do not claim that supply and demand growth occur purely in reality. There is the assumption in neoclassical growth theory of full utilization of the available supply of labor and of the existing stock of productive capital.

Solow (2000, 350) observes that the three founders of the theory were all Keynesian in their analysis of macroeconomics. Full employment of resources or equality of savings and investment is merely an assumption used for theoretical simplicity. Fluctuations in these models alter the rate of investment, affecting the trajectory of potential output. The neoclassical term in the theory has various explanations (Solow 2000, 350–5). The models use the assumption of perfect competition but the results are independent of this type of market organization. There is the assumption of constant returns to scale and diminishing returns to the use of an input. Earlier models use the conventional consumption and savings equations but later models incorporate intertemporal optimization of utility. The earlier models treat technology as exogenous but newer models analyze technology as endogenously generated. The models can be extended to various assumptions on returns to scale. Knowledge can create market power, requiring assumptions different from those of perfectly competitive models.

The aggregate production function has the following expression (Mankiw 1995, 276):

$$Y = F(K, AL) \tag{1.1}$$

The variables are *Y,* output, *K,* capital, *L,* labor and *A,* a proxy of technology. Aggregate output is a function of capital and efficiency units of the labor force, *AL*, consisting of both the quantity of labor and its productivity, which is determined by technology. The factors of economic growth are capital accumulation, labor force growth and technology. This model assumes that technology is exogenous. This means that technology is determined outside the model by different factors. The model assumes technology as given.

There are three problems with the neoclassical growth model (Mankiw 1995, 281–9):

1. *Differences in international income levels*. Income levels of rich countries are about ten times those of poor countries. However, the model explains difference of income levels of only a multiple of two. Allowing for differences in technology, or production function, still cannot account for income that is five times higher in rich than in poor countries.
2. *Convergence rates*. The typical definition of convergence is that poorer economies tend to grow faster than rich ones. The model predicts convergence of a country to a steady state conditional on the country's rates of savings and population growth, for which there is statistical support. However, the model does not predict the actual rates of convergence to the steady state.

3. *Return differentials*. The marginal product of capital is the increase in output caused by the use of another unit of capital, or the first derivative of the production function with respect to capital. Using another unit of capital in a poorer country should result in a larger increase in output than in a rich country. That is, there should be a higher return to capital in the poorer than in the richer country, attracting capital from the richer to the poorer country where it could obtain a higher marginal return. The neoclassical model using the Cobb–Douglas production function predicts much higher differentials of the rate of return of capital than those observed in reality.

There could be an adjustment of neoclassical growth theory by considering a measurement of capital that raises the return to capital as a fraction of national income or capital share (Mankiw 1995, 289–95). The use of a higher capital share in the neoclassical model eliminates the three problems outlined above. There are two major reasons why the capital share may be higher in reality (Mankiw 1995, 290–5).

Capital may have positive externalities that are not measured in the national accounts. In fact, the nature of externalities is that their price is not observed, as the use of air in manufacturing steel that creates the externality known as pollution. A positive externality is a benefit passed on by an activity to another activity. For example, education has positive effects in the production of many goods and services; the production of education benefits other activities. In the same way, there may be benefits of capital accumulation by the owners of capital that benefit others. National income accounting may underestimate the true contribution of capital to economic activity because of the benefits created to other activities that are not measured.

The national income accounts may not measure capital in its entirety (Mankiw 1995, 293–5). The capital measured in the accounts is physical capital, consisting mostly of plant and equipment. The process of capital formation consists of foregoing income presently to consume more in the future. Thus, acquiring skills is an important form of increasing the capital stock. Human capital, in the form of school and on-the-job training, is not included in the national income accounts. The exclusion of human capital underestimates the capital share in national income.

Growth in the neoclassical model eventually approaches the exogenous rate of technological progress (Mankiw 1995, 296). Convergence to different steady states explains international differences in growth rates. The persistence of economic growth in neoclassical theory is not very revealing. Theorists eventually turned to explaining persistent growth by the endogenous growth theory (Mankiw 1995, 295–301) as in the works of Uzawa (1965), Lucas (1988) and Mulligan and Sala-i-Martin (1993).

The simplest endogenous growth model has the following expression for the production function (Mankiw 1995, 296):

$$Y = AK \tag{1.2}$$

The doubling of capital in this expression doubles output; the definition of constant returns to scale. Mankiw (1995, 296) analyzes the role of savings by introducing a simple accumulation equation:

$$\frac{\mathrm{dK}}{\mathrm{dt}} = sY - \delta K \tag{1.3}$$

Here s is the rate of savings and δ the rate of depreciation. The two equations then yield (Mankiw 1995, 296):

$$\frac{1}{Y}\frac{\mathrm{dK}}{\mathrm{dt}} = \frac{1}{K}\frac{\mathrm{dK}}{\mathrm{dt}} = sA - \delta \tag{1.4}$$

Income grows indefinitely if $sA > \delta$, even dropping the assumption of exogenous technology. In the neoclassical growth model, savings causes growth temporarily but eventually growth and savings are independent as the economy reaches the steady state. There is growth indefinitely in the endogenous growth theory as long as there is saving in excess of the rate of depreciation of capital. There can be significant differences in income levels over time and capital need not flow from rich to poor countries.

An important issue in endogenous growth theory is the interpretation of capital, *K*. Mankiw (1995, 296) argues that the best approach may be to consider capital as a type of knowledge. There is an iterative process in that knowledge is used in the production of more knowledge. It is important to distinguish knowledge, the perception by society of the functioning of the world, from human capital, the effort to transmit this perception to the labor force. Mankiw (1995, 296) argues that accumulation of human capital is subject to diminishing returns. Endogenous growth could still explain perpetual growth by accumulation of knowledge. There are models in which one sector concentrates in the production of goods and another sector engages in the production of innovation and technology, such as the contributions by Uzawa (1965), Lucas (1988) and Mulligan and Sala-i-Martin (1993).

There has been intensive empirical research on the determinants of growth using cross-section data for many countries. There are several typical problems of econometric estimation in these studies (Mankiw 1995, 303). Economic models commonly consist of the determination of variables in a system of simultaneous equations. A single regression equation expresses a variable in terms of others that are assumed to be exogenous to the model. However, theories claim that the models are jointly determined. Numerous problems of estimation develop and it is difficult to establish causality among the variables. A second problem, also common in all econometric research, is that the variables on the right-hand side of the regression equation are highly correlated with each other and measured with errors that enter in the disturbance and correlate with the determining variables. The breaking of assumptions of the statistical model of estimation by least squares casts significant doubts on the results of this research.

A panel of 100 countries in 1965–95 is used by Barro (2001) to analyze the effects of education on economic growth. There is positive significant association

between growth and the starting level of average years of schooling of adult males at the secondary and higher levels. Diffusion of technology is important because new technologies would be complementary with these levels of education. However, economic growth is not significantly associated with secondary and higher level education of females, suggesting that women are not well utilized in the labor force of many countries.

Many research studies of the determinants of economic growth estimate regressions of the rate of growth of a cross-country sample of a large number of explanatory variables. The common regression, according to Sala-i-Martin *et al*. (2004, 813) and Sala-i-Martin (1997, 183), is of the following form:

$$\gamma = \alpha + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n + \epsilon \tag{1.5}$$

The variable γ is a vector of the rates of economic growth of the countries in the sample, α is a constant, ϵ is the disturbance term, the x variables are the explanatory variables and the β are their respective coefficients. There is a wide range of explanatory variables among the various research studies. Sala-i-Martin *et al*. (2004, 813) find that the essays report a sample, not necessarily random, of the many regressions run by the researchers. The results show correlation of the rate of growth with such variables as the initial level of income, various measures of education, policy variables and a large number of other variables. Ideally, the explanatory variables in equation (1.5) should be clearly specified by theory, preferably derived from micro foundations and explaining the interrelation of variables. However, there is no theory of growth that can be used to specify equation (1.5) but rather what Sala-i-Martin *et al*. (2004, 813) refer to an "artistic" imagination in providing a large number of explanatory variables. If the number of observations increased without limit, the coefficients of many of the explanatory variables would tend to zero. However, the number of possible explanatory variables can exceed the number of countries in the world. The use of arbitrary sets of variables in preferred specifications to circumvent the lack of sufficient observations can provide spurious correlations.

A research approach, according to Sala-i-Martin *et al*. (2004, 814), is to admit that there is uncertainty about the appropriate specification or model. Probabilities would then be assigned to the various models, in what is known in the literature as Bayesian model averaging (BMA). The prior distributions of all the parameters conditional on each possible model would have to be specified in a pure Bayesian approach. Sala-i-Martin *et al*. (2004, 815) determine the significance of explanatory variables in cross-country regressions of the rate of economic growth by means of a technique that they call Bayesian averaging of classical estimates (BACE). This method combines the ordinary least squares (OLS) estimation of standard econometrics, assuming diffuse priors and accounting for the term "classical estimates," with the averaging of estimates across models, which departs from Bayesian analysis. Sala-i-Martin *et al*. (2004, 815) enumerate various advantages of this approach.

The sample used by Sala-i-Martin *et al*. (2004, 819–21) consists of 68 variables, 67 explanatory variables and the rate of growth of a country that is the 68th variable. It uses the rate of economic growth for 88 countries in the period 1960–96. There are 18 variables that are significantly associated with the rate of economic growth. The model provides precise estimation and shows that the variables have significant explanatory power. The remaining 46 variables are not estimated precisely and have weak explanatory power. The variable designed to capture the effect of human capital is the rate of primary schooling enrollment in 1960. It shows positive association with economic growth and the inclusion probability is 0.80. An increase in the primary school enrollment rate by 10 percentage points is associated with an increase in the growth rate of 0.27 percentage points. A high average price of investment goods in the beginning of the period of observation shows strong and inverse relationship with subsequent income growth. There is also significant and robust partial positive correlation between income at the beginning of the period of observation and subsequent economic growth. The proportion of the area of a country in the tropics has negative relationship with income growth. The density of population of a country in coastal areas is positively associated with economic growth. Life expectancy is used to capture the effects of nutrition, health care and education. Countries with high life expectancy in 1960 show higher rates of growth in subsequent periods.

Institutions and economic progress

The subject of economic history is the study of institutions through time, as defined by North (1994, 359). This field of research provides new insights into the past and feedbacks into the theory of economic change. Economists have not been able to develop a dynamic theory of economics comparable to the framework of GE theory. The task of economic history is restricted to analyzing the past performance of economies through time, using comparative static analysis. There is no available comprehensive analytical framework.

The theory of economic growth, or models of economic growth, provides an elegant analysis of a world without frictions. The original work focuses on the development of technology and endogenous models introduce human capital. North (1994, 359) argues that growth theory ignores the structure of incentives in institutions and the investments by societies in those institutions. The models of growth, North (1994, 359) argues, have two implicit erroneous assumptions that institutions and time are not important. The analysis retains the tools of microeconomic theory and the assumption of scarcity. It changes the assumption of rationality and adds the time dimension.

In the NIE framework, political and economic institutions determine economic performance by providing an incentive structure for society (North 1994, 359). Learning over time shapes the beliefs of societies that determine choices. Learning accumulates over time and is transmitted by the culture of a society over generations. There are formal constraints such as rules, laws and constitutions and

informal constraints such as norms, conventions and codes of conduct. Enforcement of constraints is essential to incentive structures. The existence of transaction costs and uncertainty suggests that efficient markets are rare in reality. The design of development policy is constrained by the lack of theory and empirical evidence on what are the factors of economic progress.

England after about 1750 constitutes the first case of successful transition to the modern factory system and accelerated economic growth. The work of North and Weingast (1989) provides an institutional explanation of factors that ignited growth, raising one of the most important counterfactual issues in economic history, how England surged ahead and France remained behind for one century. The crucial institutional change was the Glorious Revolution of 1688 that constrained the behavior of the Crown with a Parliament playing a central role and an independent judiciary. The result was a constraint of the coercive power of the Crown to confiscate property by redefining property rights on its behalf. The new institutions increased the value of private property rights and their enforcement, generating rules promoting long-term growth. There were incentives to economic and political actors. The revolution was a radical departure from a system that favored the Crown and privileged actors at the expense of private rights.

Major changes in government finance and capital markets provide the detailed quantitative evidence for analysis of the institutional hypothesis of North and Weingast (1989). Capital markets are extremely sensitive to the definition, protection and enforcement of property rights. There was governmental arbitrariness in payments on loans before the Glorious Revolution. The Crown would not repay the loans, forcing their renewal and failing to pay interest for many years. Various measures recovered public finance and the capacity of the government in borrowing. Parliament earmarked new taxes to pay interest on new long-term loans, effectively restricting the King from not paying interest to debtors. The BOE was not authorized to lend to the government and loans to the Crown passed through the Bank that would cease payment if it had not received interest on funds advanced to the government. Subsequently, a fund was created to make payments to debtors in case that earmarked revenue was insufficient.

The fiscal reform was highly successful in creating the borrowing capacity of the government. Before the fiscal reform, the government debt was £1 million, about 2–3 percent of GDP of around £41 million. Holland was borrowing at the time £5 million in long-term periods at interest rates of 4 percent per year while the English Crown was paying 6–30 percent per year. Nine years after the Glorious Revolution, in 1697, North and Weingast (1989, 822–3) show that borrowing grew fourfold to £7.9 million. In 1697, the debt stood at £16.7 million, being equivalent to 40 percent of GDP, compared with £1 million in 1688, or 1 percent of GDP. The increase in the debt did not cause inflation. The rate on loans declined from 14 percent per year in the 1690s to 6–8 percent by the end of the decade, declining further to 3 percent in the 1730s. The higher perception of the government as a debtor is illustrated by the rise in borrowing volume while the interest rate collapsed, without an increase in inflation. To be sure, economic conditions contributed to this performance but the quality of government

management significantly increased in response to the incentives in the new institutions.

The recovery of the credibility of government borrowing, according to North and Weingast (1989, 824–5), illustrates the commitment by the government to protection of private rights. They document this contention by means of data on private capital markets because of the paucity of information on the economy. The argument is that the institutional change that improved the credibility and borrowing capacity of the government constituted a large and effective positive externality that promoted the parallel development of a market for private debt. Cameron (1967) analyzes and provides empirical evidence on the critical role of banks in the early stages of industrialization, including the experience in England before the industrial revolution. North and Weingast (1989, 829) argue that the institutional structure of new banks facilitated the intermediation of savings between borrowers and lenders. Private securities and negotiable instruments developed in England in the early eighteenth century, financing numerous economic activities. Private interest rates declined together with rates on government loans, facilitating capital accumulation. Trading in private securities rose from £300,000 in the early 1690s to £3,400,000 per year by the early 1710s. In general, North and Weingast (1989, 828) conclude that the available evidence shows the development of the private capital market together with the increasing credibility of the government as a debtor.[1]

Combining economics, political science and history, Summerhill (2007a, b) extracts important conclusions from the singular sample of institutional change, public finance and private financial repression in the empire of Brazil in 1822–89. Brazil did not miss an interest payment, engaging in government borrowing without debt repudiation or default during seven decades. Even more surprisingly, most of the borrowing of Brazil was in long-term bonds and the interest rate declined over time. In 1870, the external debt of Brazil reached £41,275,961 while the debt in the internal market was £25,708,711 or 62.3 percent of the total (Summerhill 2007b, 73).

There is significant difference between the experience of Brazil and that of Latin America, according to Summerhill (2007b). The initial loans to the Spanish American countries that became independent in 1820 resulted in total defaults and these countries experienced significant difficulty in borrowing abroad during the following six decades. Several of the countries that borrowed again also experienced new defaults through the nineteenth century. Venezuela had four separate defaults. Mexico had a default in 1827 and rescheduled its debts on eight different occasions, paying interest sporadically. In 1855, 44 percent of Latin America's total foreign sovereign debt was in default and about 86 percent of all government loans in London that were in default were to Spanish American countries. Summerhill (2007a, b) provides important findings relating to three theories: the commitment theory of respect of claims of private sovereign creditors enunciated by North and Weingast (1989), the original sin (OS) proposition of Eichengreen *et al*. (2005) and the debt intolerance (DI) analysis of Reinhart *et al*. (2003).[2]

The prediction of the commitment theory of North and Weingast (1989) is that positive external economies of secure private rights in sovereign credit would lead to development of private financial institutions (Summerhill 2007b, 22). Brazil created institutions and mechanisms that ensured secure rights to lenders of the government similar to those of the Glorious Revolution of England analyzed by North and Weingast (1989). However, Summerhill (2007a, b) provides evidence that there was significant financial repression in Brazil in the period of the empire in 1822–89.[3] Government policies repressed the establishment of joint-stock companies and the supply of bank credit. The financial repression of Brazil was implemented by the same institutions that made sovereign borrowing credible and successful. Summerhill (2007b, 23) argues that his research confirms a qualification of the North and Weingast (1989) view:

> Not only is a revolution in public finance not necessary, it is also, unfortunately, not a sufficient condition for the development of robust domestic capital markets. Brazilian public finance was far more similar to the successful cases among the North Atlantic nations than it was to Brazil's less fortunate Spanish American neighbors. But this did not result in flourishing private capital markets

The causality from public borrowing protecting private rights flowing to strong private financial development breaks in the case of Brazil. There is no automatic development of the private financial sector because of positive externalities arising from credible sovereign borrowing. There is not universality in the implications of the experience of England and of advanced economies of the North Atlantic.

Summary

Globalization acquires tight substance for analysis when defined as the cross-border movements of goods, services, capital, technology, ideas and humans. The unifying element of IEI is the analysis in terms of the theories of state intervention. IEI is an effort in IEFP and institutions. There are conflicting views on the benefits and disadvantages of globalization. The theories of the state permit the analysis of individual views. However, economics does not provide a definitive theoretical and empirical method to discriminate among the various views. Even the irreversibility of globalization can be shown to be inconsistent with historical evidence.

The projection of globalization for a quarter of century into the future shows that conflicts will continue to challenge the process. There must be caution in blaming IEI for not providing an idealized world. No social or economic system is successful in this endeavor. The preliminary data show significant concentration of income in a few advanced countries. Chapter 2 of Volume II provides more technical analysis of poverty and inequality in the world economy. Globalization

is evaluated in terms of its contribution to economic growth and improvement of living standards. The theory of economic growth, or models of economic growth, provides important insights but is still far from being a precise quantitative analysis of the determinants of the progress of countries. The NIE provides new approaches that are changing the interpretation of history and theory.

2
The Official Institutions

Introduction

The international system that evolved after the two world wars has been characterized by the coordination of IEFP by means of rules and international institutions. The analysis of IEFP is conditioned by these rules and institutions. The advanced countries have significant influence on the IFIs through consultations in two forums, the G7 and the G10. A significant part of the rule making originates in the meetings of finance ministers and heads of central banks of the G7 and in the financial institutions of the G10.

The core IFIs are the IMF and the WB. The IMF is entrusted with international monetary and financial stability while the WB is engaged in structural lending, poverty reduction and technical assistance. There is major research output by both institutions that provide significant information on the world social and economic affairs, constituting a GPG (Joyce and Sandler 2007). The IMF and the WB also function as a cushion for conflicts within the G7 and also between the G7 and other groups of countries. The IMFC of the IMF is a broader group of periodic consultation of 20 countries.

The BIS is the key standard-setting institution in the world economy with such contributions as the Basel II capital adequacy requirements that are adopted by banks that account for most international transactions. The BIS is also the key world forum on issues relating to central banking, payments and settlement systems, international financial issues and global stability. The BIS also provides banking services for the gold and FX reserves of central banks. The three multilateral development banks make significant regional contributions in structured financing and information. The WTO is the vehicle for the creation of agreements on multilateral trade. These agreements provide secure property rights on international market access, according to Bagwell and Staiger (2001), which are essential in IEI.

There are central banks in almost every country. The section on central banks analyzes the institutions in the United States, the EMU, Japan and the United Kingdom. The capacity of the major central banks to manage financial crises is under severe test due to the global credit contraction. The UN is the largest IO.

The UN work on FDI is considered in Chapter 3 and the contribution on climate change is considered in Chapter 2, Volume II.

The G7 and the G10

The G7 started initially as the Group of Six, meeting for the first time in 1975 in Rambouillet, France, including the United Kingdom, the United States, France, Germany, Italy and Japan. Canada joined in 1976 converting it into the G7. The Group of Eight (G8) is the G7 including Russia, which attends meetings since 1991 but became a full member only in 1998. The president of the EC represents the EU but does not participate in political discussions. Originally, the meeting was a forum for trade and economic issues but gradually included political and security matters. Leaders appoint personal representatives, "sherpas," who meet regularly to discuss agendas and evaluate progress (Ortiz de Arri 2004).[1] Ministers continue to meet during the year to complete work discussed in the summit. Members rotate yearly in the presidency of the G8. It is becoming common for the G8 to invite leaders of other countries to participate in the meetings but there are no proposals to widen the membership. This participation is designed to broaden consultations among world leaders.

The G10 includes a group of industrial countries – Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. The central banks of this group cooperate to regulate international finance. The Group of Thirty (G30) is a private, non-profit institution whose members are distinguished in private and public sectors and academia. The G30 is a consultative group on international economic and monetary affairs.[2] It meets twice a year to discuss important economic and financial events and issues.

The international financial institutions

The IFIs include the IMF, WB, BIS and MDBs – IADB, EIB and ADB. A group of nations created the IMF and WB in 1944 at Bretton Woods to promote stable economic growth. The IMF would provide short-term assistance. The WB would extend assistance to countries requiring long-term reconstruction. International rules would promote growth of world trade with falling tariffs. An important motivation for the creation of the new international economic institutions was avoiding the repetition of the failures of the Paris conference after World War I and the Great Depression of the 1930s (Boughton 2004).

The IMF

Various events changed the role of the IMF in the 1990s, according to Krueger (2004). The transition of the Soviet Union and Eastern European countries generated the need for assistance of a different nature by the IMF. That group of countries required temporary financing to implement structural reforms that

could permit improved fiscal and economic management. The IMF and other institutions contributed advice and assistance in transforming countries in transition.

Capital account crises in the 1990s posed a major challenge to the international financial system. These crises occurred in emerging markets – Mexico 1994–5, Asia 1997–8, Russia 1998, Turkey 2000 and Argentina 2001–3. According to Krueger (2004), the crises were different in nature and scale. Krueger classifies them as capital account instead of current account (CA) crises. These crises occurred after liberalization of financial flows. Crises occur rapidly and require immediate policy measures and assistance. Foreign investors lose confidence in the ability of the emerging country to service its debt. Even if economic policy is sound, there is reversal of capital flows. Catalytic financing by the IMF intends to improve investor expectations on the capacity of the country to service its debt. However, the support of a program by the IMF is no longer a guarantee for recovery of investor confidence as shown by the recent crisis in Argentina.

As of the end of March 2007, the IMF has 185 members that contributed $327 billion in quotas. The total usable resources are $246 billion and the 1-year forward commitment capacity is $190 billion. The IMF has outstanding loans of $28 billion to 74 countries. The staff of the IMF totals 2716 in 165 countries. In 2006, the IMF concluded 128 surveillance consultations of member countries, of which 122 published voluntarily the reports. The IMF provided 429.2 person years of technical assistance in 2006.[3]

IMF resources originate in quota contributions by members. The economic position of a member relative to other members largely determines its quota.[4] The IMF denominates quotas in terms of its unit of account, Special Drawing Rights (SDR). The United States is the largest contributor with a quota of SDR 37.1 billion, approximately $56.1 billion. A country pays 25 percent of its quota in SDR or widely accepted currencies (US dollar, euro, yen or pound sterling) and the rest in the member's own currency. Quotas determine how much an individual country can borrow from the IMF. The IMF conducts review of quotas every 5 years. Approval of quota increases requires a majority of 85 percent of votes. In January 1999, the IMF approved an increase in quotas by 45 percent because of growth of the world economy, risks of financial crisis and liberalization of trade and capital flows. The 30th review of quotas in 2003 did not recommend change in the quotas. The next review is due on January 30, 2008. The IMF earns a spread between interest payments and receipts. In 2003, the IMF paid $1.8 billion to quota subscribers and other operating expenses and received $3.7 billion from borrowing countries. The administrative expenses of the IMF totaled $0.9 billion. The IMF added the surplus of around $1 billion to the General Reserves Account.

Article I of the IMF defines its major responsibilities. The role of the IMF is to promote international monetary cooperation. The Fund would facilitate growth of international trade with exchange stability. It would assist in creating a multilateral system of payments. The IMF would make resources available, under safeguards (conditionality), to member countries that experience balance of payments difficulties. Currently, the prevention of crises and resolution of those that occur are the most important functions of the IMF. The tools of the IMF are

surveillance to prevent crises, technical assistance to strengthen countries and catalytic financing to facilitate crisis resolution.

The highest decision body of the IMF is the Board of Governors. There is one governor and one alternate governor for each country. The member country appoints the governor, usually the finance minister or the governor of the central bank. The Board of Governors meets once a year. It can delegate to the Executive Board all except certain reserved powers.[5]

The Executive Board conducts the daily business of the IMF. Member countries or groups of countries appoint its 24 Directors. The Managing Director of the IMF is the Chairman of the Executive Board, which meets several times each week. The IMF management and staff prepare papers used for decisions by the Executive Board. The G7 countries have a combined 44.05 percent of voting power, of which 16.79 percent belongs to the United States alone:[6]

	Percentage of vote
G7	44.05
US	16.79
Japan	6.02
Germany	5.88
United Kingdom	4.86
France	4.86
Italy	3.20
Canada	2.89
G8	46.75
G7	44.05
Russian Federation	2.70

Article IV, Section 3(a) provides that "The Fund shall oversee the international monetary system in order to ensure its effective operation, and shall oversee the compliance of each member with its obligations under Section 1 of this Article." Section 1 has four obligations: implementing economic policies that foster economic growth with price stability, promoting economic and financial conditions that do not cause disruptions, avoiding manipulation of exchange rates to prevent external payments adjustment and maintaining exchange rates that are compatible with objectives. Section 3(b) authorizes the Fund to engage in surveillance of exchange-rate policies of members. Moreover, each member must provide information to the IMF which is necessary for surveillance.[7]

Surveillance still focuses on exchange rate, monetary and fiscal policies. However, the IMF added other concerns over time. It added structural policies after the debt crisis of the 1980s that required structural changes. Assistance to countries in transition motivated broadening structural policies. In the 1990s, capital account crises caused significant disruption of internal financial sectors, magnifying the impact of crises. The IMF and WB created the Financial Sector Assessment Program (FSAP) to evaluate financial sectors of countries. The Asian crisis revealed numerous institutional weaknesses in countries that could have contributed to

worsening crises. In addition, financial institutions were not transparent, contributing to asymmetry of information. The IMF and WB created reports on observance of standards and codes (ROSC), an integral part of Article IV surveillance. The IMF continues to assess risks and vulnerabilities, expanding beyond the CA and foreign debt to vulnerabilities in capital flows.

The Managing Director of the IMF, De Rato (2007Jun), announced what he calls the "first major revision in the surveillance framework in some 30 years." The Executive Board of the IMF approved a comprehensive policy statement on surveillance. The core mandate of the IMF in surveillance is the maintenance of a country's external stability. The new principle states that: "a member should avoid exchange rate policies that result in external instability." De Rato (2007Jun) argues that the principles were drafted in 1977 under entirely different conditions, focusing on manipulation of exchange rates for balance of payments concerns and short-term volatility of the exchange rate. In the recent environment, the problems with exchange rates have been caused by the maintenance of exchange rates at undervalued or overvalued pegs because of domestic reasons. There has been more recent manipulation of exchange rates because of capital account vulnerabilities. De Rato (2007Jun) informs that the change in the surveillance framework has broad support from industrial, emerging and developing countries. Chapter 5 in Volume II considers the friction over the alleged undervaluation of the Chinese currency to maintain export competitiveness, which the United States finds to be a prime reason for global external imbalances.

The World Bank

The WB has the same origin as the IMF in the Bretton Woods conference in July 1944. Its first loan was $250 million in 1947 to help France in war reconstruction. Currently, the focus of the WB is on poverty reduction. There are also 185 member countries in the WB Group. It has a multidisciplinary staff of 10,000 in 109 country offices, including headquarters in Washington, DC.[8]

The WB provides grants, interest-free loans and technical assistance to countries. Loans have terms of 35–40 years with 10-year grace periods. The International Development Association (IDA), part of the WB Group, provided $161 billion in credits and grants since beginning operations in 1960, at the rate of $7–9 billion per year. About 50 percent of IDA assistance is to the poorest countries in Africa. Approximately 40 high-income countries contribute to the IDA every 3 years. The contributions by these donors account for more than one half of the $33 billion in resources for the 14th replenishment that finances projects over the 3-year period ending on June 30, 2008. This replenishment amounted to an increase of 23 percent, the largest in more than two decades.

The initial member of the WB Group, the International Bank for Reconstruction and Development (IBRD), provides loans to higher-income developing counties. It is structured as a cooperative for the benefit of its 185 members. The objective of the IBRD is "to reduce poverty in middle-income and creditworthy poorer countries by promoting sustainable development through loans, guarantees, risk management products and analytical and advisory services." The IBRD is an elite

institution that pioneered in the risk transfer of interest rates and exchange rates in derivatives with the first exchange rate swap in 1981. The IBRD introduced the first global bond in 1989 and the first entirely electronic bond offering via the Internet in 2000. The WB also had the first electronic swap offering in 2003. The major currency of WB securities is the dollar but it has issued securities in more than 40 different currencies. The IBRD has enjoyed a triple-A rating from credit agencies since 1959. Its borrowing rate is close to that of US treasuries. The high credit rating originates in the capital requirements that are backed by its 184 shareholder governments. An additional source of credit quality is the strong balance sheet of the IBRD, its traditionally excellent financial management and its status of preferred creditor when a country encounters difficulties in meeting obligations. This mechanism of high credit rating coupled with sound management has enabled the taxpayers that contribute to the IBRD to generate over $400 billion of loans with contributed capital of $11 billion since 1946. Terms of these loans are 15–20 years with 3–5 years grace periods.

Another arm of the group, the International Finance Corporation (IFC), promotes private investment with support to high-risk projects and countries. The FSAP is a joint program of the IMF and the WB, consisting of the most important surveillance documents of the IFIs. The teams in missions to countries combine highly trained specialists from many institutions in a large variety of fields, an important GPG.

The Bank for International Settlements

The objective of creating the BIS in 1930 was managing the Young Plan on war reparations that the Treaty of Versailles imposed on Germany at the end of World War I. However, the BIS focused rapidly on cooperation among central banks and, eventually, with other agencies in promoting monetary and financial stability. The BIS is also the forum for central bank governors and experts on central banks and other agencies. The Bank conducts its own research in financial and monetary economics and contributes to collection, compilation and dissemination of economic and financial statistics.[9]

The BIS has been a banker for central banks, providing banking functions for gold and foreign exchange transactions. It has played an important role in European payments and exchange-rate arrangements. The BIS provided financial assistance in cases of currency crises and in IMF programs in Mexico in 1982 and Brazil in 1998.

There are 55 member central banks of BIS, which vote in General Meetings. Voting power is proportionate to the number of BIS shares held by a member central bank. The Board of Directors has 19 members. There are six ex-officio directors, consisting of the governors of the central banks of Belgium, France, Germany, Italy and the United Kingdom and the Chairman of the FRBO. These ex-officio members appoint another member of the same nationality. The Board elects a Chairman from its members for a 3-year term and also a Vice Chairman. Since 1948, the chairman also holds the position of President. The Board meets six times a year to review reports from BIS management. The BIS employs staff of 557 from

48 countries. The Board delegates daily management of the BIS to the senior executive officer, or General Manager. The BIS has three main departments: General Secretariat, Monetary and Economic Department and Banking Department. There is also a General Counsel.

The multilateral development banks

The IADB is the oldest regional development bank.[10] It started with a proposal by Brazilian President Juscelino Kubitschek in 1958. The Organization of American States drafted the Articles of Agreement creating the IADB. The Bank approved $129 billion in loans and guarantees to finance projects with investments totaling $291 billion. It also provided $1.95 billion in grants and technical cooperation financing. The Bank has a Board of Governors that delegates daily operations to the Board of Executive Directors with 14 members. Voting power in the two boards is proportionate to subscription of capital to the institution. The 26 Latin America and Caribbean (LAC) countries have 50.02 percent of voting power, the United States 30 percent, Canada 4 percent, the 15 European countries, Israel and the Republic of Korea 10.98 percent and Japan 5 percent.

The IADB derives its financial resources from its members, borrowing in financial markets, trust funds under administration and by engaging in co-financing ventures. The IADB has $101 billion of ordinary capital, 4.3 percent of which is paid in directly by member countries. The remaining 95.7 percent is callable capital guaranteed by member country governments. This capital structure, together with preferred creditor status provided to the IADB by borrowing member countries, allows the Bank to issue bonds in global financial markets. The IADB has triple-A rating and issues $4.7–4.9 billion of bonds yearly. It has never had losses in its loans and never had to use callable capital to pay off debt. The IADB participates in co-financing of large projects with the WB, IFC and the Andean Development Corporation.

The ADB dates to 1966 and has 67 members, of which 48 are from the Asian region and 19 from other parts of the world. Loan approvals by the ADB have increased from $5.3 billion in 2004 to $7.9 billion in 2006. About two-thirds of loans in 2006 were to China, Pakistan and India. The ADB also engaged in $2.5 billion of co-financing. Sovereign loans totaled $6.82 billion in 71 loans for 59 projects and programs. Net income was $436 million in 2003, declining from $978 million in 2002. The Bank has $53.2 billion of authorized and subscribed capital as of December 2006. It gross income in 2006 was $1.9 billion. As the other MDBs, the ADB has a triple-A credit rating.[11]

The objective of the ADB is shifting to poverty reduction. The Bank has a Board of Governors with 48 members from the Asia-Pacific region and 19 from outside the region. The Board of Directors consists of 12 directors elected by the Board of Governors, eight from the Asia-Pacific region and four others from outside the region. Directors work full time at the headquarters in Manila.

The Treaty of Rome created the EIB.[12] The objective of the EIB group is to promote smaller business by medium and long-term financing jointly with the banking sector. It is also a source of venture capital in the region. Members of

the EIB are members of the EU, all of whom subscribed capital. The EIB works closely with banks in the region providing long-term finance for specific capital projects. In January 2007, the subscribed capital of the EIB was €164.8 billion. Germany, France, Italy and the United Kingdom have equal shares in that capital equivalent to 16.17 percent. In 2006, the EIB approved projects for total value of €53.4 billion. Standard & Poor's and Moody have rated EIB as AAA since the first rating in 1975, the same as Fitch since the first rating in 2003. The 25 members of the EU own the EIB; three-quarters of these members have triple-A rating.

The World Trade Organization

The effort of creating a world system of multilateral trade was processed through the General Agreements on Tariffs and Trade (GATT). In its 47-year history, GATT was merely a provisional agreement and vehicle for negotiation (WTO 2007 Feb, 15). Parallel to the creation of the IMF and the WB, about 50 countries engaged in discussions to create the ITO as a trade agency of the UN. According to the WTO (2007Feb, 15), the charter of the ITO was broad, encompassing issues beyond trade such as rules on employment, commodities, business, investment and services. The plan consisted of establishing the ITO at a UN conference on trade and employment in Havana, Cuba in 1947. There were simultaneous consultations by 15 countries beginning in December 1945 on reducing and binding tariffs. The objective of this effort was to reverse the protectionism arising from the Great Depression. The group of nations grew to 23 and signed an agreement on October 30, 1947. This was the origin of GATT. The countries participating in the Havana conference finally reached an agreement in March 1948 on the charter of the ITO. The US government abandoned the effort to approve the charter in the US Congress in 1950. GATT became the vehicle for multilateral trade negotiation until the creation of the WTO in 1995.

The WTO (2007Feb, 101–11) has a unique governance and organization. The member countries run the WTO. The decisions are by consensus of its members, either by the ministers that meet at least once every 2 years or by their ambassadors or delegates, meeting in Geneva. There is no delegation of authority to an executive board as in most of the IFIs. The benefit of reaching decisions by consensus is that they are acceptable to all the members. However, it is far more difficult to reach decisions by consensus of around 150 members. Proposals have been made by members to create a smaller executive body, such as a board of directors, but have not moved forward.

The highest authority of the WTO is the ministerial conference that can decide on all issues within any of the agreements. The ordinary work of the WTO is handled by three bodies: the General Council, the Dispute Settlement Body (DBS) and the Trade Policy Review Body. Because of the consensus governance of the WTO, all three bodies are essentially the same or the General Council and the membership includes all the members of the WTO. The three bodies report to the ministerial conference. There are various councils and committees but their

membership is the entire group of members of the WTO. The secretariat of the WTO is located in Geneva with staff of around 630 and is headed by a Director General.

Trade rounds have been the vehicle for reducing tariffs and trade impediments (WTO 2007Feb, 16–17). There were eight trade rounds in 1947–94. The number of participating countries was 23 in 1947, declining to 13 in 1949 and increasing gradually until jumping to 62 in the Kennedy Round of 1964–7 and to 123 in the important and inclusive Uruguay Round of 1986–94. The Kennedy Round marked the broadening of the agenda to include tariff and anti-dumping measures.

Multilateral trade agreements are lengthy and quite complex.[13] There are a few important general principles (WTO 2007Feb 10–12):

- *Most-favored-nation (MFN)*. The agreements under the WTO do not permit countries to discriminate among their trading partners. A special concession granted by one country to another must be granted to all other WTO members. MFN clauses have been historically a major instrument for multilateral trade in contrast with bilateral agreements. It is essential to locate world production according to the lowest cost of production. The MFN clause is in the first article of GATT and a priority in the General Agreement on Trade in Services (GATS) and in the Trade-Related Aspects of Intellectual Property Rights (TRIPS). However, exceptions are allowed in preferential trade agreements (PTA) where the members discriminate against non-members. Another exception is to allow preferential access to the domestic market by a developing country. A country can also discriminate products that are traded unfairly. There are some exceptions to discrimination in services. However, there are severe conditions for these exceptions.
- *Equal national treatment*. This is the requirement to extend the same treatment to foreign goods entering the country as to goods produced internally. This principle is extended to foreign and domestic services, trademarks, copyrights and patents as well as goods once they have entered the national market. There is the same principle in GATT, GATS and TRIPS but with different application.
- *Freer trade*. The WTO (2007Feb, 11) encourages the gradual movement toward freer trade. The barriers to trade include tariffs, import bans and quotas. Exchange-rate policies and bureaucratic hurdles have been discussed in various occasions. The gradual approach allows countries to make the necessary adjustment to freer trade. Developing countries are given more time to make the adjustments.
- *Predictability*. The WTO (2007Feb, 11–12) encourages a predictable and thus more stable business environment by means of binding and transparency. The opening of trade under the WTO rules consists of binding commitments to ceilings on tariff rates. The percentage of tariffs bound by the Uruguay Round increased for developed countries from 78 percent to 99 percent, for developing countries from 73 percent to 98 percent and for transition economies from 73 percent to 98 percent. In agricultural trade 100 percent of tariffs are bound. The multilateral trade system of the WTO discourages quotas. The surveillance

of the WTO through its review mechanism encourages transparency at the national and multilateral levels.
- *Fair competition*. The WTO (2007Feb, 12) seeks rules that promote competition that is fair, open and without distortions. The MFN principle and agreements on dumping are examples of this fairness approach.
- *Development and reform*. The WTO (2007Feb, 12–13) argues that its system provides contributions to development. It acknowledges the need for flexibility and adjustment time for developing countries. Three-quarters of the members of the WTO are developing countries and 60 percent of developing countries implemented autonomous trade liberalization during the Uruguay Round. The Doha Development Round (DDR) intends to provide better conditions for developing countries.[14]

The central banks

Economic policy has raised the role of monetary policy during the past three decades. There has been increasing emphasis on the role of nominal demand in affecting prices and economic activity in the short term. Monetary policy influences the central bank policy rate that in the short term affects nominal demand and general economic activity. Stabilization policy through monetary instead of fiscal policy is currently more common in practice and even in the economic literature with notable dissent (Arestis 2007). The four main central banks of the world are analyzed in turn below.

The Federal Reserve System and US regulators and supervisors

The complex system of regulation and supervision of financial institutions in the United States is shown in Table 2.1. There are three types of banks in the United States according to the government agency that provided the charter and whether they are members of the FRS (FRBO 2005, 12). The banks that receive their charter from the federal government through the Office of the Comptroller of the Currency (OCC) in the US Treasury are national banks and by law must be members of the FRS. There are banks chartered by the states that are members of the FRS and other that are not members of the FRS. There is no mandatory membership requirement for state-chartered banks to become members of the FRS but they can elect for membership if they meet the requirements by the FRBO. There were approximately 7700 commercial banks in March 2004, according to the FRBO (2005, 12), of which about 2900 were members of the FRS, about 2000 being national banks and 900 state banks. Member banks must subscribe 6 percent of their capital and surplus as stock of the corresponding regional FRB, 3 percent as paid-in capital and the rest subject to call by the FRBO. There is no control power in this capital subscription, which is simply a legal obligation of FRS membership.

The Federal Deposit Insurance Corporation (FDIC) supervises 5250 banks and is the primary federal supervisor and regulator for state-chartered banks that are not members of the FRS. The FDIC administers the $49 billion insurance fund of

Table 2.1 US agencies of regulation and supervision of depository financial institutions

Agency	Responsibilities
Federal Reserve System	I Supervision • Supervision of state-chartered banks that are members of the FRS About 900 state member banks • Foreign operations of member banks • US operations of foreign banks • Edge Act and agreement corporations engaging in foreign banking About 5000 bank-holding companies II Regulation • Regulations applying to the entire banking industry • Regulations applying only to member banks • Regulations to implement federal laws of consumer protection Truth in Lending Equal Credit Opportunity Home Mortgage Disclosure Acts
Office of the Comptroller of the Currency	• Charter authorization, regulation and supervision of all national banks • Supervision of the federal branches and agencies of foreign banks
Federal Deposit Insurance Corporation	• Examination and supervision of 5250 banks and savings banks • Primary federal regulator of state-charted banks that are not members of the FRS • Back-up supervisor for remaining insured banks and thrift institutions
Office of Thrift Supervision	• Examination, supervision and regulation of 853 savings associations insured by the FDIC • Registration, examination and regulation of 481 registered savings and loan holding companies (SLHC)
Office of Federal Housing Enterprise Oversight	• Broad-based examinations of Fannie Mae and Freddie Mac • Stress-testing Fannie Mae and Freddie Mac to develop a risk-based capital standard
National Credit Union Administration	• Charter authorization and supervision of federal credit unions • Operation of National Credit Union Share Insurance Fund

Table 2.1 (Continued)

Agency	Responsibilities
New York State Banking Department	• New York State Banking Board: promulgation of general and specific regulation on banking in NYS, approve or disapprove issue of charters, licenses and establishment of bank branches • Examination of financial entities with total assets of $1.3 trillion

Source: FRBO (2005), OCC (2007), OTS (2007), OFHEO (2007), NCUA (2007), NYSBD (2007).

financial deposits. The Office of Thrift Supervision (OTS) is entrusted with providing charters, supervision and regulation to the savings and loans institutions. The Office of Federal Housing Enterprise Oversight (OFHEO) examines and determinates the capital adequacy of two large public companies, Fannie Mae and Freddie Mac, which are engaged in the mortgage business. The National Credit Union Administration (NCUA) provides the charters of federal credit unions and administers the insurance of deposits in those institutions. The structure of the various supervisors and regulators is discussed below in turn.

The OCC (2007) is part of the US Treasury and was established in 1863. The director of the OCC is appointed by the President for a 5-year term with the advice and consent of the US Senate. The OCC charters, regulates and supervises all US national banks and supervises the federal branches and agencies of foreign banks. There are four district offices in the United States and an office in London to supervise the international activities of national banks. The examiners of the OCC supervise domestic and international activities of national banks. These examiners also review the internal and external audits and legal compliance of banks. An important current function is the capacity of the management of banks to measure and control risk. The OCC is authorized to take supervisory measures against non-complying banks and to issue rules and regulations on bank investments, lending and transactions. It authorizes the application for new charters, branches, capital and modifications of the corporate structure of banks. The objectives of the OCC are to maintain the safety and soundness of the national banking system, to promote competition in banking services, to improve the efficiency of its supervision and to maintain fair and equal access of the public to banking services. There are no appropriations of Congress to the OCC, which depends on the fees of its examinations and applications and the returns on the investment of its holding of US treasury securities.

The FDIC is an independent agency of the US federal government (FDIC 2007). It was established in 1933 to alleviate the failure of thousands of banks. It claims that no depositor lost any funds in an insured bank since the beginning of FDIC insurance in 1934. The insurance fund of the FDIC has total resources of $49 billion that back the insurance of $3 trillion of deposits in nearly all US banks and thrifts. There are no appropriations by Congress to the FDIC. The premiums

of insurance paid by banks and thrifts plus the returns of investments in US treasury securities provide for the expenses of the FDIC. In each bank insured by the FDIC, savings, deposits and other deposit accounts, when combined, are insured to the maximum of $100,000 per depositor. It also insures individual retirement accounts (IRA) and Keoghs up to $250,000. The FDIC has staff of 4500, with headquarters in Washington, DC, and six regional offices and multiple field offices throughout the United States. A five-person Board of Directors manages the FDIC. The President appoints and the Senate confirms the directors with a maximum of three originating in the same political party.

The OTS is a bureau of the US Treasury established on August 9, 1989 (OTS 2007). The main statute regulating the OTS is the Home Owners' Loan Act that was originally approved by Congress in 1933. The OTS charters, examines, supervises and regulates Federal savings associations insured by the FDIC. The OTS also examines, supervises and regulates state-chartered savings associations that are insured by the FDIC. It also registers, examines and regulates SLHCs and other affiliates. In September 2006, the OTS regulated 853 savings associations that had $1.63 trillion in assets. The OTC supervised 481 holdings company enterprises with about $7.7 trillion in assets. The holding companies regulated by the OTS own about one-half of all savings associations and 78 percent of the total assets of savings associations. The director of the OTS is appointed by the President and confirmed by the Senate for a 5-year term. The main objective of the OTS is to provide for a safe and sound thrift industry. It also provides for a competitive environment in the industry, a flexible regulatory framework and excellence in its activities.

The Federal Housing Enterprise Financial Safety and Soundness Act of 1992 created the OFHEO (2007) as an independent entity within the Department of Housing and Urban Development. The head of the OFHEO is appointed by the President for a 5-year term. The objective of the OFHEO (2007) is ensuring the strength of the housing finance system by means of maintaining the safety and soundness of the Federal National Mortgage Association, known as Fannie Mae, and the Federal Home Loan Mortgage Company, known as Freddie Mac. These entities are Congressionally chartered public companies and the largest housing finance institutions in the United States. Their business consists of buying mortgages from primary lenders, such as commercial banks, thrift institutions, mortgage banks and other lenders. They can hold these mortgages in their own portfolios or sell them as mortgage-backed securities to investors. The secondary market for mortgages is considered important in ensuring the depth and liquidity of the mortgage market, which allows consumers to acquire housing. The combined assets of Fannie Mae and Freddie Mac were $1.7 trillion at the end of 2007 and the mortgage book $5.0 trillion. The terms of the charters of Fannie Mae and Freddie Mac exempt them from state and local taxation and from the registration requirements of the SEC. The US Treasury provides a back-up credit line to both companies. The OFHEO (2007) conducts broad-based examination of the housing companies and engages in stress-testing of interest rate and credit rate scenarios to determine the

adequacy of their capital relative to their risks. It has authority to enforce standards.

The NCUA (2007) was created to charter and supervise federal credit unions and the National Credit Union Share Insurance Fund (NCUSIF) established in 1970. It is an independent federal agency. The NCUSIF insures member deposits in credit unions to the federal limit of $100,000. It is administered by the NCUA and is backed by the "full faith and credit" of the US government. The NCUSIF holds about 1.30 percent of the deposits of federally insured credit unions. The law requires that federally insured credit unions maintain 1 percent of their deposits in the NCUSIF and the board of the NCUA has the authority to impose a premium increase if required. There have been no losses by members of the NCUSIF. The President appoints three board members, confirmed by the Senate, of which only two can originate in the same political party. Account holders in federal and state-chartered credit unions total 80 million.

The New York State Banking Department (NYSBD 2007) is the supervisory and regulatory body of financial institutions in New York State (NYS). The NYS Banking Law of 1932 created the NYS Banking Board that is currently a quasi-legislative body issuing general and specific regulation on banking in NYS. The NYS Banking Board cooperates with the NYSBD in formulating banking standards, having the power to approve or reject banks charters, licenses and the establishment of branch banks. The NYS Banking Board has 17 members and is chaired by the Superintendent of Banks of NYS. There are eight members chosen from the public and eight members that must have experience and represent diverse areas of banking. The eight members with experience are chosen from eight different groups, including foreign bank corporations that have a license to operate a branch or agency in NYS. The NYSBD is the main regulator for state-licensed and state-chartered financial entities. The assets of the regulated institutions are about $1.3 trillion. It is the oldest regulatory agency in the United States. The NYSBD has 600 staff of which 73 percent employed as bank examiners. The fees received by the NYSBD pay for its expenses. There are multiple regulatory and supervisory institutions in the states of the United States.

The US Congress created the FRS with the Federal Reserve Act of 1913. There have been many other legislative measures since 1913 (FRBO 2005, 2). Meltzer (2004, 2008) provides a history of the FRS and Friedman and Schwartz (1963) contribute a classic monetary history of the United States. The FRBO (2005, 1) interprets the responsibilities of the FRB into four different areas:

- *Monetary policy*. The FRBO and the Federal Open Market Committee (FOMC), according to the Federal Reserve Act Section 2A: "shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates"
- *Supervision and regulation*. The FRS is one of the regulators and supervisors of the banking and financial system of the United States. The objective of regulation

and supervision by the FRS is to maintain a sound banking and financial system, protecting consumers in their credit transactions
- *Systemic risk*. The FRS contains systemic risks in the general effort of maintaining the stability and soundness of the US banking and financial system
- *Financial services*. The FRS provides financial services to the US government and domestic and foreign financial institutions

The three objectives of monetary policy – stable prices, maximum employment and moderate long-term interest rates – may be conflicting in practice. After the second oil price increase in 1980, inflation in the United States rose to double-digit levels, prompting the FRBO to increase interest rates close to 20 percent per year. Maximum employment and moderate long-term interest rates were sacrificed to focus policy on preventing inflation from running out of control. In a way, it could be argued that inflation control was ensuring adequate employment and lower interest rates in the medium term. Central banks have traditionally been more concerned with inflation control and this emphasis has gained strength in the past 15 years with the movement toward transparency and inflation targeting.

The FRS is a federal government agency (FRBO 2005, 4). It is ruled by a seven-member FRBO; the members are appointed by the President of the United States and confirmed by the Senate. FRBO members have 14-year non-renewable terms and are appointed in staggered fashion such as to have one term expiring on January 31 of each even-number year. The US President appoints the Chairman and Vice Chairman of the FRBO for 4-year terms. They must be members or appointed simultaneously as members and must be confirmed by the US Senate. The FRS has a staff of somewhat less than 2000.

There is significant interface and cooperation of the FRBO and other branches of the US government (FRBO 2005, 5). The Chairman of the FRBO testifies every year around February 20 before the Senate Committee on Banking, Housing and Urban Affairs and around July 20 before the House Committee on Financial Services. There is a broad range of issues discussed in these appearances, including the conduct of monetary policy, the evolution of the US economy and its prospects for the future. The FRBO provides Congress a report on these issues before testimony by the Chairman. The Chairman also meets periodically with the President, the Secretary of the Treasury and other members of the administration. The Chairman of the FRBO has, together with other heads of central banks, a major role in the international financial system. The Chairman of the FRBO is the alternate US member of the board of governors of the IMF, a member of the board of the BIS and a member of important international meetings, including representation at the Organization for Economic Co-operation and Development (OECD). The G7 meeting of finance ministers and central bank governors has the participation of the Chairman of the FRBO.

There are 12 regional Federal Reserve Banks (FRB) that together with their branches conduct operations of the FRS (FRBO 2005, 6). The FRBs and their branches operate the US system of payments, distribution of currency, supervision

and regulation of member banks and bank-holding companies and banking transactions for the US Treasury. Each of the FRBs is responsible for FRS business in a specific region of the United States and receives the deposits of banks in the region. The services of the FRBs and their branches to depository institutions are under broad oversight responsibility by the FRBO. Congress also has oversight authority over the FRBs.

The FOMC of the FRS has the responsibility for US monetary policy (FRBO 2005, 11). The FOMC is legally responsible for oversight of open market operations by which the FRS affects the level of reserves of depository institutions that influence US monetary and credit conditions. It also directs FX operations of the FRS. The FMOC consists of the seven members of the FRBO and five of the 12 presidents of FRBs that serve 1-year terms on a rotating basis with the exception of the president of the FRB of New York (FRBNY) that is a permanent member. The FOMC independently determines its organization as provided by the law. Traditionally, it elects the Chairman of the FRBO as its Chairman and the president of the FRBNY as its Vice Chairman. The FOMC conducts eight formal meetings every year in Washington, DC, but can hold telephone consultations or other meetings throughout the year.

US depository institutions maintain deposits in their accounts at the FRBs (FRBO 2005, 27). The accounts are used to make and receive payments for the institutions themselves or for their clients. The FRBO imposes reserve requirements on all depository institutions, including commercial banks, savings banks, savings and loan associations, credit union and US branches and agencies of foreign banks. The FRBO has maintained a policy since the early 1990s to impose reserve requirements only on transactions deposits and interest-bearing deposits that provide unlimited checking privileges. The depository institutions maintain required reserves in the form of cash in vault and deposits in their accounts at the corresponding FRB. The required reserve balance is the excess of the required reserves over vault in cash. Deficiencies incur a charge. The depository institutions may also hold contractual balances in excess of required reserve balances to cover unexpected transactions. Excess reserves are balances that exceed reserve requirements and contractual balances and are relatively small because they do not pay interest.

The fed funds rate is the interest rate paid on unsecured overnight loans of funds deposited at the accounts of depository institutions in FRBs, constituting the policy rate of the US central bank. Open market operations constitute the main instrument used by the FRBO to attain a market-clearing fed funds rate that is around the desired target of monetary policy (FRBO 2005, 34). The FMOC authorizes the desk at the FRBNY to conduct open market operations to maintain the desired fed funds rate. The desk engages in transactions with primary dealers that are qualified by capital and other standards. The operations with primary dealers are conducted in the form of auctions. On the basis of information and analysis, the desk continuously assesses the level of reserves that would maintain the desired fed funds rate.

Assume that the desk decides that more reserves are needed. When significant injection is required, the desk could engage in outright purchase of authorized

securities, such as US treasuries, federal agencies' securities and mortgage-backed securities with guarantee of federal agencies (FRBO 2005, 40). The typical needs are not that sizeable and the desk would normally engage in financing the position in treasuries of a primary market dealer in a sale and repurchase agreement (SRA). The dealer sells the security to the treasury in exchange for cash with the agreement to repurchase it the following day at a specified price that includes the 1-day interest. There can also be an agreement for a longer term in case the desk anticipated the need for many days ahead. In both cases, the desk of the FRBNY injects money into circulation: to pay for the securities it acquires and to finance the position of the dealer. The larger availability of bank reserves would tend to lower the fed funds rate.

Assume that the desk decides that the level of reserves is excessive, probably causing a decline in the fed funds rate. The desk would then withdraw reserves by means of the sale of securities to the dealers or by financing its securities with the dealers. In the outright sale of securities, the dealers pay with cash for the securities, contracting the amount of reserves. The instrument for financing positions of the FRS is to engage in a reverse sale and repurchase agreement (RSRA). The desk of the FRBNY would sell its securities to a primary dealer with the agreement to repurchase them in 1 day at a specified price plus 1-day interest. Funds would flow from the account of the dealer to that of the FRBNY, contracting the level of reserves. The desk could also arrange a longer-term financing period for the RSRA according to the estimate of reserves in the days ahead. In both cases, funds flow into the FRS: by the payment for the purchase of the securities sold and by the financing of the securities of the FRS. The level of reserves would tend to contract, moving the fed funds rate toward the desired target.

The FRBO has been extremely active in raising and lowering interest rates in the recent past. The range is high, from a peak of 8 percent in the more inflationary period around 1990 to 1 percent during the period of fear of deflation around 2003. The fed funds rate has increased by 425 basis points to 5.25 percent per year, where it has remained unaltered since June 29, 2006.

The European Central Bank

The European Commission (EC) provided in the Delors Report of April 1989 three stages toward economic and monetary union (Scheller 2006, 21). The first stage would consist of the removal of all hurdles to financial integration, while reducing the differences in economies policies among member states of the European Union (EU). Economic convergence would be strengthened in the second stage while creating the basic institutions and structure of the EMU. The exchange rates would be locked in the final stage, assigning the monetary and economic duties to the institutions. The Maasstricht Treaty creating the EU was signed on February 7, 1992, and entered into force on November 1, 1993. On January 1, 1999, the conversion rates of the members of the EMU were fixed, the ECB assumed the responsibility for monetary policy in the euro area and the euro replaced the national currencies (Scheller 2006, 25). The 11 original members of the EMU are Belgium, Germany,

Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal and Finland. Greece joined in 2001, raising the number of members to 12.

The European System of Central Banks (ESCB) and the ECB were established by a statute of the EU on June 1, 1998 (ECB 2004, 9). The distinction between the ESCB and the ECB will continue until there are member states of the EU that have not adopted the euro. The maintenance of price stability is the primary objective of the ESCB. Without sacrificing the objective of price stability, the ESCB would contribute to the general economic objectives of the EU. These objectives are maintaining high levels of employment, non-inflationary sustainable growth and the convergence of economic performance. There is explicit emphasis on the priority to price stability based on the proposition that it is required for a sound economy and high employment levels. The ESCB is entrusted with four tasks for the euro area: the design and implementation of monetary policy, FX operations, management and holding of FX reserves of the member states and promoting sound operation of the systems of payments. The ECB has exclusive authorization for the issue of banknotes within the euro area. The ECB will cooperate with the authorities that are responsible for prudential supervision of credit institutions and the stability of the financial system in the individual states. Thus, the euro area has a single authority for monetary policy but continues to have prudential supervision as a responsibility of domestic regulators and supervisors.

There are two key decision-making bodies in the ECB, the Governing Council and the Executive Board, with a third, the General Council, existing until some EU member does not adopt the euro (Scheller 2006, 51). The Governing Council is composed of the six members of the Executive Board and the governors of national central banks (NCB) that have adopted the euro. The Governing Council formulates the monetary policy of the euro area, taking the key decisions such as the determination of the key ECB interest rates, the design of the strategy of monetary policy, the guidelines for execution of operations of monetary policy and the decisions on the administration of the ECB. It has the system of equality of votes of the 18 members or the principle of one member, one vote (Scheller 2006, 53). The decisions are on the basis of majority vote except in two specific cases where a two-thirds majority is required (interference by an NCB and operational methods different than in the statutes) and unanimity for changes in the statute of the ESCB. The governing council meets twice a month, analyzing monetary and economic conditions and taking required decisions at its first monthly meeting. The operations of the ECB are conducted by the Executive Board (Scheller 2006, 59). The six members, including the President and Vice President, are appointed by the heads of state or government of the euro area countries on recommendation by the EU Council (EUC). The Executive board manages the current business of the ECB, organizes the meetings of the Governing Council, implements the monetary policy of the euro area and has some powers under delegation by the Governing Council. There is a prominent statutory role for the President of the ECB. The General Council provides an institutional link with the NCBs of the members of the EU that are not in the euro area (Scheller 2006, 61).

The ECB Governing Council chose a quantitative definition of price stability in October 1998 to make monetary policy transparent, providing a yardstick for the public to evaluate the ECB and to guide price expectations (Scheller 2006, 80). Price stability, according to the ECB, is a year-on-year increase of less than 2 percent of the harmonized index of consumer prices (HICP) for the euro area. This definition was refined by the Governing Council in May 2003. The ECB intends to maintain euro area inflation below but close to 2 percent in the medium term. The HICP is a consumer price index for the euro area. The redefinition occurred in 2003 when there were fears of deflation in the United States, Germany and China in addition to the deflation in Japan (Peláez and Peláez 2005, 18–27). It also takes into account the known measurement errors in consumer inflation indexes that were mentioned during the fear of deflation. If there is an error of 1 percentage point in measuring inflation, a year-to-year increase of 1 percent measured by the price index could be a situation bordering on deflation. The medium term horizon is consistent with the technical literature on the lags in effect of monetary policy on inflation.

Open market operations constitute the main instrument of implementation of policy by the ECB (Scheller 2006, 87–9). There are four types of open market operations used by the ECB. The main refinancing operations are the most important instrument of influencing liquidity and interest rates and to signal the policy direction in the euro system. Most of these refinancing operations have a 1-week maturity, taking the form of standard tenders with a pre-announced schedule and execution within a 24-hour period. The counterparties of the ECB must meet certain eligibility criteria and, in general, all credit institutions in the euro area could potentially qualify to be eligible counterparties. The ECB also engages in monthly refinancing operations with 3-month maturity to provide longer-term funds to the euro system. There are additional fine-tuning operations to manage liquidity and influence interest rates in accordance with policy needs. The final form consists of structural operations to influence market liquidity over the long term but there has not been need yet for this instrument. There are two standing facilities. Banks can borrow from the ECB through the marginal lending facility using collateral at a rate that is set higher than the market rate. The deposit facility allows banks to deposit their excess reserves at a rate that is lower than the market rate. The lending and deposit facility trace a corridor within which the overnight money market rate fluctuates. There is a system of minimum reserves that credit institutions must hold in the corresponding NCB.

The Bank of Japan

The Institute of Monetary and Economic Studies (IMES) of the BOJ prepared a document, IMES (2004), on the functions of the BOJ. Japan established the BOJ in 1882 as a central bank. The Bank of Japan Law was promulgated in 1998 with significant revision of existing statutes. The BOJ conducts monetary policy and acts as lender of last resort, being the bank of banks, the bank of the government and the authority issuing banknotes. Japanese financial institutions can deposit funds in BOJ accounts called current accounts. Financial institutions can withdraw

from these accounts when they require liquidity. They can also use deposits in the current accounts to settle transactions with other financial institutions by means of transferring their funds from their accounts to those of other institutions. Thus, the current accounts serve as the payments settlement mechanism of the Japanese financial institutions. The reserves of financial institutions with the BOJ are deposited as current accounts (IMES 2004, 55–78). The current accounts thus act as the clearing and payments system of the financial system of Japan.

Article 2 of the 1998 law stipulates that the BOJ will use monetary policy to maintain price stability to guarantee the sound development of the economy (IMES 2004, 16–18). Articles 3 and 5 provide for autonomy by the BOJ in conducting required monetary policy. The Policy Board of the BOJ, its highest decision body, is independent from the government that cannot dismiss its members or order specific policy actions or operations. The Policy Board is composed of nine members, including the Governor, two Deputy Governors and six appointed members (IMES 2004, 21–2). The cabinet of Japan appoints the nine members that have to be approved by the Diet (parliament). The members elect the chairman of the Policy Board that is currently the governor of the BOJ. The decisions are taken by a majority vote of the nine members of the Policy Board. The board has authority on monetary policy, business operations and internal management. It meets more than twice a week because of its comprehensive agenda. The monetary policy meetings are held twice a month to decide on key issues such as the official discount rate, the guideline and framework for monetary operations and the view of the BOJ on economic and financial conditions. The headquarters of the BOJ are in Tokyo, with 33 branches and 13 local offices across the country.

Article 4 requires that the bank maintain communication with the government, allowing representatives to submit proposals and views (IMES 2004, 17–18). However, government representatives do not have formal votes in decisions on monetary policy. Article 3 also provides that the BOJ should conduct its operations and policy-making process with transparency, clarifying its decisions to the public. The decisions taken by the Policy Board are revealed to the public after every meeting, including the guidelines for money market operations and the BOJ's evaluation of economic and financial conditions. The BOJ also provides the Diet two reports every year and the governor appears before relevant committees to explain policies, operations and balance sheet conditions.

The policy rate of the BOJ is the uncollateralized overnight call rate (IMES 2004, 126). Financial institutions make their final daily adjustment of their current account balances at the BOJ in the call market. The objective of monetary policy is to influence other interest rates and ultimately transactions in the economy. The Policy Board takes decisions on interest rates at its monetary policy meetings based on the evaluation of economic and financial conditions. The decisions and the evaluation are released to the public. Open market operations constitute the major tool of influencing the level of current account balances to attain the overnight call rate decided at the monetary policy meeting. If the BOJ desires to increase the level of current account balances, it buys securities or engages in financing SRAs. If the BOJ desires to reduce the level of current account balances, it sells securities or engages in RSRAs.

The Bank of England

There is a separation of responsibilities of the three monetary authorities in the United Kingdom: HM Treasury, the BOE and the FSA, as shown in Table 2.2. A formal memorandum of understanding of HM Treasury (2007d) with the BOE and the FSA governs the principles and responsibilities. The principles for effective financial system oversight are accountability, transparency, avoidance of duplication and the sharing of information. The Treasury is not responsible for the operations of the BOE and the FSA. However, there is an understanding of cases in which the BOE and the FSA must alert the Treasury about serious problems. In general, the framework assigns the responsibility for monetary policy to the BOE, the authorization, supervision and regulation to the FSA and the general legal and regulatory responsibility to the Treasury.

HM Treasury (2007d) chairs the Standing Committee on Financial Stability that has representatives of the Treasury, the BOE and the FSA. This is the main forum

Table 2.2 Framework of cooperation for financial stability of the United Kingdom

Guiding principles

- *Accountability*. The definition of the responsibilities must be unambiguous to show the accountability of each authority for its actions
- *Transparency*. Parliament, the markets and the public must know the responsibilities of each authority
- *Definition of responsibilities*. Proper accountability and efficiency require the avoidance of duplication
- *Information exchange*. Efficiency and effectiveness requires provisions for sharing information

Responsibilities of the BOE

- Contribution to overall financial stability
    - Stability of the monetary system, acting in the market to manage fluctuations in liquidity
    - Overseeing the infrastructure of the financial system, helping to avoid systemic risk
    - View of the financial system as a whole, advising on UK financial stability
    - Limiting the risk for the financial system of problems in specific institutions

Responsibilities of the FSA

- Authorizing and supervising banks, investment firms, brokers and so on
- Supervising financial markets, securities and clearing and settlement systems
- Operations in certain cases of problem firms
- Regulatory policy

Responsibilities of HM Treasury

- Institutional structure and legislation of financial regulation
- Informing and accounting to Parliament for problems and measures in the financial system
- Accountability within government for strength of the financial sector to operational disruption

Source: HM Treasury (2007d).

for policy coordination and agreement among the three authorities. It provides a vehicle for sharing information on threats to the financial stability of the United Kingdom. There are regular meetings of the deputies of the institutions. In case of the need of government support operations, the meetings involve the principals: the Chancellor of the Exchequer, the Governor of the BOE and the Chairman of the FSA.

The BOE was established in 1694, nationalized in 1946 and became independent in 1997. It is the central bank of the United Kingdom. The BOE Act of 1998, Table 2.3, consolidated the reform of the financial system. This act is admirable

Table 2.3 The BOE Act of 1998

Court of directors

- Composition: Governor, two Deputy Governors (5-year terms) and 16 Directors (3-year terms) appointed by Her Majesty
- Functions:
  - Manage bank affairs other than formulation of monetary policy
  - Determine objectives, strategy and effective use of BOE's resources

Monetary policy

- Independence from the Treasury
- Objectives:
  - Maintain price stability
  - Support the government in the objective of growth and employment but subject to attaining price stability
- Specification of objectives by the government
  - Once in every period of 12 months the Treasury will specify the definition of price stability and the economic policy of the government

Monetary policy committee

- Responsibility: formulating the BOE monetary policy
- Composition: the Governor and Deputy Governors of the BOE, two members appointed by the Governor after consultation with the Chancellor of the Exchequer (one with responsibility at the BOE with monetary policy analysis and other with BEO responsibility for monetary policy operations) and four members (with knowledge or experience relative to the functions of the committee) appointed by the Exchequer; terms are for 3 years
- Publication: BOE must publish in reasonable time the decisions that require action to meet objectives with consideration if publication of decisions affects the desired outcome; minutes are published before the end of the 6 weeks beginning with the day of the meeting but not if publication of decisions affects the desired outcome; voting preferences of members are published

Inflation report

- Content: review of monetary policy, assessment of inflation in the United Kingdom and expected approach to meeting the objectives of the BOE
- Periodicity: quarterly or other period agreed by the MPC

Transfer of supervisory functions of the BOE to the FSA

Source: http://www.bankofengland.co.uk/about/legislation/1998act.pdf

in terms of its simplicity and has proved highly effective. The BOE has a Court of Directors, with a Governor, two Deputy Governors and 16 Directors with the primary responsibility for the management and efficiency of using resources of the institution. The BOE is independent from the Treasury in its conduct of monetary policy. Its objective is to maintain price stability, supporting the government's economic policy of growth and employment but subject to attaining price stability. There is a separation of power in that every 12 months the Treasury defines price stability, in terms of a target rate of inflation, and the economic policy of the government. The BOE is independent in the policy formulation of how to attain its objectives but not in defining them. The act created the Monetary Policy Committee (MPC) that formulates the BOE's monetary policy.[15] The MPC includes the Governor, Deputy Governors, two members from the areas of monetary policy analysis and operations of the BOE and four outside members. The outside members have been chosen with knowledge and experience in economics. The act created a report that became the inflation report, an important document of disclosure in inflation targeting (BOE 2007May). It also transferred the supervisory functions of the BOE to the FSA.

The UN

The UN charter was drawn by 50 countries meeting in San Francisco at the UN Conference on International Organization in 1945 (UN 2004). The official beginning of the UN occurred on October 24, 1945, when a majority of signatories – including China, France, the USSR, the United Kingdom and the United States – ratified the charter. This charter establishes the rights and obligations of the member states and the organs and procedures of the UN. The purposes of the UN in the charter provide that it is the center for harmonious actions of nations in attaining multiple ends of international peace and security, friendly relations among nations and cooperation in solving international economic, social, cultural and humanitarian problems. The UN also promotes respect for human rights and fundamental freedoms.

The UN (2004) is composed of six organs, 15 agencies and various programs and bodies. The General Assembly of the UN is its main organ of deliberation. It includes all member states of the UN with one vote per member. The decisions on peace and security, admission of new members and budget issues require a two-thirds majority while other decisions are by simple majority. The General Assembly only has the power to make non-binding recommendations to member states on international issues of its competence. However, it has initiated actions on political, economic, humanitarian, social and legal issues, affecting millions of people throughout the world.

The Economic and Social Council (ECOSOC) is the main forum for international economic and social issues. It also provides policy recommendations to member states and the UN. The ECOSOC has authority to initiate research and report

on multiple economic and social issues. It also provides assistance and organization of major international social and economic conferences and the follow-up process of these conferences. The ECOSOC influences about 70 percent of the human and financial resources of the UN. It coordinates the economic and social work of the 14 specialized agencies of the UN, 10 functional commissions and five regional commissions. The 11 UN funds and programs provide reports to the ECOSOC.

The Millennium Declaration (MD) of the UN (2000) strengthened the role of the ECOSOC. The MD contends that the current "central challenge" is ensuring that globalization benefits all the people in the world. It argues that there are "great opportunities" in globalization but that benefits and costs are unevenly shared and distributed. The UN (2006) monitors progress in attaining the MDGs.[16] The major difficulties are encountered by developing countries and the countries in transition. An inclusive and equitable process of globalization requires sharing the benefits among all the people. The process requires policies that benefit developing and transition countries; these countries should participate in designing the policies. The multilateral trading and financial system would have good governance. The financial, monetary and trading systems would be transparent, open, equitable, rules-based and predictable. The MD resolved to halve by 2015 the proportion of the world population earning incomes of less than $1 per day and the proportion of people suffering hunger and unable to reach or afford safe drinking water. It also resolved to provide by 2015 full primary education to children everywhere, boys and girls alike. The MD resolved to reduce maternal mortality by three-quarters of current rates and mortality of children under five by two-thirds of current rates. The MD also proposes to preserve environmental resources.

Summary

International rules and institutions constitute the framework of coordination and cooperation in the international financial system. Institutions are not static but evolve significantly over time. The current role of the IFIs developed during the postwar period. A major contribution of these institutions is in the provision of knowledge, which is a GPG that otherwise would not be forthcoming. The IMF is changing its method and role of surveillance to include international imbalances and the management of exchange rates. An institution has to be flexible to face new challenges that threaten the existence of the system that it is designed to protect. The WB is focusing on assistance to developing countries and the eradication of poverty. The joint surveillance of economies of member countries by missions of the IMF and the WB provides valuable information and exchange of policy proposals, showing in relief the need for institutional and structural changes. These joint IMF/WB missions have also helped to disseminate standards and codes. The process of institutional change has to accompany the rapid pace of change in IEFP.

The resolution of major crises in the current international financial system is processed through central banks – the FRBO, the BOE, the ECB and the BOJ. The IFIs play a leading role in emerging market crises. The crisis of real estate in the United States created a worldwide credit contraction that is testing the capacity of central banks to resolve crises.

3
Private Institutions

Introduction

There are key private institutions in the money and capital markets that intermediate funds between savers and investors. This chapter provides the foundation of information and analysis required in Chapter 5 on intervention by the state and Chapter 3 of Volume II on financial globalization. Commercial banks are essential in nearly all economies with market allocation. They were among the first institutions to engage in cross-border transactions. There is a brief introduction to commercial banks in this chapter that is complemented in various sections throughout the remainder of this book.

The advice on the structure of capital and the funding of corporations is provided by investment banks. The United States has repealed the Glass-Steagall Act that prevented commercial banks from engaging in investment banking. Changes in technology, international markets and regulation cause restructuring of corporations that is processed by M&As. The appropriate section below provides the data on global M&As and the major institutions engaged in the process. There is discussion of the institutional framework that governs corporations and thus M&As. The fairness and effectiveness of this framework is essential to well-functioning markets.

HFs are among the most criticized institutions. There is thorough discussion of HFs. An important development in recent times is the acquisition of corporations by PE firms that raise large funds from investors to convert corporations into private ownership. Another form of financing of companies is by venture capitalists (VC) that contribute capital and other resources to start-up companies and other ventures that require capital for development. The exit of PE and VCs to realize their capital gains is processed through IPOs. The summary recapitulates some of the major themes.

Commercial banks

Banks have played and continue to play an extremely important role in economies around the world. Table 3.1 provides data on selected international banks. There

Table 3.1 Selected international banks $B 2006

	Assets	Market value	NIBT
Citigroup	1,884	263	29
Bank of America	1,459	226	32
J P Morgan Chase	1,351	178	20
UBS	1,965	45	10
Credit Suisse	1,029	35	9
HSBC Holdings PLC	1,712	220	22
Deutsche Bank AG	1,486	43	8
Royal Bank of Scotland	1,707	79	17
Credit Agricole	957	27	5
BNP Paribas	777	23	4
Mitsubishi UFJ Financial Group*	1,196	56	0.1
Santander Central Hispano STD	633	86	8

*Fiscal year ending Mar 07.
Note: US banks data are market value on May 11, 2007; the other banks are shareholders' equity.
Sources: US banks: http://online.wsj.com/home/us
HSBC:
http://a248.e.akamai.net/7/248/3622/04269761a2506b/www.img.ghq.hsbc.com/public/groupsite/assets/investor/hsbc2006ar0.pdf
Mitsubishi:
http://www.mufg.jp/english/ir/fs/backnumber/2007mufg-mar/pdffile/highlights0703_e.pdf
http://www.mufg.jp/english/ir/fs/backnumber/2007mufg-mar/pdffile/financial_info0703_e.pdf
Credit Agricole: http://www.credit-agricole-sa.fr/IMG/pdf/CAG010_DRF06_GB_PDFi.pdf
Royal Bank of Scotland: http://www.shareholder.com/Common/Edgar/844150/950103-07-1017/07-00.pdf
BNP Paribas: http://invest.bnpparibas.com/en/financial-reports/documents/Registration_document_2006.pdf
Santander Central Hispano:
http://www.santander.com/csgs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobheadername1=Content-Disposition&blobheadervalue1=filename%3DInformacion+Economico-Financiera.pdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1178829910482&cachecontrol=immediate&ssbinary=true
UBS: http://www.ubs.com/1/e/investors/topics.html
Credit Suisse: http://www.credit-suisse.com/investors/en/index.jsp
Exchange rates from FRBNY:
http://www.ny.frb.org/markets/fxrates/historical/home.cfm

is no intention to rank them by size, strength or relative importance. The largest commercial banks have traditionally been among the most international institutions with business around the world.

The relative importance of banks prevents the concentration of analysis of all the issues in one section. Chapter 4 contains aggregate data on banking for the world. Banks are among the most regulated institutions. Table 3.1 illustrates one of the main alleged reasons for state intervention. Bank capital is relatively small compared to bank assets. Banks leverage their operations by issuing liabilities, the most traditional being demand deposits. This borrowing allows banks to create assets well above their capital. The recurring banking crises have resulted in strict regulation. Thus, the analysis of state intervention in Chapter 5 contains significant material relating to banks. The role of banks is further examined in Chapter 3 of Volume II on financial globalization. In most countries, banks are the most

important financial intermediary. The development of a world standard for capital regulation of banks, Basel II, is considered in detail in Chapter 4 of Volume II together with its application to developed and emerging countries.

Investment banks

The activities of investment banking are closer to capital markets than commercial banking. In most countries, a universal bank provides all banking services. The United States restricted commercial banks from engaging in investment banking beginning in 1933 with the Glass-Steagall Act. The signing into law of the Gramm-Leach-Bliley Act by President Clinton on November 12, 1999 repealed the Glass-Steagall Act (Barth *et al*. 2000). Kroszner and Rajan (1997) provide an important critique of the Glass-Steagall Act. US banks are engaging in commercial and banking activities. US investment banks possess competitive advantages in skills, capital and distribution that dominate global investment banking. After the US loss of competitiveness in finance, US investment banks were already deriving significant part of their business, if not the major part, from overseas markets. The best-known activity of investment banks is in M&As. However, investment banks also advise corporations on their capital structure, assisting with the underwriting and placement of debt and equity securities. Investment banks also innovate and make markets in financial services.

Table 3.2 provides some data on major global investment banks. There is no intention to rank the institutions by any criteria. The value of assets camouflages the actual management of assets and movement of funds and capital. Investment banks have limited but highly specialized staff and use the most advanced financial technology. Together with other financial institutions, they

Table 3.2 Global Investment Banking $B 2006

	Assets	**NIBT**
Goldman Sachs	838	14.6
Merrill Lynch	841	10.4
Morgan Stanley	167	6.6
Lehman Brothers	503	5.9
Citigroup	1,884	29.6
J P Morgan Chase	1,351	19.9
Deutsche Bank AG	1,486	8
UBS	1,965	10
Credit Suisse	1,029	9
China International Capital		
ABN AMRO Rothschild		
Barclays Capital		

Sources: US banks: http://online.wsj.com/home/us
UBS: http://www.ubs.com/
Credit Suisse: http://www.csfb.com/home/index/index.html
Deutsche Bank: http://www.db.com/index_e.htm

provide an essential service in restructuring companies and markets to maximize opportunities and the benefits from efficient allocation of resources. The benefits of finance as well as the critique of these benefits are analyzed in greater detail in Chapter 3 of Volume II on financial globalization.

Governance and exit

There is a normative part of the agency problem. Owners (principals) delegate to senior managers (agents) the maximization of their wealth (Jensen and Meckling 1976). The contract should provide incentives for managers to protect and promote the wealth of owners. There are costs of monitoring by the owners, bonding costs to protect the owners from decisions of managers and the residual or difference between actual and optimum wealth maximization. The positive part focuses on the incentives by owners (stockholders and debt creditors) and managers that determine their contract. The incentives include such things as restrictions on budgets, auditing, control systems, compensation benefits and so on.

Agency costs exist in reality, much as is the case of transaction costs. The analysis focuses on the difference between the optimum solution provided by free markets in the first-best competitive allocation and the existence of control decisions within firms (Coase 1937). Managers derive satisfaction from perquisites such as larger offices with views, more expensive computers than those required, contributions to charities, acquisition of inputs from friends and the like (Jensen and Meckling 1976). A significant number of these perquisites provide non-monetary satisfaction. There could be criminal activities such as managers decorating their personal apartments with paintings worth $50 million. The value of the corporation managed by agents will be lower than the value managed by the owners at least by the amount of the agency costs. This is a problem that was first mentioned by Adam Smith (Berle and Gardiner 1932; Jensen and Meckling 1976).

There is an issue of the possible existence of market failure (Jensen and Meckling 1976). The firm managed by an owner would attain the maximum efficiency of Pareto optimality. However, the firm managed by agents of owners would differ from the maximum efficiency of Pareto optimality by the positive agency costs. There is the argument that the comparison is part of the Nirvana fallacy. The real world firm characterized by positive agency costs cannot be evaluated by the ideal Pareto-optimal firm of blackboard economics in which agency costs are zero. Economic growth with joint-stock corporations with limited liability required the delegation by many owners to professional managers. The introduction of government managers would create different types of agency costs, some of which were experienced in centrally planned economies characterized by significant inefficiency, inferior products and surplus production that accumulates in unsold stockpiles. It is conceivable that government intervention would also result in departures from the Pareto optimum by the owner-manager because of positive agency costs.

Capital markets can play an important role in monitoring and reducing agency costs. The price of stocks reflects the existence of agency costs. Owners can retain investment bankers to price the company as a whole and if sold in segments. There are no agency costs when the owner and manager are the same, as in venture capital and private equity. The process of creative destruction of capitalism of Schumpeter (1942) requires the ability to restructure entire industries and the economies to maximize dynamic economic efficiency, or long-term economic growth. Financial institutions provide important checks on distortions such as agency costs.

The essence of capitalism is the process of creation and destruction (Schumpeter 1942). A third industrial revolution beginning in the 1970s has created excess capacity by technology, organizational change, government policy and globalization (Jensen 1993).[1] Imperfect information about internal costs and those of competitors do not warn managers of the need to exit in market segments. High-cost producers need to exit the markets. A capital market's exit by M&A is less traumatic than bankruptcy. The increase in value caused by M&As can be derived from increasing efficiency and also from wealth transfers.

There are four control forces that can soften the difference between the decisions by managers and what is socially optimal: capital markets, government, markets for products and factors of production and the system of internal controls of corporations under the responsibility of boards of directors (Jensen 1993). The board is responsible for the entire viability of the firm. It selects, hires, fires and awards compensation to the CEO. However, boards have taken action too late, when bad performance was evident. CEOs may influence boards in such a way that they create an unfavorable culture, rendering them ineffective. Boards may not be informed adequately by the firm and some members may not be knowledgeable about financial or production issues. There may be more concern in boards about downside issues and adverse publicity than with value maximization. Board members typically have very small or no holdings of shares of the company. Ideally, the CEO should be the only member of management in the board. Excessive size in boards may subject them to easier control by CEOs. Typically, the CEO is the chairman of the board, but separation of the two functions may result in better governance for the board.

Venture capital and LBOs provide examples of effective governance (Jensen 1993). The organization in limited partnerships delegates the role of active investors in managing the corporation to the general partners by the investors in the funds. The managers and board members hold significant parts of the shares. Board members represent significant holdings. Boards are relatively small, typically with less than eight members. The CEOs rarely chair the boards. The information problem is diminished because the active investors become familiar with the entire business during the due diligence in acquisition or investment and bring in their staff. The active investors also link the corporation with capital markets and investors.

An important part of the business of investment banks is advice to clients on the issue of debt and equity. In a way, this is complementary to the advice on

restructuring the corporation by M&As. Companies depend on investment banks for the type of securities to issue, the evaluation of the financing available in markets, the timing of placement of securities and the geographical distribution of the market. Investment banks conduct the underwriting and distribution of the securities.

Corporate takeovers result in major changes with gainers and losers. Restructuring of companies may be required because of technological and organizational changes that affect volumes and prices of products and the profitability of business segments. A dynamic economy requires transfer of resources toward activities that can contribute to higher growth. The restructurings affect various groups of shareholders, creditors, employees, competitors, suppliers and customers. The closing and opening of plants affect communities in localities and even entire regions. There is significant pressure on legislatures and regulators to influence takeovers.

There is a market for corporate control by competing managers, which can be considered as an extension of the market for managers. Business models change rapidly. For example, the mechanical typewriter lasted decades until replaced by the electric typewriter. The subsequent product, the word processor, lasts only a few years. Segments that generated high profits suddenly cause losses. Managers find hurdles in abandoning older strategies because of the pains of closing or selling entire product lines and divisions. The takeover occurs because new management can change more rapidly and effectively the business model, increasing the profitability of the corporation. Progress requires reallocating resources to more dynamic opportunities. Resistance to change can prevent economic growth. Takeovers are better alternatives for restructuring and exit of business lines than costly bankruptcies.

Mergers and acquisitions

The discussion below initially provides general information on the current activity of M&As. The remainder of the section focuses on the issue of whether there is sound governance of the process of M&As, in particular the creation of standards and enforcement of governance. There are numerous stakeholders in M&As. The essence of the problem is whether the governance system protects shareholders from managers and acquirers of public corporations. Corporate law is essentially determined by the Chancery Court and the Supreme Court of Delaware. The process evolved on its own, allowing the flexibility for change while protecting the shareholders.

Financial data on the major investment banks of the world are provided in Table 3.2. The complexity of the transactions, range of products and services and sophistication of technical analysis are extremely difficult to summarize with numbers or even analytical descriptions.

There is an important issue of whether M&As restrict entry into markets. The banking industry provides a useful sample, according to Berger *et al*. (2004), because its products are relatively homogeneous. Moreover, banks in the United States operate in segmented markets under different conditions. Expected profits and growth of markets constitute the factors of M&As in early research.

Berger *et al*. (2004) use a large sample, including more than 10,000 M&As in over 2700 local markets. The period of observation covers 19 years in which there were almost 4000 actual market entries. The econometric research finds increases in the probability of entry in markets after M&As. The results are robust to the use of different econometric methods, changes in the specification of exogenous variables and changes in data samples. The key result is that M&As increase subsequent new entry. The reduction in lending to small business caused by M&A consolidation is partly compensated by entrants, what Berger *et al*. (2004) consider to be an external effect of consolidation.

US investors have given trillions of dollars to corporations whose managers have discretion on their fortunes and profits. This power given to people who are not owners of the property has been studied intensely with the rise of the corporate form. The earliest warning of Berle and Means (1932) would suggest investment in bonds instead of equities. However, the returns on equities have surpassed those in bonds and the system of managers of corporations with many shareholders has worked effectively. Rock (1997, 1010) finds this to be the "central mystery" of corporate law. The traditional explanation of corporate law for the system to work rests on three types of arguments, according to Rock (1997, 1011):

- *Legal constraints*. The courts enforce legal prohibitions of theft, embezzlement, insider trading and others. They also enforce more vague legal constraints such as the duty of care and the duty of loyalty. Managers are caught by the courts in violation of these legal constraints, which act as deterrent of misconduct
- *Institutional structure*. Managers are checked by boards of directors, outside directors, shareholder voting, proxy contests and derivative suits
- *Market monitoring*. Managers are also checked by markets in products, labor, capital and corporate control. Ineffective or corrupt managers can lose their jobs when the companies are restructured or sold

Rock (1997, 1011) does not find that the checks on managers are very powerful with the exception of competitive markets in cases where they do exist.

The community of the corporate system is relatively small. Rock (1997, 1013) argues that it consists of several thousand senior managers and directors of large, publicly held corporations. There is an additional small group of lawyers, mainly in New York and Wilmington but with some in Chicago and Los Angeles. The court in charge of oversight for the most part, because of Delaware's attractive franchise of corporate form, is the Delaware Chancery Court with judicial review by the Delaware Supreme Court. Highlighting the small legal community, the decision makers responsible have close to only five members. Rock (1997, 1014) shows "how a small community imposes formal and informal, legal and nonlegal, sanctions on its members."

The essence of Delaware fiduciary law is that boards have freedom of discretion as long as they follow the right procedural process and act in good faith (Rock 1997, 1015). This can be in marked difference to other countries where protections have a stronger substantive approach. In Delaware, the courts define good faith by

means of descriptions of the conduct of manager, director and lawyer which are fact intensive and saturated with norms. Delaware fiduciary law is characterized by standards that are generated in a narrative process. The stories of this process cannot often be reduced to a rule. Instead, the Delaware courts provide parables of what are good and bad managers and lawyers to define their job descriptions. Rock (1997, 1015) finds value in thinking "of judges more as preachers than as policemen."

An excellent illustration of the operation of the review function of Delaware courts is provided by Rock (1997) in terms of the management buyouts (MBO) of the 1980s. There were 404 MBOs in the value of $162.02 billion in 1981–90. There were only 15 cases in the Delaware courts in that period relating to MBOs even with this amount of deal activity. The MBOs are especially important because they involve the acquisition of the company by the managers from the shareholders, creating opportunities for conflict of interest. An important consideration by Rock (1997, 1095) is that the critical cases involving Macmillan, Fort Howard and RJR Nabisco were only written in 1988 and 1989, almost a decade after the boom in MBO activity began in 1981. Transactions were rapidly developing, putting pressure on business attorneys to advise their clients in an environment of vaguely defined norms on how the law would develop.

Rock (1997, 1099) argues that "Delaware is a reasonably efficient system of corporate governance." Opinions at this level focus primarily on granting preliminary injunctions. The common thread was that the opinions were critical of the conduct of the defendants. The deep judgments of the conduct of managers consisted of fact-intensive narratives of the process by which the companies dealt with bidders and management. They marked the way for future conduct to be examined by courts and to be adhered to by companies facing such situations. These opinions contain narratives on the independence and activism of the special committees, the role of the investment banker adviser and the search for alternative bids. The Delaware courts shifted the emphasis, in opinions and extrajudicial communication, to influence the conduct and formation of the special committees tasked by the board with evaluating the proposed business transaction (Rock 1997, 1104). In deciding these cases, the Delaware court used the standard of the "business judgment rule" or alternatively the "entire fairness standard." The courts did not give rules on how MBOs should be conducted, but clear procedural steps arose as best practices which would grant and for process which would gain greater deference to managers from the courts.

A summary of the standard that arises from the written opinions late in the 1990s is provided by Rock (1997, 1062). The Delaware courts recognized the existence of an inherent conflict of interest in MBOs. In those cases, the court has favored a special independent committee to negotiate with management and third parties. Moreover, the special committee has its own independent investment banking and legal advisers. Counsel should ascertain that managers involved in the MBO do not appoint the members of the special committee and the investment banker adviser. Further procedural safeguards include an effective announcement by the special committee of the existence of a bid by management,

ensuring that all material information is available to prospective bidders. The special committee should not improperly favor management over third parties that may enter the bidding. In addition, the special committee should test the market for possible alternative offers, but is not required to conduct an English style auction. There is another important norm in the Delaware courts that is relevant to M&As and buyouts developed in the so called Revlon line of cases. Management can "just say no" to an offer for the corporation if it is contrary to business plans that have been designed to optimize the corporation's long-term business model. Much like all this area of law, exceptions arise to when this situation really occurs.

The value of M&A transactions jumped from $44 billion in 1980 to $247 billion in 1988. Kahan and Rock (2002) argue that a significant share of these transactions were hostile takeovers or defensive transactions. In general, the focus of corporate legal doctrine and scholarship is on the relative power of managers and shareholders in the ultimate decision of selling or keeping the ownership structure of the company unaltered. The poison pill became the centerpiece instrument of defense because of various advantages as described by Kahan and Rock (2002). Namely, there are no significant costs in adopting the pill and the conduct of business by the company is not altered. The most important advantage is that it gives the board time to evaluate its options as the pill substantially hinders the short-term ability of an acquirer to take over a company with a poison pill unless the target board redeems it.

One of the crucial early questions became whether a company could "just say no," using a phrase of the US First Lady of the time, choosing not to redeem the pill indefinitely on the argument that the hostile bid was not high enough. The Delaware Supreme Court provided its opinion on the subject in 1988, permitting Time to proceed with its tender offer for Warner Brothers and maintaining its poison pill. The board of Time was supported in its decision to turn down a conditional offer by Paramount of $200 per share, a premium of 58 percent over Time's pre-offer share price. Kahan and Rock (2002) point to the support of the decision by the board of Time given by the outside directors of its board on the basis of a fairness opinion by the investment banker advising Time. A corporation need not abandon a corporate plan in exchange for short-term shareholder profits unless there is no basis for the corporate strategy. Kahan and Rock (2002) argue that the Delaware court prefers bilateral decisions, which are those that are favored by both management and shareholders, because they are more likely to enhance welfare. The "just say no" doctrine was a unilateral doctrine, favored by management. The Delaware courts may not be supportive of a "just say no" decision that does not have the support of the outside directors of the board based on the fairness opinion by an investment bank. However, this may have started to shift slightly as one of the central questions post this period was the ability of the shareholders to effect the redemption of the pill by the board.

After a brief interruption in the recession of the early 1990s, M&A activity entered into a phase of even more rapid growth, jumping from 3510 deals in 1995 with value of $356 billion to 10,883 deals in 2000 with value of $1284.8 billion (Kahan and Rock 2002, 10). During this period, the largest number of

takeovers was nominally friendly in contrast with the hostile bids of the 1980s. There were also significant changes in corporate governance. Outside independent directors acquired more power than in earlier periods, increasing their share in corporate boards. Kahan and Rock (2002) also contend that outside directors are more effective, in effect causing the dismissal of CEOs with poor performance. Moreover, outside directors are more likely to strengthen shareholder value during tender offers and stock prices increase in response to their appointment. There are also higher premiums in MBOs of corporations with boards that have a majority of independent directors. This strengthening of outside directors has increased the monitoring function of boards. The changes in the composition and relative influence of outside directors were accompanied by a shift in compensation of managers by stock options. Stock options are often seen as the best way to tie the interest of management and the board with the performance of the company. However, managers gain in takeovers because of the bidding of stock prices but also by golden parachutes providing severance payments, benefits, early vesting in pension plans and acceleration in vesting of unvested options (Kahan and Rock 2002, 14). The equilibrium between these devices is a fine one, while golden parachutes and other such payments have a legitimate purpose in maintaining management during the possible takeover transaction and ensuring continuation of management should it fail, there are also questions involving self-interest of management in assigning themselves such huge payoffs. Courts often follow the Delaware model of looking at the process of the implementation of such devices and often use certain limits communicated via the precedent system. The overall change in governance on the corporate form has been more in accordance with the bilateral approach of the Delaware courts, benefiting both management and shareholders.

The corporation can be viewed as governed by the primacy of the board or by the primacy of shareholders. Nearly all public corporations are run by boards of directors. There are two theories considered by Stout (2003) of why boards manage corporations. The monitoring theory is more dominant. There are some efficiency explanations for monitoring by boards in terms of the costs, feasibility and apathy of decisions by shareholders that could number in the hundreds of thousands in many public corporations. The monitoring theory is based on two pillars. It becomes extremely difficult for shareholders to obtain sufficient information on the business of the corporation to participate in decisions. Thus, shareholders delegate to better informed directors the decisions of the corporation. The separation of ownership by shareholders and control of the corporation by managers raises issues of agency costs. Managers, or agents, could pursue their self-interest instead of those of the shareholders, or principals. The directors of the board do not have the conflicts of interest of management. The two pillars of support for monitoring by boards are their knowledge of information relative to shareholders and their lack of conflict of interest relative to managers. The directors in boards monitor, on behalf of shareholders, the conduct of managers.

Boards oversee the performance of professional managers, intervening only in extreme situations. Stout (2003) argues that the monitoring model explains why

shareholders would hire outside directors to watch and control the conduct of managers. However, there is no explanation in the monitoring model of why shareholders would grant to directors the control of the corporation, including all its assets and output. An important aspect of the limitation of the model is the authority of the board to decide not to distribute cash in the form of dividends. In such a case, the board limits the capacity of shareholders to extract wealth from the corporation.

The mediating theory is the second approach considered by Stout (2003). There are two interesting ways of considering the firm. Executives, shareholders and directors are not the only actors in corporations and shareholders are not necessarily victims and in fact can exploit companies. Shareholders can exploit other shareholders by obtaining specific concessions for a group in detriment of the majority. Creditors can also be misled by shareholders that take excessive risks not revealed in the creation of the credit contract. Shareholders can also cheat on employees by promising rewards that are not subsequently provided and then firing them.

There are important legal duties owed by officers and directors to the corporation, including the duty of care and the duty of loyalty. The duty of care requires directors to act in good faith, exercising the care of a prudent person and in the reasonable belief that they are promoting the best interests of the corporation. Reasonable diligence requires that directors make decisions based on collecting and analyzing material information. The courts do not rule what should or should not be done but simply state what was done or not in a specific situation and if it constituted or not due care (Knepper and Bailey 2002, 3.01). The duty of loyalty prevents directors from using their positions to make secret or personal profits, giving the corporation the benefit obtained as a result of their official positions (Knepper and Bailey 2002, 1.05). Directors must be scrupulous in protecting the interests of the corporation and in refraining from injuring the corporation. This duty of loyalty originates in prohibition of self-dealing in a fiduciary relationship (Knepper and Bailey 2002, 4.01).

The fiduciary duties of directors require that they promote the best interests of the corporation. They are required not to play favoritism among stockholders or classes of stockholders. The fiduciary duties require that directors act in good faith in all cases, in a conscientious way and exercising their best judgment. There is a higher standard for directors with specialized knowledge, requiring advocacy within the board of conclusions reached from that knowledge (Knepper and Bailey 2002, 1.07).

These duties come to play important roles in the context of defending against hostile takeover attempts. Management will often attempt to use defensive devices at such times. However, it should be noted that the main purpose of defensive devices is to increase the capacity of the board to find a better deal by giving the directors more time; it is not to make the corporation immune to takeovers. Perhaps the only true way to make a corporation immune to a takeover under Delaware's jurisprudence is the concentration of voting securities in friendly hands (Knepper and Bailey 2002, 14.06). Starting in the backdrop of the takeovers of the

1980s, the Delaware courts modified the standard of review by focusing on the duties of directors in approving a takeover in the Unocal line of cases. Takeovers are a special time in the existence of the corporation, for self-interest of managers or the board can clearly clash or mesh with the interest of the corporation. This was an area where previous jurisprudence, first appearing with greenmail cases such as *Cheff v. Mathes* 199 A.2d 548, had stagnated into simply pronouncing certain responses to achieve approval from the court.

In *Unocal v. Mesa Petroleum*, 493 A.2d 946 (Del. 1985) the court unveiled an enhanced scrutiny standard, now commonly known as the Unocal standard. The directors of Unocal had attempted to prevent its acquisition by Mesa Petroleum Corp. by approving an exchange offer of stock held by the public for debt securities but excluding the shares held by Mesa Petroleum Corp, a so-called discriminatory tender offer. The Delaware Supreme Court analyzed the conduct of the directors in excluding the shares of Mesa Petroleum Corp. from the tender offer. The opinion of the Delaware Supreme Court found that the directors had the "fundamental duty and obligation" to protect the company and its shareholders from possible injury, no matter where it originated. The fundamental aspect of the change in the court's jurisprudence is that the court extended the review of the board's actions in authorizing the action in an enhanced fashion. Consequently, the board now has an initial burden of proof of the existence of a threat to the policy and effectiveness of the corporation. This burden was met by showing good faith and informed decision-making. Some threats recognized by the court in this early period included insufficient price, inadequate timing and nature, probable illegality, risk of execution, quality of offered securities and effects on non-shareholders such as creditors, customers, employees and possibly the community in general (Knepper and Bailey 2002, 14.06). The second prong of the Unocal test specifies that the defensive measure must be reasonable relative to the threat.

Through much of the 1980s and onto current times this standard evolved substantially, up to where the court follows the current Unocal-Unitrin standard when first evaluating a defensive technique. *Unitrin, Inc. v. American Gen. Corp,* 651 A.2d 1361 (Del. 1995). The new standard adds further clarifications to the second prong of Unocal ensuring that the device is not draconian (meaning it is neither preclusive nor coercive) and that the response falls within a range of reasonableness. As described by Rock, the use of the standard is a fact-intensive pursuit depending heavily on the facts of the previous cases (Rock 1997). However, even the Unocal-Unitrin standard is not the end of the inquiry. Certain situations, such as the board attempting to entrench itself may add the Blasius standard to the second prong of Unocal, which requires a so far fatal inquiry from the board to show a compelling justification for its action of entrenchment. Other situations can trigger the Revlon moment, when all hopes of corporate effectiveness have failed and all that there is to do is secure the best price for the shareholders, requiring the board to drop its defenses and in some occasions enter into an auction process. *Blasius Indus. v. Atlas Corp.*, 564 A.2d 651 (Del. Ch. 1988); *Paramount Communications, Inc. v. QVC Network, Inc.*, 637 A.2d 34 (Del. 1994); *Paramount Communications, Inc. v. Time, Inc.*, 571 A.2d 1140, 1152 (Del. 1989); *Revlon, Inc. v.*

MacAndrews & Forbes Holdings, Inc., 506 A.2d 173 (Del. 1986). It is important to note that directors can implement defenses even if there is no current takeover proposal. In fact, it may very well be in their interest to do so, as the timing of implementation is a factor that the court often looks to in terms of rooting out self-interested behavior of the board. However, there is no duty of directors to implement defenses before takeover attempts.

There are various takeover defense techniques (Knepper and Bailey 2002, 14.06). The best known is the poison pill which aims to make a takeover prohibitively expensive, at least until a friendly board can be voted in to redeem the pill. One of its major advantages is that as long as the charter of the corporation allows the issuance of preferred stock, the board may implement this device without shareholder action. The typical poison pill may have a flip-over, a flip-in component or both.

The defense begins by the directors approving the issuance rights via dividends to its shareholders and tying it to the common shares. These rights allow the shareholder to purchase stock or other security upon a triggering event. Such a triggering event may be the acquisition of stock by an outsider of above 10–20 percent of the outstanding stock (flip-in) or the actual merger by the outsider of the target corporation (flip-over). The flip-in component thus allows the shareholder to buy the share of the target corporation at a substantial discount, while the flip-over pill allows the shareholders holding the rights to acquire the bidder's stock at a substantial discount. The flip-in discourages the bidder by making the price of acquiring the target corporation more expensive as it dilutes the bidder's ability to acquire shares as target shareholders buy at their discounted price advantage. The flip-over provision only occurs after there is a merger; it works by diluting the value of the bidder's common shares. Consequently, the flip-over provision works well in protecting target shareholders from an unfair coercive second step merger (Cox *et al*. 2002, 23.7; Knepper and Bailey 2002, 14.06). This preferred stock converts into stock after a hostile takeover and requires high dividend payments. The acquirer either purchases the shares at a high price or pays the dividends, in either case, an effective prohibitive price for the acquisition of the company. There are variations of the standard poison pill, such as the poison put. The debt securities of the companies could have a provision by which the holders of the securities can call the bond, recovering their investment, in case of a takeover. There was a broad affirmation of poison pill plans by the Delaware Supreme Court and by the Chancery Court of Delaware *Moran v. Household Int'l, Inc.*, 500 A.2d 1346, 1350 (Del. 1985) (Knepper and Bailey 2002, 14.06).

Leveraged buyouts

The leveraged buyout (LBO) consists of the acquisition of a company financed mainly by debt of the company (Knepper and Bailey 2002, 14.12). In the typical LBO, the company is taken private and in many cases significant new owners are members of management and even employees in some cases. LBOs can be attractive during periods of low interest rates. The LBO can take a company private while providing value to its shareholders. The success of the LBO depends on the

business plan of the acquirers relative to the debt they issue. A sound business strategy would result in present value of benefits higher than the present value of debt, making the LBO highly successful. The rationale for LBOs is the need for restructuring corporations to promote efficient resource allocation. A dynamic economy benefits from opportunities to take a company private to improve its business model. At a future date the company can again become public to realize the value of the successful strategy. In a world of rapidly changing technology and competitive advantage of markets, the flexibility of LBOs is required.

There are displaced workers in LBOs, a cost that must be balanced with the increases in employment and efficiency of successful business strategies. Another important feature of contemporary industry is the focus of companies on specific areas of the production chain instead of on all the possible activities. There may be significant value in breaking up a company to focus on its most productive activity that could be compromised by keeping activities that are performed more efficiently in other companies.

There is a potential conflict of interest in the case of the acquisition of a company by managers and employees using the LBO process. The interests of the shareholders may not be adequately represented by the acquiring management (Knepper and Bailey 2002, 14.06). The reduction of these conflicts of interests occurs through procedural mechanisms, including special committees of independent directors with their own investment bankers and lawyers.

Hedge funds

There is unusually bad press for HFs, according to Gieve (2006, 447):

> They often appear as the latest in a long line of financial demons—from the "gnomes of Zurich" whom Harold Wilson blamed for the pressure on the pounds in the 1960s, the asset strippers and property tycoons of the 1970s, Gordon Gekko and the "liar's poker" players of the trading floors of the late 1980s and Harry Enfield's "loadsamoney" lads of the 1990s.

There are omissions in this list that could also include the financial managers in the recent corporate scandals, the futures trader that caused the collapse of Baring Brothers, the Sumitomo copper trader and finance ministers in emerging market crises. The FT (2007May17) quotes a politician referring to predatory investors as "locusts." HFs evoke remunerations of millions of dollars, esoteric mathematical models and computer programs, opacity of balance sheets and strategies and offshore fiscal paradises. After Long Term Capital Management (LTCM) they also became synonymous with systemic risk and the threat of recession and unemployment.

The explosive growth of assets under management (AUM) in HFs, from $200 billion in 1998 to $1.25 trillion in 2006, is partly explained, according to Gieve (2006, 448), by financial theory and technology that allowed specialization into components parts of complex investment products. These products were

divided into components for trading in specialized markets. Professionals that could understand and attempt to manage the complexities of the new financial theory and technology established firms of their own. The response of financial institutions was to create their own HFs. Prime brokers and investment banks derive high returns from complex trading and became important participants in the industry.

The general characteristic of a HF is the flexibility of its business model and the unrestricted investment process (Garbaravicius and Dierick 2005, 7). HFs choose location in unregulated and tax-free jurisdictions. Financial management is actually located in one of the financial centers such as London or New York. The clientele is typically composed of high net-worth individuals. The public participates through funds of hedge funds (FOHF) or in the third tier of funds of funds of hedge funds. The management of a HF earns a small management fee and a relatively high percentage performance fee. There is asymmetry of the returns because of the lack of a penalty rate for negative returns. There is an implicit penalty because the partners may invest in the fund. Redemption may be restricted for periods of time. The participation of managers may limit risk taking. There is little regulation and disclosure of HFs. The legal structure varies, including private investment partnerships and offshore investment corporations.

The type of investment strategy is a more useful yardstick to classify HFs, according to Garbaravicius and Dierick (2005, 8–9). The term HF originates in earlier funds that combined long and short positions to insulate portfolios from risk. HFs are no longer engaged in these neutral strategies. A typical strategy is to create portfolios on the basis of views on the direction of markets. Directional strategies may or may not be hedged.

LTCM based its strategy on the view that spreads would tighten in fixed-income securities relative to treasuries. One strategy was to take long positions in mortgages hedged with short positions in treasuries of comparable duration. The determination of the hedge ratio of mortgages to treasuries depends on correlations. Unfortunately, correlations are not immutable. The herd of imitators of LTCM, because of the exceptional talent of its management, exited positions after the Russian crisis in 1998. According to the PWGFM (1999, 12), the devaluation and moratorium of Russia provoked a flight to quality. Liquidity premiums and risk spreads increased around the world. The risk-management models of LTCM and other financial institutions had not adequately captured the possible losses in such events. Risk-management models did not warn about the impact on correlations of the simultaneous shocks to multiple markets. Increasing correlations revealed that portfolios were not as diversified as measured by the models. Scholes (2000) finds in retrospective that LTCM should have conducted more stress-testing of positions.

The change in correlations turned the position of LTCM into a naked option, that is, a directional position without hedge (Jorion 2000). Laubsch and Ulmer (1999) argue that stress-testing for the tightening of the spread of corporate bonds relative to treasury securities would have revealed the extreme losses of the portfolio of LTCM during a flight to quality as that occurring during the Russian crisis

of 1998. LTCM illustrates another characteristic of HFs, the use of high leverage. The balance sheet of LTCM on August 31, 1998 shows assets of $125 billion (PWGFM 1999, 12) while the equity capital was $4.8 billion on January 1, 1998. The unusual circumstances of market behavior caused the coordinated liquidation of LTCM without losses. The potential systemic effects of LTCM have been vastly exaggerated.

The strategy of LTCM was also a type of riskier arbitrage. In the case of LTCM, the arbitrage was what the managers considered excessively high-risk spreads of fixed-income securities relative to treasuries. HFs may use mathematical programs to make numerous trades to arbitrage small discrepancies in security prices in various markets. The origin of these strategies is in mathematical programs capturing small discrepancies between a portfolio of securities and the index of the exchange where they traded. Leverage and other factors introduce an element of risk but it is lower than in the case of purely directional trades such as the belief in a change in interest rate policy of the central bank.

Another approach in the analysis of LTCM is that by Furfine (2006) of considering costs and benefits in the moral suasion by the FRBO to prevent disorderly liquidation. There were 14 banks engaged in the friendly liquidation of LTCM of which nine were directly involved in lending, the "LTCM banks." There was no credit restriction or rationing in financial markets of the LTCM banks. The decrease in net borrowing by these banks occurred with simultaneous increase in interbank lending. Furfine (2006) concludes that the reduction in net borrowing by the LTCM banks was voluntary. Other analysis shows that there was no perception in the market that the nine LTCM banks would be considered by banking supervisors as too big to fail. Furfine (2006) concludes that the market did not assess a significant probability to failure by the LTCM banks as the potential consequence of liquidation of the HF. The costs of the moral suasion to orderly liquidation of LTCM may have occurred in the form of an extension of the doctrine of too big to fail. Furfine (2006) finds that the large, complex banking organizations began to pay lower rates on overnight unsecured borrowing while the nine LTCM banks experienced higher rates. Furfine (2006) finds that the FRBO moral suasion may have implicitly extended the too big to fail doctrine. He cautions that definitive conclusions require precise measurements of costs and benefits together with how they actually impact social welfare. However, it appears that the benefits of the moral suasion may have been lower than the costs.

A third HF strategy, according to Garbaravicius and Dierick (2005, 9), is to take positions on expectation of market events.[2] Companies experience mergers, acquisitions, reorganizations and bankruptcies. A common strategy, for example, is to take long positions in the target company together with a short position, or cash delayed position, in the acquiring company. The rationale for such strategy is that the price of the target company will increase because of the bidding for its acquisition but the costs of assimilating the target may cause temporary decline in the acquiring company. The objective of the HF is to gain the difference in prices. Block (2006) finds that this price difference is typically 5–10 percent in the interval between announcement and resolution of the merger. Losses can occur

if the merger does not occur. However, Block (2006) finds that by evaluating the likelihood of the merger, the HF normally earns high returns in various market conditions. HFs also benefit from the possibility of investing in distressed securities. Most other funds cannot make such investments. There are vulture funds and investors that invest in defaulted debt of emerging and developing countries for a few cents on the dollar in the expectation of selling during a rally in prices. Beattie (2007) documents several episodes of vulture funds. The risk of event strategies is the non-occurrence of the event. For example, the merger may not occur or the emerging country may not surface out of default. The positions would be offset at a loss. In the case of distressed securities there may not be a market or it may be so illiquid as to cause heavy losses.

There are risks for investors in HFs other than performance risk (Garbaravicius and Dierick 2005). Some of the additional risks may be related to manipulation of asset value by managers. A fund is as good as its managers such that departure of managers may affect its performance before investors can liquidate their positions. Liquidity may increase bid/ask spreads, causing significant decline in asset values. Some of these risks are present in other types of fund investments.

LTCM was an exceptionally large fund. Garbaravicius and Dierick (2005, 20) provide data showing that most HFs have less than $100 million in AUM. The samples that they use contain only 65 funds with more than $1 billion in assets. There are limitations with the quality of the data.

There are some potential beneficial effects from HFs, as identified by Garbaravicius and Dierick (2005, 25–7). The size of HFs is still not sufficient to make significant difference in most markets. The flexible business model can influence markets. This model includes leverage, alternative market strategies and more frequent trading. HFs create liquidity in markets where there may be fewer participants because of higher risks. According to the PWGFM (1999, A5–A6), HF trades in convergence arbitrage strategies provide liquidity to other investors that benefit from the opportunity to trade at relatively uniform prices. Trades by HFs on mean-reversion strategies may reduce volatility in markets. HFs may trade in specialized markets (PWGFM 1999, A6). Examples of such markets are credit derivatives, collateralized debt obligations (CDO), emerging bonds, leveraged loans and distressed markets. Enhanced risk management tools and spreading of risks among participants may be positive for markets, allowing reallocation of risks, an important function according to the PWGFM (1999, A6–A7). HFs may maintain positions and capital during volatile market conditions, thus contributing to greater stability. For example, HFs are acquiring distressed mortgage securities in 2007, preventing further collapse of the market. Moreover, HFs do not accentuate market movements because they do not participate in trend trading. There are also diversification benefits as shown by the low correlation of HF family indexes and the indexes of major stock markets. Risk-adjusted returns of HFs have been attractive.

There are multiple arguments about the risks of HFs for market stability, considered by Garbaravicius and Dierick (2005, 27–35). The foundation of analysis still depends on the experience of LTCM. HFs rely on significant leverage to generate

returns that collect a performance fee of 25–30 percent and still leave sufficient returns to continue attracting clients. The leverage ratio of LTCM was 25 to 1. Stress tests would probably advise against taking such type of leverage. In fact, stress tests using extreme events may deter any leverage. Leverage means borrowing from counterparties. If there is stress in HFs, it may spread to its lenders. The lenders of LTCM included some of the prime financial institutions in the world. The fears of systemic risk may have been unwarranted because liquidation was costless for the major lenders.

Table 3.3 shows the potential adverse effects of HFs. The major risk of HFs is in the form of the repercussions on other institutions in the event of unanticipated losses with high leverage. Prudential regulation of a business model such as that of HFs may simply lead to banning their existence. There are such risk-management controls in existence through the management of counterparty risk of the prime lenders to HFs such as investment banks and other prime brokers. There may be indirect effects in that a third party undermined by excessive leverage with HFs could affect other financial institutions. Another area of concern is the concentration of HFs in high-risk markets. Volatility in those markets could affect other markets, causing systemic problems. The impact of HFs on market volatility is still an unresolved issue of research. The superior quality of the management of LTCM caused concentration of similar trades. It does not appear very likely that such quality of management and concentration will be repeated.

The light regulation of HFs is not because of concerted action to avoid it or the exploitation of loopholes. Paredes (2006, 4) argues that HFs clearly qualify for exemptions in all the pertinent US laws: the regulation of public offerings by the Securities Act of 1933, the disclosure requirements on public companies by the Securities Exchange Act of 1934 and the regulation of mutual funds by the Investment Advisers Act of 1940. A divided vote passed Rule 203(b)(3)-2 of the Securities and Exchange Commission (SEC) requiring a HF manager to "look through" in counting each HF investor as a client. Thus, the threshold number of

Table 3.3 Potential adverse effects of hedge funds

Counterparty risk
Direct risks of credit extended by prime brokers
Indirect risks of a third party affected by excessive lending to HFs
Impact on markets
Frequent trading of portfolios
Concentrations in high-risk markets
Volatility benefits of HFs
Inconclusive evidence
Crowded trades
HFs concentrate on similar strategies

Source: Garbaravicius and Dierick (2005, 35–49).

15 clients under Section 203(b)(3) of the Investment Advisers Act would no longer protect the investment manager of a HF from registering with the SEC.

There are numerous new requirements of HF managers as registered advisers, enumerated by Paredes (2006, 5–6): disclosures to the SEC, provision of basic information to clients, procedures for proxy voting the HF, adoption of a code of ethics, implementing internal controls and compliance procedures and appointment of a chief compliance officer. The enforcement of this registration would certainly export the entire HF industry away from the United States. However, Paredes (2006, 6) documents how the federal Court of Appeals for the DC Circuit vacated the rule for HFs by the SEC, reinstating the regime of the Investment Advisers Act, by which HF managers do not have to register.

The Securities Act of 1933 provides a safe harbor for accredited investors, which includes institutional investors and individual investors with certain financial qualifications, such as net worth in excess of $1,000,000 and income in excess of $200,000 in the past 2 years (Paredes 2006, 6–7). The SEC returned to the issue by proposing a new definition of accredited investor: the "accredited natural person," which applies to HF offerings. The new definition requires the earlier conditions and ownership of $2.5 million in investments. This threshold would be adjusted for inflation in the future. The new approach could be considered as "investor-side" regulation, that is, who qualifies for investing in HFs, and would not distort the market as much as direct regulation.[3]

Private equity

In transactions in PE, the acquiring group may change the management of the target company it acquires. In venture capital deals, the management remains and the VCs provide capital and other services. The realization of capital gains in both types of deals requires an exit, typically in the form of IPOs. Important characteristics of PE, VC and IPOs are discussed below.

PE firms obtain funds from large investors such as pension funds, endowments and so on. The contributors of these funds are the limited partners. The managers of the funds are the general partners. PE firms, sometimes called private investment firms, use the funds to buy publicly owned companies. The objective is to increase the value of the firms with the intention of realizing high profits in making them public again. Another alternative is to sell them at a profit without turning them public.

Some of the major PE groups are shown in Table 3.4. The Carlyle Group (2007) was established in 1987. It engages in global operations, originating, structuring and acting as lead equity investor. Its transactions include "management-led buyouts, strategic minority equity investments, equity private placements, consolidations and buildups and growth capital financings." The staff is composed of 400 investment professionals. It has offices in 18 countries in North America, Europe, Asia, Australia and Africa. Its resources originate in over 1000 investors in 61 countries. Investment since 1987 has totaled $26.4 billion in 601 transactions. The commitment of own funds is $2.1 billion. The largest share of activities is

Table 3.4 Private equity groups

	Assets under management (AUM)
Blackstone Group	79
Carlyle Group	57
Bain Capital	40
Kohlberg, Kravis Roberts & Co.	30
Texas Pacific Group	30

Sources: Carlyle Group.
http://www.thecarlylegroup.com/eng/company/index.html
Blackstone Group http://www.blackstone.com/private_equity/index.html
http://online.wsj.com/article/SB117974471829909375.html?mod=sphere_ts
Bain Capital http://www.baincapital.com/pages.asp?*b*=1.
Kohlberg, Kravis, Roberts & Co. http://www.kkr.com/who/who.html
Texas Pacific Group http://www.texaspacificgroup.com/about/index.html

68 percent in buyouts. The largest industrial sectors are telecom and media with 26 percent and real estate with 16 percent. The heaviest geographical concentration is in North America with 67 percent. Europe accounts for 18 percent and Asia for 15 percent.

The Blackstone Group (2007) began operations with a staff of four in 1985 and resources of $400,000. The Blackstone Group manages $32.4 billion in private equity funds in more than 100 companies in many industries. It has five capital partners' general funds. The transactions have included LBOs, joint ventures, partnerships, recapitalizations and growth capital investments in multiple industries. It has offices in New York, London, Mumbai and Hong Kong with staff of 80 investment professionals. The real estate funds of Blackstone have received over $13 billion. The investors in these funds include the pension funds of corporations, states as well as foundations and endowments. The corporate debt area of Blackstone manages over $8 billion in transactions in leveraged finance markets. Blackstone also has an alternative asset management unit with $18.4 billion of AUM invested in HFs.

China announced its intention to invest $3 billion in Blackstone (Linebaugh *et al*. 2007). The interest of China is in obtaining higher returns on its reserves and that of Blackstone in finding business in China. The investment was announced days before the meetings in Washington, DC, between the US Treasury Secretary, Hank Paulson, and the Chinese Vice Premier, Wu Yi, in which a main topic was the undervaluation of the Chinese currency. Blackstone had announced earlier in 2007 its plans to launch an IPO of $4 billion that would raise $7 billion because of the commitment by China. The intended IPO of Blackstone was of 133.3 million common units in a price range of $29–31 a unit. The symbol in the NYSE is BX. The Blackstone Group has about $79 billion of AUM and the IPO initially appeared to value it at $30–40 billion. The deal with China gives it an entry into a country where the Carlyle Group and TGP have been making business for a longer period.

According to the data from Dealogic in the Dow Jones Newswires (2007Jul 2), the volume of global IPOs reached over $132 billion in the first half of 2007. This

represents an increase of 23 percent over the same period in 2006. The largest deal was that of the Blackstone IPO of $4.8 billion. JP Morgan led the offerings in equities with deals totaling $46.4 billion, nearly 10 percent of the market. The other top companies in this group were Morgan Stanley, Citigroup Inc., UBS and Goldman Sachs Group Inc.

In the first day of trading on June 22, 2007, the price of Blackstone's IPO jumped by 15 percent to $35.30 and even reaching a high of $38 during the trading session (Ball 2007). In part because of the uncertainties of the markets, the price then retreated to $29.72 on July 3, 2007. The lead underwriters, Morgan Stanley and Citigroup Inc., priced the issue in the range of $29–$31. The IPO raised $4.1 billion with the sale of 133.33 million common units. The Chinese government purchased $3 billion at a discount of 4.5 percent of the IPO price. The total raised by Blackstone was $7.7 billion. The value of Blackstone at the IPO price would be $33.6 billion. The IPO was seven times oversubscribed. The Blackstone group had $88.4 billion of AUM in early May and had net profit of $2.3 billion in 2006. The profit of Blackstone was $1.13 billion in the first quarter (Ball 2007).

Blackstone closed on August 8, 2007, the largest buyout fund in the world, with AUM of $21.7 billion (Politi *et al*. 2007). Most of the resources were raised in 2006 before the credit tightening. The fund is larger than the $15.6 billion buyout fund closed in April by Goldman Sachs. The boom in PE continues after the IPOs of the main groups. On July 3, 2007, the Blackstone Group announced the agreement to acquire Hilton Hotels for $47.50 a share in cash, or $18.5 billion, in addition to assuming debt of $7.5 billion (Audi and Sanders 2007). The price was 40 percent higher than the closing price for Hilton the day earlier of $33.87. Hilton had been implementing a model of managing instead of owning hotels, which is expected to continue under Blackstone.

Kohlberg, Kravis, Roberts & Co. (KKR 2007) was established in 1976, completing over 150 transactions with aggregate value of $279 billion. The equity investments of KKR were valued at $74 billion at the end of 2006. This represented a multiple of 2.5 times of invested capital of $30 billion. The investors include "corporate and public pension funds, financial institutions, insurance companies and university endowments." The staff consists of 90 investment professionals in nine global industry groups and offices in North America, Europe and Asia. KKR has been involved in some of the best-known transactions, including the 1989 buyout of RJR Nabisco for $31.4 billion and the 2006 buyout of HCA for $33 billion.

On July 3, 2007, KKR (2007PR) announced the intention to register common units in the NYSE, using the symbol KKR. The registration refers to an aggregate amount of $1.2 billion of common units. KKR (2007PR) intends "to use the net proceeds from the offering to grow its business, to make additional capital commitments to its funds and portfolio companies and for general purposes." The offering was expected to be concluded in the third or fourth quarter of 2007 but may be delayed because of adverse market conditions. The company is changing its name to KKR & Co. LLP (Berman 2007). The filings of the two largest PE groups show that the return of KKR over the life of various investment funds was 20.2 percent per year after fees. The IPO information of Blackstone shows slightly higher return

of 22.6 percent per year. There is a difference in the KKR IPO in that the founding partners of KKR do not intend to sell part of their shares in the offering. KKR is seeking to reduce its dependence on sources of capital from third parties. PE firms paid $9.6 billion to investment banks in the first half of 2007, according to data of Dealogic quoted by Berman (2007), an increase of 35 percent over the same period in 2006. KKR expects to find less expensive and simpler forms of financing acquisitions in a new capital market.

The HF industry is also moving toward IPOs. Fortress Investment Group LL C, with $36 billion of AUM, became a publicly traded company in February (Zuckerman 2007). Fortress is a manager of alternative investments including HFs, PE funds and publicly traded alternative investment vehicles (WSJ 2007FIG). The sources of income of Fortress are management fees, incentive performance fees and returns on investments in its funds. On July 3, 2007, the market value of the capital of Fortress was $9.3 billion. Insiders owned 76.96 percent of the company and 210 institutional holders owned 8.32 percent. The number of employees was 550. AUM at Fortress total about $36 billion, of which $18 billion in PE, $13.5 billion in HFs and $4.7 billion in publicly trade real-estate companies (Zuckerman 2007).

The public route is becoming increasingly popular with many large HFs interested in raising resources by IPOs (Zuckerman 2007). Och-Ziff Capital Management Group LLC is also registering for an IPO with the intention of raising about $2 billion. The company is also engaged in PE and real estate. It was founded in 1994 and has grown aggressively with an increase in AUM from $7 billion in 2002 to $27 billion in 2007. Congress is considering an increase in the tax paid by partners of publicly trade partnerships from 15 percent to 35 percent, which is the corporate-tax rate.

There are various reasons for the rush to IPOs by PE companies and HFs (Zuckerman 2007). The PE companies and some of the HFs raise resources frequently to acquire companies. The raising of funds for LBOs can be time consuming and even tortuous. The availability of permanent capital from an IPO could be attractive. In the case of HFs, there is not a major incentive to grow in AUM because of the difficulty of finding a sufficient volume of high-return investments. In fact, some HFs have returned funds to their investors. The largest two HFs in the United States are owned by two major investment banks: JP Morgan Asset Management, with $34 billion in AUM, and Goldman Sachs Asset Management, with $32.53 billion in AUM, according to data of Absolute Return in Zuckerman (2007). Another disadvantage of public registration is the sensitive nature of HF investments that could lead to imitation by other investors. However, Zuckerman (2007) finds that growth may be attractive to HFs because of lower trading fees and financing costs. Risk management can provide diversified investment strategies. There may be also benefits in recruiting talent by means of a public filing. The offerings preserve shareholder power by means of special class shares for the current owners.

Texas Pacific Group (TPG 2007) is a global private investment firm with $30 billion of AUM. The company manages various funds in private equity,

venture capital, public equity and debt investing. TPG was established in 1992. It searches for returns from investing in change of industry trends, economic cycles or special circumstances of companies. TPG finds a different philosophy in its dealing with complex and distressed companies that are facing significant changes, providing companies with guidance in strategy, finance and operations. Its investments extend from the United States to Europe and Asia.

Bain Capital (2007) was established in 1984 and has about $40 billion in AUM. It has a set of funds in private equity, venture capital, public equity and leveraged debt assets. The focus of Bain Capital (2007) is in developing a competitive advantage in the intensive use of people and in a value-added investment approach. The team of Bain Capital consists of 175 investment professionals with expertise in consulting, investment banking and operating management. The company has completed over 200 equity investments with aggregate transaction value in excess of $17 billion. It has invested in a wide range of industries, including IT, communications, healthcare, industrial/manufacturing, retail and financial services. The stage of investment in private companies has been wide from venture and expansion capital to growth capital for private and public companies. Bain Capital has engaged in MBOs and industry consolidations in mature industries.

The PE business is booming with a flood of cash into the private investment companies and record acquisitions. Wolf (2007Feb) comments that: "the barbarians are again at the gates." In February, KKR and TPF announced the largest buyout of a public company, TXU, one of the largest public utility companies in the United States. The analysis conflicts in opposing views, with defenders arguing that PE activities increase the efficiency of companies. There is criticism that PE companies merely manipulate finances of companies and strip their assets. Wolf (2007Feb) points out an obvious test: the growth of PE occurs because buyers and sellers are meeting each others' desires. The prosperity of PE signals that it is adding value.

There are several important considerations in the case against PE surveyed by Wolf (2007Feb). PE does not provide significant diversification relative to a portfolio of equities; it is less transparent; it has risks of high leverage; and the fees are quite high. The deduction of debt from taxes while dividends are taxed subsidizes LBOs. The agency problem may exist in PE transactions as managers make deals in their self-interest but not necessarily in the interest of shareholders.

There are arguments in defense of PE also surveyed by Wolf (2007Feb). PE consolidates management and shareholder, eliminating the conflict of interest of management promoting its self-interest and not those of the shareholders. There are numerous benefits in going private: avoidance of excessive regulation, expensive shareholder suits and quarterly reporting. Debt costs are also deductible from taxes in the case of private companies. The level of debt forces managers to focus on making the company efficient. However, there is a new conflict of interest between the limited partners investing in PE companies and the general partners that receive a management fee of 1.5–2 percent plus 20 percent contingent on profits. There is an incentive to go broke when the fund is having trouble.

Wolf (2007Feb) argues that the issues cannot be solved theoretically. The empirical evidence is mixed as in all economics.

Wolf (2007Feb) reaches three conclusions. PE investment is of such level of risk that should be considered only by sophisticated investors. There is still not sufficient knowledge on how PE improves the efficiency of companies. However, the process of capitalism is characterized by trial and error; there are costs of learning. There is a strong case for eliminating the biases in taxation for deducting debt relative to taxing dividends to equity. PE has become large and transparency may become an advantage.

One of the alleged advantages for PE is the end of the distinction between managers promoting their self-interest and shareholders. Executives would have clearly aligned incentives to perform in the best interests of the shareholders. Plender (2007) argues that PE suffers from a flawed alignment of the interests of general partners that run the company and the outside investors that provide the funds. The general partners earn a management fee of 1.5–2 percent plus 20 percent on profits. Plender (2007) argues that the growth in volume of PE should have caused a decline in the fees of general partners, which has not occurred. General partners continue to earn large fees even if they fail to provide the returns expected by investors.

The experience of the endowment of Yale University is seen by Plender (2007) as evidence on the principal agent problem in PE. The conclusion by the chief investment officer of Yale University is that the returns of investors or limited partners in PE are below market returns after deduction of fees. The general partners receive high rewards for returning below market returns at high risk. The performance fee of 20 percent of profit instead of value added separates the returns of the general and limited partners. There is an incentive for the general manager to place the investments of the limited partners at risk. Investors may experience disappointment arriving late in a crowded party. Even when PE performs well in improving operations of companies the limited partners do not receive a fair share of benefits.

One of the most successful financial companies, Goldman Sachs Group Inc., is planning a private equity fund with about $19 billion (Sender 2007). This is the largest sum raised by a Wall Street firm. The Goldman Sachs Capital Partners VI is designed to bring Goldman Sachs to the same level as the Blackstone Group and KKR that are in the process of closing funds of $20 billion each. The new fund is twice the current fund of Goldman of $8.5 billion, raised in 2005, and is ahead of the $15 billion of TGP and $10 billion of Bain Capital. Securities firms are following Goldman Sachs in using their own capital in trading and investment. The risks and returns are higher than in the traditional advisory role. Other investment banks such as Merrill Lynch, Morgan Stanley and Citigroup are venturing in this business.

There can be conflicts of interest by the PE activities of investment banks (Sender 2007). There can be competition with clients because the PE companies are clients of the investment banks. There can also be conflicts of interest in hostile bids for corporate customers. Sender (2007) argues that one-half of the resources in Goldman Sachs PE funds originate in its balance sheet or its staff while the rest

comes from wealthy clients and corporate pension funds. Investors in Goldman's funds realized a 42 percent gross internal rate of return in 2000–6, for 2.3 times the original investment. The intention of Goldman is to remain on the buy side, earning advisory fees as well as the capital gains from PE.

Investment in PE in the past 20 years has yielded 14 percent versus 9.7 percent for the S&P 500, according to TF. The performance of 20 years will continue to attract investors, according to Purcell (2007). The "friction costs" of PE can be high. They consist of a 2 percent fee on committed capital or about 4 percent on invested capital. There is a contingent fee of 20 percent of profits, which can be 5 percent if returns are 25 percent. There are additional fees of 2 percent for acquisition, disposal, company fees and legal fees. The total friction costs can be 11 percent per year. The high leverage in PE transactions in markets with low cost of debt can reduce the friction costs to about 5 percent per year.

There are costs in public companies, calculated by Purcell (2007). The brokerage fees or money and mutual fund fees amount to 1–2 percent. The friction costs can be higher than the 5 percent of PE because of hidden costs in more responsive boards and costs of compliance, litigation and the loss of management talent to private companies. Private company boards are chosen for their knowledge of increasing revenue, margins and profits and can have much better results. The public company board may not focus on maximizing value. There are high costs of compliance with securities laws by public companies, requiring expensive accountants, financial advisors, lawyers and systems engineers. Public companies are also the target of class action lawsuits because they are more likely to settle. The legal fight by private companies may deter frivolous lawsuits. Private companies may be more successful in providing the remuneration and freedom of decision required to attract the most talented managers.

Private companies can focus on internal rates of return (Purcell 2007). They also economize on capital, which is allocated to high-growth opportunities. This flexibility and agility of investment decisions is far more difficult in public companies with multiple constituencies of shareholders, employees, management, lender, union, politicians and regulators. Innovation is more likely to thrive in this agile environment of decisions. Purcell (2007) argues that PE is a capitalist response to a market that is not efficiently allocating capital.

The returns to investing in your own company relative to investing in a portfolio of publicly traded stocks constitute an important research issue analyzed by Moskowitz and Vissing-Jørgensen (2002). Households account for about 75 percent of private entrepreneurial holdings in the United States. There is also significant concentration as households maintain 70 percent of their holdings in a single company in which they have important management responsibilities. Moskowitz and Vissing-Jørgensen (2002, 752) provide data showing that the market value of private equity increased from $3.7 trillion in 1989 to $5.7 trillion in 1998 while public equity increased in the same period from $1.6 trillion to $7.3 trillion. The ratio of private to public equity declined from 2.32 in 1989 to 0.79 in 1998. The annual returns to private equity calculated by Moskowitz and Vissing-Jørgensen (2002, 756) are not very different from those

of public equity: 12.3 percent for private equity versus 11.0 percent for public equity in 1990–22, 17.0 percent in 1993–5 versus 14.6 percent and 22.2 percent in 1996–8 versus 24.7 percent. Diversification conceivably would provide higher returns than concentration of investment. The entrepreneurial activity with high concentration provides returns in the sample that are not very different from the diversified portfolio in publicly traded companies.

Initial public offerings

The IPOs are at the very center of the debate on whether the United States is losing its competitive advantage in finance. Fewer foreign companies are listing their IPOs in US exchanges and even US companies are choosing foreign exchanges to raise their initial public capital. IPOs constitute one of the best exit vehicles from their investments for PE and VCs in order to realize capital gains.[4]

The American Depositary Receipt (ADR) was introduced in 1927 during the bull market of the 1920s, just before the Great Depression, by J. P. Morgan (Schaub 2003, 1). The purpose of ADRs is to trade in foreign securities without the inconveniences of trading in foreign exchanges and converting into foreign currencies. The ADR is a receipt that trades in US equity markets. This receipt is backed by shares of the corresponding foreign stock that are deposited in a US custodian bank. The bank assigns a dollar value to the shares and groups them in bundles. The value of the receipt corresponds to the average share price before trading in the United States. The first issue of the equity of a company in the United States is considered by the NYSE as an IPO. ADRs that are backed by already issued stock of a foreign firm are considered as seasoned equity offerings (SEO).

The sample used by Schaub (2003) consists of 179 ADRs in the NYSE from January 1987 to May 1998. There are 129 IPOs and 50 SEOs. There are 89 ADRs from emerging markets and 90 from developed countries and 35 countries are represented in the sample. The results differ by short and long term measured as days after introduction and in yearly intervals up to 3 years, respectively. In early trading, the IPOs underperformed the index S&P 500; the IPOs outperformed the SEOs and the portfolio of developed markets outperformed that of emerging markets. In the long run, the ADR group outperformed the S&P 500, measured in 1, 2 and 3 year intervals. The IPO group outperformed the SEO group but then underperformed it in the 2 and 3 year intervals. In the long term, the SEO and IPO ADRs underperformed the S&P 500. In the long run, the emerging market group outperformed the developed market group but both underperformed the S&P 500. The portfolio of Latin America had the worst performance. Europe outperformed Latin America and the Asia Pacific group. The conclusion by Schaub (2003) is that ADRs are overpriced in US markets in both the short and long term. ADRs underperform in fashion similar to US domestic IPOs.

Foreign firms will issue their stock for the first time in the United States if the costs of issuing in the United States are equal or lower than in their country of origin, as argued by Bruner *et al*. (2004). In 1991–9, a total of 371 foreign companies issued their first stock in US IPOs with total volume of $45.6 billion (Bruner *et al*.

2004, 43). An important characteristic of the companies engaging in first-foreign US IPOs is their size relative to issues in their domestic market: $817 million in assets and $100 million in size of issue for first-foreign US IPOs compared with $77 million in assets and $41 million in issue size for firms choosing to list the IPO in their home markets. The first-foreign IPO issuers in the United States are larger firms of higher quality. There should be lower premiums for issuing in their home markets but not necessarily in the US equity markets. Another important characteristic is that 37 of first-foreign IPOs list in the NYSE.

First-foreign firm US IPOs face possible higher costs because of asymmetry of information. This is an important market friction discussed in Chapter 5. Investors know less about the issuing firm and its home country than is the case of the issuers. Thus, there could be a premium in the market price of the IPO because of the paucity of information. In this case, there would be important determinants of asymmetry of information such as geographic proximity, language, culture and industry structure, covered in literature surveyed by Bruner *et al*. (2004, 45). In the sample of Bruner *et al*. (2004, 47), 57 percent of the foreign-firm US IPOs originated in developed countries and 43 percent in emerging markets. The offers with cultural ties to the United States were 51.5 percent of the total and those with common language with the United States accounted for 33.7 percent of the total.

Market conditions constitute another important determinant of the cost of issue. Performance of the equity market in general and of the stock in particular is important in determining the issues in US equity markets. Bruner *et al*. (2004, 48) argue that the pattern may be different in cross-border issues. The benefits of portfolio diversification may be realized by investors when the US market is weaker than the home market of the foreign issuer. The weakening of the foreign currency relative to the US dollar may increase demand for US foreign stocks because of lower dollar costs of the investment. The empirical results of Bruner *et al*. (2004) suggest that foreign firm US IPOs occur under favorable conditions in foreign and US equity markets and benign foreign exchange markets. These conditions tend to reduce the perception of country risk.

The general conclusion of Bruner *et al*. (2004) is that foreign-firm first US IPOs have costs of issue equivalent to those of US firms. The costs include the underpricing of the issue together with the underwriting costs. The findings are robust to variables such as firm and issue size, developed or emerging market origin, time period, common cultural characteristics with the United States and other attributes. Although most issuers are located in countries with higher country risk than the United States, there is low premium in first-foreign US IPOs. The cost of issuing in the United States must be lower or equal to that in the home country for a company to issue in the United States. Bruner *et al*. (2004) argue that issuers of foreign-first US IPOs must have potential lower costs issuing in their home markets because they are the best firms in their home countries. The fact that these foreign-first US IPOs are the best in their home countries raises the issue of whether there are significant costs resulting from less familiarity by investors than with US firms. Less familiarity occurs in the form of less coverage by analysts and higher country risk. Other factors such as greater size, tangible assets, geographic

proximity, visible listing exchanges and issuance in multiple markets compensate for less familiarity. Issue costs of first-foreign US IPOs do not show costs higher than comparable domestic US IPOs. The data conform to the contention of selective entry. The best firms issue their first IPOs in the United States, compensating with their quality the higher risks originating in less information.

The conflict of interest hypothesis, which inspired the prohibition of underwriting of securities by commercial banks under the Glass-Steagall Act, postulates the existence of a conflict of interest on the part of commercial banks. This hypothesis and the empirical evidence disputing its validity are analyzed by Kroszner and Rajan (1997). The essence of the hypothesis is that banks promote the issue of securities by their nonperforming customers. Success in the issue of securities could allow the banks to exit companies that are not creditworthy, reducing their exposure to default risk. A competing approach is the "certification of value hypothesis" (Hebb and MacKinnon 2004, 69). Investment banks do not have as much information on some companies as their creditor commercial banks.

The previous relationship with a company enables commercial bank to provide more information about its operations than what may be publicly available. Investment banks may not search for that information because of its high cost. A commercial bank may certify the true value of a company with which it has had previous relationship because it has no incentives to reduce information collection costs. The issue of equity provides empirical evidence for the testing of the relative merits of these hypotheses. The capital structure of a company is altered by the issue of equity, creating higher value and reduction of the probability of default. The commercial bank could benefit if the risk spread of debt securities were to respond positively to an enhanced capital structure. Hebb and MacKinnon (2004) find significantly higher uncertainty in an IPO when the lead underwriter is a commercial bank. This supports the possibility of perception by markets of a conflict of interest when commercial banks are lead underwriters of IPOs.

The revolution in technology combined with the outsourcing of various parts of the production chain resulted in an increase in the optimum size of firms in fragmented markets. Brown *et al*. (2005) find three forms for consolidation of companies to achieve optimum size in these industries. Larger firms in the industry could acquire smaller ones to reach optimum size but there have to be such large firms with sufficient resources to engage in the required acquisitions. Consolidation could also occur with funding by private investors but there is the hurdle of the availability of sufficient resources.

The third alternative is the roll-up IPOs (roll-ups) that flourished in the United States in the second half of the 1990s. The roll-ups consist of the simultaneous public offering of several firms within a shell company designed for that purpose. It circumvents the problems of lack of funds in the form of large firms or private investors. The roll-up IPO provides the shell company with liquid shares and cash to acquire the merged companies. The resources obtained in the process of roll-up can be used in further consolidation to acquire more companies. Significant growth can be attained in a relatively short period. Brown *et al*. (2005) researched 47 roll-ups in 1994–8. The returns on stock prices of these companies were poor.

However, they find that there were differences in returns. The critical element of success was retaining the original founders of the companies. The lesson from this experience is that adequate initial governance is important for success of consolidation.

There are three options for a private firm: remaining private, going public via an IPO and being the target of a takeover by a public firm. Brau *et al*. (2003) consider the factors that influence the decision of going public via an IPO or being acquired in a takeover by means of a sample of 9500 privately held firms. Table 3.5 shows the factors that determine the IPO versus the takeover. Liquidity and ownership by insiders are two critical internal factors. There is greater likelihood that the IPO road is followed by firms in which insiders retain significant interest in the firm. If insiders desire cash, it is more likely that the firm will be in a takeover. The larger firms are more likely to follow the IPO route. The ratio of market to book value is associated with takeover. Insiders in takeovers receive a premium that is only 78 percent of the payoff in IPOs. The higher liquidity desired by insiders explains the acceptance of this 22 percent discount.

VCs provide capital to companies that do not have cash flows to pay interests and dividends. VCs face two types of risks in their financing of companies, liquidity and technology risks (Cumming *et al*. 2005). VCs invest for periods of 2–7 years with the objective of recovering their investment and receiving an adequate return. The exit out of investment by VCs is the IPO market. The returns to investment must be high because of the liquidity risk of the IPO market: exit may have to be delayed if there is no demand for IPOs. Liquidity follows the general behavior of the stock market. There is an additional technology risk, which consists of the feasibility and actual return of the projects of the company financed by VCs. These risks vary by the stage of the company. Cumming *et al*. (2005) consider an early stage that requires seed capital, start-up resources, early R&D and various types of equity. In the second stage, the company engages in expansion. The later stage includes bridge loans, open market purchase and private investment in a public company. The technology risk is higher in the early stage when the success is less certain than in the later stage.

An intuitive view is that there would be more investment by VCs in the early stage when the stock market is booming and there is high demand for

Table 3.5 Factors of IPO and takeover

IPO	**Takeover**
Industry concentration	High market to book value
High tech activity	Financial services
Booming IPO market	High debt
Cost of debt	Liquidity for insiders
Insider interest	
Firm size	

Source: Brau *et al*. (2003).

IPOs. Cumming *et al*. (2005) provide a counterintuitive model with different predictions. VCs would invest in later stage companies when markets are liquid in order to capture quick returns via exit in IPOs. In these liquid markets, VCs would show lower propensity to share their investments via syndications because the risks of exit are lower. When markets are illiquid, VCs would invest less and concentrate their investments in early stage projects. In these illiquid markets, VCs would have higher propensity to share their investments, diversifying risk via syndications. Cumming *et al*. (2005) find support for these propositions on the basis of random sampling of a large sample of investments in 1985–2004.

Equity market liberalizations and IPOs share in common the widening of participation by new classes of investors (Martell and Stulz 2003). Equity market liberalizations in emerging markets attract foreign investors and IPOs attract the general public. The difference is that equity market liberalizations do not have the underpricing and underwriting effects of IPOs because the shares in liberalizations are already trading. Nevertheless, the liberalization creates the opportunity for offerings that would not occur without it. The main benefit of equity market liberalizations is that the widening of the shareholder base increases the prices of the stock of companies. The dividend yield is a proxy for the cost of capital and its decline during liberalizations.

The returns to investors from liberalization are significantly high. Martell and Stulz (2003, 98) calculate the returns of stocks of emerging markets in excess of the risk-free interest rate for 11 years around liberalizations, 5 years before and 5 years after liberalization. The average return above the risk-free rate is 491–546 percent depending on the choice of liberalization dates. The returns are below the risk-free rate in the last 2 years after liberalization. There is a similar pattern of returns across countries. The early high returns are followed by price declines in both stock market liberalizations and IPOs.

A private firm goes public in pursuit of cash, external finance for further growth or equity in the capital structure. Martell and Stulz (2003, 99) argue that firms in emerging market liberalization pursue similar objectives. Firms in emerging markets typically have a controlling group that owns a majority of shares. There must be benefits for the controlling groups to seek market liberalization. Martell and Stulz (2003, 100) find three possible benefits. IPOs constitute an exit for owners of the private firm going public, which may be also a motive for controlling groups in firms of emerging markets. Liberalization also provides an opportunity to raise capital. Listing in US markets permits the firm to increase its capital base in exchange for the protection of minority shareholders. True benefits for controlling groups are realized if the funding opportunities for growth in the domestic market have been exhausted. However, this situation must occur in an environment of high perception of soundness of country risk. Consolidation of gains from equity market liberalization requires adequate governance and protection of investor rights to prevent reversals of equity prices.

The conventional analysis of IPOs argues that they are underpriced at issuance, increasing sharply initially and then providing low long-term returns. The vast traditional literature explains the underpricing of IPOs and their high initial price

increases in terms of compensation for risk or the cost of information. IPO first-day returns in recent decades have averaged 10–15 percent (Purnanandam and Swaminathan 2004). Underpricing in these theoretical models measures fair price as that prevailing in the first day. Other explanations argue that the investment banker and the owners of the private company price the IPO below what they estimate to be the price given the potential demand for the new issue.

The approach of Purnanandam and Swaminathan (2004) is to estimate the price of IPOs relative to a calculation of fair value. They use various price multiples – the price to EBITDA (earnings before interest, taxes, depreciation and amortization), price relative to sales and price relative to earnings – of the industry peers that are not IPOs. This estimate of fair value (V) is compared with the offer price (P) of the IPOs. The sample consists of 2288 relatively large IPOs in 1980–97. Relative to the industry peers that are not IPOs, the median IPO is overvalued by 14–50 percent depending on the matching criteria used. The lowest overvaluations of 14 percent occur with the matching criterion of analyst growth evaluations. The conclusion is that investors may place excessive emphasis on optimism of growth and not sufficient consideration of profitability in their valuation of IPOs.

The results are inconsistent with the view that IPOs are underpriced relative to fair value but are consistent with the view that IPOs tend to underperform in the long term. Cross-section tests of portfolios show a statistically and economically significant positive relation of the price to fair value ratios (P/V) and first-day returns but a negative association with long-term returns. Overvalued IPOs provide 5–7 percent higher returns on the first day but 20–30 percent lower returns in the long term. Information asymmetries would suggest that undervalued IPOs would provide the highest 1-day returns, which is not the case. The IPOs that are overvalued have lower current profitability coinciding with higher growth prospects; the undervalued IPOs have higher current profitability but lower long-term growth prospects. The overvalued IPOs do not realize their long-term growth prospects at issuance.

There appear to be benefits of the involvement of VCs in IPOs, according to empirical research by Bouresli (2002) using a sample of IPOs in 1995–8. There are more independent, outside and VC directors in the board of IPOs with support of VCs and less insiders and affiliated directors. In addition, CEOs have less ownership of IPOs firms when there is support of VCs. Governance is enhanced by the participation of VCs. The more independent governance resulting from involvement of VCs strengthens the performance of the IPOs. VCs provide essential professional monitoring.

Summary

There has recently been much discussion on the management of regulation and its actual costs and benefits. The FSA appears to have developed an interesting approach focused on objectives and based on standards instead of on rules. A unified regulator that does not engage in high-profile prosecution may be more effective. Prosecution with high press exposure does not deter dishonesty but the

few recent cases have shown major losses in market value of large companies, which affect the public that invests in the companies. The risk-based approach of the FSA is less intrusive in the operation of business and its allocation of resources. Chapter 4 of Volume II contains recent analysis and proposals to change the nature and intensity of regulation to prevent the loss of competitiveness in finance of the United States.

The Delaware courts have created an adequate system of governance for the conflicts of interest resulting from MBOs. The system is sound and adapts to circumstances. Shareholder rights are protected in M&As. Agency problems may not be as dramatic as alleged or otherwise publicly traded companies would not have high long-term returns.

HFs are indirectly regulated through their borrowing from prime brokers and banks. There is not an appealing argument for regulation of HFs to protect sophisticated investors from taking risk. Alleged systemic effects of LTCM and HFs seem to have been vastly exaggerated.

Technology and globalization constantly change the optimum size of companies and the most efficient organization of the production chain. PE and VCs provide vehicles to restructure companies and industries, allowing the efficient allocation of resources. Regulation must accommodate innovation while maintaining fairness.

4
Risk Management, World Trade, Foreign Investment and Finance

Introduction

The creativity of finance professionals in developing and marketing new products is moving far ahead of the technical capacity to measure their risks and rewards. Risk management is still a challenge to most financial institutions, supervisors and regulators.

Separate sections below provide analysis of risk management, the standard of the financial industry VaR, credit risk models and stress tests. The following sections introduce the dimensions of world trade, FDI and financial markets, providing essential background for discussion of the analytical and empirical issues of international economic and financial policy in subsequent chapters. Some conclusions are summarized at the end of the chapter.

Risk management

The measurement of risk is a highly technical process that requires specialized professionals with practitioner experience. It may require consulting with commercial vendors and academics when problems become difficult to resolve internally.

Risk measurement alone does not ensure an effective risk management process, according to Laubsch and Ulmer (1999). The characteristics of effective risk management are shown in Table 4.1. The first-class standards such as Basel II require the involvement and accountability of senior management and the board of companies for the risk management process and its inputs. This requirement is important because some of the measurements of risk management may reveal the impairment of the capital position of the company under certain portfolio strategies. The company's survival is threatened by the erosion of its capital.

The ideal company of some size must have a dedicated risk management group. The manager of this group should be a member of senior management. The risk management group and its decisions must be entirely independent of risk-taking and trading units. This independence ensures the integrity of the process and its credibility. It is similar to the separation of accounting from the profit centers. The group must be capable of finding the information on exposures required

Table 4.1 Characteristics of effective risk management

Accountability of senior management and the board for risk management
Dedicated independent risk management group
Independent of risk-taking centers
Capable of obtaining required information through the organization
Reporting to senior management
Clarity of risk policies
Approval of policies by senior management and board
Internal code of policies in widely available and updated documents
External evaluation of risk policies and technical expertise
Management discipline
Accountability of risk-taking units to senior management and the board
Incentives for following risk policies and procedures
Internal risk transparency
Explicit communication of risk exposures by risk-taking units
Market experience and knowledge
Taking and reviewing of decisions by experienced market professionals
Assessment of risk reports by experienced professionals

Source: Laubsch and Ulmer (1999).

for measurement of risk. It should report directly to senior management while maintaining the process of gathering reliable information with risk-taking units.

The company determines risk policies that are clear in meaning and implementation. The senior management and board should approve these policies. There should be wide dissemination of the policies in internal documents that are widely available and frequently updated.

The risk process should have its code of conduct and discipline. The senior management and the board are accountable for discipline because of the potential impact on capital of careless risk decisions. Managers should have incentives for following risk policies and procedures.

There is no substitute for the market experience and knowledge of professionals in the company. The management of risk requires decisions that cannot be based alone on risk measurements. The ideal combination of risk and return for the company must be evaluated by professionals with significant market experience.

Value at risk

This section provides an analysis of the standard for fixed-income risk measurement. VaR measures maximum expected loss in a target horizon for a desired level of confidence (Jorion 2006, Gibson 2001, Gibson and Pritsker 2000, Holton 2003, Mina and Xiao 2001). Calculation of VaR requires a probability distribution of future profit and loss scenarios of financial assets in the portfolio. A pricing function calculates profits and loss of the instruments. A VaR of 99 percent is the loss corresponding to say, 1 percent, in the left tail of the distribution of profit and

loss scenarios, measured in a fixed time horizon. Generally, banks announce maximum loss, VaR, as, for example, $100 million per day with 99 percent probability. That is, the bank expects the loss to exceed $100 million only in 1 percent of possible occurrences.

VaR considers "risk factors," or financial variables, in particular, equities, foreign exchange rates, commodity prices and interest rates. The method requires generating future scenarios of profit and loss of portfolios combining financial instruments that are sensitive to risk factors. A classic approach by RiskMetrics™ assumes that logarithmic returns of risk factors, standardized by a measure of volatility, are independent across time and normally distributed (Mina and Xiao 2001). That is, one-day returns of risk factors conditioned on the current level of volatility are independent across time and normally distributed. In addition, exponentially weighted moving averages of past returns provide the best method of estimating volatilities of risk factors. The process follows a geometric random walk with a drift or expected return, μ, and a volatility, σ. There is an explicit assumption that the return is zero, equivalently, $\mu = {}^1\!/_2\sigma^2$. The approach can consider any number of risk factors, using a covariance matrix of correlations among factors.

The VaR method uses several approaches. Delta-normal methods consist of a set of return measurements using first derivatives, delta, under assumption of the normal distribution. A basic assumption in this method is that a linear equation can approximate pricing functions of every instrument. Historical data or values implicit in option pricing formulas provide the input for calculation of parameters. The first derivative of the financial instrument measures sensitivity. The delta-normal method has an important advantage that the profit and loss of individual positions add to the total profit and loss of the portfolio.

One example is to adjust positions in options by delta, the first derivative of option price relative to the underlying instrument or by the first derivative relative to time to expiration, time decay. Option pricing formulas assume lognormal distribution of stock prices. There are several deficiencies. First derivatives localize effects in very small intervals. Thus, first derivatives do not capture major risks resulting from jumps of variables, such as the behavior of interest and exchange rates during stress. In addition, distributions of financial assets in reality show fat tails, kurtosis and other peculiarities not captured by normal distributions. Moreover, nonlinearities characterize many financial risks. The major advantage of delta-normal methods consists of the simplicity of aggregation of normally distributed returns with straightforward calculation of risks. However, delta-normal methods may not capture important risks.

The method of "Greek Letters" uses second derivatives of option prices to calculate risk. The Amendment of the Capital Accord to Incorporate Market Risk (BCBS 1996a, b) uses a truncated Taylor series expansion of option prices:

$$dC = \Delta dP + {}^1\!/_2\Gamma dP^2 + \Lambda d\sigma \tag{4.1}$$

where C is the option price; Δ, delta, the first derivative of option price relative to the underlying; P, price of the underlying; Γ, gamma, the second derivative

of option price relative to the underlying; Λ, vega, the first derivative of option price relative to σ, volatility (standard deviation) of the underlying. The Greek Letters method captures behavior of non-linear processes. However, computation becomes complex for positions with numerous risk factors.

The method of Historical Simulations uses historical series of prices or returns of financial assets to calculate returns. The method uses these returns to calculate profit and loss scenarios with which to generate probability distributions. Suppose there are 1000 profit and loss scenarios. The 95 percent VaR would be the lowest fifth percentile of the losses. In the case of 1000 scenarios, it would be the highest 50 losses. In words, VaR would be the maximum loss of the portfolio 95 percent of the time. It circumvents many problems such as non-linearity, fat tails, assumptions on the stochastic structure of markets and errors of models. However, historical market data do not provide satisfactory results in measuring financial risk. History does not project the future precisely, especially extreme events. Short series are insufficient but long series include periods that are no longer relevant. Similarly, econometric relations may be valid for some periods but not for others. Structural change of relations among variables characterizes financial markets.

Option pricing uses the Monte Carlo method to calculate prices of instruments with embedded options such as mortgages. Correlations and volatilities obtained from historical data or implicit in prices such as options provide the input for estimates of parameters. A stochastic process generates prices or rates of financial variables for every interval in the future with a corresponding probability of occurrence. Price formulas measure position values, calculate returns and generate a distribution of returns with which to measure VaR. Monte Carlo methods encompass numerous types of risk, including: non-linear, volatility, model, volatility changes, fat tails and extreme scenarios. However, in addition to high cost, the stochastic model is arbitrary as well as the price formulas for options and mortgages. All methods have deficiencies. Thus, other tests of sensitivity considered below complement VaR.

VaR provides synthetic information for market risk of the entire bank, trading activities and traders (Mina and Xiao 2001, 89–99). Marginal VaR is the difference of VaR with a specific position less VaR without that position. It permits the calculation of what happens to risk by adding a position or group of positions. Incremental VaR measures changes in risk by adding a small portion of a position. Expected shortfall is a measure of losses on average when they exceed VaR. A risk report could list VaR at a confidence level and expected shortfall for parametric, Monte Carlo and historical methods. Assuming the normal distribution, parametric methods are suitable for linear relations and Monte Carlo methods for non-linear relations. For non-normal distributions, historical methods are best for either linear or non-linear relations. It may be convenient to report internally VaR by business unit and counterparty. A corporate level VaR report can provide VaR for business units and risk factors (FX, interest rates, equities and commodities). In fixed-income trading units, it is possible to report VaR by maturity and traders.

VaR models are adequate for ordinary times, that is, those periods in which there are no large jumps in financial variables. Event risk is merely another name

for jumps in financial variables. An earnings surprise or the announcements of default are examples of event or jump risk. Gibson (2001) argues that the simplifying assumptions in VaR models prevent them from capturing event risk. This feature of VaR models is recognized by banking supervisors in the special treatment for specific risk, or the component of VaR that is not modeled by market shocks. Specific risk includes idiosyncratic risk, which consists of price variation uncorrelated with market-wide shocks, and event risk. There is a regulatory capital charge of specific risk in market risk (Gibson 2001):

$$3 \times \text{VaR from market wide shocks} + 4 \times \text{specific risk VaR}$$

Specific risk has a higher multiple because VaR models do not consider event risk. The supervisor can reduce the multiplier to 3 if the VaR model incorporates event risk.

The Risk Management Group (RMG) developed a new methodology, RM2006, to deal with various issues and improvements in techniques and data (Zumbach 2007a, b). Two critical problems with simpler VaR models are the time-varying volatility and fat tails (Gibson 2001, Zumbach 2007a, b). Volatility tends to cluster in periods, that is, there are wide fluctuations in financial prices in a brief time period. The clusters of high and low volatility provide information that is useful in modeling financial prices. In addition, volatility is correlated over time, providing another source of information.

Zumbach (2007a, b) provides a sample of the annualized daily returns for the UK stock index FTSE 100 in 1988–2006. The mean annualized average volatility for the data is 15 percent. However, the sample contains returns with absolute values exceeding 45 percent, 60 percent and even 75 percent, corresponding to multiples of 3, 4 and 5 of mean average volatility. Financial data are characterized by distributions with fat tails, that is, with abnormally high increases or decreases of prices. The probability of occurrence of these events is low. Once it occurs the event becomes a fact with strong impact on the capital of the institution. Volatility is not constant but changes over time. Another concern that led the RMG to the new standards is the need to evaluate risks for horizons up to a year for institutions such as life insurance firms and pension funds as well as for purposes of strategic management. An important constraint is to maintain the simplicity of the approach, which is a determinant of its wide use. Risk is the measurement of the probability of very high negative returns in the future. The new models of risk measurement provide more information on this type of risk.

Credit risk models

Professors Duffie and Singleton (2003) denominate default mode (DM) credit models as *reduced form models*, following the convention in academic and industry research. According to Finger (2002), reduced form models obtain default probabilities with information from actual credit prices. The concern is not to explain the causes of default likelihood but rather how markets assess individual credits. The usefulness of these models is in comparison of different instruments of credit

risk. Reduced form models do not intend to explain why default occurs. In fact, the arrival of default is a "surprise." However, the models rank risks across different types of credit risk.

The simplest case of reduced form models considers default as the first arrival time, τ, of a Poisson process (Billingsley 1995, Karlin and Taylor 1981). The mean arrival rate, λ, or *intensity*, is constant. The expected time to default is $1/\lambda$ and the survival probability for t years, $p(t)$, is $e^{-\lambda t}$. Thus, time to default is exponentially distributed. There are various academic and industry-tractable models of default intensity, surveyed by Duffie and Singleton (2003).

Duffie and Singleton (2003) denominate mark to market (MTM) credit models as *structural models*. These structural models of credit risk relate the creditworthiness of a firm to its current assets and their evolution over time (Finger and Stamicar 2005). The models calculate the probability of decline of the value of the assets below the liabilities, over a specified time period, using the level of assets, the volatility of assets and the level of liabilities. The value of the equity of the firm is the value of the assets less the liabilities. The models establish a relationship between the equity and credit markets where the path of the firm's assets determines the firm's equity and credit. Information in equity markets is more transparent and liquid allowing measurement and analysis of credit markets.

Two classes of successful structural industry models by Moody's MKMV and RiskMetrics are considered below after some required background. The departing premise of structural models is the seminal contribution by Fisher Black and Myron Scholes (1973) and Robert Merton (1974). Default at time T occurs when the value of the assets, $A(T)$, is below the value of the firm's debt, D, or $A(T) \leq D$. The market value of the firm's assets follows a log-normal diffusion process, Duffie and Singleton (2003). Thus, the firm's equity is a call option on the total assets, A, with strike value at the firm's debt, D. The Black–Scholes formula can be used to obtain the value of the firm's debt by deducting the option price from the initial asset value.

The log-normal diffusion process of the asset value follows (Duffie and Singleton 2003):

$$\frac{\mathrm{d}A_t}{A} = (\mu^{\mathrm{a}} - \gamma)\mathrm{d}t + \sigma^{\mathrm{a}}\mathrm{d}B_t \tag{4.2}$$

where μ^{a} is the mean rate of return on assets, γ is the proportional cash payout rate, σ^a is the asset volatility and B is a standard Brownian motion (see Billingsley 1995). There are also first passage models in which default is triggered when assets cross a default barrier (Duffie and Singleton 2003).

Survival probabilities measure the likelihood of no default in a given time period. Default probabilities consist of one less survival probabilities.

Cox and Ross (1976) rely on the basic principle of arbitrage that two portfolios with the same payoff must have the same current price. The Black–Scholes riskless hedge is preference free. That is, the instantaneous drift of the security's diffusion process is not a determining variable. Actually, the only determining parameters are the riskless rate and the instantaneous volatility of the underlying's diffusion.

Since the existence of the riskless hedge is independent of preferences, valuation can be made under the assumption of risk neutrality. In such a world, both the option and the underlying yield exactly the riskless interest rate, *r*. Specifically, the conditional expectation of underlying returns is as follows:

$$E[S_T/S_t|S_t] = e^{r(T-t)} \tag{4.3}$$

where *S* is the underlying, *T* is the index of continuous time at maturity and *t* is the current time.

Let *h(S)* be the boundary value at maturity, $max\{S_T - K, 0\}$ in the case of a call, *K* being the exercise price, or $max\{K - S_T, 0\}$ in the case of a put, and $W(S_t, t)$ the current price of the option. Then,

$$E[W(S_T, T)/W_t|S_t] = 1/W(E[h(S_T|S_t]) = e^{r(T-t)} \tag{4.4}$$

or

$$W(S, t) = e^{-r(T-t)}E[h(S_T)|S_t] \tag{4.5}$$

The expectation is with respect to the risk-neutral probability distribution of the stock price at time *T* given the stock price at time *t*.

A basic property of a price system should be the lack of arbitrage opportunities, or lack of "creating something from nothing." If there were arbitrage opportunities, investors would demand unlimited amounts of the arbitrage strategies and markets would not clear. An arbitrage opportunity is defined as a non-positive initial portfolio value, a certain non-negative terminal value and a positive terminal value with positive probability. That is, an arbitrage opportunity consists of:

$$V(0) \leq 0 \qquad Q\text{-}a.s. \tag{4.6}$$

$$W[V(T) \geq 0] = 1 \tag{4.7}$$

and

$$Q[V(T)] > 0 \tag{4.8}$$

where *V* is portfolio value and *Q* is a probability measure representing the common probability belief of all economic agents.

The fundamental theorem of Harrison and Kreps (1979) postulates that there are no arbitrage opportunities in simple strategies in a security price system if and only if there is an equivalent martingale measure Q^*. Simple strategies are those that require trading only at a finite number of times. The restriction to simple strategies is designed to eliminate doubling strategies, as in Harrison and Kreps (1979, 400), which, as in roulette, could eventually result in winning if repeated an infinite number of times. This can occur even if the time interval is small because of the assumption of continuous trading. The continuous rebalancing of the Black and Scholes (1973) riskless hedge is not a simple strategy.

More general strategies are arbitrage free if a non-negative wealth constraint is imposed (Dybvig and Huang 1988). Margin requirements (Heath and Jarrow 1987)

and an integrability condition (Harrison and Pliska 1981) also serve the same purpose.

In pricing, the intensity of reduced form models, λ, becomes a risk-neutral intensity, λ^* (Duffie and Singleton 2003). The Brownian motion of the log-normal diffusion process of asset value, B, becomes a risk-neutral Brownian motion, B^*.

Crosbi and Bohn (2003) provide the essence of the proprietary successful model of Moody's MKMV to measure expected default frequency (EDF). Default risk is the uncertainty that a firm may not be able to service its debt and obligations. It is not possible to differentiate ex-ante firms that will default from those that will not default. However, it is possible to make evaluations of the probability of default. Firms borrow with a spread over the default-free rate of interest to compensate lenders for the possibility of default.

There are three types of risks in a position on a single security. The default probability is the probability that the borrower or counterparty will not service its obligations. Loss given default is the proportionate loss in case the borrower or counterparty defaults. Migration risk measures the probability and change in value resulting from changes in default probability. There are two risks in a portfolio of securities. Default correlations measure the relation among the default risks of borrowers and counterparties. Exposure risk is the portion of the portfolio subject to risk of default by each borrower or counterparty.

There are three determinants of the probability of default. The market value of assets is an approximation of the future cash flows of the firm discounted by an appropriate discount rate. Asset risk measures the risk of the firm and its industry. Leverage measures what the firm must repay calculated by the book value of liabilities relative to the market value of assets. However, many firms continue to service their debts even after the book value of liabilities exceeds the market value of assets. Part of the reason is that some liabilities are of long terms. The default point is somewhere between long-term liabilities and current liabilities. The appropriate net worth of a firm equals the market value of assets less the default point. A firm defaults when its market net worth is zero.

Differences in default probabilities arise partly from differences in asset risk. For example, a high technology company shows substantially higher volatility of market asset value than a consumer goods company. Thus, the high technology company shows higher default probability than the consumer goods company.

Distance-to-default combines asset value, business risk and leverage into one measure of default risk. It relates market net worth to the size of one standard deviation in the movement of asset value:

$$\text{Distance to Default} = \frac{[(\text{Market Value of Assets}) - (\text{Default point})]}{[\text{Market Value of Assets}]^*[\text{Asset Volatility}]}$$

Distance to default provides the number of standard deviations of a firm's market value of net worth away from default. In the denominator, it combines three important credit determinants of the firm: assets, business/industry risk and leverage. The denominator incorporates effects of industry, geography and firm size implicit in asset value and volatility. The distribution of asset values or the default

rate for a specific distance-to-default would permit computation of the default probability.

MKMV departs from the principle that market prices and financial statements are relatively efficient. That is, it is very difficult to beat the market consistently. Thus, their model uses market prices to determine default risk. Vasicek and Kealhofer developed a model to conceptualize and estimate the default probability. This model assumes that the firm's equity is a perpetual option. The firm defaults when asset value reaches the default point. MKMV uses a default data base to estimate an empirical distribution that maps the distance-to-default to a default probability.

MKMV uses the Vasicek–Kealhofer proprietary model to compute EDF, which is the probability of default during the next year or years. EDF uses equity prices and financial statements as inputs. Default is failure to service any scheduled payments, interest or principal. Calculations of EDF for 5 years provide a term structure of EDF.

There are three steps in the calculation of EDF. First, market value and volatility of equity together with book value of liabilities provide estimates of asset value and volatility. Second, asset value, asset volatility and book value of liabilities furnish the distance-to-default. Third, distance-to-default and the default rate for specific levels of distance-to-default permit direct calculation of default probability.

The model departs from the postulate that equity is a call option on the underlying assets of the firm. Thus, the market value and volatility of assets can be measured using an option pricing approach. Consider a very simple case of only one type of assets and one type of liabilities. Because of limited liability, equity holders have the right, but not the obligation, to pay off the creditors and assume control of the remaining assets of the firm. In this simple case, equity is equivalent to a call option on the firm's assets with strike price equal to the book value of the firm's liabilities.

The approach obtains asset value and asset volatility from option-implied values. In the simple case, there are two equations with two unknowns, asset value and asset liability:

$$\text{Equity Value} = \text{Option Function (Asset Value, Asset Volatility, Capital Structure, Interest Rate)}$$

$$\text{Equity Volatility} = \text{Option Function (Asset Value, Asset Volatility, Capital Structure, Interest Rate)}$$

There are four critical determinants of default probability of a firm over a horizon, H, current asset value, distribution of asset values at time H, volatility of future asset values at time H and the level of the default point or book value of liabilities. Two other determinants are the expected rate of growth in the asset value over the horizon and the length of the horizon, H. The analyst determines H.

The default probability, EDF, would be simply the tail in the future distribution of asset values at and below the default point. This distribution is very difficult to measure. MKMV first measures the number of standard deviations of asset

value away from default. It then uses empirical data to compute the corresponding default probability. The data base of MKMV contains 250,000 company-years of data and more than 4700 cases of default or bankruptcy. These data provide a frequency table with which to map distance-to-default to probability of default.

A method to test EDF models is the power curve showing the tradeoff between defaulting firms to the proportion of firms excluded. The model is more powerful if it excludes proportionately more defaulting companies for a given percent of firm population excluded. At the extreme, if 100 percent of the firms are excluded there is no lending to defaulting firms. The power consists of excluding the highest percentage of defaulting companies for a given percent of excluded companies.

Gupton and Stein (2005) explain how Moody's KMV developed LossCalc™ to predict loss given default (LGD). The set of data includes 3026 recovery observations of loans, bonds and preferred stock 1981–2004, with 1424 defaults of public and private firms. An error in LGD, 1 – recovery rate, is as damaging as an error in EDF. Accurate estimates of LGD improve allocation of economic and regulatory capital.

LossCalc conforms to Basel II requirements that LGD reflect cyclical variability and historical recovery. It includes time-varying factors and uses histories that are longer than the 7 years required by Basel II. LossCalc uses two time horizons, immediate, for use in applications under 1 year, and 1 year, for applications of 1 year or more.

LossCalc uses nine explanatory factors, with low colinearity, to predict LGD:

- *Collateral and backing*: cash, assets and support from subsidiaries;
- *Debt type*: loan, bond, preferred and so on;
- *Three types of firm status*: leverage adjusted for credit cycle; relative seniority; firm-specific Moody's KMV distance-to-default;
- *Two industry factors*: historical averages of industry recoveries; distance-to-default across many companies aggregated at the industry and regional level;
- *Macroeconomy/geography*: regional flags; distance-to-default for many firms aggregated at the regional and industry level.

The MKMV distance-to-default public-firm model calculates the market value of the firm's assets and compares it with the book value of its liabilities. Information of equity markets and the firm's market value of assets provide signals of the market's evaluation of the future of the firm.

LossCalc transforms predictive factors into univariate factors. For example, leverage is more important to losses during contractions. LossCalc relates leverage to global corporate default rates. It aggregates transformed variables using multivariate regression techniques and maps the model output to historical LGD.

The recovery rate is measured as market value 1 month after default provided by bid market quotes. The rationale for this 1 month approach is to observe recovery after the market can evaluate post-default corporate information. A longer time period could result in quotes that are too thin but provides time for investors

to dispose recently defaulted debt. The approach avoids difficulties of assessing post-default cash flows and valuing instruments that replace the debt.

Economic or risk-neutral methods observe LGD by means of post-default debt prices or infer LGD from equity and debt prices. The method of *implied loss given default* estimates the default likelihood of the firm to select the LGD that best depicts the market price of the debt relative to model valuation. In liquid markets, it is possible to observe the *market value of LGD*. Many investors trade out of defaulted securities in approximately 1 month after default. Investors specialize in defaulted debt price according to expected recovery. LossCalc uses post-default market valuation to measure the recovery ratio. However, recoveries are not normally distributed. LossCalc uses a beta distribution to convert recoveries to a normal distribution.

The final output of LossCalc consists of a conditional estimate of prediction intervals (PI), showing a range where the actual value should fall in a specific percentage of the time. These PIs can be used in a Credit-VaR model. The range of PIs indicates the uncertainty of the recovery rate process and the ability to realize the mean of the prediction. The precision of the mean recovery forecast can be measured. Thus, a 90 percent PI shows upper and lower bounds where the realized value will fall 90 percent of the time. In other words, the realized value will fall outside PI only 10 percent of the time.

Bank data do not include loans past due 90 days that are restructured or "cured." MKVM finds that cured rates in banks range between 20 and 50 percent. LossCalc assumes a 100 percent recovery rate on the cured part of debts and applies the forecast of LGD to the remaining part, or one less cured rate. The net effect is:

$$\text{Aligned Recovery} = (\text{cure rate} \times 100\%) + (1 - \text{cure rate}) \times \text{LossCalc Recovery Forecast}$$

The objectives of model validation are to evaluate overall model performance, fit, reliability and robustness over time and credit cycles. LossCalc validates its model through the method of walk forward. It fits a model to a one-time period and tests in a subsequent one from the past to the present. Thus, LossCalc does not test with data used to fit the model and validates over time and cycles. LossCalc provides lower mean squared errors of predicted and actual values than historical averages and tables of averages and higher correlations over two horizon periods, 1991–2001 and 1993–2004, for immediate and 1-year models.

The "power" of a model is its ability to rank higher-than-average losses versus lower-than-average losses. In practice, the power of a model consists in deviations from predicted and actual higher-than-average losses. Tests show that LossCalc is more powerful than tables of averages for both immediate and 1-year models.

An analysis of the CreditGrades™ model of the RMG requires background on credit derivatives, the credit default swap (CDS) and collateralized credit obligations (CDO). In a CDS, a *buyer* of protection pays a periodic fee to a *seller* in exchange for a payment in case of a *credit event* of a *referenced credit*. Some types of credit events include bankruptcy, merger, cross-acceleration, cross-default,

downgrade, failure to pay, repudiation, restructuring and currency inconvertibility. Referenced credits could include a named issuer, a corporation, a private borrower and a sovereign. The buyer pays a periodic annuity (A) to the seller. In case of a credit event, such as default, the seller pays typically the face value less the market value at default.

Duffie and Singleton (2003) identify two pricing problems. First, there is need of a price at origination, which consists of choosing A such that the market value of the CDS is zero. Second, the CDS changes value after origination because of movements of interest rates and credit quality, causing the need to find a MTM price.

The pricing of CDS spreads requires various assumptions. One method prices spreads by means of arbitrage relative to a synthetic default swap, which consists of a long position in a default-free floater and a short position in a defaultable floater (Duffie and Singleton 2003). The synthetic default swap consists of shorting the underlying par note issued by the referenced credit for say, 100, and investing the 100 in a par default-free note, held to default time, τ, or maturity of CDS, T. The coupon on the defaultable floater equals the coupon on the default-free note plus a spread, which on subtraction of the coupon on the default-free note provides the spread. Duffie and Singleton (2003) add a repo special and other transaction costs to obtain the all-inclusive par spread. Other methods could price directly by using an intensity model.

The Joint Forum of BCBS, IOSCO and IAIS (2004) issued an important document on credit risk transfer. A *traditional CDO* consists of a portfolio of credit exposures, segmented into tranches and transferred to an investor. A reference portfolio can consist of cash credit risk exposures, bonds or loans, or synthetic credit risk exposures, and CDS. These traditional portfolios employ a securitization strategy similar to that of mortgage-backed securities and asset-backed securities. A new generation of portfolio products, single-tranche CDOs and n^{th} to default basket swaps, requires more complex financial engineering techniques similar to those used in interest rate options and equity derivatives. Notional exposures are not useful as a measure of risk.

Duffie and Singleton (2003) distinguish between the cash flow CDO, paying the interest and principal of a collateral pool of debt instruments, and a market value CDO, paying in accordance with the MTM of the pool. The CDO distributes the interest and principal of the collateral pool to three prioritized tranches. The senior tranche resembles a short option on the performance of the CDO, with value declining with increases in default correlations of instruments in the pool. The junior or subordinated equity tranche resembles a long call on the performance of the CDO, with value increasing with the default correlations of the pool. There is an intermediate or mezzanine tranche. Duffie and Singleton (2003) define the credit model problem as using the joint distribution of instruments in the collateral to measure the risk and valuation of the CDO.

The hypothetical example of the Joint Forum (2004) consists of a synthetic CDO of $1 billion with three tranches. The unrated equity tranche has the first $30 million of losses, the second tranche the subsequent $70 million and so on. The reference portfolio consists of 100 single-name CDS of $10 million each and

average credit rating of single-A. A bank could select the credits of the reference portfolio to hedge loans on its balance sheet, issuing such a synthetic CDO. An investment bank could create the synthetic CDO on behalf of an asset manager who chooses the reference portfolio based on fundamental credit analysis.

Commonly, the different investors acquire the three tranches. An important feature of the synthetic CDO is to create products tailored to investor classes. In this example, the equity tranche pays LIBOR plus 12 percent and would be sold to an asset manager or a HF. A regional bank seeking to diversify credit exposure may acquire the mezzanine tranche paying LIBOR plus 2 percent. Investors desiring low risk, low return may acquire the third tranche, which pays LIBOR plus 10 basis points.

In the example, investors pay the principal amount. Defaults would reduce principal. Investors' principal would be deposited in a collateral account and invested in government securities or AAA debt. There are also CDOs with unfunded tranches, structured as swaps without initial payments. Investors receive spreads periodically and must make payments when their tranches default. These unfunded CDOs create counterparty risk.

If there are no defaults in the reference portfolio, there are quarterly payments in waterfall fashion, from senior to equity tranches. Suppose that there is a loss of 60 percent of notional value in one of the single-name reference swaps, $6 million, corresponding to a recovery rate of 40 percent. This loss would cause writing down the principal amount of the equity tranche by $6 million. There would be no losses to the other tranches. However, the overall CDO MTM value would decline because of the lower value of the equity tranche. The example illustrates credit transfer. Suppose that a bank was the counterparty of the single-name CDS. The bank would receive a credit of $6 million on the CDS that would offset part of the loss on the credit. Investors in the equity tranche would bear that loss. Thus, the bank exposure to default is transferred to CDO investors.

There are two economic reasons for CDO markets. First, loans and bonds are relatively illiquid. Therefore, it is costly and difficult to create portfolios that meet the risk/return profile desired by investors. CDO technology is cheaper than creation of the portfolios by investors. Second, regulatory capital is typically above economic capital required by markets to take risk. Banks entered the market to reduce regulatory capital. Duffie and Singleton (2003) distinguish between balance sheet and arbitrage CDO. A bank could enter in a CDO, or collateralized loan obligation, to remove assets such as loans from the balance sheet. The resulting securitization would increase the liquidity and value of those assets. An investment bank could issue an arbitrage CDO to realize part of the difference between the value obtained from management fees and sale of the CDO and the cost of buying the collateral assets in the secondary market.

Duffie and Singleton (2003) analyze three sources of illiquidity that promote or restrict the use of CDOs: moral hazard, adverse selection and trading costs. Moral hazard originates in the diminished incentive for asset managers to choose the highest quality of the collateral pool and for the trustee to enforce strict covenants. A seller of a CDO can mitigate information asymmetry by concentrating the

positions of collateral with fear of adverse selection into smaller subordinate tranches. Trading cost motivation relates to adverse selection. The seller concentrates the more liquid assets, with lower trading costs, in senior tranches, and the less liquid assets in junior tranches.

There are three credit risk measures of a CDO:

1. Sensitivity of the value of the tranche to credit spreads on the names in the reference portfolio;
2. Expected loss (EL) of the tranche from defaults in the reference portfolio up to the maturity of the CDO;
3. Unexpected loss (UL), or loss due to default say, one standard deviation above EL of the tranche.

There is also correlation risk in CDO tranches and their prices reflect expectations of investors of correlated defaults during the term of the CDO. Correlation risk is similar to business cycle risk. High correlation of defaults characterizes downswings of business cycles. There are business cycles models of credit risk such as the one used in Basel II. There is higher exposure of the equity and mezzanine tranches to recession.

The underwriter of a traditional CDO acquires and stores a portfolio of bonds, loans or CDS and attempts to simultaneously, as possible, place the tranches – equity, mezzanine and senior – with investors. Unless the underwriter acquires all or part of the equity tranche, its risk is limited to the time from storage until sale of all tranches of the CDO. Because of the difficulty of finding investors for all tranches, underwriters began to offer single-tranche CDOs. The Joint Forum of BCBS, IOSCO and IAIS (2004) obtained information that single-tranche CDOs account for a larger number of new placements.

In a traditional CDO, a dealer would sell credit protection to buyers, such as banks, asset managers and HFs, by means of single-name CDS, thus creating an exposure to credit risk. The dealer protects its exposure to default and changing spreads by buying credit protection from buyers of the tranches, which are effectively selling the credit protection to the banks, asset managers or HFs through the intermediation of the dealer. In a single tranche CDO, the dealer buys credit protection from investors only on one tranche. The dealer hedges its credit exposure by selling protection against default and changes in credit spreads through CDS on the entire reference portfolio of the tranche. The required amount of hedge changes together with changes in credit spreads, requiring changes in hedge ratios to prevent risk exposure. The single tranche CDO requires dynamic hedging to maintain the proper amount of hedge that avoids risk exposure.

A single tranche CDO creates four types of risk that require dynamic hedging, Joint Forum (2004):

1. *Delta and model risk*. The dealer must calculate the deltas of each CDS in the reference portfolio, or change in position resulting from change in spread. These deltas are model dependent and thus create an additional model risk.

2. *Liquidity risk*. Deltas change over time requiring adjustment to positions. Trading costs may increase because there may be limited liquidity in the CDS market.
3. *Spread risk and jump-to-default risk*. Small changes in CDS spreads or unexpected defaults require hedges that are complex in nature. Relatively large changes in credit spreads or unexpected defaults could cause difference in behavior of the tranche and the hedge position, what the market terms convexity or gamma risk. The Joint Forum of BCBS, IOSCO and IAIS (2004) observes that the current practice of managing these risks is more an art than a science.
4. *Correlation risk*. Pricing and hedging a CDO requires assumptions on correlations of various single-name credits in the reference portfolio. There is risk that the correlation assumption could be erroneous. Increases or decreases in correlation cause tightening or widening of credit spreads and corresponding profits or losses in MTM.

In the beginning of the CDO markets, collateral consisted of investment grade and high-yield corporate credits. More recently, there has been use of mortgage-backed securities, residential and commercial, as well as consumer loans, in response to lower yields of corporate debt. There have been also a few CDOs using private equity investments, FOHFs and middle market loans to small and medium enterprises (SME).

There has been also growth in credit index products. Two families of such indices are TRAC-X and iBoxx. These are broad indexes with segments according to geography (United States, Europe, Japan and emerging markets), investment grade/high-yield, sector (financials, industrials, etc.) and maturity (5/10 years). It is much simpler to create products with these indexes.

CreditGrades is a relatively new product of CreditRisk (Finger 2002), endorsed by three leading financial institutions, J. P. Morgan, Deutsche Bank and Goldman Sachs. CreditGrades is a response to the need for stand-alone quantitative evaluation of credit risk. Part of this need is the result of the capital adequacy standards of Basel II. However, rapid growth of credit derivatives, such as the CDS, and complex credit derivative products, such as the CDO, has been accompanied by growth in the number and diversity of players in credit markets. The credit market now includes not only banking institutions but also derivative traders, asset managers, HFs, insurance and reinsurance companies. The main objective of CreditGrades is to measure accurate credit spreads instead of default probabilities. The training data are market spreads and not actual defaults. CreditGrades intends to track credit spreads accurately, providing warning of a firm's credit impairment. Thus, CreditGrades provides measurements of credit quality that are complementary to other industry models. An important feature of CreditGrades is a pragmatic approach, with simple formulas using a few market observable variables. Sensitivities are easily derived. The objective of the model is to link equity and credit markets with a simple but robust framework.

There is an option-type payoff of equity value in liquidation, the maximum of zero or the excess of assets over liabilities. The discounted expected value of this

future payoff is equity value, determined by an option pricing formula. Implementation of CreditGrades assumes that equity value is equal to assets less liabilities at all times, reaching a simpler relation between assets and equity.

The general principle of structural models has not changed, using equity markets as the main source of information. However, applications have changed together with the growth of derivative credit markets (Finger and Stamicar 2005). Initial uses of models centered on lending decisions based on estimates of default probabilities instead of providing pricing information. The paucity of credit pricing information prevented calibration and application of models to true credit prices. Growth, diversification and maturity of credit derivative markets placed different demands by practitioners. While the source of information continued to be equity markets, there was growing demand for indicative prices for credit. Product development changed toward providing over or under valuation of credit relative to peers and changes of credit conditions for firms.

Structural models relate essential firm characteristics to prices on diverse contracts:

FIRM CHARACTERISTICS	*PRICES OF CONTRACTS*
Asset value	Equity
Asset volatility	Equity options
Liability	Credit
Recovery rate	

The *fundamental approach* consists of estimating model input parameters to calculate model prices of financial instruments. The data consist of the firm's equity price, estimates of historical volatility, an assumption of recovery rate and estimates of the default par spread from the firm's balance sheet. CreditGrades provides asset volatility for calculation of the fair value of the CDS.

The *market-based approach* uses market prices of financial instruments to calculate models parameters that permit recovery of these prices. In this approach, the data consist of the firm's equity price and the price of an equity option at the money. The assumption of a recovery rate permits an estimate of debt per share. The model calculates the asset volatility that prices the option correctly and computes the fair level of the CDS.

CreditGrades assumes that the firm's asset value follows a diffusion process (Finger 2002):

$$\frac{\mathrm{d}A_t}{A_t} = \sigma^{\mathrm{a}}\mathrm{d}W_t + \mu^a\mathrm{d}t$$

where A is asset value, W is a standard Brownian motion, σ^{a} is asset volatility and μ^{a} is asset drift.

The default barrier is the value of the firm's assets that remains after default. If L stands for global recovery value for debt holders and D is the debt-per-share of the firm, the multiple LD is the value left for debt holders after default. CreditGrades finds that the combination of a fixed default barrier and the pure diffusion process of asset value results in very low short-term spreads. The solution is to consider

L as a random variable with mean $L*$ and percentage standard deviation ξ. The characteristics of L are as follows:

$$E[L] = L^* \tag{4.10}$$

$$\xi^2 = \text{Var}(\ln(L)) \tag{4.11}$$

$$LD = L^* D e^{\xi Z - \xi^2/2} \tag{4.12}$$

Z is a standard normal random variable, independent of W, unknown at $t = 0$ and revealed only at default, τ. The survival probability at t depends on the asset value not hitting the default barrier, L^*D, before t. There is uncertainty about L such that the default barrier can be touched unexpectedly in the form of a "jump-like default event."

If $A(0)$ denotes the initial asset value, there is no default if:

$$A(0)\mathrm{e}^{\sigma^2 Wt - \sigma^{a2} t/2} > L^* D e^{\xi Z - \xi^2/2} \tag{4.13}$$

The model is driven by the distance between the asset value and the default barrier. CreditGrades uses the known distribution for first time hitting Brownian motion to obtain a closed form for the survival probability at time t. The model converts the survival probability into a credit price by introducing the risk-free rate and the recovery rate for a specific class of debt, such as senior unsecured debt. L^* is the average over all classes of debt. Thus, the model provides a closed form to price CDS par spreads. The distribution for the first stopping time of Brownian motion permits a closed form of the full-term structure of survival probabilities.

Calibration of the model results in a closed form expression of the survival probability in terms of observable variables. These variables are the initial stock price, the reference stock price, the reference stock volatility, debt per share, D, the average global debt recovery, L^* and ξ, the percentage standard deviation of the default variable. The model obtains debt-per-share from financial statements. The global debt recovery, L^*, is estimated by the Portfolio Management Data and Standard & Poor's database. Historical databases yield estimates of 0.5 for L^* and 0.3 for ξ.

CreditGrades is supported by historical back testing over industries and ratings. There is support from additional research that includes comparison with credit analysis. The difference between the model spread and market spread is unbiased, independent of industry and rating and diversifiable because it is white noise.

Duffie and Singleton (2003) discuss integrated market and credit risk in portfolio measures such as VaR. This process must include both default and fluctuation in credit quality. The analyst must consider sensitivities of all positions originating in market risk factors – prices, rates, volatilities and so on – and specific fluctuations in counterparty credit quality. A risk model combining changes in a vector of market risk and a vector of counterparty credit quality, incorporating appropriate correlation, could measure the total risk of all positions. There are modeling hurdles because of the skewness and kurtosis of the probability distributions of asset returns. The expected third power of deviations characterizes skewness as

the degree of negative and positive deviations from the mean. Models of stochastic volatility capture volatility skew. The expected fourth power measures kurtosis as the degree to which a distribution is thin or fat tailed. A jump process captures fat tails in distributions. A combined stochastic volatility jump diffusion model captures both features of the distributions.

The inputs of a model of integrating market and credit quality risk include:

- A sufficient statistic of credit quality and a corresponding survival probability to the VaR time horizon;
- A vector of factors of credit quality fluctuation;
- A vector of factors of market risk fluctuation;
- LGD and the recovery rate, 1 – LGD, which could be random;
- A default index equal to unity in default and zero in survival.

Duffie and Singleton (2003) express the change in market value at the horizon of VaR as:

Valuation of survival with the new market and credit quality risk factors +
Valuation associated with default − Current valuation

The default index is simulated with the survival probability when it is zero and with the recovery probability when it is unity. In case of unity, the model simulates LGD. In case of zero, the model simulates fluctuations in the vectors of market risk and credit quality. The above equation measures the change in market value. The model applies the process to all the portfolio positions with all counterparties, aggregating all individual portfolios to measure the total change in value. The simulation allows for correlations across all default indexes of all portfolios and of the market and credit quality risk factors. The generation of many simulations would generate a random sample, with which to estimate VaR and other risk measures. Duffie and Singleton (2003) consider alternatives to this Monte Carlo method to obtain measures of integrated market and credit quality risk.

Stress tests

The process of stressing portfolios with shocks of risk variables has multiple applications. Financial institutions use stress tests as part of their risk management processes. There are other applications of stress tests in the private sector. The surveillance of the IMF under Article IV also uses stress tests of the financial sector. The field of macroeconomic stress tests is rapidly growing. Central banks also use stress tests as part of their process of crisis prevention. The applications of stress tests in the private sector and in monetary policy are discussed below in turn.

Tests by financial institutions

Stress tests consist of a set of technical methods used by financial entities to calculate potential effects of exceptional, but plausible events, on values of positions

(CGFS 2000; Blaschke *et al*. 2001; Mina and Xiao 2001, 39–45). The principal methods include:

- *Simple sensitivity tests*: measure effects on portfolio values of predetermined changes in only one factor, or variable. A common example consists of measuring effects on positions of changes of plus or less 100 basis points in yields of bonds.
- *Scenario analysis*: calculates the impact on portfolio values of simultaneous change in several factors, or variables. Tests can use changes in exchange and interest rates, commodity prices and stocks in historical episodes – the Asian crisis, stock market declines in the United States in 1987, 2000–3—or hypothetical scenarios – the global decline in stock markets, monetary policy tightening in the United States and conflict in the Middle East.
- *Maximum loss*: measures the highest possible deterioration of portfolio value resulting from the adverse combination of various factors or variable levels. It is not very useful in fixing operational limits.
- *Theory of extreme value*: obtains values of portfolio losses in tails of the probability distribution of returns, considering fat tails and kurtosis. A great advantage is to estimate the probability of exceptional events. However, there is difficulty in including several types of risk simultaneously. The method assumes lack of correlation among extreme value over time. Another problem consists in lack of information on extreme events to make statistical inference.

The CGFS (2001) conducted a first survey of stress tests in financial institutions in 2000. The CGFS (2005) conducted a second survey of stress tests in 64 banks and securities firms in 16 countries. The institutions reported 960 stress tests, involving over 5000 risk factors. Central banks had subsequent meetings with the participants in the survey to discuss the practice of stress testing. A general conclusion is the existence of a wide diversity across firms of stress tests and their role in risk management. The scope and sophistication of the tests vary in accordance with the scale and complexity of operations of the different companies.

In terms of contribution to risk management, the CGFS (2005) finds that stress tests are mainly a complement to the basic VaR analysis. The tests in the survey can be classified as scenario and sensitivity tests. The scenario tests can be driven by a portfolio or an event approach. In the portfolio approach, risk managers in the firm analyze and identify the vulnerabilities that may exist in the portfolio. Scenarios are designed to cause stress in the identified vulnerabilities. Tests of market exposure would shock interest rates and tests of FX exposures would shock exchange rates. A second form of scenario tests attempts to reveal the vulnerabilities arising from an event that is a cause of current concern to senior management. The devaluation of the dollar and the increase in oil prices would be types of such current events. Tests are designed to determine how the event would affect risk factors of the portfolio. The behavior of variables can be obtained from historical data or can be created for the tests. Sensitivity tests analyze the impact on the portfolio resulting from fluctuations in variables. A typical test is to shock balance

sheets by increases or decreases in interest rates by various numbers of basis points. Another type of sensitivity test would use historical behavior of variables to shock portfolios.

Stress tests have evolved from simple analysis of unlikely but plausible events to other concerns about the company, according to the survey of the CGFS (2005). The traditional use of stress tests is as a complement of VaR analysis. The tests calculate the impact on the company of tail events resulting from extreme fluctuations in prices that would be represented in the recent price experience used in VaR models. Another use of stress tests is in understanding the profile of risk of the company. Examples include the tests on corporate clients, sensitivity tests such as shifts in the yield curve and non-linear shocks such as options. Some companies are using stress tests in the allocation or limits of use of capital. The objective is to identify situations where the company may experience losses that significantly affect the level of capital. A small number of companies are using stress tests in the process of deciding the level of economic capital. There are larger numbers of firms using stress tests to specify limits on positions and allocate capital across portfolios and units. A method such as VaR is used to allocate economic capital and design a business plan, determining credit, market and operational risk. The results of the stress tests are used to check the adequacy of capital. There are also innovative stress tests used to assess the risks of business lines, which then serve as input in the overall business model of the company.

There are some general considerations of the results of the survey of the CGFS (2005). The tests do not reflect the exposure of the firms or how they assess the probability of given events. The tests originate in various areas within firms. The classification into categories may be somewhat artificial. The two surveys are not comparable. Stress tests of trading portfolios account for 80 percent of the total. The principal risk factor is the interest rate with less participation of credit, equities and FX.

The CGFS (2005) reports that companies continue to use traditional historical events such as Black Monday in 1987, the bond market losses in 1994, the LTCM episode and the Russian default in 1998. There is growing interest in the Asian crisis of 1997 because of the greater participation of Asian firms in the survey. The fluctuations of markets following the terrorist attacks in the United States in 2001 are also used in stress tests of fixed income, equities and credit. Many tests using hypothetical scenarios focus on changes in the potential of economic growth, using such events as faster increase in interest rates in industrial countries. The decline of growth in the advanced countries leads to tests of widening sovereign credit spreads and decline in stock prices of emerging countries. Changes in oil prices are widely used in stress tests. Parallel changes in interest rates and even shifts in yield curves are used in the most common sensitivity tests. More than one-half of the tests use increases in interest rates. The net long duration position of financial firms may explain the concern of testing interest rate increases. The future trend is likely to consist of greater focus on credit derivatives and the integration of risks, both of which pose major challenges of measurement, analysis and judgment.

Macro stress tests

Sorge (2004) surveys the state of the art in testing macroeconomic impacts on the financial sector. The initial work consists of defining the aggregate portfolio and designing and calibrating the macro stress scenario. The ultimate objective is to assess the capacity of the financial sector to withstand risk. There are two avenues from the first to the last stage: measuring the impact of specific risk factors or integrating market and credit risks. Sorge (2004, 3) represents macro stress testing in terms of the following equation:

$$\Omega(\tilde{Y}_{t+1}/\tilde{X}_{t+1} \geq X^*) = f\{X^t, Z^t\} \tag{4.14}$$

The tilde denotes the unknown future value of a random variable, $\tilde{Y}_{t+1}$ is the financial system, $\tilde{X}_{t+1}$ is the set of macroeconomic variables under stress, X^t is the history of past realizations of macroeconomic variables until time t and Z^t is the history of past realizations of other relevant factors. The inequality $\tilde{Y}_{t+1}/\tilde{X}_{t+1} \geq X^*$ captures the uncertain realization in the future of a measure of adverse shock of the financial system conditional on a tail realization, $\tilde{X}_{t+1} \geq X^*$, of macroeconomic stress. The loss function $f(\cdot)$ maps macroeconomic shocks to the final effects on the aggregate variables of the financial sector. The arguments in this function – risk exposures, default probabilities, correlations and feedback effects – link variations in macroeconomic variables to aggregate financial distress. Sorge (2004) finds that most works on macro stress-testing use the ratio of potential losses to available capital as the measure of distress of the financial system.

The risk metric $\Omega(\cdot)$ compares the vulnerability of the financial system across portfolios and scenarios. Sorge (2004) distinguishes two approaches followed in actual work. The piecewise approach consists of predicting individual FSIs as point estimates in various stress scenarios. This is similar to a conditional expectation based on tail events. Sorge (2004, 9) expresses the piecewise approach in terms of the following expression:

$$E(\tilde{Y}_{t+1}/\tilde{X}_{t+1} \geq X^*) = f\{X^t, Z^t\} \tag{4.15}$$

The approach consists of the estimation for each portfolio and time of a measure of distress of the financial system as a linear function of a vector X of macroeconomic variables. For example, the measure of distress Y could be loan loss provision and the macroeconomic variables could be GDP, inflation, interest rates and debt ratios. The relationship between macroeconomic variables and FSIs is estimated on the basis of historical data using various models surveyed by Sorge (2004). The method simply relates a measure of distress Y to macroeconomic variables in an extreme event, $\tilde{X}(t+1) \geq X^*$, that is, when macroeconomic variables exceed a critical threshold of vulnerability. The piecewise approach is more intuitive and has lower computational costs. The estimated parameters are used to simulate macroeconomic shocks on FSIs. The piecewise approach uses linear functional forms, has no feedback effects and can suffer from parameter instability in longer horizons.

The integrated approach takes into account the entire distribution of portfolio losses, $\tilde{Y}$, which could occur as a result of macroeconomic shocks in a specific

scenario of stress. The target level of confidence is frequently used in VaR models. An important effort is the integration of market and credit risks. There have been efforts to incorporate non-linear effects of macroeconomic variations on credit risk. The VaR measures cannot be added across institutions. The practical applications have used only credit risk models in short-time horizons. Financial instability occurs over longer periods than the 1-year horizons of risk management. There are significant difficulties for financial institutions in raising capital during periods of stress. Thus, the problems of financial institutions may extend for long periods. Increasing the horizon creates problems with the restrictive assumptions of the models that are even less valid for longer periods. There are no studies of parameter instability and feedback effects over long horizons. It is particularly difficult to model linkages among financial institutions. Feedback effects of the real and financial sectors are also quite difficult to specify and measure. There are analytical and empirical reasons for integrating market and credit risk. Drehmann *et al*. (2006) convincingly argue that changes in interest rates affect the credit quality of bank assets, liabilities and off-balance sheet items. They provide a model for stress-testing integrated market and credit risk. The integrated approach has great appeal but finds major roadblocks of analytical and empirical nature.

Policymakers may find conflicts in attaining stability of exchange and interest rates jointly with government debt sustainability and financial sector viability. Basu *et al*. (2006) provide a framework to assess the trade-offs among these multiple objectives. The objective of this framework is to assist in quantifying the effects of policy adjustment measures on the balance sheets of the financial sector. The IMF surveillance tools are classified by Basu *et al*. (2006, 4) into the following components: dynamic financial programming of four sectors (real, fiscal, external and monetary), dynamic debt sustainability evaluation, analysis of financial sector indicators (FSI) and stress-testing and scenario analysis and the balance-sheet approach analysis.

The framework of Basu *et al*. (2006) would use the macroeconomic projections to project the balance sheets of the financial sector, which would project the profit and loss of the financial sector and its capital adequacy. Additional interest rate projections would be required. There would have to be specifications of non-performing loans (NPL). The framework would permit sensitivity stress tests such as shocking the system with increases in interest rates together with FX crises. Basu *et al*. (2006) warn that the framework would still require prudential supervision and regulation. The framework can also be adapted to evaluate the effectiveness of monetary policy.

The BOE, Hoggarth *et al*. (2004), conducts macro tests of UK banks as part of the UK FSAP process. The first step is the design of adverse macroeconomic scenarios, consisting of worst historical cases at the tail of 99.5 percent. The exercise consists of both bottom-up and top-down approaches (Jones *et al*. 2004). In the bottom-up approach the BOE provides the individual banks simulations from an extended version of its medium-term macroeconometric model (MTMM). The banks calculate the LGD and the credit deterioration. The banks also calculate the expected credit loss. The results of these calculations are provided to the BOE that maps

them into the current portfolios of banks, obtaining the increase in losses and the threshold for bank failure for every bank. Finally, the BOE analyzes secondary effects on other banks. In the top-down approach, the BOE uses the simulations of its MTMM to make its own calculations of the aggregate provisions of banks. The BOE also uses a vector autoregressive (VAR) model with a limited number of macroeconomic variables and write-offs by banks.

World trade

The benefits of trade and its relation to economic growth constitute one of the most actively debated issues in international economic policy and in globalization. The analysis and empirical research relating to trade are considered in Chapter 6 of this volume and Chapters 1 and 2 of Volume II. The objective of this section is to provide background on the volume of world trade and its growth rate.

Exports and imports of merchandise and services are shown in Table 4.2, which also provides the distribution by regions. In 2005, total exports of merchandise and services reached $12,574 billion, about 27 percent of world output of around $44 trillion. The share of Europe in exports of merchandise is about 43 percent, which is equal to the share in exports of services. In contrast, the share of North America in exports of merchandise is only 14.5 percent and 21.7 percent in exports of services. The significantly high trade deficit of the United States is shown by exports of $904 billion in 2005 compared with imports of $1732 billion. This is one of the critical vulnerabilities of the world economy, analyzed in Peláez and Peláez (2007) and in Chapter 5 of Volume II. Another important feature of world trade is the significant share of China in world exports of 7.5 percent, not

Table 4.2 World trade by regions 2005 $B

	Merchandise				Services			
	Exports	**%**	**Imports**	**%**	**Exports**	**%**	**Imports**	**%**
World	10,159	100	10,511	100	2,415	100	2,345	100
North America	1,478	14.5	2,285	21.7	422	17.4	366	15.6
United States	904	8.9	1,732	16.5	354	14.6	281	11.9
South America	355	3.5	298	2.8	68	2.8	70	2.9
Europe	4,372	43.0	4,543	43.0	1,245	52.0	1,120	48
Africa	298	2.9	249	2.4	57	2.0	69	3.0
Middle East	538	4.1	322	3.1	55	2.3	85	3.6
Asia	2,779	21.8	2,599	24.7	525	21.7	573	24.4
China	762	7.5	660	6.3	74	3.1	83	3.5
Japan	595	5.9	515	5.8	108	4.5	133	5.7
CIS	340	3.3	216	2.1	42	1.7	62	2.6

Sources: http://www.wto.org/english/res_e/statis_e/its2006_e/section3_e/iii01.xls
http://www.wto.org/english/res_e/statis_e/its2006_e/section3_e/iii02.xls
http://www.wto.org/english/res_e/statis_e/its2006_e/section3_e/iii04.xls
http://www.wto.org/english/res_e/statis_e/its2006_e/section3_e/iii05.xls

much less than 8.9 percent for the United States. However, there is an issue of the actual value added in China, which imports semi-finished goods to re-export them with finishing touches in production. Another key feature of world trade is the small share by developing countries in Africa, only 2.9 percent of world exports of merchandise. There is an issue of fair trade in the form of greater access to markets by developing countries, especially in agricultural products that receive high protection in developed countries.

The leading exporting countries in 2005, according to the WTO (2006, 17), were Germany with $969.9 billion (9.3 percent of the total), the United States with $904.4 billion (8.7 percent of the total) and China with $762.0 billion (7.3 percent of the total). The leading importing countries were the United States with $1723.4 billion (16.1 percent of the total), Germany with $773.8 billion (7.2 percent of the total) and China with $660 billion (6.1 percent of the total). In 2005, the WTO (2006, 108) provides the breakdown of exports by products as:

- 8.4 percent in agriculture;
- 17.2 percent in fuels and mining products with fuel accounting for 13.8 percent of total world exports;
- 72 percent in manufactures (of which 37.9 percent machinery and transport equipment).

In 2005, the WTO (2006, 109) provides the breakdown of world exports of commercial services as 23.6 percent in transportation, 28.4 percent in travel and 48.1 percent in other commercial services.

The yearly average growth rates of world trade and output are shown in Table 4.3. The data on value reflect growth of volume and of inflation. The high numbers in the 1970s reflect the environment of inflation resulting from the oil price increase. An important characteristic of the growth rates is the higher rate of growth of export volume relative to production and world GDP. For the period as a whole, 1950–2005, the average yearly rate of growth of trade volume was 6.2 percent, much higher than the rate of growth of world GDP of 3.8 percent.

An important characteristic of trade is that the long-term average yearly growth rate of manufacturing exports, 7.6 percent, is much higher than those of manufacturing production, 5.7 percent, and growth of world GDP, 3.8 percent. The growth rate of manufacturing exports in the long term of 7.6 percent is twice the rate of growth of agricultural exports, 3.6 percent. Econometric research on the relation of economic growth and trade is inconclusive, as discussed in Chapter 6 of this volume. Thus, it is difficult to specify and test the proposition that growth of trade causes overall economic growth.

Financial flows and foreign exchange

The standard-setting activities of IFIs can be considered as public goods (Joyce and Sandler 2007). The analysis of public goods is provided in Chapter 5. Consumption of an additional unit of public goods by an economic agent does not detract

Table 4.3 Growth of world trade 1950–2005 average % per year

Year	Value exports Total	Agriculture	Manufacture	Volume exports Total	Agriculture	Manufacture	Total	Agriculture	Manufacture	World GDP
1950–63	7.4	3.7	10.1	7.7	4.5	8.6	5.2	2.9	6.6	4.7
1964–9	9.9	4.3	9.6	8.9	4.6	11.8	6.3	2.4	7.9	5.7
1970–9	19.6	16.1	19.1	5.9	3	7.4	4.3	2.4	11.3	4.3
1980–9	6.3	4.3	8.3	3.8	2.1	5.6	2.4	2.3	2.9	3.2
1990–9	6.3	3.2	7.3	5.7	3.7	6.4	2.3	2.2	2.3	2.1
2000–5	10.6	7.6	9.4	5.6	3.6	6.3	2.7	2.1	2.9	2.8
1980–05	7.3	4.6	8.2	4.9	3.0	6.1	2.4	2.2	2.7	2.7
1950–05	9.7	6.3	10.7	6.2	3.6	7.6	3.9	2.5	5.7	3.8

Sources: Calculated from data in WTO.
http://www.wto.org/english/res_e/statis_e/its2006_e/its06_longterm_e.pdf
WTO (2006, 189).

from consumption of more units by other agents. There are no restrictions on the consumption of public goods. Finally, public goods are not likely to be produced by the private sector. These three characteristics seem to apply to the provision of information and statistics by the IFIs. The BIS (2003) provides important financial statistics that are available in their website. The use of these statistics by an economic agent does not reduce their availability to other economic agents. It is unlikely that these data would be forthcoming from the private sector. They provide input for research at the BIS, other government institutions, the private sector and academics.

The development of statistics at the BIS (2003) was conditioned by financial events that were of interest and concern to G10 banking supervisors. The history of the development by the BIS (2003) of statistical information parallels the evolution of international finance in the past five decades. The Eurodollar market developed in the 1960s as a result of the flight to London of financial institutions escaping domestic regulation in the United States. The BIS (2003) provided G10 supervisors the data required to follow the rapid growth of the Eurodollar market and its possible consequences for monetary stability. The oil price increases of the 1970s and early 1980s created liquidity that was transferred by banks through the Eurodollar market to developing countries. The debt crises of the 1980s generated the need for data on borrowing countries and the risk exposures of international banks.

The increasing deregulation, globalization and innovation in financial markets created the need for the BIS (2003) to collect and estimate data on international securities, syndications and foreign exchange. The process of risk transfer in more complex financial transactions created demands on the development of sophisticated derivatives. The BIS (2003) engaged in collection and publication of exchange-traded and over the counter (OTC) derivatives. Monetary authorities in the G10 found the need to monitor the risk of these new products for financial and monetary stability. The emerging market crises of the 1990s generated the need, after the Asian crisis of 1997, for concerted effort by the BIS (2003), the IMF, the OECD and the WB to provide data on international debt. The effort by the BIS (2003) in data collection provides part of the foundation for the analysis of international financial sensitivity in its *BIS Quarterly Review* and its *Annual Report*. The implementation of Basel II will increase transparency of the transactions of banks from most jurisdictions in the world. Information, statistics and analysis constitute important public goods provided by the IFIs.

The BIS data on bank assets and external assets and domestic and international debt securities are shown in Table 4.4. The dollar values in 2006 are quite high. The average yearly growth rates of bank assets have been in excess of 13 percent. There has been more than a doubling of bank assets per decade in the past 40 years. The growth of international debt securities in the past 20 years has been 16.2 percent per year on average.

The BIS (2005) finds an increase in banking consolidation in 1995–2004. The number of banks accounting for 75 percent of the turnover in FX declined between

Table 4.4 Bank assets and external assets and domestic and international debt securities

	2006 $B	Average yearly growth rate % per year	
Bank assets	29,381	1977–2006	13.4
Bank external assets	26,094	1977–2006	13.8
Domestic debt securities	48,715	1989–2006	7.5
International debt securities	18,434	1987–2006	16.2

Sources: Bank assets: http://www.bis.org/statistics/pcsv/prov1.csv
http://www.bis.org/statistics/provbstats.pdf#page=7
International debt securities: http://www.bis.org/statistics/qcsv/anx12a.csv
Domestic debt securities: http://www.bis.org/statistics/qcsv/anx16a.csv

1995 and 2004 from 20 to 15 in the United Kingdom, from 20 to 11 in the United States and from 24 to 11 in Japan.

The BIS (2005) has conducted six triennial surveys of foreign exchange and derivatives. The 2004 survey reported by BIS (2005) included the participation of 52 central banks and monetary authorities. The foreign exchange data cover spot transactions, forward contracts and foreign exchange swaps. The OTC data cover currency and interest rate derivatives. The data also cover outstanding values of OTC derivatives in foreign exchange, interest rates, equity, commodities and credit.

The BIS (2005) reports an increase in daily turnover of traditional foreign exchange transactions in 2001–4 by 57 percent, reaching $1.9 trillion in April 2004. At constant exchange rates, the increase is by 36 percent. Various types of counterparties drive this growth. There is a suggestion by market sources that the growth is driven by the combined trading activities of HFs, commodity trading advisers and asset managers. The fastest growth was in trading between banks and financial customers that increased its share in total turnover from 28 to 33 percent. The composition of FX trading was dominated by the dollar with 89 percent of all transactions, the euro with 37 percent, the yen with 20 percent and the UK pound with 17 percent. The United Kingdom continues to be the most important center of trading with 31 percent of total turnover, 19 percent for the United States and 8 percent for Japan.

The BIS (2005) also reports an increase of global daily turnover of FX and interest rate derivative contracts by 74 percent in the 3 years ending in 2004, reaching $2.4 trillion. The increase at constant exchange rates is 51 percent, much higher than the 10 percent experienced in the earlier 3-year period. The rapid growth in interest rate derivatives drove daily turnover to $1025 billion, closing the gap with FX derivatives, which reached $1292 billion in April 2004. Exchange-traded derivatives reached daily activity of $4.7 trillion, growing by 114 percent in the 3-year period ending in April 2004. The greater participation of HFs and asset managers, the growth by 57 percent in daily turnover of traditional FX transactions and the large variation of the dollar versus other currencies explain this growth in derivatives.

There was widespread and intensive search for yields after the FRBO reduced the fed funds rate to 1 percent. Galati and Marvin (2004) ponder that the increasing activity between banks and financial customers could have been part of this hunt for yields. Real money managers are defined as players that manage actual amounts of funds in contrast with leveraged players that magnify their yields by means of leverage. Galati and Marvin (2004) argue that real money managers and leveraged players engaged in two strategies targeting the same currencies, arbitrage of interest rate differentials and trading on trends in exchange rates. In 2001–4, currencies in countries with high yields appreciated, attracting real money managers and leveraged players.

The interest differential strategy, according to Galati and Marvin (2004), includes the "carry trade," which is analyzed in Chapter 5 of Volume II. A trade in those markets involves borrowing in a low-yielding currency, such as the yen, with a simultaneous long position in a high-yield currency, such as the Australian dollar, in the expectation that the exchange rate would not change, offsetting the interest-rate differential. The continuing depreciation of the dollar and the maintenance of the interest-rate differential maintained the profitability of these trades, attracting higher turnover in the FX markets. Galati and Marvin (2004) argue that the probable funding currencies were the US dollar, the yen and the Swiss franc, all low-yielding currencies at the time. The long positions were probably in Australian and New Zealand dollars and several emerging market currencies. There is some support for this conjecture from the fast increase in turnover in the Australian dollar, 98 percent, and the New Zealand dollar, 152 percent.

The second strategy is labeled momentum trading, following trends in exchange rates. These trades supported existing trends. The depreciation of the dollar was 15 percent against the Canadian dollar and yen and over 30 percent relative to the Australian dollar. There is positive association of turnover growth with increases in interest rate differentials of major currencies relative to the US dollar in statistical analysis by Galati and Marvin (2004). The change in the exchange rate relative to the US dollar in the prior year is also associated with growth of FX turnover. There was also increasing volume resulting from hedging of FX risk. Investors also perceived higher relative returns in FX strategies than in portfolios of bonds and stocks.

FDI, equities, securities and derivatives

The benefits of FDI constitute another important issue of international economic policy. The benefits of the openness to FDI and financial flows are considered in Chapter 3 on financial globalization in Volume II. The objective of this section is to provide data on the dimensions of FDI and securities.

The data of UNCTAD (2006, 9) are shown in Table 4.5. There has been strong dynamism in the world's inflow of FDI, jumping from $59 billion in 1982 to $916 billion in 2005, at the average yearly rate of 12.7 percent, shown in Table 4.5. In the same period, FDI outflows in the world increased from $28 billion to $779 billion, at the average yearly rate of 15.6 percent. The inward stock of FDI increased

Table 4.5 Average yearly growth rates of FDI 1982–2005

	2005 $B	Average growth rate 1982–2005 % per year
Inflows	916	12.7
Outflows	779	15.6
Inward stock	10,130	12.7
Outward stock	10,672	13.3

Source: UNCTAD (2006, 9).

from $647 billion in 1982 to $10,130 billion in 2005, at the average yearly rate of 12.7 percent. In the same period, the stock of outward FDI in the world rose from $600 billion to $10,672 billion, at the average yearly rate of 13.3 percent.

The share of developed countries in FDI in 1980–2005 has been quite high. The data of UNCTAD (2006, 7) show that the developed countries had a share of 75.6 percent of the inward stock in 1980 that declined slightly to 70.3 percent in 2005 while the outward stock was relatively stable at 87.3 percent in 1980 and 86.9 percent in 2005. The share of the outward stock of the EU rose from 37.2 percent in 1980 to 51.3 percent in 2005. The developing countries increased their share in the inward stock from 24.4 percent in 1980 to 27.2 percent in 2005 while their outward stock declined from 12.7 percent in 1980 to 11.9 percent in 2005. Asia and Oceania increased their share in the inward stock from 10.5 percent in 1980 to 15.4 percent in 2005 while the share in the outward stock also rose from 2.9 percent in 1980 to 8.2 percent in 2005.

There are about 70,000 transnational corporations (TNC) in the world with 770,000 foreign affiliates, according to the UNCTAD (2006, 10). The number of TNCs in developing countries is around 20,000. UNCTAD (2006, 10) finds that FDI has grown faster than gross fixed capital formation, or domestic investment. The share of value added by foreign affiliates in world GDP, which measures the share of international production in world output, is increasing, being about 10 percent of world GDP in 2005 compared with 7 percent in 1990 (UNCTAD 2006, 10).

Round-tripping is an important characteristic of FDI data (UNCTAD 2006, 12). In this case, there is really no new investment. A local company may create a special purpose entity (SPE) in another jurisdiction, remitting funds to that SPE that then invests in the home country to capture benefits in the form of incentives or lower taxation. Round-tripping prevailed in China before its accession to the WTO and tax benefits still encourage it with Hong Kong. There is no new investment because the funds originate at home. Luxembourg provides an example of trans-shipping of investment as most FDI is trans-shipped from the SPE holding company to other countries. Offshore financial centers in the Caribbean provided 10 percent of the inward FDI to developing countries in 2000–5. In 2004, 27 percent of the outward FDI stock of Hong Kong was explained by investments in non-operating companies in offshore financial centers, especially in the British Virgin Islands. There is significant share of tax haven centers in the inward FDI stock: 14 percent of Singapore, 39 percent of Hong Kong and 15 percent of Brazil.

There is a difference between greenfield FDI and that originating in cross-border M&As (UNCTAD 2006, 13–16). Greenfield FDI consists of investment projects that result in the creation of new productive capacity, including offices, buildings, plants, factories and the movement of intangible capital. The books of the investing company and the receiving foreign affiliate are affected. The foreign affiliate uses the new funds to organize production, buying fixed assets, material, goods and services and hiring employees in the recipient country. There is an increase in capacity, production and employment in the host country. In cross-border M&As there is a merger of the balance sheets of existing companies in the host country with TNCs from other countries. There is not necessarily an immediate increase in productive capacity and spending in the host country but it could occur in the future.

The data of UNCTAD (2006, 9) show an increase in FDI inflows in 1996–2000 at the average annual yearly rate of 40 percent and of FDI outflows at 36.5 percent. The FDI inward stock increased at the annual rate of 17.3 percent and the outward stock at 18.9 percent. These growth rates were significantly driven by cross-border M&As. The annual average value of cross-border M&As in 1999–2001 was $834 billion compared with $716 billion in 2005, when the value of cross-border M&As began to increase rapidly again. The number of mega deals in excess of $1 billion per year was 134 on average in 1999–2001 compared with 141 in 2005. The share of developed countries in 1999–2001 was 90 percent on average compared with 84 percent in 2005. UNCTAD (2006, 16) identifies the factors of cross-border M&As as financial market boom, pressures to merge, strategic and financial considerations and the dot-com boom. In contrast, the current factors of cross-border M&As identified by UNCTAD (2006, 16) are economic growth, new investors including PE firms and strategic choices such as firm's growth, consolidation and protection from acquisition. Temporary speculative factors such as the dot-com boom do not influence current cross-border M&As. Economic growth and strategic objectives may result in more investment in restructuring the company for its later reorganization in an IPO or sale. It appears more likely that this change in perspective may result in greater investment in this new boom of cross-border M&As.

The BIS (2005) reports notional amounts of all transactions of derivatives as of the end of June 2004. These data are useful for comparison of spot and derivative transactions. The notional value of OTC contracts reached $221 trillion at the end of June 2004, an increase by 121 percent in the 3-year period. Credit derivatives increased by 568 percent. The risk of a derivatives contract is the cost of replacing it at a given moment in time at prevailing market conditions. Gross market values measure the absolute costs that a party in a contract would face if it were forced to replace it at a given reference date under current market conditions. The BIS (2005) finds a doubling of gross market value to $6.4 trillion at the end of June 2004 from $3.0 trillion at the end of 2001. The ratio of outstanding values to gross market value declined from 3.1 percent at the end of June 2001 to 2.9 percent at the end of June 2004. The books in derivatives increased at a higher rate than the risk that they actually present to the parties. Various risk-reducing arrangements and

legally enforceable bilateral netting reduces the credit exposure of the institutions to $1.5 trillion.

The BIS (2007 May) also conducts a semiannual survey of the OTC statistics of derivatives markets. The information originates in the G10 countries and Switzerland. The notional amounts of all OTC derivatives contracts increased from $257 trillion in December 2004 to $415 trillion in December 2006, or by 61.4 percent. The gross market value increased from $9.4 trillion in December 2004 to $9.7 trillion in December 2006, or by 3.2 percent. Thus, the increase in notional amounts was much larger than the increase in the actual risk in the contracts. The gross credit exposure declined from $2075 billion in December 2004 to $2045 billion in December 2006. There was significant growth in credit derivatives. The gross value of CDS increased from $133 billion in December 2004 to $470 billion in December 2006, or by 253.4 percent. Contracts linked to equity grew in gross value from $498 billion in December 2004 to $851 billion in December 2006, or by 70.9 percent. Interest rate contracts declined in gross value by 10.7 percent to $4.8 trillion. FX contracts declined in gross value by 18.4 percent to $4.8 trillion. The notional value of CDS increased from $6.4 trillion at the end of 2004 to $28.8 trillion at the end of 2006, or by 350 percent.

The market for asset-backed securities illustrates current activity in financial markets. The revenue to banks in 2006 from asset-backed securities reached $30 billion, according to Davies (2007). It was equivalent to revenue from equity derivatives or trading in cash equities. Financial institutions bundle CDOs and mortgages in securities that are sold to investors. The growth of this market originates in the demand for higher yields by investors and in the desire of lenders to transfer their credit risks through the capital markets. Davies (2007) refers to estimates by JP Morgan that the volume in these markets has grown from around $500 billion in 2000 to over $3000 billion in 2006, with 77 percent originating in the United States. The revenue from this business to US banks was $19.9 billion while that of European banks was $7.5 billion.

Summary

Risk measurement is still imprecise. However, it appears that financial institutions require a formal risk management process that may prevent excessive risk relative to the capital base. Senior management is accountable for the risk management process because of the potential impact of careless risk exposures on capital and the survival of the institution.

The standard of the industry VaR requires complementary stress tests. These tests are more of an art than a science in that it is always possible to imagine a scenario where the capital of the institution would be entirely eroded by a shock of variables. Simulations of tail events in leveraged financial institutions are likely to lead to taking no risks and developing no new complex products. Similar dilemmas characterize the work of supervisors and regulators. The successful institution requires balancing its risks and rewards. The experience and knowledge of portfolio managers and senior management is essential in evaluating risk/reward

measurements and in taking difficult decisions. There is no standard for credit risk models as recognized in Basel II.

World trade and financial and capital flows have been increasing at very high rates. The growth of complex financial instruments is posing challenges in risk management and in the supervision and regulation of financial markets. Chapter 5 considers the foundations for intervention by the state in the economy, which is necessary for understanding the analytical and empirical issues of IEFP.

5
The Theory of the State

Introduction

Almost all the arguments in favor or against a specific aspect of globalization are analyzed by appeal to some form or other of the economic theory of the state. It is possible to find a precise relationship to this theory in cases when it is not argued explicitly. There is no unique theory of the state in economics. There are several approaches. The objective of this chapter is to provide a comprehensive survey of these approaches that helps to understand the issues relating to globalization in the rest of this volume.

There is a typology of the interaction of business and government, consisting of three models, according to Frye and Shleifer (1997):

1. *Invisible hand*. In this regime, the government does not conflict with free initiative. It is not corrupt, relatively efficient and benevolent, without authoritarian measures. The allocation of resources is by the private sector while the government provides the most essential public goods, such as law and order, some regulation and the enforcement of contracts.
2. *Helping hand*. There is significant involvement by bureaucrats with the activities of the private sector, promoting some firms and eliminating others. The bureaucracy actively designs and implements industrial policy. These bureaucrats resolve most disputes and are related with the businessmen. There is relatively limited and unorganized corruption. The extreme version of this model is known as the *iron hand*, being found in Korea and Singapore.
3. *Grabbing hand*. There is the same but less organized intervention in this model as in the helping hand. There is a large bureaucracy with significant independence and pursuing its own interests, including receiving bribes. There is no well-structured policy design. The bureaucrats are almost independent of courts and can impose their decisions and regulations in active pursuit of their self-interest. The widespread lack of organization results in lack of legal process, resulting in private enforcement of contracts.

Frye and Shleifer (1997) argue that these are ideal types not to be found purely in reality. In practice, there will be mixtures of these three types of models.

Data for small business in Warsaw and Moscow are more consistent with the invisible-hand model in Warsaw and the grabbing-hand one in Moscow. The approach to regulation of business taken by government appears to determine the success or failure of similar reforms.

The theory of the state is the case for and against government intervention in the economy. The invisible-hand model is the analytical foundation of mainstream economics, an ideal model without government intervention. The first section below considers the conditions required for the first best of efficiency and welfare. The effort to develop this model spread over two centuries after Adam Smith (1776). An important discovery in economics is the theory of second best, which shows that when there is a market failure that prevents the first best, it may be difficult to find out theoretically or empirically the second-best outcome. A practical approach is the field of applied welfare economics, known more popularly as cost-benefit analysis. It provides limited solutions in a number of practical cases. The public interest view postulates that the government should intervene when the free-market economy cannot attain the first best in order to improve the efficient allocation of resources. A significant case for global intervention by the government is based on public goods, which would not be provided by the private sector. There is a section focusing on the theory of public goods, which have to be provided by the government. Another breakdown in the model of perfect competition is imperfect information, that is, when some economic agents have more information than others, as is the case of banks about their clients relative to investors and depositors; clients also have information about the true state of their financial situation not known by banks. The intervention by the government may not be successful, causing government failure.

The work by Coase (1960) on transaction costs raises interesting issues on the role of the government. An important aspect of the work of Coase (1937) is the initiation of the field of the NIE. A major development is the theory of capture of regulatory agencies by the regulated industries and other aspects of the economic theory of regulation. The theory of rent-seeking argues that there is significant waste of resources in seeking market power from regulators and in maintaining that power. The final approach considered in this chapter is the view of disclosure and regulation, consisting of theoretical propositions and rigorous empirical research, providing an alternative to the interpretation of the role of the state in economic activity. The chapter is completed with a summary of the approaches.

The first best of efficiency and satisfaction

Adam Smith (1776) launched economics with his *Wealth of Nations*. This is a book rich in numerous analyses of the interactions of humans in economic affairs. It would be interesting to learn what Adam Smith would think of the contemporary interpretation of his concept of the invisible hand. The proposition is that individuals in seeking their self-interest promote the public good (Smith 1776, 477):

"Every individual intends only his own gain, and he is in this, as in so many other cases, led by an invisible hand to promote an end which was not part of his intention." Perhaps it would be more appropriate to relate the ideas of Smith to the reaction during his times to mercantilism and excessive intervention by the state in economic affairs. Economists have concentrated in analyzing the conditions under which the allocation of resources in markets, without intervention by the state, would result on its own in maximum efficiency and optimum welfare or satisfaction. It took two centuries after Adam Smith to rigorously prove this proposition.

The perfectly competitive allocation plays a central role in economics and is the departing proposition that leads by relaxation of assumptions to most every other proposition. The discussion below consists of the definition of economics followed by the characterization of the Walrasian efficient allocation of resources and the Pareto-optimum allocation. The existence of a Walrasian equilibrium or allocation is essential both for the specification of the assumptions of the perfectly competitive model and the normative analysis of economic welfare. There are two fundamental theorems of welfare economics. Under the assumptions of perfect competition, economics has proved the first fundamental theorem that a free-market Walrasian allocation results in a Pareto optimum, in that it is not possible to increase the output of one commodity and firm without reducing that of another and that is not possible to increase the satisfaction of one consumer without reducing that of another. A second related theorem is that it is possible to convert every Pareto-optimum allocation into a perfectly competitive allocation. The two theorems establish that perfect competition constitutes a first-best allocation of resources in terms of efficiency and welfare.

A widely accepted definition of economics is that by Lionel Robbins. He defines economics as the study of how human behavior interacts to solve the problem of allocating scarce resources to different and competing ends (Robbins 1935). This is the definition of price theory, which analyzes how prices and quantities are determined in markets under various assumptions, typically by maximization of satisfaction by consumers and of profits by producers. There was a departure from neoclassical economics in the important work of John Maynard Keynes (1936), leading to the separate study of macroeconomics. The focus of macroeconomics is on the determination of aggregate economic activity, measured by national income, prices and employment. In recent decades, there has been a marriage of both fields as economists have endeavored to provide rigorous microeconomic foundations to macroeconomic analysis (Obstfeld and Rogoff 1996).

There is an important distinction between normative and positive economics by John Neville Keynes (1891) emphasized by Friedman (1953, 3):

> In his admirable book on *The Scope and Method of Political Economy*, John Neville Keynes distinguishes among 'a *positive science* . . . a body of systematized knowledge discussing criteria of what is; a *normative or regulative science* . . . a body of systematized knowledge discussing criteria of what ought be . . . ; an *art* . . . a

> system of rules for the attainment of a given end'; comments that 'confusion between them is common and has been the source of many mischievous errors'; and argues the importance of 'recognizing a distinct positive science of political economy

There are no ethical positions or normative judgments in positive economics, which provides a body of generalizations that can predict the effects resulting from a change in circumstances. Prediction is not the forecast of future events but the ability to use the hypothesis to predict the consequences of those changes in circumstances in past, current or future time periods. According to Friedman (1953, 7), positive economics consists of the development of a theory or hypothesis that results in "valid and meaningful (i.e., not truistic) predictions about phenomena not yet observed." It consists of abstract hypotheses that synthesize key features of the complex reality of economics.

Normative economics, or welfare economics, analyzes the desirability of alternative economic states (Graaff 1957). Economic states may differ by the distribution of resources and gains, the type of economic structure of production and consumption. Normative judgments may be required to compare the desirability of different states. A contemporary example is whether to tax or not gasoline, with analysis of the desirability of the two states of values of economic data with tax on gasoline and without tax on gasoline.

Economic analysis departs from an assumption about behavior. For example, the consumer maximizes satisfaction. It then incorporates data and definitions. In the example, satisfaction depends on the quantity and availability of commodities that provide satisfaction. The consumer has a budget constraint. The theory uses the methods of constrained maximization of calculus (Hancock 1917) to obtain the necessary and sufficient conditions for maximization of satisfaction subject to a budget constraint. The economist develops operationally meaningful theorems from abstract assumptions, using symbolic logic, as analyzed by Samuelson (1947, 1970). The theorem is in itself a hypothesis about reality that could be tested under ideal conditions.

An important problem in economics is the lack of controlled experiments with which to test the operationally meaningful theorems. However, Friedman (1953, 10) still finds hope for economics:

> The inability to conduct so-called "controlled experiments" does not, in my view, reflect a basic difference between the social and physical sciences both because it is not peculiar to the social sciences—witness astronomy and because the distinction between a controlled experiment and uncontrolled experience is at best one of degree

However, it is much more difficult to weed out empirically irrelevant and erroneous economic propositions than to demonstrate errors of logic in theoretical economics. Friedman (1956, 1957) and Friedman and Schwartz (1963) provide contributions that attempt to verify empirically their own theoretical frameworks.

In the review of Burns and Mitchell (1946), Koopmans (1947, 172) argues that empirical economic inquiry should depart from specific models of human behavior to avoid restricting "the benefit that might be secured from the use of modern methods of statistical inference." Econometric research, according to Koopmans (1947, 172), requires "assumptions expressing and specifying how random disturbances operate on the economy through the economic relationships between the variables." Mainstream economics derives economic relationships from microeconomic foundations of optimizing behavior and then verifies them and/or measure parameters with "explicit assumptions, however general, concerning the probability distribution of the variables"(Koopmans 1947, 172).

The use of theory in empirical research encountered major hurdles in the simultaneous determination of economic variables in systems of structural equations. Economists have turned to the use of time series methods to circumvent the limitations of econometric analysis of structural economic models. A recurring problem in economics is defined by Granger (1969, 424) as the "difficulty in deciding the direction of causality between two related variables and also whether or not feedback is occurring." He proposed an influential test of the relationship that is known as "Granger causality."

There was significant effort in developing large-scale econometric models of countries and even linking these models for an analysis of the world economy. Sims (1980) argues that these models are useful for forecasting and analysis of policy. The main objection to these models is, according to Sims (1980, 1) that "claims for identification in these models cannot be taken seriously." Sims (1980, 17–32) estimates a six-variable dynamic system without the use of theory and uses it to test a hypothesis explaining cyclical behavior of real variables in terms of monetary policy shocks and a Phillips curve hypothesis. The VAR method expresses all the variables in terms of their own lags and those of other variables. It has become an important tool of theoretical and empirical research in econometrics.

The foundations of general microeconomic equilibrium were provided by Léon Walras in 1870 (Walras 1954). The task of Walras is to provide the simultaneous determination of prices and quantities of goods and services by a system of simultaneous equations of demand functions by consumers, supply functions by producers and identities of demand and supply. The arguments of the demand functions of a product are their own prices, prices of related commodities and consumers' income and tastes. The arguments of the supply functions are the costs of production, prices of productive services and technology. Consumers maximize their utilities and producers their profits, taking prices as given, that is, under conditions of perfect competition. The work of Walras was a landmark in economics allowing the analysis of significant disturbances of economies (Duffie and Sonnenschein (1988, 567). The GE model is used by economists in numerous contemporary applications.

There are no definitive arguments in the work of Walras concerning the existence of a solution to his system (Arrow and Debreu 1954). The existence of a solution to the GE competitive model is meaningful for positive and normative purposes. The applicability of the model to reality requires consistency of the

equations of the model and the conditions under which there is a solution. The definition of existence can proceed as follows (Duffie and Sonnesnchein 1988, 567–8). For every commodity, the condition that aggregate demand less aggregate supply is zero results in the system of n excess demand equations z_i in n price variables, p_i:

$$z_i(p_1, \ldots, p_n) = 0 \quad i = 1, 2, \ldots, n \tag{5.1}$$

The data of the economy are tastes, technology, the initial endowment or bundles of commodities of consumers and firm ownership. There is no market power such that agents are price takers. Maximization of profits results in a unique production plan because the supply function for every firm is single valued. The aggregate demand of households depends on prices and income distribution and the aggregate household supply is the sum of initial endowments. There is a price vector, p^*, that balances demand and supply, under the data of the economy, if and only if p^* solves Equation (5.1), that is, in GE all markets clear (Duffie and Sonnesnchein 1988, 578). By interaction of the demand functions of consumers and the supply functions of producers, the equilibrium price vector p^* depends on the basic data of the economy: tastes, technology and endowments. The existence theorem verifies that Equation (5.1) has a solution with non-negative prices, that is, the existence of a Walrasian allocation.

The contribution of Arrow and Debreu (1954) consists of two theorems that specify very general conditions under which there is equilibrium in a perfectly competitive system. The first theorem states that there is equilibrium in a competitive system if every agent initially possesses a positive amount of every commodity that can be sold. The second theorem establishes the existence of a competitive equilibrium if there are types of labor with two specific properties. Each individual must be able to supply at least a positive amount of one type of labor; there is positive use for each type of labor in the production of goods. The uniqueness and stability of the solution to the competitive equilibrium were not considered by Arrow and Debreu (1954, 266) because of the need to define equilibrium and specify the dynamics of perfect competition.

Pareto-optimal allocations occur when it is not possible to increase the utility, or level of satisfaction, of one individual without decreasing that of at least another. Walrasian equilibrium allocations are obtained by market-clearing prices. Markets clear when excess demands are zero. The fundamental welfare theorems establish the equivalence of Pareto-optimal allocations and Walrasian equilibrium allocations.

The marginal conditions for Pareto optimality are obtained as solutions to the program of maximizing utility subject to constraints of resources and technology and that the utility of every other agent is fixed at a predetermined level (Duffie and Sonnesnchein 1988, 576). The solution of the constrained maximization program yields the condition that the marginal rates of substitution in consumption are equal across individuals and also equal to the marginal rate of product transformation. The Walrasian equilibrium is obtained by maximization of utility for individuals and of profits by firms in terms of a common vector of product prices.

The solution to the constrained maximization in consumption is that the marginal rate of substitution for each pair of commodities is equal to the ratio of commodity prices; the constrained maximization in production requires equality of the marginal rate of transformation to the commodity price ratio.

The marginal rate of substitution between a commodity A and another commodity B is the increase in consumption of A required to maintain unchanged satisfaction after a unit decrease in B when the amounts of other commodities are held constant (Arrow 1951, 507). The marginal rate of transformation between commodities A and B is the increase of output of A when there is a unit decrease in the output of B, with all other outputs of commodities remaining constant (Arrow 1951, 507). Thus, Pareto optimality and Walrasian equilibrium have the same marginal conditions, being the basis for what Duffie and Sonnesnchein (1988, 576) call the "'marginal-this-equals-the marginal-that' proof of the basic welfare theorems." The statement by Arrow (1951, 507) is that a necessary and sufficient condition for a Pareto-optimum distribution is that the marginal rates of substitution between any two commodities be equal for every individual; a necessary and sufficient condition for maximum efficiency in production is that the marginal rate of transformation for every pair of commodities be equal for all firms (Arrow 1951, 507).

There is a separation of the relation of the Pareto optimum and the Walrasian equilibrium into two parts. The first fundamental theorem of welfare economics is the counterpart in contemporary economics of the Adam Smith statement that individuals promoting their self-interest promote the social good. The theorem states that Walrasian equilibrium allocations are Pareto optimal. The market clearing of the GE perfectly competitive model requires marginal conditions (equality of rates of marginal substitution to relative commodity prices and equality of rates of product transformation to relative commodity prices) that are exactly equivalent to those required by Pareto optimality. The perfectly competitive model results in a maximum of efficiency in the use of available resources and existing technology in that it is not possible to increase the output of one good without reducing that of another. The perfectly competitive state results in an optimum of satisfaction in the consumption of goods in that it is not possible to increase the utility of one individual without reducing at least that of another. Resources are used to provide the highest possible satisfaction to society with the assumed distribution of income. Perfect competition is the first best of efficiency and welfare. The second welfare theorem is concerned with obtaining the efficiency of perfect competition while retaining influence on income distribution (Duffie and Sonnesnchein 1988, 576). The theorem states that it is possible to make lump-sum transfers of income such that every Pareto-optimal allocation can become Walrasian equilibrium.

There is a simple intuitive explanation of the proof of the first welfare theorem (Duffie and Sonnesnchein 1988, 577). Consider the case of pure exchange of goods. Every agent has an initial endowment and the preferences of each agent define the economy. A non-negative bundle of goods for each agent is defined as an allocation and to be feasible it must be less than or equal to the initial

endowment. Assume first that there is an initial Walrasian allocation obtained by maximization relative to the non-negative price vector, p. There is no other feasible allocation that for the same satisfaction for each household (agent) can improve the satisfaction for other households (agents). Suppose that there is such an allocation, x_1, for the first individual, 1, and that the initial endowment of the i^{th} individual is ω_i. Assume that this is the individual whose welfare improves while that of others remains the same. Because of the assumption that agents prefer more to less, the improving allocation x_1 has quantitatively more of one or several of the commodities in the bundle. Thus, agent 1 cannot afford x_1 at prices p because it exceeds the value of its endowment:

$$px_1 > p\omega_1 \tag{5.2}$$

Because every agent prefers more of every commodity than less, each agent spends its endowment (income) to maintain its utility:

$$px_i \geq p\omega_i \text{ for all } i \tag{5.3}$$

The sum of the inequalities results in the left-hand side of prices multiplying bundles of goods, or expenditures, higher than the right-hand side of initial endowments, or income, because the allocations of all agents except 1 are at least equal to their initial endowments but that of 1 is higher. An allocation, or bundle of goods at a price vector, is feasible if and only if it is less than or equal to the initial endowment or income. Thus, the allocation that improves the welfare of agent 1 is not feasible and the exchange part of the first welfare theorem is proved. There is a similar proof for the production part. Overall Pareto optimality of the Walrasian allocation is proved. Duffie and Sonnesnchein (1988, 578) point to the simplicity of the argument, which follows from the definition of equilibrium and simple addition. However, they emphasize the important insight of the argument. An allocation that Pareto improves on a Walrasian allocation needs to possess higher value than the Walrasian allocation, thus being infeasible because it exceeds the initial endowment of the system. The method of Arrow (1951) and Debreu (1951), according to Duffie and Sonnesnchein (1988, 578), provides deeper understanding of the relation between optimum welfare and efficiency, constituting a substantive improvement over the first-order conditions for an optimum. There is significant intuitive appeal. The Walrasian allocation cannot be further Pareto-improved without exceeding the budget constraint. Duffie and Sonnesnchein (1988, 581–2) provide refined statements of the two welfare theorems that do not depend on certain restrictions used by Arrow (1951).

The theory of second best

A critically important issue is what happens to the GE model when there is a disturbance preventing the conditions for the first-best allocation. The analysis of the second-best solution is provided by Lipsey and Lancaster (1956). The co-author of the seminal paper on second best argues (Lipsey 2006, 16):

> In practical situations, as opposed to restrictive theoretical models, we cannot today discover the necessary and sufficient conditions for achieving a first-best allocation of resources. Furthermore, when all the *sources* [of distortions] are considered, achieving a *second best allocation* in any practical situation looks as impossible as achieving the first best. The conditions for doing so would be impossible to derive, and, if derived, would be difficult to interpret in the real world as opposed to some restricted models where, even there, they are often too complex for practical interpretation

Lipsey (2006, 21) agrees with the proposition by Harberger (1971, 795) that finding global second or first best optimum states may not be feasible but that economists may engage in doing real marginal good in policy. There are practical situations mentioned by Harberger in which the economist is asked to provide evaluations of the relative merits of two alternative agricultural programs, the cost-benefit of constructing a bridge or the resource allocation costs of a tax. There has been successful application of second-best principles in careful studies of cost and benefits.

There are two approaches used to justify the free-market system, according to Lipsey (2006, 4). The first approach consists of the formal proof of the two fundamental theorems of welfare economics. The first theorem uses the "idealization" of perfect competition to prove that market equilibrium results in an efficient allocation of resources. By means of a few value judgments, such as the assumption of a welfare function (Bergson 1938, Samuelson 1947, 1970), this equilibrium also results in optimal allocation. This proof of these theorems was a remarkable achievement. However, the assumptions required to prove the theorems are quite restrictive and unlikely to be found in reality. Lipsey (2006, 4) calls the second approach an "information justification," which is not cast in the tight form of equations leading to a theorem. This second approach consists of two propositions. The first is that the market system is self-organized, coordinating economic decisions better than any available alternative. The coordination is not optimal but tops any alternative. The second proposition is that the market system is relatively efficient, resulting in prices that reflect relative scarcities and other factors. There are important characteristics of the market system: less coercion in a framework of decentralized power with less opportunity for corruption and encouragement of growth by profit-motivated agents using private capital. Lipsey argues that the less formal approach is more realistic and can exert greater influence outside the economics profession.

There are two approaches to economic policy, according to Lipsey (2006, 5). The more formal approach provides recommendations based on rigorous results that should apply in all circumstances. The prescription of this formal approach is to eliminate market imperfections whenever they can be detected. The more pragmatic approach uses theories that may not apply to all economies all of the time. Thus, the prescriptions are specific in a given context. He argues that the scientific approach is rarely useful and can result in more harm than good. Lipsey

disputes that economic policies can be soundly formed on economic theory and some minimal value judgments.

Applied welfare economics

The recommendation of Lipsey (2006) is that there is value in applied welfare economics, or what is called project evaluation or cost-benefit analysis. An important tool of analysis is the estimation of deadweight losses pioneered by Harberger (1971). The understanding of this concept requires the analysis of consumer surplus that is introduced below in terms of the analysis of taxes by Hotelling (1938, 1939). The introduction of these concepts is followed by the analysis of applied welfare economics.

A French engineer, Henri Dupui (Hotelling 1938, 242–4), began the work on consumer surplus in 1844 that was subsequently elaborated by economists, including Marshall (1890) and Hicks (1939). In Book Three, Chapter 6, Marshall (1890) observes that the price actually paid for a good, the market-clearing price where demand equals supply, is lower than what the consumer would be willing to pay, which is obtained from the demand curve. For every unit demanded from zero to the units corresponding to the market price the consumer obtains a benefit in that the price that she would be willing to pay given by the demand curve would be higher than what she actually pays for that unit, given by the market-clearing price. The difference between what the consumer would be willing to pay and what she actually pays is a surplus of satisfaction. The sum of all these surpluses is the consumer surplus. Similarly, the price a producer receives, or market price, is higher for every unit, at the market price, than the price at which she would be willing to sell it, read from the upward-sloping supply curve. The sum of all the differences between the price received or market-clearing price and the price at which she would have been willing to supply that unit is the producer surplus. The total surplus is the sum of the consumer and producer surpluses.

Diagram 5.1 shows the analysis of taxation presented by Hotelling 1938, 243). The assumption of perfect competition is still valid. The curve *dd'* is the market demand curve, obtained by summing all individual market demand curves. The *ss'* curve is the supply curve, obtained by summing all the individual supply curves, which in this case is equal to the sum of the marginal cost curves because of perfect competition. There is a market clearing at price p^* and quantity q^*. The consumer surplus is the area p^*dm and the producer surplus is the area p^*sm. The consumer surplus is the integral of the demand curve between the maximum price at d and the market price p^* at m:

$$CS = \int_{p}^{d} D(p)\mathrm{d}p \tag{5.4}$$

Where *CS* is consumer surplus and *D(p)* is the demand curve, monotonic decreasing and single valued, and the integral is taken from p^* to d. Alternatively, the consumer surplus is the integral of the demand curve from the origin at 0 to p^* less what the consumers pay for the commodity, $0p^*$ multiplied by $0q^*$, equal to

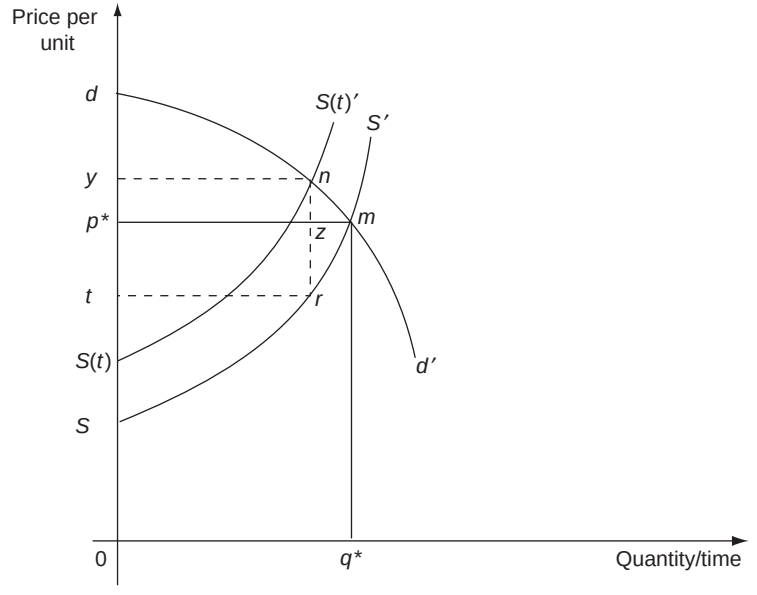

Diagram 5.1 The analysis of consumer surplus

the rectangle $0p^*mq^*$. The producer surplus is the rectangle $0p^*mq^*$ less the integral of the supply curve from s to p^*:

$$PS = 0p^*mq^* - \int_s^{p^*} S(p)\mathrm{d}p \tag{5.5}$$

Where PS is producer surplus, $S(p)$ is the monotonic increasing, single-valued supply curve and the integral is taken from s to p^*. Suppose that the government introduces a unit tax of value ty. The supply curve would shift to $s(t)s(t)'$. The loss of consumer surplus would be the area of the curvilinear triangle nzm and the loss of producer surplus the curvilinear triangle zmr. These losses are called deadweight losses. The tax revenue is the tax per unit, ty, times the units taxed, tr, equal to the area of the rectangle $tynr$. The deadweight losses are commonly analyzed in the applications by means of linear demand and supply functions in which case the consumer surplus and producer surplus become triangles.

Harberger (1971, 785) proposed three basic postulates for applied welfare economics. The value of a unit of a good for a demander should be measured by the competitive demand price. The value of a unit for a supplier should be measured by the competitive supply price. The costs and benefits of a group, such as a nation, should be added in the evaluation of projects, programs or policies without consideration of who receives the benefits.

The postulates relate to a contested issue in economics about the use of consumer surplus in the measurement of welfare. Critics argue that consumer surplus requires the following: (i) the assumption of constant marginal utility of real

income; (ii) does not consider the distribution of income; (iii) allows only for small changes in variables; iv) ignores changes in income distribution; and (v) is surpassed by more rigorous revealed preference analysis. However, Harberger proposed that consensus on the three postulates would further the interests of applied welfare economics.

The postulates are, according to Harberger (1971, 795), simple, robust and inherited from a long tradition in economics. Their simplicity resides in the use of basic economic analysis and the availability of required data. The robustness originates in the ability to define a full optimum. It is possible to introduce taxes and subsidies to ameliorate distortions such as monopoly and pollution. The analysis incorporates the excess of marginal social benefit over marginal social cost per unit of economic activity and the effects of changes in policy variables such as taxes and subsidies. Most distortions found in practice can be analyzed.

Harberger argues that the practical usefulness of economic advice does not originate in a desire for elegant economic optimum analysis. The economist, according to Harberger (1971, 795),

> is more likely to be asked which of two alternative agricultural programs is better, or what resource allocation costs a given tax increase involves, or whether a certain bridge is worth its cost. And to be relevant, his answer must recognize the existence of many distortions in the economy, over whose presence neither he nor his client have control.

Typically, the practical question involves ranking alternatives in terms of their potential damage and benefits. Harberger argues that the three postulates provide solutions equivalent to more elegant optimization exercises.

Harberger and Jenkins (2002) summarize the state of the art in applied welfare economics as follows. The three principles of Harberger (1971) are accepted. The demand price is a measure of the benefit while the supply price is a measure of the cost. Efficiency considerations dictate that it does not pay to engage in activities where supply price (extra cost) exceeds demand price (extra benefit). Similarly, it pays to expand into activities where extra benefit (demand price) exceeds extra cost (supply price).

Distortions introduce a wedge in costs and benefits, as argued by Harberger and Jenkins (2002). Taxes constitute the most common case. Consider that p^d is the demand price gross of tax, p^s is the supply price net of tax, the tax per unit is 10 percent and ΔC is the increase of the service as a result of the project. The net gain (benefit less cost) of the project is: $p^d 1.1\Delta C$ less $p^s \Delta C$ equal to $.1p^s \Delta C$, as p^d equals p^s. That is, when quantity increases with a tax, there is a welfare benefit equal to $.1p^s \ \Delta C$, and there is a loss if there is a decrease in quantity. A subsidy to production has the opposite effect: there is a loss if quantity increases, an added cost, and a gain if quantity decreases, a cost reduction. Table 5.1 summarizes the effects of taxes and subsidies.

Table 5.1 Effects of taxes and subsidies

Quantity increases		
External effect	Wedge	Change in quantity
$T_i \Delta X_i > 0$	$T_i = p_i^d - p_i^s > 0$	$\Delta X_i > 0$
$S_i \Delta X_i < 0$	$S_i = p_i^s - p_i^d < 0$	$\Delta X_i > 0$
Quantity decreases		
External effect	Wedge	Change in quantity
$T_i \Delta X_i < 0$	$T_i = p_i^d - p_i^s > 0$	$\Delta X_i < 0$
$S_i \Delta X_i > 0$	$S_i = p_i^s - p_i^d < 0$	$\Delta X_i < 0$

Source: Harberger and Jenkins (2002).

Define D_i as equal to $p_d{}^i$ less $p_s{}^i$, which is positive for a tax and negative for a subsidy, and maintain the change in quantity as ΔX_i. The general expression of Harberger and Jenkins (2002) for external effects is: $\sum_i D_i \Delta X_i$ with the sum over all *i*. In the case of no distortions in a competitive efficient allocation, the sum of external effects is zero because the D_i are all zero. The expression also simplifies evaluation, concentrating on existing distortions and not in all economic activities, to compute the overall effect of distortions.

The analysis of applied welfare economics uses the concept of sourcing (Harberger and Jenkins 2002). An increase in demand for a good eventually translates in the world market for the commodity. The source is world demand and supply: an increase in demand will reflect in increased supply from producers, in reduced demand by other consumers or a combination of both.

Suppose that there is an economic project in which part of the purchases are from demanders and must be valued at the gross or tax including price and another part is from newly generated supply that must be valued at the net of tax supply price. It is possible to derive the following formula (Harberger and Jenkins 2002):

$$p_d{}^j = p_m{}^j + f_1 T_d{}^j - f_2 T_s{}^j \tag{5.6}$$

The economic price for the *j*th good, $p_d{}^j$, is equal to the market price for the *j*th activity $p_m{}^j$, plus the adjustment upward for the tax on demanders, $f_1 T_d{}^j$ (where f_1 or sourcing coefficient is $-\eta/\varepsilon - \eta$), η is the negative price elasticity of demand and ε the positive price elasticity of supply and $T_d{}^j$ the tax on demanders) less the downward adjustment for the tax on suppliers, $f_2 T_s{}^j$ (where f_2 is $\varepsilon/(\varepsilon - \eta)$ and $T_s{}^j$ the tax on suppliers). The explanation of the expression is that the new demand by the project generates a negative externality that displaces other demanders via the tax on demanders. The project stimulates new supply, generating a positive externality via the tax on suppliers. The expression merely states that the economic price of a good is the market price with adjustments by the weighted average of the sourcing coefficients.

A typical problem found in reality is a multiplicity of tariffs on imports and subsidies on exports. The approach allows the derivation of the opportunity cost of foreign exchange, E^*, as a weighted average of sourcing factors of the taxes on t_i, the taxes on the *i*th imports, and z_j, the subsidies on the *j*th imports (Harberger and Jenkins 2002):

$$E^* = \Sigma_i f_i E_m(1 + t_i) + \Sigma_j f_j E_m(1 + z_j) \tag{5.7}$$

$E_m(1+t_i)$ is the domestic currency price of a dollar of the *i*th import inclusive of the ad valorem import tax t_i, $E_m(1 + z_j)$ the domestic currency price of the *j*th export inclusive of the ad valorem export subsidy z_j, and the f_i and f_j are respectively the sourcing factors of displacing the *i*th import with tax t_i and stimulating the *j*th export with subsidy z_j. The weights f_i and f_j are fractions and must add to one. The expression can be simplified to (Harberger and Jenkins 2002):

$$E^* = E_m(1 + \Sigma_i f_i t_i + \Sigma_j f_j z_j) \tag{5.8}$$

It expresses the opportunity cost of foreign exchange as the market exchange rate, E_m, adjusted by the weighted average of distortions in the form of import duties and export subsidies. There is, not without controversy, the expression for the opportunity cost of capital (Harberger and Jenkins 2002):

$$\omega^* = \Sigma_i f_i \rho_i + \Sigma_j f_j r_j \tag{5.9}$$

The expression states that the opportunity cost of capital, ω^*, is equal to the weighted average of the marginal productivity of capital in the *i*th good, ρ_i, and the market rate of interest in the *j*th market, r_j, weighted by the appropriate sourcing factors, accounting for the payment of capital, f_i, and the loss of revenue to the government because of the displacement of investment, f_j.

Cost-benefit analysis consists of the set of methods allowing the ranking of options of policy by economic analysis on the basis of their benefits and costs (Boadway 2006, 1). In some cases, such as a water development project at the local level, partial equilibrium analysis may be sufficient. More complex GE models may be required when analyzing taxes, subsidies and regulations that affect various markets. The concern is with the economic welfare of households. Political science may consider other important aspects.

Value judgments are kept to a bare minimum of three general principles. The preferences of a household determine its welfare. An increase of welfare is Pareto optimal in that the well-being of an individual increases without reducing that of another. There are no external concerns, such as freedom, non-discrimination and so on, other than the economic welfare of individuals in the ranking of alternative policies. There is the assumption of a social welfare function in the sense of Bergson (1938) and Samuelson (1947), in which welfare increases in all arguments. There are specific restrictions in the social welfare function and resulting complication for cost-benefit analysis (Boadway 2006, 2–6).

There is an expression for the welfare loss of a tax (Boadway (2006, 7–8):

$$\Delta W = -R_d(\text{consumer surplus loss}) - R_s(\text{producer surplus loss}) + R_g(\text{increase in government revenue})$$

The imposition of a tax causes losses in consumer and producer surplus, measured as triangles in a model of linear demand and supply and a rectangle of gain in government revenue. The redistributive weights R_d, R_s and R_g represent the effects of redistribution of income caused by the tax. The shares of individuals in different income groups are represented by the demand R_d and supply R_s weights and the share of government in revenue collected from different income groups is represented by the weight for government R_g. The method can be applied to any type of change in policy.

The basic analysis of project evaluation consists of calculating the net present value of the project. Consider a project that begins in time period 0 and ends at T, where t is the index of time, B are the benefits, C the costs and r the constant social discount rate (SDRT), then the present value is obtained by the formula (Boadway 2006, 10):

$$PV = \sum_{t=0}^{T} \frac{(B_t - C_t)}{(1+r)^t} \tag{5.10}$$

It is possible to rank policies by their PV to make choices. A policy with positive present value is socially desirable. However, there is a difficult decision as to how positive a project should be. The variables are subject to estimation error, not only the costs and benefits but also the discount rate. This process is typical in private sector companies that are making capital budgeting decisions. There are situations in which there is a maximum capital budget and the present value calculations have to be used to work within the budget. Another complication is the extension of projects over multiple time periods, making comparisons more difficult. Standard practice consists of using current consumption as the measuring rod of costs and benefits. Shadow prices may be used for such things as the cost of labor when there are distortions, which is the typical case.

The calculation of present value requires adjustments for inflation. For purposes of simplification, assume a constant rate of inflation per period of π. The conversion of nominal to constant benefits and costs is obtained as follows (Boadway 2006, 12):

$$b_t = B_t/(1+\pi)^t \text{ and } c_t = C_t/(1+\pi)^t \tag{5.11}$$

The nominal interest rate, i, must follow:

$$(1+i) = (1+r)(1+\pi) \tag{5.12}$$

Thus, the net present value can be rewritten in real terms as:

$$PV = \sum_{t=0}^{T} \frac{(b_t - c_t)}{(1+i)^t} \tag{5.13}$$

An important issue in applied welfare economics and actually in all economics is the specification and measurement of a proper counterfactual (Harberger 1997). A counterfactual is the set of data that would occur under alternative events. For example, an important counterfactual in the United States is how the economy would have performed without railroads (Fishlow 1965; Fogel 1964). The specification and measurement of that counterfactual would measure the actual benefits and costs of railroads. In applied welfare economics, the hurdle is to specify theoretically what the states of well-being would be with the project and without the project. Even if it were feasible to specify the counterfactual, what the situation would be without the project, there is a difficult empirical issue. Sound evaluation would require the measurement of the states with and without the project. In practice, this requires the projection to the future of a large number of variables. Necessarily, the task will be surrounded with significant doubts.

The public interest view

Market failure occurs when the market on its own cannot attain the first best of efficiency and welfare (Bator 1958). The public interest view recommends policies to ameliorate market failures to obtain Pareto-improvements over a free-market allocation. That is, public policy may increase satisfaction of some agents without reducing the satisfaction of others. The coercion powers of the government may be used to tax and subsidize economic activities to obtain results that are superior to those obtained under free markets. The public interest view focuses on identification of market failures and policies that can ameliorate their effects. Moreover, the public interest view predicts that government intervention occurs in response to market failures.

There are two important cases of market failures in neoclassical economics. Positive or negative external economies prevent the attainment in reality of the first best of efficiency and welfare even under conditions of perfect competition. In the second group of cases, there may be market power, monopoly or monopolistic competition, which prevents first-best allocation.

The argument by Pigou (1932) is that the social output ("national dividend") would be at a maximum with available productive resources when the marginal social product is equal to the marginal private product. When the marginal social and private products diverge, there is not maximum social output. He argued that in the case of discrepancies, government interference would tend to increase the social output instead of decreasing it as commonly argued when social and marginal products are equal. Pigou argued that such divergences would occur even in markets with perfect competition. The divergences are evident in markets with oligopolies and monopoly.

If the value of the private marginal net product is lower than that of the social marginal net product, investment would be less than socially desirable. In this case, Pigou advocates that under perfect competition maximum dividend could be attained by a proper subsidy. There would be more investment than socially warranted if the value of the marginal net product were higher than that of the social

marginal net value. The solution under perfect competition would be a tax to obtain optimum output. Monopoly power in an industry would result in less output with investment lower than socially desirable. Pigou recommends regulation of output in the case of monopoly. He also finds that taxes, subsidies and regulation may be exceptionally difficult to implement and that government operating production may be more effective than attempts to regulate private enterprise. However, Pigou argued that public operation would likely be inferior to public control of production in attaining the highest national dividend.

The analysis must include the cost of externalities when producers do not pay for a resource used in production, such as air in steel production. The cost of the externality inserts a wedge between the social and private cost of production. The marginal social cost, *MSC*, is the cost to society of producing an extra unit of output, in this case steel. The marginal private cost, *MPC*, is the cost to steel producers of producing an extra unit of output, in this case steel. The marginal external cost, *MEC*, is the cost of the externality, in this case, pollution. The marginal social cost is equal to the marginal private cost plus the externality, that is, $MSC = MPC + MEC$. In words, the social cost exceeds the private cost by the cost of the externality, or pollution in this case. Thus, if price equals marginal private cost, output of steel would be too high. The policy in this case would be to impose a Pigou unit tax equal to the marginal cost of the externality. Price would be higher and equal to the marginal social cost. For society as a whole, there would be an optimum combination of output of steel that takes into account the cost of pollution.

If there were a way in which the steel producers could compensate the affected agents for the pollution created in production, the result would be the same as with taxation, that is, price would equal marginal social cost, output being lower and price higher. In that case, the steel producers would, in economic jargon, "internalize" the externality. This is simply shorthand for the fact that producers of steel would take into account all costs of production, including the externality. The outcome would be efficient either with the tax or with the compensation by the originator of the externality to the injured party. Society would be using resources efficiently, including the use of air. Either the per unit tax or the compensation agreement would ensure the efficient outcome of maximum production less all costs, including the non-priced resource, air in this case. There is a computational problem of finding out the price of the good or service for which there is no market price. In this case, it amounts to finding out the price of pollution in the absence of a market for buyers and sellers of pollution.

The externality could be positive. That is, the production of a good might have benefits in the production of others. The most evident case is education. The more educated worker increases productivity and thus social output. The marginal social benefit, *MSB*, is the benefit to society of consuming an additional unit of a good or service. The marginal private benefit, *MPB*, is the benefit of individually consuming an extra unit of the good or service. The marginal external benefit, *MEB*, is the benefit of consumption of an extra unit of the external benefit. The marginal social benefit is equal to the marginal private benefit plus the marginal external benefit,

or $MSB = MPB + MEB$. Because *MEB* is positive, in this case, education raises the output of society via increases in productivity; *MSB* is higher than *MPB*, by the amount *MEB*. There is again the issue of pricing the socially used resource, education, which may not be accurately observed, especially when unequal in quality, as between private and public education. The government solution would be to impose a Pigou unit subsidy equal to the marginal external benefit. In this case, there is not sufficient production of the external benefit. Price would be higher by the amount of the subsidy to equal the higher marginal social benefit and output would be correspondingly higher. There remains the difficult computational problem of calculating the exact subsidy to obtain the efficient outcome of equality of marginal private benefit and marginal private cost.

An important assumption of the first best is the absence of market power. Producers are price takers, that is, they accept the market price, having no power to influence it. This is not the case of a market with only one producer, a monopolist, which can restrict quantity to increase the price of its product. The output under monopoly is lower than that under perfect competition and the price under monopoly exceeds that of perfect competition. Diagram 5.2 shows the analysis of monopoly. The market clearing under perfect competition would occur at *m*, with price p^* and quantity q^*. The monopolist would set the price at $p(m)$ with quantity $q(m)$. There is a deadweight loss measured by the curvilinear triangle *abm*. Tullock (1967) introduced the concept of the monopolist's rectangle, $p^*abp(m)$, which is a measure of resource misallocation in seeking protection for the creation and maintenance of the monopoly, discussed below in a separate section on rent-seeking. Market power is another classic case for government intervention, which can consist of regulation, taxation or direct state ownership.

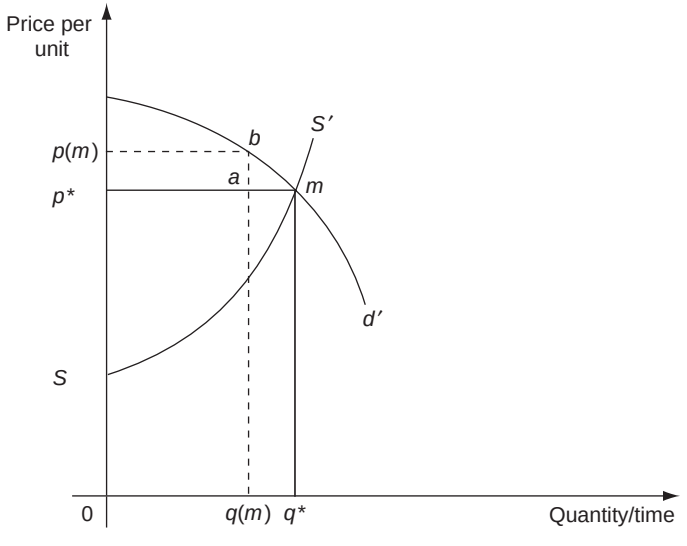

Diagram 5.2 The analysis of monopoly

Regulation can be defined as using legal instruments to implement goals of social and economic policies (Hertog 1999, 223). The government alone has the power to coerce by using instruments that can be enforced with penalties, which can take many forms, such as fines, public dissemination, prison terms, court injunctions and even the closing of the business. Economic regulation can be of the structural form, to regulate markets in the presence of market power, such as entry and exit rules and licensing (Hertog 1999, 224). Conduct regulation restricts market behavior with measures such as price controls, minimum quality standards and so on. Social regulation is oriented toward protection of the environment, labor and consumers with measures such as safety regulations (OSHA), disclosure of product content (fats and cholesterol), control of substances (DEA) and prohibitions of discrimination in employment and housing. There is a distinction between theories of positive and normative regulation. Positive theories intend to explain the economic need of regulation and its consequences while normative theories attempt to rank types of regulation by efficiency, according, for example, to their costs and benefits.

The public interest is defined as the optimum allocation of scarce resources to satisfy competing private and social ends, the definition of price theory with the inclusion of the collective good. Under ideal conditions, free markets result in optimum allocation but this is not the case in practice because of different conditions than in the theory of perfect competition. The public interest view contends that government regulation can correct resource misallocation caused by imperfections such as market power, unbalanced and missing markets and undesirable results. Collective action can be superior to individual action in enforcing contracts and ensuring property rights with lower transaction costs (Hertog 1999, 225). Table 5.2 classifies the types of market failures, the potential policies and their intentions.

There has been criticism of the public interest view. The market can compensate itself for many of the alleged market failures. The theory is weak in that it is relatively simple to find unlimited numbers of market failures and very difficult to rank them for priority action (Hertog 1999, 231). The theory of market failure assumes prohibitive transactions costs in the free market but zero costs by government regulation, which can be implemented with total efficiency. The existence of imperfections causes regulation to distort multiple markets in addition to those with imperfections. The correction of one or a few market failures, say, by setting prices equal to marginal costs, does not attain a second-best solution. The theory of second best postulates that once there is a distortion of the first best, the satisfaction of additional marginal conditions need not move the economy to a better outcome. The asymmetry of information appears to apply only to the private sector as if the government were omniscient and had command of all the information required to ameliorate the effects of missing markets or asymmetric information and effectively enforce the rules.

There is a more sophisticated version of the public interest view that does not assume perfect foresight and effectiveness by the government (Hertog 1999, 235). Regulation could still attain more efficient outcomes than the private sector or

Table 5.2 Failures, policies and consequences of public interest regulation

Failure	Policy	Intentions of policy
Imperfect competition		
Price > marginal cost	Barriers to entry/exit	Fair price
Lower output	Anti-collusion norms	Higher output
	Price regulation	
	State ownership	
Unbalanced market		
Excess capacity	Diminish number of producers	Stabilize output and employment
Price level < total costs	Macro policies	
Information		
Missing information	Licensing	Consumer protection
Asymmetric information	Self-regulation	Quality of products
Adverse selection	Misleading rules	Financial/economic stability
Moral hazard	Advertising bans	Depositor and shareholder protection
Prudential supervision		
Prudential regulation		
External effects		
MSC > MPC	Pigou taxes and subsidies	Lower output of negative externality
Excess output	Safety regulation	Higher output of positive externality
MSB > MPV		
Insufficient output		
Public goods		
Not produced	Collective provision	Higher economic efficiency
Free-rider problems		
Undesirable results		
Unequal distribution	Minimum wages	Social efficiency

Source: Hertog (1999).

private negotiation by economic agents. The government could obtain information less expensively and more effectively through coercion, such as in banking supervision and in data banks on car accidents. The revised theory still assumes that market failures exist and that the government can ameliorate them more effectively than private contracting. Regulation would still be the efficient solution for market failure.

The theory of public goods

The theory of public goods has been extended to national, regional and global cases. The analysis of international public goods and its consequences for globalization is in Chapter 2 of Volume II. Only the basic concept is introduced here to complete the case for market failures and the need of government intervention.

The cost of providing a public good to another individual is zero and it is not feasible to exclude persons from consuming it. There are two properties of public

goods, lack of rivalry and exclusion. The lack of rivalry means that consumption by an individual does not reduce the ability of others to consume it. The lack of exclusion means that nobody can be excluded from consuming it. Samuelson (1954, 1955, 1958) contends that markets do not ensure the production of public goods. Collective action is required to surmount the lack of action by the private sector.

Pure public goods have the properties of non-rivalry and are non-excludable. Non-rivalry means that the marginal cost of an additional user is zero. Thus, everybody can use the product. The non-excludable property means that no consumer can be excluded from consuming it. In the case of impure public goods, consumption may decrease with consumption of other users. The marginal cost increases, perhaps after some point, when more consumers use the good.

The specification of utility and transformation functions with both private and public goods results in the familiar conditions for maximization (Buchanan 1999, 19–22, 69–71). The summation of the marginal rates of substitution between the public and private good must equal the marginal rate of transformation, or marginal cost.

A key aspect of the theory is to determine what goods should be considered public (Buchanan 1999, 162). The issue is to specify the circumstances in which members of a politically organized society decide to provide some goods collectively. The immediate economic answer is somewhat trivial: choose the most efficient outcome. In other words, the issue is to determine when collective supply of certain goods is more efficient than private allocation in markets.

At one end of a spectrum there are goods that are purely private, being fully divisible, with a single consuming unit, the individual or the family. The other end has pure public goods that are fully indivisible in their benefit to a group that may contain unlimited numbers of individuals. In between, there are goods that are partly private and partly public (Buchanan 1999, 175). The divisibility of the goods and the interaction among small or large groups characterize the private and public nature of goods. The conclusion is that there may not be a general principle of classification and that each case may have to be individually analyzed. The important criteria for classification and efficiency in supply are the description of the good, the technology of sharing and the range of sharing.

The theory of market failures in the case of public goods does not specify the institutions required to ameliorate the failure with collective action (Buchanan 1999). Market mechanisms may not attain efficient outcomes because of the inherent free-rider problem when there are large numbers of economic agents.

Economists typically provide examples of cases in reality. Some of the best-known examples of market failures have been shown to be erroneous. Economists used lighthouses as a landmark example of a public good (Nordhaus 2005, 1): the lighthouse saves ships but cannot collect the fees directly from them, requiring collective action. The social benefit of the lighthouse exceeds the private benefit, justifying the provision of the service by the government. Coase (1974) has shown that most lighthouses in England and Wales were built in the seventeenth century for private gain. There was a sort of intervention in the form of a patent

that allowed the owners of the lighthouse to charge tolls on ships. Thus, the lighthouse service was provided by the private sector with minimal regulation by the government in the form of patents.

Imperfect information and regulation of finance

The model of perfect competition requires perfect information. All agents have the same information on prices, technology, credit and so on. Several economists writing after 1970, Akerlof (1970, 2003), Spence (1973, 2002) and Stiglitz (2002a), focus on incorporating in models asymmetry of information consisting of the assumption that some agents have information that others do not possess. These efforts prove that in case of imperfect information, the free market does not attain Pareto optimality on its own. Thus, there is the possibility that collective action may implement Pareto-improving policies.

The perception of Akerlof (2003) in developing his contribution of Akerlof (1970) went beyond the market for used cars into any market where the quality of goods would be difficult to assess. Asymmetry of information characterizes many markets, in particular credit and insurance.

The initial intention of Akerlof (2002, 413) in analyzing the asymmetry of information was to explain the illiquidity of used cars because sellers had better knowledge of the vehicle than potential buyers. Imperfect information could result in extremely thin markets. This illiquidity could explain the fluctuations in output and sales of new cars that were important determinants of economic activity in the first decades after World War II. He found that asymmetric information had solutions in some markets by means of repeat sale and reputation. However, there were other markets, such as insurance and credit that could experience serious breakdowns. Important examples were the difficulty of the elderly in obtaining health insurance and small business in receiving credit. Underdevelopment is significantly caused by the failure of credit markets. His interpretation is that the incorporation of asymmetric information in price theory constituted part of a revolution to derive postulates from more realistic assumptions.

In standard economics, markets are Pareto efficient unless there are market failures. Stiglitz (2002a, 468) argues in numerous contributions that "under the imperfect information paradigm, markets are almost never Pareto efficient." In this view, asymmetry of information requires a new paradigm of economics as well as new avenues of political economy. Asymmetry of information is widespread in the economy. It consists of the "fact that different people know different things" (Stiglitz 2002a, 469). For example, the individual buying insurance has knowledge of her health habits, such as smoking and drinking, which are not available to the insurance company. The borrower knows more about her financial situation and the viability of a project than the lender and the owner of the firm knows more than the potential investor. Market equilibrium with imperfect information may have undesirable characteristics. In the credit market, there may be credit rationing, as lenders do not lend to borrowers above a certain interest rate because

of the uncertainty that borrowers will default. This uncertainty is caused by the lack of information on the creditworthiness of those borrowers. In the labor market, the wage rate may be above the rate at which demand and supply of labor are equal, resulting in unemployment.

The fundamental theorems of welfare economics and their implications for the role of competitive markets had been challenged by market failures, such as pollution. However, Stiglitz (2002a, 477) argues that they lost relevance with the discoveries on the distorting role of imperfect information. The model with competitive markets and perfect information allowed for decentralization of decisions with positive effects on resource allocation. The models with failures of information intend to demonstrate that such decentralization does not occur in most cases. Even if the government experienced the same informational deficiencies as the private sector, there would still be room for improvement of welfare through intervention (Stiglitz 2002a, 479). This strand of thought contends that markets result in efficient outcomes only in very special cases.

Another important distortion of imperfect information arises in firms where ownership and control are separate (Stiglitz 2002a, 481). Managers may promote their own interest instead of those of shareholders. Majority shareholders may benefit their interests at the expense of minority shareholders. There is possible welfare improvement in the regulation of corporate governance. The failures of governance also suggest that there may not be maximization of shareholder wealth as assumed in the theory of finance. Takeovers of firms would not ensure such maximization.

Imperfect information affects decisions on wages and prices more than in volumes such as employment. Firms are more reluctant to make adjustments in wages and prices because of greater uncertainty. As a result, adjustments are in quantities such as employment.

Information asymmetries are extremely important in credit markets. Thus, markets failures are more pervasive in credit. As a result, Stiglitz (2002a, 484) proposes significant regulation of financial markets.

Stiglitz (1994) argues that financial markets differ from other markets, being more likely to experience failures requiring intervention. There are forms of intervention that will improve the functioning of financial markets and the economy. Financial markets are characterized by major intervention in the form of banking and securities regulation. There is significant direct engagement in lending, such as government guarantees for loans, small business, housing, exports and other activities. Financial crises have been common. These crises have proved that financial institutions may direct resources to activities with negative returns instead of the usual concept of allocating scarce resources to highly productive activities. Stiglitz (1994) argues that stock and bond markets only finance a fraction of total investment and that the costs are high when taking into account the resources required to operate financial markets. The stock market is more like "a gambling casino" instead of a source of capital for new projects and expansion of established ones. The new technology allows faster registering of transactions but it may not increase efficiency.

Financial markets perform numerous important functions. They intermediate funds from savers to investors, monitoring and enforcing contracts, evaluating projects and pooling, transferring and sharing risks. Financial markets trade over time periods, working with information and managing risk. Stiglitz (1994) argues that there are links of risk, trading over time periods and information in the analysis of financial markets. The role of these markets is as the brain of the economy in the form of allocation of resources. Thus, failure in financial markets affects the performance of the entire economy.

There is a critique of the efficiency of competitive markets because of imperfect information (Stiglitz 1994). According to this view, the fundamental welfare theorems asserting that competitive markets are efficient do not provide any guidance on financial markets that produce, process, disseminate and use imperfect information. There are conceivable forms to improve efficiency by means of government intervention in financial markets. Market failure originates in costly information. Information is more important in financial markets than in those of goods. According to Stiglitz (1994), information is a public good. Thus, there is a role for government intervention to provide enough information that would not be provided under free financial markets.

There are seven market failures in the analysis of Stiglitz (1994):

1. *Monitoring*. The information on the soundness of a financial institution is valuable to investors and depositors, being a public good.
2. *Monitoring externalities*. The selection and monitoring by a financial institution may encourage other lenders, causing a positive benefit. Similarly, unsound creditors may cause difficulties in the raising of capital, causing a negative externality.
3. *Bankruptcy and insolvency*. There are externalities of financial problems. The failure of one or several institutions may cause credit problems for borrowers.
4. *Missing and incomplete markets*. Adverse selection and moral hazard inhibit trade and efficiency.
5. *Imperfect competition*. The imperfect nature of information causes imperfect competition in financial markets that significantly depend on information.
6. *Pareto inefficiency*. Imperfect information causes Pareto inefficiency in financial markets because of the breakdown of the assumption that information is exogenously obtained.
7. *Uninformed investors*. There may be improvements in markets if government requires greater disclosure of information needed by investors.

Government failure

The correction of market failures by designing policies that attain efficient allocation appears quite difficult. Once the economy is in the world of second best, policy design may be frustrating. The authorities would need perfect information,

that is, the regulators must be omniscient and omnipotent, similar to the benevolent dictator of welfare economics. The possibility of government failure is actively debated in the technical and policy literature.

There may be a fallacy in the analysis of market failures. Pigou is careful in outlining the difficulties of determining in practice the measures to correct for externalities. Other writers may be excessively enthusiastic in comparing intervention by a government that never makes mistakes with a "blackboard" or textbook case of market failure. This is the "Nirvana Fallacy," comparing theoretical markets that have imperfections with flawless government intervention (Demsetz 1969). If the markets fail because of imperfect information, government intervention will also fail for the same reason. There is no superiority of information by the government in intervention. For example, there is no reason why government-owned banks would give fewer loans to defaulting companies than privately owned banks.

The process of diagnosis of market failure, the "double market failure test," analyzes the problems caused by the failure and non-market problems that may occur by the effort to ameliorate it (Zerbe and McCurdy 1999, 2000). That is, the policy analyst considers the problems and the consequences of actions to remedy them. The solution should cause the least possible interference with the market. The United States determined by Executive Order 12866 in 1993 that federal officials conduct an economic analysis of proposals for regulation, assessing if the problem is a "significant market failure."

The costs required to transfer, establish and maintain property rights are called transaction costs (Zerbe and McCurdy 1999, 2000). They consist of the costs of negotiation, contracts, lawsuits and so on. In practice, they are not zero. Trades would be undertaken if transaction costs were zero or less than the potential gains of trading. There is market failure when the trades do not occur. There is market failure when the value of the unpriced externality exceeds transaction costs. Transaction costs without evident price are ubiquitous, the same as externalities. Thus, there are large numbers of market failures. For example, if an inefficient breach of contract is encouraged by law, it produces an externality. The concept of market failure can lead to almost unlimited intervention by the government. Transaction costs exist when there is non-market failure in the form of ineffective bureaucratic amelioration of market failure. However, non-market failure costs are not powerful in preventing government intervention.

One of the classic examples of externalities causing market failure is that used by Meade (1952a) about the positive external economies provided by beekeepers in the pollination of apple growers, using it as a practical example of how taxes and subsidies could be used in competitive markets to ameliorate market failures. Cheung (1973) analyzed the system in Washington State in the United States, showing that contracts between beekeepers and farmers have existed for very long periods. In both cases, the alleged externalities were actually internalized through agreements among the parties without government intervention. The beekeepers of the twenty-first century transport their bees by truck around the country to sell their lucrative services (Engelhaupt 2006):

> While California beekeeper Orin Johnson prepares his bees for the coming almond season, hundreds of trucks loaded with beehives are bearing down on his state. They are all headed for the almonds. It's a caravan that people in the bee business join every year, chasing the blooms and the dollars. 'Commercial beekeeping can be very lucrative,' says Johnson, who is also vice president of the California State Beekeepers Association. Farmers in the United States pay about $150 million a year to rent hives, and demand is growing

There evidently is bargaining between beekeepers and growers all over the United States and no need for the system of taxes and subsidies envisioned by Meade on the basis of alleged lack of knowledge of externalities by bees that is compensated by beekeepers.

A market failure occurs when market institutions do not allocate resources in such a way as to result in Pareto optimality. Government intervention requires assessing if the market is not allocating resources efficiently and if government intervention can improve on the performance of the market with benefits that exceed the costs of intervention (Winston 2006, 2). There is government failure when intervention was not required and in cases when a different form of intervention than the one followed would have been more efficient. Intervention should be altered when economic welfare is reduced or resources allocated in a way that is significantly different than the one suggested by the standard of efficiency. While theory can provide optimum policies to correct market failures, the evaluation of government failure requires solid empirical evidence. In the past century, the US government has intervened with antitrust policy and regulation to restrict market power and ameliorate imperfect information and externalities. The government has also provided or financed social services that could not be provided by the private sector.

There are three basic postulates of applied welfare economics in the original framework of Harberger (1971). The benefits and costs to consumers must use consumer surplus; the benefits and costs to producers must use producer surplus; and the benefits and costs to groups should use the addition of consumer and producer surpluses.

If a firm attempts to capture consumer surplus by using illegally its market power, the government, by the codified antitrust laws, can stop that conduct and those of similar enterprises. In the presence of pricing above marginal cost, the government can regulate prices to equal marginal costs or use a subsidy or tax to allow the monopolist to earn normal profits. In both antitrust and regulation, the government attempts to move prices close to marginal costs.

Winston (2006, 14) researched the available empirical evidence in scholarly research and concluded that US policies did not increase consumer welfare in the case of monopolies, mergers and collusion. The regulation of agriculture and international trade actually produced significant deadweight losses in transfers from consumers to producers. Scholarly research also shows that US markets are relatively competitive with deadweight losses of 1 percent of GDP, but without excluding distortions of price originating in regulation and trade protection. There

is the counterfactual issue of whether the markets would be less competitive had there not been antitrust and regulation efforts. The research results show that significant competition in the United States eroded monopolies, created difficulties for collusion and resulted in mergers that increased efficiency or had no effects.

The results of scholarly research do not show market failures or effective regulation to ameliorate information problems (Winston 2006, 28). There were no major welfare losses to society because of the information problems in product markets and workplaces. The measures by the government were weak, searching for problems and without much benefit to society.

Policies to ameliorate effects of externalities were successful in some cases with benefits exceeding costs but those gains could have been attained with significantly lower costs (Winston 2006, 42). There were evident regulatory failures with costs in excess of benefits. There are expectations that policies relying on market-friendly approaches may be successful at lower costs. The available scholarly evidence shows that direct involvement of the government has been unsuccessful (Winston 2006, 63): "Public financing and management of transportation infrastructure, public lands, and various services have been extremely inefficient and have strained the budgets of all levels of government."

The cost of inefficiencies caused by the government in intervention to ameliorate market failures is in the hundreds of billions of dollars (Winston 2006, 73–4). In cases of actual existence of market failures, there were successes at the expense of diminishing significant benefits and there were reductions of welfare in various instances. Government failures occur because policies are erroneous or ineffectively implemented, being subject to influence by interest groups against the general social interest. There are cases when there is evidence favoring government measures but politics and ineffectiveness of the relevant agencies prevent sound policy and implementation. Frustrated with the lobbying for regulation by certain types of business, Milton Friedman (1999) identified a suicidal impulse of parts of the business community.

An approach to government intervention is to seek actions that are Pareto efficient in that they improve the welfare of at least one person without damaging that of others (Stiglitz 1998, 4). However, after some time in government, Stiglitz believed that actions were warranted that only hurt a small group of persons but improved the lot of the many. One of his examples is that an improvement in the legal system may only hurt lawyers. However, he argues that even those policies are difficult to implement because "almost everybody" does not gather sufficient support. The legal profession and legal scholars may strongly disagree with this view.

The essence of understanding government failure, according to Stiglitz (1998, 5), is the failure to provide the correct incentives for government to be effective. There are numerous government failures, such as in policies on trade, agriculture, health, social issues and the environment (Stiglitz 1998, 6). He argues that in most these cases the proposed policies were "near" Pareto improvements, harming only a few but benefiting the many. There are four important impediments to government success, according to Stiglitz.

The government cannot make early commitments. The implementation of a Pareto-improvement policy evolves in stages. Some groups will anticipate damage to their interests and will oppose the policy. This restriction is experienced by the executive as well as Congress.

It is difficult to form coalitions and engage in bargaining in situations with imperfect information. Stiglitz (1998, 11) argues that both market and government failure can occur because bargaining with imperfect information may result in outcomes that are not optimal. The process resembles dynamic programming in stages where there is uncertainty and imperfect information.

Destructive competition may prevent sound policy implementation. There is not perfect competition in politics. Less than perfect competition, with elements of market power, can result in defeat of policy (Stiglitz 1998, 12).

The uncertainty of the consequences of change may frustrate policy formation and implementation. Asymmetry of information in markets may prevent trades. There may be opposition to policy because of the uncertainty as to how it may politically benefit the proponents (Stiglitz 1998, 13).

Coase, transaction costs and property rights

Neoclassical economics ignored the existence of transaction costs. This is not uncommon when developing theories from abstract assumptions; a change in assumptions leads to a different proposition. The fact is that transaction costs are significantly large and cannot be ignored in the analysis of the firm and in their relation to property rights. Unfortunately, significant part of the literature and textbooks emphasize the unimportant case when transaction costs are zero, which hardly ever occurs in reality. The work by Coase (1960), where allegedly a "Coase theorem" was introduced, is one of the most quoted essays in economics and has generated debate on what Coase actually meant. There are some references here to an unending literature: Butler and Garnett (2003), Campbell and Klaes (2005), Canterbery and Marvasti (1992), Cheung (1998), Coase (1959, 1960, 1974, 1988, 1991a, b), Friedman (1991), Glaeser et al. (2001), McChesney (2006), McCloskey (1998), Medema (1994) and Medema and Zerbe (1999), Posner (1993).

The objective of Coase (1960) is the analysis of nuisances, or the actions of companies that have damaging effects on others. His initial example is the smoke of a factory that affects its neighbors. The target of his critique is the proposition by Pigou (1932) that the harmful effects of externalities separate social and private costs. The policies could consist of making the owners of the originator of the harmful effects, in that case the polluters, liable for the damage caused to others, in that case, those damaged by the smoke. Another policy would be to tax the factory in the money amount of the damage caused. Zoning could restrict production that results in externality. Coase (1960) contends that these policies are inappropriate and may lead to effects that are not necessarily or usually desirable from a social point of view.

An important point by Coase (1960) is that the conventional approach to externalities identifies a perpetrator and a victim and takes actions to make the perpetrator compensate the victim. Coase argues that the approach is wrong because of the essentially reciprocal nature of externalities. The principle should be to prevent the most serious harm.

The *first case* considered by Coase (1960) is that of the pricing system working effectively *with liability for damage and without costs*. In this case, the damaging business has to pay for the cost of the damage and he explicitly assumes that there are no costs of transactions. The importance of the work of Coase (1960) is to incorporate these costs in the decision by firms, revealing their implications for allocation and public policy. The costs consist of almost everything that is not included in the costs of physical production and transportation. They include the costs of negotiation, legal counsel, litigation and enforcement of judgments, among many. If there are no such costs, the party that is liable would bargain with the other party and enter into an agreement that would internalize the externalities. Thus, transaction costs are the expenses incurred in bargaining the effects of externalities or could be considered as the costs of internalizing the externalities. The discovery in this case of liability and no transactions costs is that if property rights are well defined and there are no transaction costs the perfectly competitive market would attain efficient allocation without the need of government intervention. Coase (1960) does not claim that this case occurs in reality but simply uses it to place in relief the neglect of the costs by neoclassical economics and how they affect property rights and a solution to the problem. It is not a new theorem but rather the qualification of an important proposition of neoclassical economics.

The *second case* considered by Coase (1960) maintains the assumption of no transaction costs. However, in this case there is no rule of liability for damages. The pricing system has no liability for damage and no transaction costs. In this case, there may still be bargaining between the parties in the externality but a solution is uncertain. The competitive pricing system may or may not internalize the externalities.

Coase (1960) states that the assumption of no transaction costs is used in the first two cases but that he considers it to be very unrealistic. He proceeds to describe the types of transaction costs. These costs include discovering the party for the transaction, communicating the desire to bargain and the terms of bargaining, engaging in the negotiations to reach a settlement, drafting the contract, ascertaining by inspection that there is compliance with the terms of the contract and many other transaction activities. Coase (1960) contends that these transaction costs are quite high in the real world. He argues that these costs could be sufficiently high such that they would preclude the transactions hypothesized in the model with no transaction costs. Coase (1960) argues that in cases of high costs the government may use its coercion powers to force a solution. However, he is careful to state that such a solution is not costless because the government also faces costs, which in some cases may be extremely high. The arrangements to find a solution may differ from case to case.

The new institutional economics

The progression of the work of Coase (1937) created a new field of inquiry in economics, the NIE. The so-called Coase theorem was not the original and main research agenda of Coase.

The work of Coase (1937) is credited with the beginning of the NIE (Coase 1998, 72). It originated in dissatisfaction with conventional or mainstream economics. The theory departs from the observation that economics has merely formalized Adam Smith in the 200 years after the publication of his work. While this is an exceptional achievement, the impressive theoretical development, according to the NIE, is lacking in factual support.

Economic welfare depends on the flows of goods and services and in turn on productivity. Adam Smith showed how productivity depended on specialization. Coase (1998, 73) contends that exchange makes specialization possible and that the productivity of the economic system is enhanced by lower costs of exchange, or transaction costs. These costs depend on institutions: the legal system, the political system, the social system, culture, education and so on. Economic performance is determined by institutions, which is what provides relevance and importance to the NIE.

The analysis of Coase assumes that the cost of coordination of the firm in managing inputs is less than that of using the price system. Demsetz (1997, 426) defines management costs as those incurred in coordinating the use of resources. The costs of using the price system are those analyzed by Coase, consisting of price discovery, negotiating and exchanging. Demsetz provides as example of management system costs (MSC) those of negotiating working conditions with an employee while the example of price system costs (PSC) are those incurred in exchanging goods or services. The firm is established when the MSCs, or costs of deliberately managing inputs to obtain an outcome, are lower than the PSC, or costs of using the price system. In the perfectly competitive model, there are no knowledge imperfections, such that there is no cost of obtaining technology and discovering prices, where PSC and MSC are equal to zero. In fact, neoclassical theory ignored MSCs, concentrating only on production inputs and transportation costs. Self-production is a perfect substitute for the firm in the perfectly competitive model.

If PSCs are zero, allocation is through the market via specialization and the firm does not have a major role. If PSCs become very large, there is an incentive for reduced exchange, leading to vertical integration of the firm, with little specialization. In vertical integration, the exchange within the firm, outside the price mechanism, would replace market allocation. Demsetz (1997, 427) argues that neoclassical theory is concerned with zero PSCs in a hypothetical framework of self-production and specialization with allocation by the market. In contrast, Coase is concerned with high PSCs that result in vertical integration, less specialization and allocation by coordination (or management) within the firm. Contemporary economic theory assumes positive information costs, focusing on agency problems and seeking optimum combinations of management controls with market incentives.

The interpretation of Coase (1960) by Williamson (1994) is that Coase pushed the assumption of zero transaction costs to the limits of absurdity to focus attention on the real-world positive and high transaction costs. The zero transaction costs assumption has the dual purpose of showing the special case of Pigou's argument as well as focusing attention on the critically more important problem of definition of property rights. There was no role for property rights in Pigou's model. Another important feature of Coase is the view that idealized organizational frameworks, such as in price theory, are not operational. The task is to evaluate alternative forms of organization in a comparative institutional framework because all possible structures of organization have flaws. The valid research agenda consists of focusing on microanalysis of contracts, contracting and organization. This research agenda is complex and its implementation quite difficult.

The objective of Coase (1937) is to provide an explanation of why economics analyzes allocation of resources by the price mechanism while there is the independent assumption of an entrepreneur or, as he terms, coordinator, whose task is to effect the allocation. His attempt is to explain how the choice of alternatives occurs in practice. Coase defines the firm as a set of interrelations that has its origin in the allocation of resources by an entrepreneur. The allocation by the price system must be complemented by the coordinating role of resources within firms that is conducted by an entrepreneur.

The reason for establishing a firm versus a single individual originates in the costs of using market allocation. Coase (1937) identified a variety of the costs of using the price mechanism:

- *Price discovery*. There is cost in discovering the relevant prices.
- *Contract negotiation*. There are costs in negotiating and reaching a contract for each transaction in a market.
- *Contract drafting*. The results of the negotiation must be incorporated in a formal contract.
- *Contract compliance*. There are costs in supervising and enforcing the compliance with the contract.

This process can be explained by means of a current transaction, trade financing of exports. The exporting firm must find a buyer and a price for the product in overseas markets. This requires the cost of acquiring knowledge of foreign markets in multiple ways. In addition, the firm must find the price at which the product can be sold in various markets and make a choice of selling abroad versus selling at home. These functions require expenditures in financial planning. There is then a complex, costly process of negotiating a contract, likely with several potential customers. Language and cultural skills may be quite important. The drafting of the contract will require expenditures with specialized attorneys, perhaps in more than one jurisdiction or through a law firm with international contacts. There is then the process of negotiating trade finance with an international bank or a domestic bank that acts as a correspondent of a foreign bank. The exporter would then obtain the proceeds of the future sale immediately instead of having

to wait for several months until the products are actually exported. The receipt of the funds immediately allows the firm to hire employees, buy inputs and pay all the operational expenses of production. The bank will have to check the credit and extend credit to the foreign buyer, which results in expenditures that are likely to be charged as fees to the exporter that receives the proceeds immediately. The exporter must be vigilant that the foreign buyer will comply with the agreement. The transaction costs included in theory by Coase are an important part of everyday business, currently and in historical times.

There are two distinguishing characteristics in the NIE, the claims that institutions are important and that they can be analyzed by economic theory. Williamson (1985, 1994, 1998, 2000b) considers that the second characteristic distinguishes the NIE from the initial US institutionalists. The focus is not the traditional economic concerns of allocation but the use of economic tools to analyze how institutions developed they way they did.

Table 5.3 shows the stages of institutional development that require different forms of social analysis (Williamson 2000b, 596–8). Institutional research is concerned with the two intermediate stages, institutional environment and governance. The final stage is the subject of the theory of choice or mainstream economics.

The research on the economics of property rights focuses on the issues of the second stage of institutional environment. According to a strand of thought, proposed by Coase, the system of private enterprise needs property rights to function adequately. The user of a resource has to remunerate the owner. There must be definition of property rights and a process of arbitration of disputes for optimum allocation of resources.

An important characteristic of the NIE is the criticism of ideals based on omniscience, benevolence, nil transaction costs and similar assumptions. The works of Coase and Demsetz challenged the proposition of omniscient and benevolent governments that could ameliorate all market failures. All forms of organization are subject to failures, including markets and the government.

An important characteristic of the work of Coase (1960) is the critique of the comparison of the actual world with idealized constructs, such as resource allocation in perfectly competitive models. Williamson (2002, 439) explores the public

Table 5.3 Stages of economic institutions

Stage	**Institutional characteristics**
I Embeddedness	Informal institutions, customs, traditions, norms, religion
II Institutional environment	Game rules: property (polity, judiciary, bureaucracy)
III Governance	Game play: contract, relating governance structures and transactions
IV Allocation/employment	Prices, quantities, incentives

Source: Williamson (2000).

policy consequences of such comparison. The argument by Coase is that the concern with the ideal models led to the view that market failures are ubiquitous but that government failure never or seldom occurs. The important intellectual consequence is the abandonment of the truly important research agenda on the comparison of actual structures of organization with the recognition that all are flawed.

The analysis of Coase (1937) leads to the concept of the firm as a governance structure (Williamson 1998, 75). Governance and transactions are aligned in accordance with their economies of transaction costs, requiring descriptions of transactions, governance structure and the process of economizing transaction costs. The fundamental transaction of transaction-cost economics is vertical integration. There are multiple consequences for policy arising from labor, capital, corporate governance, regulation/deregulation, multinational and public sector transactions.

A departing observation for agency theory is the separation of the owners of the firm, called principals, and the managers, called agents (Klein 1999, 465). This separation generates a conflict if the agents promote their interests instead of those of the principals. However, there are various types of competition – in product markets, in the internal market for managers and in corporate control – that may discipline managers. The internal organization of the firm continues to be viewed in terms of the principal-agent problem but with the constraint of competition. Research attempts to uncover the impact of ex-ante incentives to check moral hazard by agents. There are multiple costs of the agency problem: monitoring expenditures by the principal, bonding expenditures by the agent and the foregone trades because principals cannot provide adequate incentives for non-observed conduct by agents.

There are important considerations of the theory and empirical research of the NIE for public policy, antitrust and regulation (Klein 1999, 478; Williamson 1985). The transaction costs approach postulates that economizing of transaction costs causes vertical integration, contrary to the traditional view of vertical integration that assumed companies internalize production of inputs and products to appropriate rents from market power. In this view, vertical integration may increase instead of reducing efficiency. Traditional theory ignored transaction costs, which can be quite high.

The analysis of the economic history of Latin America is shifting toward identifying actual causes of economic retardation (Haber 1997). There is new and diversified emphasis on the role of institutions and their relation to finance by Haber (2007), Hanley (2005), Maurer (2002), Marichal (2002), Marques de Saes (1986), Musacchio (2005), Summerhill (2007a, b, 2003) and Triner (2001). The work of Cameron (1967) documents the importance of banking in the early stages of industrialization, facilitating or retarding economic progress. Haber (2007) compares the experience of new world economies – Brazil, Mexico and the United States – in political organization, banking and economic development.

There is no theoretical or empirical determination of a unique set of institutions that promotes economic progress. Haber (2007) identifies institutional deficiencies in wealth expropriation by the government and market power in

banking, creating progress-restricting associations with business sectors. Mexico and Brazil implemented financial repression in the historical period after independence, preventing market entry, which benefitted the self-interest of politically connected entrepreneurs. In contrast, the US financial system, even discounting distortions such as one-branch limits, permitted relatively more competitive banking. Haber (2007) traces the difference in the United States to a more open political system with elections, competitive parties and federal system allowing state authority. These findings open a promising research agenda. Increasing ISI in the twentieth century created new distortions in the form of subsidized directed lending, excessive protection of industry perpetuating market power, related lending in banking, central government and state ownership of banks in Brazil and eventually collapse of the rate of economic growth. There are also important links to the pioneering work of North and Weingast (1989), to more recent work by Rajan and Zingales (2003a) and to the application of the economics of regulation to finance such as by Kroszner (1999) and Barth *et al*. (2006).

The economic theory of regulation

The economists of the University of Chicago developed what came to be known as the economic theory of regulation. This theory is the essence of the private interest view of regulation with predictions that are different than those of the public view. The public view predicts that regulation will occur in response to market failures. The excess profits charged by a monopolist or the externalities of pollution cause the government to intervene in order to find an efficient allocation that cannot be obtained in a free market. The private interest view claims that the regulated industrialists, politicians and government officials interact to create regulatory agencies and measures to optimize their self-interests. It is common for regulation to have outcomes that are different from those intended by regulation (Peltzman 2004).

The departing point of Stigler (1971) for what came to be known as the economic theory of regulation (Posner 1974) is that the state has the power to help or harm many industries. The theory intends to analyze the parties receiving the benefits or costs of regulation, the shape of regulation and its impact on efficiency or resource allocation. The main proposition of Stigler is that the regulated industry acquires the regulation and manipulates it for its benefit. This aspect of the theory became known as regulatory capture or the control of the regulatory body by the regulated industry for its self-interest.

There were two views of industry regulation, according to Stigler (1971, 3–4). The prevailing view was that regulation is created for the benefit and protection of the public or a subset of it. Harmful effects to the public are explained by side effects of social goals or distortion of the main rationale of regulation. The second view considers politics too difficult to explain logically because of the existence of benevolent measures such as the emancipation of slaves but also of deplorable actions such as politicians diverting public funds to their personal

wealth. The state is designed to satisfy the desires of members of society. The task of the theory is to unveil how an industry or group uses the state for its self-interest.

The state has a unique resource in its power to coerce (Stigler 1971, 4–5). Taxation permits the government to seize money. The state does not require the consent of individuals and companies to organize resources and take decisions of households and companies. Thus, an industry can capture the state to increase its profits. The industry may obtain four different types of favors from the government (Stigler 1971, 4–6):

1. *Direct subsidy of money*. This is not necessarily the primary use of the government by an industry. There have been these subsidies throughout history. Stigler (1971, 4) provides several examples, including subsidies of $1.5 billion per year to the airlines through 1968.
2. *Restriction of entry in the industry by a rival*. The regulatory body restricts instead of widening competition. Import quotas in oil, tobacco and sugar are good examples. Interstate tariffs and barriers are also designed to limit competition. Another example was the FDIC that restricted entry of new banks by failing to insure them. The FDIC reduced the rate of entry of commercial banks by 60 percent. Industries and professions with organizational and financial strength will use the power of the state to restrict entry of competitors. Stigler also observes another use of power in the form of slowing the rate of development of new competitors.
3. *Interference with substitutes and complements*. Stigler uses the example of support for subsidies to airports by the airline industry: airports are complements of the airline business. Building codes were used by trade unions in construction to restrict labor-saving materials.
4. *Price-fixing*. Industries will seek coercive powers to fix prices by regulatory bodies even in industries with regulated barriers to entry.

However, there is no profit maximization of the industries by using these public policies because the politicians and officials will create restrictions on cartel policies. Regulatory bodies change the relative strength of control of an industry by firms. The relative strength may be measured as the capacity of a firm to influence industry output. Political decisions consider the relative political value of individual firms so that smaller firms may be beneficiaries of regulation. Stigler (1971, 7) observed that quotas in industries were not given with regard to cost minimization criteria so that smaller firms were awarded higher quotas than without regulation. He found this pattern of behavior to be common in regulated industries. Politicians also appoint politically powerful members to regulatory boards. The concession of television channels is not made on the basis of criteria of industry efficiency but rather on the provision of service to smaller communities with political objectives of influencing votes.

The theory of economic regulation of Stigler (1971) integrates economic and political analysis (Peltzman 1989, 1). The departing proposition is that politicians

are the same as other individuals in maximizing their own interests. Thus, interest groups can provide financial support to politicians or regulators to influence the nature of regulation.

Before the economic theory of regulation, the standard in regulation was the "normative analysis as a positive theory," or public interest view. Market failure was the major motivation for regulation. The objective of regulators was to eliminate or diminish the effects of market failures. Peltzman (1989, 4) states that the list of potential market failures would never be finished because of the creativity of economists is finding new ones. Natural monopolies and externalities were the main market failures in the 1960s.

In Stigler's formalization of the economics of regulation, the objective function for maximization includes attaining and maintaining power (Peltzman 1989, 6–7). The representative politician has the power of deciding the variables in regulation such as prices, numbers of firms and so on. Votes and money are the two objects of choice in the utility function of politicians. Groups may vote for or against the representative politician depending on the effects of a regulatory measure. The politician prefers decisions that result in favorable votes because his goal is to obtain and maintain power. There are multiple forms by which regulatory decisions can secure campaign funding, free efforts to get out the vote, bribes or well-remunerated political appointments.

The representative politician values wealth and knows that the successful election bid requires campaigns that have financing and qualified staff. Thus, the politician will focus on the consequences of regulatory measures for obtaining votes as well as money for electoral purposes. The essence of the theory of Stigler is that the representative politician does not maximize the welfare of the constituency but rather his very own. Optimization of aggregate welfare is important only in increasing the economy to obtain a larger share of its growth. In short, the politicians and regulators exchange regulatory measures for votes and money. The delivery of the benefits requires some form of group organization.

There are two restraints or costs in the theory of Stigler: costs of organization and information (Peltzman 1989, 7–8). The group acquiring the regulation must deliver the required campaign resources and voters must have the information. The existence of these costs suggests how the benefits of regulation are acquired by the producers. In a market with potential for regulation, the number of buyers is typically large while the number of sellers is small. In the extreme, there is only one producer in a natural monopoly and millions of consumers. The process of organization and its costs will be typically high for many consumers. It is also more difficult to organize collective action of many consumers because of the possibility of free riding: many will not pay the costs hoping that they will obtain the benefits for free because others will pay their part (Olson 1965).

The target of regulation is one or a few producers operating in monopolistic or oligopolistic markets. These producers do not have to create costly organizations to raise the funds required to bid for the regulatory measures because they are individually financially strong. The producers will likely win the bidding for regulatory measures because of the strength of their financial position and the ease

of organization. Regulatory capture is more likely by producers than consumers. Regulatory measures will be designed to maximize the self-interest of the producers, politicians and regulators instead of the welfare of society. Posner qualified the prevalence of the self-interest of producers by pointing to internal subsidization, or cross-subsidization, forcing producers to sell to selected consumers at prices often below cost. Regulators force producers to subsidize certain consumers with rents created by regulation. Regulation created a cartel of surface transportation for railroads but also imposed the continuance of passenger service at high losses for the companies (Peltzman 1989, 9).

Further development of the theory of regulation departed from the proposition by Peltzman (1989, 9–11; 1976) that politicians allocate rents to producers and consumers such that their utility is maximized. The allocation of small rents to consumers may still make the regulatory benefits attractive to producers. In addition, regulation need not cover the needs of all consumers but only those of certain groups. Peltzman concludes that there is a tendency toward systematic, cross-subsidization based on costs. In addition, the market determination of the division of rents between producers and consumers is offset by regulation.

The theory of regulation was further refined by Becker (1983). The regulator creates rents and divides them between consumers and producers. Groups are organized to obtain benefits or exemptions to pay for the benefits of others. Winners and losers in the process exert pressure. Equilibrium consists of the balancing of this pressure. The deadweight loss is equal to the gain of the winner less the loss of the loser caused by the change in output resulting from the regulation. The competing pressures on politics originate in these gains and losses. Becker (1983, 395) considers that deadweight costs of taxes and subsidies are "perhaps the most important variables in the analysis." These costs affect "the allocation of time between work and 'leisure,' investments in human and non-human capital, consumption of different goods and other behavior."

The deadweight costs increase at an increasing rate after increases in taxes and subsidies. The group receiving the subsidy lowers its pressure following an increase in the deadweight cost because a smaller subsidy can be obtained from tax revenue. Taxpayers increase their pressure after an increase in the deadweight costs of taxes since tax reduction does not significantly affect what is available for subsidy. Taxpayers can better compete for influence because of the advantage provided by deadweight costs. Numbers are important because there is less opposition by taxpayers to subsidies when the tax per person decreases because of many taxpayers. There is greater advantage for groups to obtain subsidies when their numbers are smaller than those of taxpayers. Becker (1983, 395) provides the examples of the successful power of influence of farmers and urban dwellers, which are sufficiently small in numbers relative to the dilution of their subsidies among many taxpayers. Becker (1983, 396) is careful in pointing to the restrictive assumptions of the model, the difficulty in successfully modeling the political sector and the need to incorporate other types of analysis.

Peltzman (1989, 13) summarizes the findings of the economic theory of regulation. The best organized groups will obtain more benefits from regulation than

those that are large and difficult to organize. The better organization of producers makes them favored to obtain more benefits from regulation than consumers. There would be a coalition that would win the benefits but it would include some representation of consumers. There will be an optimized distribution of rents across the winning coalition. Changes in demand will be offset by regulation to preserve the optimal distribution within the coalition. The rents originating in concession of prices to producers will be partly used to cross-subsidize high-cost consumers. The distribution of wealth of regulation creates sensitivity to dead-weight losses. The regulators will try to prevent reduction in total wealth because it would diminish the political returns obtained from regulation.

There is an important weakness in the economic theory of regulation. It is too general about the entry into regulation, or why and how the regulatory body was established in the first place (Peltzman 1989, 14–16). The main explanation is that politicians seek attractive fields of regulation in which to enter and avoid or exit from unfavorable ones. In Stigler's theory, the facility of organization and economic power of producers is relatively stronger than of consumers, leading to the conclusion that regulation generating high benefits to producers should be universal. Regulation should start in industries where the advantage of producers is relatively stronger. In the case of industries that are competitive relative to one where there exist market failures, entry of regulation would likely occur in that with market failures. Thus, the market failure view provides a somewhat more compelling theory of entry.

Rent-seeking and public choice

The analysis of rent-seeking began with the pioneering works of Tullock (1967, 1980) and Krueger (1974). The basic idea is that the monopolist spends resources in seeking the rents from regulation and in maintaining them. These expenditures in rent-seeking are a waste of resources.

Rents are excess profits, that is, profits higher than those that are required for the firm in perfect competition to start production. Monopoly profits are rents. The existence of rents causes the issue of the consequences of their distribution (Roe 2001, 3) that does not exist in a situation of no rents. The distribution of rents could occur in the political area, affecting the politics of democracy. Rents also affect the governance of corporations because of their internal distribution. Higher rents increase agency costs for principals, causing structures within firms to restrain those costs. Similarly, higher rents increase political struggle to distribute them within the national economy.

There is a measurement of the rent obtained by the monopolist by Tullock (1967) called the monopolist's rectangle. The area of a rectangle in a price-quantity space is revenue, the product of price per unit multiplied by quantity; for example, $5 per unit sold times 5 units sold is $25 of revenue. The revenue to the monopolist is the price at which it sells the product, monopoly price, times the units sold, monopoly quantity. Because of market power, the monopolist charges a higher

price than that which would prevail under perfect competition. The monopolist sells a lower quantity than under perfect competition at a higher price. The concept of the monopolist's rectangle is as follows:

> Revenue obtained by the monopolist less the revenue that the monopolist would obtain if it sold its products at the price that would prevail under perfect competition
>
> = (price under monopoly X quantity under monopoly) LESS (price under perfect competition X quantity under monopoly)

That is, the monopolist's rent is measured as the excess revenue that it obtains from charging a price, monopoly price, which is higher than the price that would occur under perfect competition. The monopolist rectangle is the area $p(m)bap^*$ in Diagram 5.2.

Mainstream economics restricts the welfare loss of monopoly to the loss in consumer surplus, the area *abm* in Diagram 5.2. In conventional views, the monopolist's rectangle is merely distributional in nature, a transfer of resources from consumers to the monopolist. However, there is a different interpretation (Buchanan *et al*. 1980; Posner 1975; Tullock 1967 and vast literature). In this analysis, firms anticipate the rents to be obtained from monopoly and spend ex ante to obtain the monopoly via regulation, such as with entry barriers, and also ex post to preserve it. These expenditures by firms constitute a waste of resources that should be added to the consumer surplus to obtain the loss caused by monopoly.

There is an alternative interpretation of the process of rent-seeking, called directly unproductive profit-seeking activities (DUP) by Bhagwati (1982). The DUP concept is an extension of the important contribution by Krueger (1974) that coined the term rent-seeking. In the rent-seeking concept, there is diversion of resources from productive activities to efforts in obtaining barriers to trade, such as quotas, with resulting loss of welfare in excess of the Harberger (1971) consumer surplus of applied welfare economics. The DUP concept of Bhagwati (1982) considers the diversion of resources to obtain profits in activities in general. For example, DUP would include smuggling to avoid official imports instead of only rent-seeking via quotas as well as normal tariffs.

Scholars have extended the argument beyond the allocation of resources to the analysis of the firm (Roe 2001, 6–9). There is competition among firms in the political system to obtain the monopolist's rectangle but there is similar struggle within the firm – by shareholders, managers and employees – to share in the rectangle. This struggle is important to understanding corporate governance and the impact of the monopolist's rectangle in the political system. The nature of product markets and politics affects legal structure. Countries with less competitive markets have stronger protection of labor and weak protection of shareholder rights. An opening to competition, such as in the EU, can increase competition, reducing monopolist rents and the pressures for its division. There is a positive relation among social democracy, concentration of corporate ownership and prevalence of

monopoly. In the same way, there is a positive association among conservative politics, diffuse ownership and strong competition in markets (Roe 2001, 32).

The importance of the influence of James M. Buchanan in the relation of economics and politics is comparable in dimension to the volume of his contribution and the challenge to surveying 374 items, including 37 books and monographs by 1986 (Sandmo 1990, 50). The output continues to increase since 1986 not only by Buchanan but also by many others.

Buchanan (1987, 243) was inspired by the work of Wicksell (1896) to challenge the prevailing analysis of assuming a benevolent dictator maximizing welfare to reach rules of conduct for a society. The objective of Buchanan was to formulate a "model of the state, of politics" before analyzing the welfare states of alternative economic policies. The thrust of the ideas was to develop the "constitution of economic policy," consisting of analyzing political agents with the rules and constraints that determine their actions. Buchanan considers that economists have been excessively concerned with choice and costs, which are not observable, instead of focusing on observable exchange. Economists had developed their interest in welfare economics as social engineering, believing that their tools allowed them to improve efficiency in allocation of resources and to optimally plan the government. The issues of deficits and internal debts create major complications in government management (Buchanan 1987, 250):

> It is almost impossible to construct a contractual calculus in which representatives of separate generations would agree to allow majorities in a single generation to finance currently enjoyed public consumption through the issue of public debt that insures the imposition of utility losses on later generations of taxpayers. The same conclusion applies to the implicit debt obligations that are reflected in many of the intergenerational transfer programs characteristic of the modern welfare state

The contribution of Wicksell is a foundation of public choice economics, focusing on three key elements: "methodological individualism, homo economicus and politics-as-exchange" (Buchanan 1987, 243). There is an inherent coercion in collective action. There is agreement by individuals to this coercion only if their interests are advanced by the "ultimate constitutional exchange" (Buchanan 1987, 246). There must be a model of exchange to justify the consistency of the state's coercion with the value norm of individualism that provides the foundation of a liberal social order.

There is a distinction between internal and external externalities (Buchanan and Vanberg 1988, 57). The internal externality has external effects outside the contractual relation but has internal effects on the group of parties in the contract. The external externality is external to the specific transaction of the contract as well as to the contractors.

The correction of externalities in the Pigou (1932) framework consists of incorporating the social costs. There are also distinctions between private and political

corrections of externalities (Buchanan and Vanberg 1988, 58). The private solutions were discovered by Coase (1960). There could be bargaining between the creators of the externality and those affected by it or there could be a merger of the creator of the externality with its victim. In general, there would be a rearrangement of rights within socially determined rules and laws. These private corrections of externalities consist of trades occurring in a specific institutional context.

The political correction of externalities requires a change in the structure of the rules in the form of an abolishment of prior legal rights of the affected activity. Instead of trading of rights, as in the private solution, there is a redefinition of rules. Buchanan and Vanberg (1988, 59) state that political solutions occur when transactions costs are significant but the affected parties may also seek political solutions even when transactions costs are not critical. Transaction costs significantly increase together with the number of affected parties. There are obstacles to private solutions of bargaining and mergers when there are many parties to an externality; political corrections become less expensive. The political solution can take three forms – redefinition of rules, regulation and taxation. In the presence of high transaction costs, regulation and taxation become the practical alternatives. Buchanan and Vanberg (1988) focus their analysis on the neglected issue of whether politicization corrects the externality in the conventional form of internalizing its costs. Using a majority vote model, they conclude that the efficient outcome recommended by welfare economists would be attained only under very special assumptions about the composition of members in the polity. In public choice economics there would not be an efficient outcome because the government would not promote the public interest. There would be government failure. Greater knowledge about the political process is required to make sound predictions about political corrections of market failures.

The view of disclosure and regulation

There is no organized school of thought in this view but many scholars taking independent views on the theory of the state. In this current of thought, empirical research is quite important but based on theoretical propositions using mainstream economics. An important link among the scholars engaged in this research is the emphasis on disclosure and clear rules of regulation but even this link can be misleading as to the content and conclusion of this research. In a way, many scholars are following new avenues of research that do not easily fall within the prior views. A significant part of this research is on the regulation of finance.

A sort of general framework for this current of thought is found in Shleifer (2005). The public interest or helping hand theory of regulation claims that there are market failures because of monopolies, externalities and other market imperfections such as asymmetry of information. The theory argues that the government is benign and can solve most of these market failures, creating a more efficient economy. This theory can be used to propose government regulation or intervention and also as a prediction of why there is government

intervention. There is regulation in most everything that we do and the theory can be used to explain it. For example, governments have set maximum rates of prices of electricity and telephone calls to prevent monopolies from earning excessive profits. A similar example is that governments impose minimum wages to prevent companies from not paying labor a fair wage. There are laws and securities regulators to prevent issuers of securities from exploiting investors.

The economic theory of regulation of the Chicago School of Law and Economics criticizes the public interest view and proposes a new theory and policy. The public interest view exaggerates the extent of market failures and the inability of the market to correct them (Shleifer 2005, 440). For example, there is more potential entry and competition in apparent monopolies than conceded by the public interest view that would eliminate or significantly reduce the exploitation of consumers. The recent changes in the market for telephone services illustrate how consumers benefit from competition in what was considered a long-lasting monopoly. Regulation can result in effects that are opposite to those intended, such as laws for the protection of endangered species, resulting in preemptive destruction of their habitats, and employment laws to protect workers with disabilities, creating barriers to employment of disabled workers. Even when competition cannot solve the alleged market failures, there could be private sector solutions to the alleged market failures. One important example is the association of securities dealers to protect the stability of their markets (and avoid adverse regulation).

The Chicago School provides an alternative when competition and association do not solve the alleged market failure. Problems can be solved with appropriate contracts and common law of torts (Shleifer 2005, 441). For example, there can be disclosure by issuers of securities, or banks, to potential investors and depositors with audited guarantee of accuracy, avoiding misrepresentation and resulting appropriation of funds. The enforcement of contracts, such as provisions on remedies for accidents, would guarantee efficiency of outcomes. In the absence of contracts, courts can apply tort rules that result in efficient outcomes. The threat of awards by courts to harmed plaintiffs prevents inadequate actions. The role of the regulatory helping hand is significantly reduced by the existence of contracts and appropriate enforcement of tort laws.

The economic theory of regulation deepened the critique of the public interest view. According to Shleifer (2005, 441), Stigler (1971) and Posner (1974) analyzed the capture of the process of regulation by an industry. For example, the monopolist uses the regulatory process to maintain its monopoly, blocking entry of competitors that could result in an efficient outcome. Railroads, trucking, public utilities, state regulation of banks and many others provide important examples of how regulatory bodies acted against the general interest of consumers. There is also the issue of competence, whether well-intentioned regulators have the knowledge and incentives to promote the efficient outcome. The Chicago School provides numerous cases of regulatory failure.

However, Shleifer (2005, 441) argues that the Chicago School is not a definitive answer. There could be an excessive interest on the malevolent, incompetent regulator and the competent, benevolent judicial system. Regulators and judges are government servants, experiencing political pressures, incentives and limitations. The regulators may not be a solution but that could also be argued about the court system. There are cases in which regulation may be beneficial. For examples, investors may prefer the prevention of excesses by issuers of securities obtained through a regulatory body. Shleifer (2005) proposes to blend the Chicago objections to the public interest view with recognition of public intervention in some activities.

There are four idealized, progressive strategies for a society to attain an objective of efficiency (Shleifer 2005, 442):

1. *Market discipline*. The financial institution or issuer of securities discloses critical information about its operations and guarantees its accuracy.
2. *Private litigation*. Investors and depositors can use tort laws in the judicial system to recover losses from issuers of securities.
3. *Public enforcement through regulation*. Regulatory agencies impose a decision on financial regulations, such as intervention or liquidation of banks, fines, limits on asset creation and so on.
4. *State ownership*. The government expropriates banks or creates government banks to allocate resources in a desired way.

The strategies may coexist, such as private litigation in a regulated market or competition in a regulated market. There can also be intermediate situations between pure private litigation and regulation, such as private litigation to enforce public rules.

Suppose that a country desires to have stable and sound financial and banking markets. It could choose among four strategies to attain these goals (Shleifer 2005, 442). There can be reliance on the interests of banks in preserving their reputation by disclosing all information about their operations and guaranteeing its accuracy. There is here the least involvement possible by the government with competition and private agreements determining the outcomes.

In the second strategy, the government can rely on the enforcement of laws through the judicial system, with depositors and investors recovering their misappropriated funds in civil litigation (Shleifer 2005, 442–3). There may be use of custom and common law, resulting in less involvement by the government in dictating laws. However, there is decision authority by judges that are government agents. The judicial system is a public good.

The regulatory approach would consist of capital requirements, supervision, regulation and rules of disclosure, as in Basel II, which is discussed in Chapter 4 of Volume II. Government intervention significantly increases in this strategy. The government writes the rules as in dictating the application of Basel II to local conditions, supervises their implementation (through a central bank or other

monetary and securities authorities) and imposes penalties (as provided in local legislation and recommended in Pillar 2).

The final strategy would consist of nationalization of banks by the government to ensure the planned allocation of resources. In this case, the government assumes the entire control of banking in the country.

Shleifer (2005, 443) refers to an institutional tradeoff between disorder and dictatorship. In the first strategy of solutions by competition and private arrangements, there would be costs such as private agents harming each other with theft, overcharge, cheating, external costs and the like. In the fourth strategy of dictatorship, the government would impose those costs on individuals. The theory proposes that society find equilibrium in this tradeoff that optimizes its preferences for government involvement. There are multiple advantages and disadvantages in all four strategies.

The vast research in this strand of thought covers general issues of regulation, banking regulation and financial sector regulation. The balance of this section outlines some of the major results.

A model by Glaeser *et al*. (2001, 854) shows that regulators could be better motivated to investing the resources required to understand the law and peculiarities of a case. However, they can also take decisions based on their political interest instead of their legal and financial soundness. There appear to be significant gains in enforcement efficiency by reducing the costs of acquiring information by law enforcement officials.

Djankov *et al*. (2002) find in their sample of 85 countries that regulation is less burdensome in countries with open political access, stronger restrictions on the executive and enhanced political rights. Regulation is more burdensome precisely in countries with regimes that are unrepresentative, limited and lacking in freedom. The statistical results control for per capita income to avoid the possibility that richer countries may need less regulation because they have fewer market failures and legal systems to correct them. Djankov *et al*. (2002) conclude that "entry is regulated because doing so benefits the regulators."

Corruption may have high costs for economic development. The competition of multiple agencies to charge corrupt regulatory fees can significantly increase the costs of business. An example provided by Shleifer and Vishny (1993) was the numerous charges imposed by many government agencies to companies seeking to do business in the Russian Federation. A second cost of corruption originates in the secrecy of the bribes – investment may concentrate in areas such as defense instead of health because of the effectiveness in keeping the bribes secret.

An important part of research of the view of disclosure focuses on banking regulation. Barth *et al*. (BCL)(2006) conducted massive research that raises strong doubts on the benefits of banking regulation. The sample collected by BCL covered 152 countries, with a survey consisting of 12 parts and 275 questions. It was an improvement of an earlier survey covering 107 countries with 12 parts and 180 questions. BCL underscore three limitations of their research: the novelty of the data that will result in different analyses in the future, the endogenous biases inherent in all econometric research and the difficulty in controlling for various

biases of interpretation. The results do not provide support for the public interest view of government intervention and regulation but support the private interest view. A critical finding is the support for regulations that enforce bank disclosure and strengthen market discipline of banks.

The experience of 1921–33 shows that the securities underwritten by bank affiliates were of higher quality than those underwritten by investment banks. In fact, the difference in performance of underwritings by bank affiliates and investment banks is stronger in the case of lower-rated securities where banks could have had greater potential conflict of interest originating in being privy to information not available to the public. Kroszner and Rajan (1994, 829) conclude that "the focus of legislative action on protecting the investing public from the effects of conflicts of interest has been misplaced." The combination of commercial and investment banking in one universal-type bank did not result in defrauding of the public.

La Porta *et al*. (2002) use data from 92 countries. On the average, the government owned 59 percent of the equity of the ten largest banks in 1970 and 42 percent in 1995. State ownership of banks is very common in poorer countries and in those with weak protection of property rights, strong state intervention in the economy and incipient financial sectors. The ownership of banks by the state was followed by a slower pace of development of the financial sector and lower productivity and economic growth.

There is a theory of regulatory reform that proposes that crises cause the reforms. This could be an alternative to the political economy approach. The association of crises with reforms is explained by the political economy approach in terms of several factors (Kroszner 1999, 22–3). Reforms follow crises because the dilution of political strength of groups alters the equilibrium of competing interests, facilitating change. Crises can also change the relative costs and benefits of specific types of regulation. The incentives for change to bureaucracies can increase after a crisis. The economic costs of crises can also educate the public as to the costs and benefits of regulation.

The econometric research of La Porta *et al*. (1998) provides interesting conclusions on investor and creditor rights in relation to families of legal rules. There is much stronger protection of rights of investors in countries where the legal rules originate in the tradition of common law than in that of civil law, with the tradition of French civil law being the worst and those of German-civil-law and Scandinavian countries falling in between. There is strong protection of investors of all types in common-law countries. The evidence supports their hypothesis that shareholders and creditors in different legal jurisdictions have different bundles of rights, which depend on the laws instead of on the securities. The strongest enforcement of laws is in German-civil-law and in Scandinavian countries, followed by common-law countries, with French-civil-law countries being the worst. Enforcement quality is independent of the standards, such as accounting, but is positively associated with income level. La Porta *et al*. (1998) also identify that low quality of investor protection generates alternative mechanisms of protection. In some cases, there are provisions in statutes in the form of mandatory dividends or legal reserve requirements. Civil-law countries use these alternative protection

mechanisms. Concentration of ownership is another course of protection because of weak rights of shareholders. The three largest shareholders own about one-half of the equity of a public company in the data set. Concentration of ownership is inversely associated with sound accounting standards and shareholder protection, showing that concentration is a reaction to weak protection of investors.

La Porta *et al*. (2006) studied securities laws in 49 countries in relation to the issue of new securities. They conclude that securities laws contribute to improving markets because they facilitate private contracting. The existence of a focused and independent regulatory enforcer does not show statistical significance in developing capital markets. Larger stock markets are positively associated with disclosure requirements and liability standards that allow investors to recover losses. The emphasis on market discipline and private litigation of common law, in the form of private contracts and standard disclosure, explains the stronger development in countries with that legal regime.

Using a sample for 49 countries, La Porta *et al*. (1997) analyze external finance in terms of origin of the legal system, strength of legal protection of investor rights and quality of enforcement of laws. The results show that the legal environment is important for developing a country's capital markets. Legal protection of investors by laws and their enforcement encourages them to exchange funds for securities, broadening capital markets. The lowest development of capital markets is in countries with civil-law systems, especially worst in French civil-law systems.

Summary

There is a wide spectrum of arguments in favor of and against government intervention. The main analysis for departure is the first best of efficiency. Under ideal conditions, a Walrasian allocation is a Pareto-efficient allocation. With suitable lump-sum transfers every Pareto-optimal allocation can become a Walrasian allocation. There are two cases for government intervention in neoclassical economics. Producers could earn excess profits by using their market power, resulting in lower welfare relative to perfect competition. In addition, negative externalities result in more output than the social optimum and positive externalities in less output than the social optimum. The remedies range from regulation to government ownership and control of industries. The theory of second best illustrates the difficulty of finding an ideal allocation when even one of the conditions for the first best of efficiency is violated in theory or practice.

The public interest view generalizes the case of government intervention by introducing the concept of market failure. The breakdown of the assumptions of the first best of efficiency opens the possibility of Pareto-improving policy. An important development is the extension of the breakdown of competition to cases of imperfect information. The theory of public goods introduces classes of goods that are required but only the government would provide them.

The private interest view affirms that regulation originates and perpetuates itself by the self-interest of politicians, government officials and the regulated industries. In practice, regulation frequently attains results that are opposite to those

intended by policy. The NIE incorporates transaction costs and the role of institutions to explain long-term growth and market organization. Various theories explain the distortions resulting from rent-seeking activities and the promotion and defense of government programs.

Recent research is focusing on a modified private interest view in which institutions play an important role. This new current of analysis emphasizes general contributions on multi-country differences in the rule of law. Theoretical research is accompanied by empirical verification. Disclosure is important for monitoring the financial sector by the market and regulators.

6
International Exchange of Goods and Services

Introduction

The analysis of the gains from trade began in modern economics with Smith (1776) and Ricardo (1817). In a rare consensus, economists tend to agree that there are benefits from trade in the form of more efficient resource allocation. The first section below provides the important analysis of the gains from trade. The relaxation of the conditions of the first best of efficiency leads to the analysis of distortions or market failures that motivate more analysis. The main principle is to correct domestic distortions with domestic policy instruments to permit the economy to obtain the benefits from trade. It is difficult to relate empirically trade openness and economic growth.

The United States uses antidumping and safeguard sanctions that many consider to be disguised protectionism. One of the most debated issues in policy is whether employment and wages of less skilled workers in advanced countries decline because of trade in products intensive in cheap labor, which are exported by developing countries. In 2004, the issue of losses of services jobs to offshore locations received disproportionate attention in the press and public debates. The summary provides some conclusions.

The gains from trade

Adam Smith (1776) argued that it would be advantageous for a country to specialize in those activities in which it had an absolute advantage in production. Absolute advantage means that the country can produce those goods at a cost lower than any other country. An efficient allocation would require that countries specialize in the production of those goods in which they have an absolute advantage.

Two classical economists, David Ricardo (1817) and Robert Torrens (1808, 1815), are credited with the discovery of the doctrine of comparative advantage (Chipman 1965a, 480–2). This doctrine was a major improvement over the

absolute advantage proposition. It is difficult to explain it intuitively (Bhagwati 1999, 5):

> When asked by the famous mathematician Ulam: 'what is the most counterintuitive result in Economics? The Nobel laureate Paul Samuelson chose this Law [of comparative advantage] as his candidate

Classical economists assumed for analytical simplicity that labor was the only cost of production, what is known as the labor theory of value. Moreover, labor was mobile within the country but not among countries. Thus, costs of production were expressed in terms of units of labor per time period. Table 6.1 shows the famous example of Ricardo. Portugal has an absolute advantage in the production of both wine and cloth; that is, it can produce either good at a lower price, in terms of men per year, than England. There would still be an advantage for both countries to engage in trade. England can produce cloth at a relatively lower cost than wine, 0.83 men per year (100/120), than Portugal 0.88 men per year (90/80). Portugal can produce wine at a relatively lower cost, 0.88 men per year, than England, 1.2 men per year. Thus, it pays for England to specialize in accordance with comparative costs (or comparative advantage), producing the commodity that is relatively cheaper to produce at home, cloth, and exchanging it for the commodity that is relatively more expensive to produce at home, wine. England would be able to consume wine with trade at 0.88 men per year relative to 1.2 without trade. Similarly, Portugal would be able to consume cloth with trade at 0.83 men per year relative to 1.125 without trade.

The principle of comparative advantage states that countries should specialize in the commodities that they can produce at relatively lower costs exchanging them for those they can produce at relatively higher cost. The progress in economic analysis relative to Smith (1776) consists that under certain restrictive assumptions it is possible to gain from specialization according to comparative advantage. If the world consists of only one country with two regions, England and Portugal, it is evidently better for the world to produce cloth in England at 0.83 men per year and wine in Portugal at 0.88 men per year. The theory explains why countries trade – because of differences in relative costs – but does not explain why relative costs differ among countries. The determination of relative costs by differences in factor endowments is the result of work by Heckscher (1919), Ohlin (1933) and Samuelson (1948, 1949, 1951, 1953).

The proposition of Ricardo explains that countries trade because of differences in relative costs but does not provide an analysis of the determination of the terms of trade or relative prices of exports and imports (Chipman 1965a, 482). There is widespread belief that Ricardo argues that the equilibrium price ratio is somewhere in between the ratios of comparative costs. Ricardo states that England would exchange cloth produced with 100 men for wine produced with 80 men. There could be an implication that the ratio of the price of cloth to the price of wine would be unity, being in between the cost ratios of 80/90 and 120/100 (Chipman 1965a, 482).

Table 6.1 Trade examples of David Ricardo and Paul A. Samuelson

Cost of production of wine and labor in England and Portugal Men per year	**England**	**Portugal**
David Ricardo		
Absolute costs		
Wine	120	80
Cloth	100	90
Relative costs		
Cloth/Wine	100/120 (0.83)	(90/80) 1.125
Wine/Cloth	120/100 (1.2)	80/90 (0.88)
Paul A. Samuelson 1: Ricardo		
Absolute costs		
Wine	2	0.5
Cloth	0.5	2
Relative costs		
Cloth/Wine	0.5/2 (0.25)	2/0.5 (4)
Wine/Cloth	2/0.5 (4)	0.5/2 (0.25)

J. S. Mill Assumption: consumers spend 50 percent of their income on wine and 50 percent on cloth

Perfectly competitive outcome:

Before trade:

England: 1 of cloth, 0.25 of wine

Net national product: $[(1)(1/4)]^{1/2} = 1/2$

Portugal: 0.25 of cloth, 1 of wine

Net national product: $[(1)(1/4)]^{1/2} = 1/2$

After trade:

England: 1 of cloth, 1 of wine

Real income: $[(1)(1)]^{1/2} = 1$

Portugal: 1 of cloth, 1 of wine

Real income: $[(1)(1)]^{1/2} = 1$

Paul A. Samuelson 2: Ricardo and Sraffa

Production structure:

England: one unit of cloth uses ½ of labor and can be produced with 1/8 of labor plus ¼ of wine as input of production

Portugal: one unit of wine uses ½ of labor but can be produced with 1/8 of labor when combined in production with ¼ of cloth as production input

After trade:

Price of wine relative to price of cloth, $P_W/P_C = 1$

Expressing prices in terms of wine:

$P_C W = 1/8 + (P_W/W)1/4 = 1/8 + (P_C/W)1/4 = 1/6 = P_W/W$

Consumption in England = Consumption in Portugal = 3 units of wine and 3 units of cloth

Real national income:

England = Portugal = $[3 \times 3]^{1/2} = 3$

Source: Ricardo (1817), Samuelson (2001).

The determination of the terms of trade or ratio of export to import prices was considered in the first essay by Mill (1844): "Of the laws of interchange between nations; and the distribution of the gains of commerce among the countries of the commercial world." Mill (1844) analyzed how the terms of trade were determined by demand and supply. Chipman (1965a, 491) argues that Mill provided "a genuine and correct proof of the existence of equilibrium." Mill also analyzed the conditions for full and partial specialization. Samuelson (2001) provides a fresh numerical example shown in the second part of Table 7.1. He incorporates the assumption of Mill that "people everywhere opt to spend their incomes 50–50 on wine and cloth" (Samuelson 2001, 1205). The model of Ricardo (1817) resulted in full specialization: all the cloth of the world would be produced in England and all the wine of the world in Portugal. Each country exports to the other country one unit of the good it had produced at lower relative cost in autarky, a term used by economists to denote the situation where there is no trade. Real income without trade is ½ in each country and increases to unity after trade in each country.

Samuelson (2001) then uses the contribution of Sraffa (1960) that commodities can be conceived as being used in production of other commodities. The objective is to show the increase in productivity resulting from the combination of labor with other inputs, capital being the missing concept in the classical labor-theory of value. There is a dramatic increase in welfare after the specialization brought about by trade, shown in Table 7.1. Real national income under the use of inputs other than labor and free trade is three compared with one under free trade and only labor input and ½ under autarky and use of only labor. Samuelson (2001) also shows that there are significant gains from trade even if the countries differ in relative productivity.

Neoclassical economists built on the issues raised by Mill (1844), providing the theoretical structure showing the determination of the terms of trade, or relative prices, in international trade (Chipman 1965b, 658–9). In essence, the neoclassical model is a GE model of the determination of prices and quantities of goods and services exchanged by countries.

Consider this analysis is applied to the gains from trade (Bhagwati 1968, 139). The model assumes perfect competition as applied to trade among countries. A useful development is the production possibilities frontier or product transformation curve. Diagram 6.1 shows the product transformation curve as *OMN*. The basic concept behind the curve is economic or opportunity cost: the cost of producing an extra unit of a commodity, say q_2, is the units of an alternative commodity, q_1, which could have been produced but were foregone in order to produce that extra unit of q_2. At *M* the country produces only *OM* units of q_2; at *N* the country produces only *ON* units of q_1. The production of an extra unit of q_1 at *M* requires the reduction of production of q_2. This analysis easily extends to multiple products and countries. The product transformation curve is shaped by the state of the arts in technology and the meaning of its concave-inward shape is that there are diminishing returns in production. The availability of factors of production and technology determines the product transformation curve. A country is restricted to produce at or inside the product transformation curve. Points

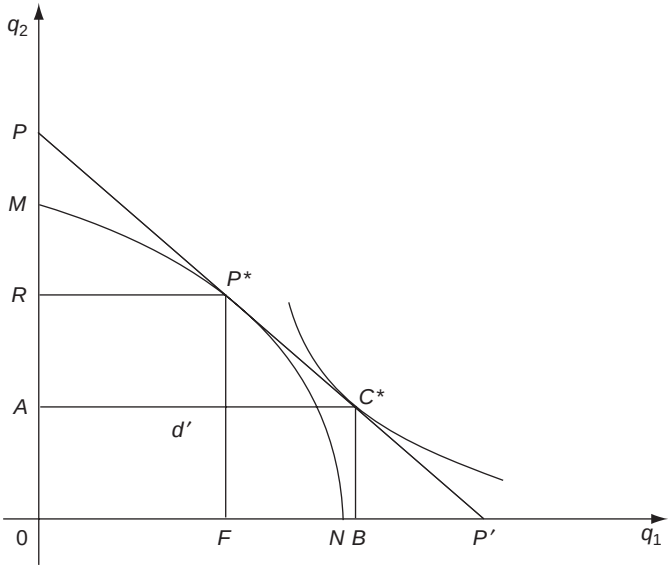

Diagram 6.1 The gains from trade

inside the product transformation curve are feasible but not efficient. Economic growth shifts outwardly the opportunities beyond the product transformation curve, allowing the country to consume more of both goods. The slope of line *PP′* is the terms of trade, the ratio of q_2 to q_1 or the price of q_2 in terms of units of q_1.

Assume that the line *PP′* is the one that prevails under trade. Production would occur at P^*, with the country producing *OR* units of q_2 and *OF* units of q_1; there is Pareto optimality in production because at that point the rate of product transformation of q_2 into q_1 is equal to the price ratio. Consumption occurs at C^*, with the country consuming *OB* units of q_1 and producing *OF* units; there is Pareto optimality in consumption because the rate of commodity substitution between q_2 and q_1 is equal to the price ratio. The gains from trade are illustrated in the same form as in the revealing numerical examples by Samuelson (2001). Trade permits the country to separate the point of production, P^*, from the point of consumption, C^*. That is, trade permits the country to consume in sets that are outside the restrictions of its product transformation curve. The country exports *AR* units of q_2, the difference between its production of *OR* and its consumption of *OA* units of q_2, and imports *FB* units of q_1, the difference between its production of *OF* units and consumption of *OB* units of q_1. Autarky is not efficient in the sense of Pareto when there is the possibility of trade. The gains from trade allow a country to escape the limitations of its endowment of productive factors and technology, consuming sets of commodities and services that are preferred to those attainable under autarky.

The basic theorem is that free trade is superior to no trade, proved by Samuelson (1939). Under the assumptions of absence of monopoly power and technology that results in a concave-inward product transformation curve, Bhagwati (1968, 138) states the theorem in terms of the following propositions:

Proposition 1: The trade situation (i.e., the opportunity to trade) is superior to the no trade situation (i.e., the absence of trade opportunity), from the viewpoint of technical efficiency.
Proposition 2: Under perfect competition, free trade will enable the economy to operate with technical efficiency.
Proposition 3: Under perfect competition, free trade will enable the economy to maximize utility, subject to the given constraints, so that, from the viewpoint of utility-wise ranking as well, free trade is superior to no trade.

Distortions

The recurring problem in economics is that the first-best outcome requires the assumptions of the perfectly competitive model. The relaxation of assumptions leads to the theory of the second best. Restoring one or several of the marginal conditions will not necessarily improve welfare because of non-measurable effects on other markets and distortions. The terms market failure and distortion are interchangeably used in the literature for assumptions that are different than those of perfect competition. Significant part of theory consists of analyzing outcomes in the presence of distortions. Economic policy focuses on the outcome of different instruments used to correct distortions.

An immediate assumption that is questioned is the existence of monopoly power. A country with monopoly power in a commodity could impose an optimum export tax or tariff and gain in welfare by improving its terms of trade. Thus, free trade is not optimum from the point of view of an individual country that has monopoly power (Broda *et al*. 2006). For example, this was the idea behind the withdrawal of coffee stocks from the market by Brazil in the twentieth century (Delfim Netto 1959; Peláez 1971, 1973, 1979). Eventually, Brazil lost its ability to influence world coffee prices because high world prices created by its monopolistic withdrawal of coffee from the market encouraged production in other countries. OPEC is a multi-country cartel organized to maintain prices above what they would be under free trade, thus improving the terms of trade for OPEC members. Trade wars or retaliation can be damaging to multiple parties. A country has monopsony power when it accounts for a major part of the purchases of a good, such as the United States in oil. A monopsonist can impose an import tax or tariff and gain relative to free trade again by improving the terms of trade on its favor. Johnson (1953) showed that it is possible but not necessarily likely for a country to gain by an optimum tariff even in the presence of retaliation.

There is a subset of conditions in which there is restricted trade (Bhagwati 1968, 142). Assume that the restrictions are in the form of three types of policies: tariffs, quotas and exchange restrictions. In these cases, Kemp (1962) shows that restricted

trade, in the form of tariffs, quotas and exchange restrictions, is preferable to no trade.

There are many types of distortions identified by economists that defy analysis within limited space. The mere classification of the distortions is challenging by itself. Fortunately, Bhagwati (1971), Bhagwati and Ramaswami (1963) and Bhagwati *et al*. (1969) have provided an important general result (Bhagwati 2001; Panagariya 2006). The optimum policy in the presence of distortions is not to interfere with trade. Distortions should be corrected at their source and not in trade flows. That is, the presence of market imperfections requires domestic regulation, not trade policy such as by means of tariffs. The existence of unemployment should be alleviated by fiscal and monetary policy together with perhaps safety nets, not by interfering with trade. The correction of domestic distortions, such as pollution, should be by means of domestic policy instruments not by trade-related instruments. The country would correct the distortions and still gain from trade. Individual issues of the relation of trade with trade promotion, employment, wages, offshoring of jobs and fair trade incorporating labor and environmental standards are considered below in individual sections.

Trade openness

The openness to trade of countries constitutes an important issue of practical policy and academic debate. One of the classical arguments for diminishing the openness to trade was the infant industry argument. Interruption of trade was advisable if there were dynamic learning effects for an industry. Free trade could be restored once the infant industry matured. The initial postwar period was dominated by aggressive promotion of development by means of trade and exchange policies restricting imports. The objective of these policies was the development of domestic import-competing industries. This initial period was followed by approaches and policy measures on liberalization of trade restrictions. There have been numerous studies attempting to measure the relationship between trade openness and economic growth but the evidence is not conclusive. Endogenous growth models would be highly useful because international diffusion of technology is considered beneficial to the welfare of the world and individual countries. However, there are difficulties in verifying these models.

There was a proposal for ISI in the initial postwar period, consisting of two types of arguments. Tropical trade had an unfavorable outcome in the form of unequal distribution of the gains from trade. The conventional neoclassical interpretation would argue that the price of manufactures would decline because of technological progress in industry while the price of agricultural products would increase because of the limited stock of land. Prebisch (1950, 1984) argues that there was deterioration of the terms of trade of primary producing countries – export prices of primary-producing countries relative to their import prices – in the period from 1870 to 1940. Prebisch claims that in the 1930s primary products could only buy about 63 percent of manufactures that could have been bought in the 1860s. Singer (1950) argues that primary product prices decline over time

because of low income elasticity – prices increase less than proportionately relative to an increase in income. In addition, the revenue of primary producers declines over time because of the low price elasticity of demand. The primary-producing countries did not enjoy the gains of technology because they consumed industrial goods whose prices increased more than proportionately than the prices of the primary products they produced. The industrial countries benefited from technology by producing manufactures that gained in price relative to the primary products they consumed. Differences in labor organization were important in this unequal distribution of gains from technology. Labor unions in developed countries ensured price rigidity during business cycles while the lack of labor organization in primary-producing countries ensured price flexibility.

There is an important new series of the terms of trade and analysis of the historical period (Jeffrey Williamson 2000a; Hadass and Williamson 2001). The data are constructed from annual price quotes in domestic markets, which truly capture the probable impact on national economies. There was improvement of the terms of trade for all trading regions, including the land-abundant New World (the United States, Canada and in some periods Argentina and Uruguay), the land-abundant Third World, the land-scarce Third world and the land-scarce Europe. The evidence consists of time series data for seven countries in the Asian periphery, seven in the European center and five in the New World originating in European colonization.

A study has shown a "marked long-term downturn" of the terms of trade of primary producers between 1900 and 2000 when "raw materials lost between 50 percent and 60 percent of their relative value to manufactures" (Ocampo and Parra 2003, 7). There were structural breaks in the terms of trade. World War I caused significant changes in the world economy, causing major decline in the terms of trade of primary production. There is no trend between the 1920s and 1970s but another downturn in the 1980s following the slowing world economy after 1973 (Ocampo and Parra 2003).

The economic policy corresponding to the view of secular deterioration of the terms of trade consisted of import substitution industrialization (ISI). A related interpretation claimed that economic growth only occurred in Latin America during adverse shocks in which exchange crises or interruption of trade caused ISI (Furtado 1959). These adverse shocks were the two world wars and the Great Depression. There was a relatively widespread strategy of ISI in the 1950s, 1960s and 1970s. The work of Furtado (1959) consisted of hypotheses with almost no empirical information. The initial industrialization of Brazil occurred and made progress during periods of outward-direct export activity (Peláez 1972, 1979). The route of adjustment of Brazil from the Great Depression in a simple Keynesian model was not the destruction of coffee stocks financed in reality mainly with taxes instead of money creation but the fiscal deficit created by the revolution of the State of São Paulo in 1932, seeking autonomy from the rest of Brazil and a major drought in northeast Brazil (Peláez 1968a, 1968b, 1972; Peláez and Suzigan 1981). There is a competing interpretation that the exchange-rate flexibility caused by the abandoning of the gold standard by Brazil cushioned the domestic economy from the Great Depression, allowing import substitution in

already existing domestic industrial activities and creating a significant trade surplus (Peláez 1968a, b, 1972). The diminished impact of the Great Depression in countries that followed exchange-rate flexibility was a worldwide experience (Friedman and Schwartz 1963, 301).

The impulse of growth of the coffee economy of Brazil was quite strong in the period of the free coffee economy 1857–1906 before the first market intervention by Brazil to support prices (Peláez 1976b). In the period of the free coffee market of 1857–1906, two non-parametric tests accepted the null hypothesis of no trend and rejected the null hypothesis of no oscillation (Delfim Netto 1959). Thus, coffee prices oscillated without trend. Physical exports of coffee increased at the high yearly average rate of 3.5 percent (Peláez 1976b). Brazil's exchange receipts from coffee exporting in sterling increased at the average rate of 3.5 percent per year and receipts in domestic currency at 4.5 percent per year. Great Britain supplied nearly all the imports of the coffee economy. In the period of the free coffee market, British export prices declined at the rate of 0.5 percent per year. Thus, the income terms of trade of the coffee economy improved at the relatively satisfactory average rate of 4.0 percent per year. This is only a lower bound of the rate of improvement of the terms of trade. While the quantity of coffee remained relatively constant, the quality of manufactured products improved significantly during the 50-year period considered.

The tropical exporting economy of Brazil experienced an opportunity of absorbing rapidly increasing quantities of manufactures from the "workshop" countries and significant flows of direct investment from Great Britain. Therefore, the coffee trade constituted a golden opportunity for modernization in nineteenth-century Brazil. This opportunity came too late relative to other areas of recent settlement in the new world. Brazil's retardation was caused by arriving too late, just before the process of diffusion of technology was interrupted by two world wars and the Great Depression. These adverse shocks were adverse in every form. The theory of adverse shocks for Brazil is in sharp contradiction with historical records and data.

In her presidential address to the American Economic Association, Krueger (1997, 1) recalls that the dominant policy after the war was ISI by any policy means, including import prohibition. Import substitution was the condition for industrialization, which in turn was the essence of development. This approach is in contrast with the widely accepted policy of the late 1990s, consisting of an outward-directed trade regime. The incentives in this regime are mainly by exchange-rate adjustment, affecting output in exports and import-competing sectors. Krueger (1997, 2) states that "while other policy changes also are necessary, changing trade policy is among the essential ingredients if there is to be hope for improved economic performance." Krueger (1997) believes that the approach will change according to developments in theory and measurement but that there is no foreseeable return to the ISI policies of the early postwar period.

There was such lobbying of the strategy of ISI that exceptions for these policies by developing countries were included in the Article XVIII of GATT (Krueger 1997, 5). This exception permitted developing countries to use tariffs and quantitative restrictions. The exceptions sanctioned the value of inward-directed

strategies and provided incentives for developing countries to follow policies that would not result in future sound growth.

The policies of restrictive trade regimes were combined with development plans, directed credit, state-owned enterprises (SOE) and overvalued exchange rates (Krueger 1997, 6). The excellent economic conditions prevailing in the 1950s and 1960s allowed countries to grow fast, creating the myth that the policies were sound. The contraction in supply of foreign exchange together with the increase in demand caused foreign exchange scarcity, at high prices, with many countries rationing foreign exchange. As Krueger (1997, 6) remarks "the resulting system had little to do with encouraging infant industries." Balance of payments problems occurred sporadically as a result of the exchange scarcities and world conditions, resulting in stabilization programs because of high fiscal and external deficits. The economies of developing countries moved in what economists characterized as "stop-go" fashion. The economies stopped during stabilization programs caused by exchange and fiscal crises and then experienced booms after stabilization, leading to another crisis.

The search for an explanation of protection led to the model of rent-seeking (Krueger 1974). The traditional model measured deadweight costs from tariffs as the triangle in the demand curves. The lobby efforts resulted in the use of resources to obtain import licenses and access to foreign exchange in auction systems. Reflecting on this period, Krueger (1997, 7) pointed to the vested interests that are created by policy:

> When policy reforms were attempted, it was clear that those administering earlier policies were in the forefront of those opposing change, alongside the beneficiaries of protection (or other policies)

As during most economic controls, there were vehicles to avoid foreign exchange controls. In this case, the vehicles consisted of overinvoicing, underinvoicing, price transfers among transnational companies, dividend remittances, movement of blocked funds, intercompany loans and so on.

Economists have believed for a protracted period of two centuries that the infant industry argument was a sound case for departure from a system of free multilateral trade. The argument was first proposed by Alexander Hamilton in 1791 and subsequently developed by Friedrich List and John Stuart Mill (Melitz 2005). One of the prerequisites found by Mill was the existence of external dynamic learning effects to firms. Mill also added the requirements that protection must be temporary until the mature industry does not require protection. The added condition by Charles Francis Bastable is that "the cumulative net benefits provided by the protected industry exceed the cumulative costs of protection" (Melitz 2005, 178). The set of requirements is known as the Mill–Bastable Test.

An important influence on ISI in the initial postwar period was the extension of the infant industry argument from a single industry to the entire manufacturing sector (Baldwin 2003). There was an early warning of the error in the application of the infant industry argument in the context of development (Baldwin 1969). The

period immediately after the war was favorable for developing domestic industry because of shortages created by the war. The success of the policies led to the extension of protection to many sectors. Many developing countries, especially in Latin America, imposed tariffs, quantitative restrictions and overvalued exchange rates to protect their industries. There were also lines of subsidized credit. The policies of economy-wide infant industry protection and subsidization resulted in fiscal imbalances, inflation and balance of payments crises, lowering growth rates and causing political volatility.

Baldwin (2003) identifies two mistakes in economic thought supporting these policies, both of which were covered by Meade (1955a). If average costs of production are sufficiently low after the infant industry learning period, the net present value of the discounted cash flows of the projects would allow the firms to raise funds in capital markets. Capital markets' imperfections are not a valid ground for financing the projects. The multitude of unwarranted projects misallocated resources and moved the economies away from optimal long-term growth. It was not the quest for industrialization that was faulty but the inefficient path followed. The second point observed by Baldwin (2003, 1969) is that the profits created by the trade restrictions attracted more entrants in the expectation of capturing the learning economies, lowering the actual discounted cash flows of the projects because of competition. The actual solution found was to protect the rents of a few favored entrants by means of regulation and through subsidies. The policies created incumbents that developed positions of power to protect their rents indefinitely, constituting an interest group that prevented progress and maintained low-quality, high-price products behind an umbrella of protection from competition. Opportunities for corruption occurred in multiple forms.

Economic research turned to analyzing the effects of import substitution policies and the measurement of effective protection (Edwards 1993, 1361–5). There are multi-country studies on trade openness and their impact on the economies of developing countries by Little *et al*. (1970) and Balassa (1971). According to Edwards (1993, 1362), the major contribution of these studies is to measure effective rates of protection to assess "how the structure of protection to intermediate and final goods affected relative profitability to sectoral value added." The key measurement is the actual rate of protection to value added in specific industries. The empirical conclusion was that the protection of value added in manufacturing was much higher than nominal tariffs, distorting income distribution, lowering savings and increasing unemployment and idle capacity. Restriction of competition had multiple adverse effects, similar to those found theoretically in monopoly power.

The NBER project of Krueger (1978) and Bhagwati (1978) is the second round of research (Edwards 1993, 1364). This research classifies trade regimes according to their openness. It broadens the approach away from merely tariffs to encompass trade liberalization. The measurement of trade orientation is the ratio of the effective exchange rate of imports, including tariffs, import charges and an adjustment of quantitative restrictions, to the effective export rate adjusted by subsidies and incentives to exports. If the effective exchange rate is higher

than unity, the country has an import substitution policy. The ratio below unity denotes an export promotion policy and unity corresponds to neutral trade policy. Edwards (1993, 1365) finds that this approach does not accurately define trade regimes and cannot precisely measure trade orientation. The approach has the inclusion of the exchange rate as a critical component of trade policy. There is the problem of turning nominal devaluation into an inflation-adjusted or real devaluation.

Edwards (1993) surveys the theoretical and empirical research on these policies, providing interesting interpretation of trade orientation and liberalization in Chile and Korea. The import tariffs of Chile were 105 percent on average in 1973 (Edwards 1993, 1374). There were dramatic quantitative restrictions, ranging from import prohibition to deposits of as much as 10,000 percent of value prior to importing. The exchange system consisted of 15 different exchange rates. Chile eliminated all quantitative restrictions and lowered the average tariff to 44 percent by August 1975 and to 15 percent by 1987. In addition, Edwards (1993, 1374) argues that the liberalization of trade was accompanied by significant exchange-rate depreciation. Manufacture's share in GNP declined from 30 percent in 1974 to 22 percent in 1981.

The yearly average rate of growth of Korea's merchandise exports was 23 percent in 1963–2000, a performance used to illustrate outward-directed growth. As Edwards (1993, 1375–6) shows, Korea was not always open to trade. In 1950–63, there were licenses and tariffs on imports as well as multiple exchange rates. Systematic trade liberalization began in 1964 with devaluation, unification of exchange rates, gradual reduction of import tariffs and reduction or elimination of quantitative restrictions. At the end of the 1980s, Korea had reduced tariffs to about 10 percent, eliminating licenses. An impressive performance in Korea was the shift to exports of manufactured products. However, Korea subsidized exports in various ways (Edwards 1993, 1376).

There is uncertainty on the empirical relationship between trade openness and economic growth. Rodriguez and Rodrik (2001) argue that there are three propositions on the relationship of trade policy and real GDP in an economy that takes world prices as given. First, without market imperfections, trade restrictions lower GDP at world prices; with market failures, trade restrictions could increase GDP but they need not be the optimum policy. Second, in the neoclassical growth model, trade restrictions do not have an effect on the steady-state rate of economic growth; there could be growth effects in the movement toward the steady state. Third, in growth models with endogenous technical change, lowering trade restrictions increase GDP growth in the world economy. Rodriguez and Rodrik (2001) argue that the three propositions taken together do not result in an unambiguous relationship between trade liberalization and economic growth. Long-term GDP could be higher with trade restrictions than in their absence if there are market failures such as positive production externalities in domestic import-substituting industries. If the restrictions increase the activities of sectors that are more dynamic in technology, endogenous growth models may show positive association between trade restrictions and higher rates of growth of

production. In a technologically backward country, specialization through trade in traditional goods can cause a reduction in the rate of long-term economic growth.

In the survey of studies showing positive association between trade openness and growth, Rodriguez and Rodrik (2001) find what they consider to be similar problems. The strength of the results derive from misspecification of the relations or the use of indicators of openness that constitute proxies for other policy or institutional variables that independently have adverse effects on growth. The estimated coefficients of the indicators of openness are related to controls for the policy and institutional variables. Rodriguez and Rodrik (2001) are skeptical that there is an inverse relation between trade restrictions and economic growth using the observed measures of trade restrictions. They consider the search for such a relationship to be "futile." Instead, they propose research on relations between trade policy and growth that are contingent on other factors, such as size of country, the pattern of comparative advantage, the type of world growth and so on. There could also be high returns from studies that use plant level data to uncover how trade policy affects production, employment and choice of technology.

The advice to developing countries typically emphasizes that reducing trade barriers is more effective in promoting economic growth than tightening the restrictions (Baldwin 2003). However, Baldwin (2003) points out that since the research by Bhagwati (1978) and Krueger (1978), policy recommendations have not concentrated exclusively on trade openness but have also included: "a stable and non-discriminatory exchange-rate system and usually also the need for prudent monetary and fiscal policies and corruption-free administration of economic policies for trade liberalization to be effective in the long-run." Rodriguez and Rodrik (2001) argue that trade liberalization could be on balance positive solely on the basis of comparative advantage and that there is no evidence contrary to this view. What they consider inadequate is the claim that trade openness on its own is sufficiently strong to promote economic growth, replacing entirely development strategies.

Transmission of technology is fundamental in the distribution of productivity in the world (Keller 2002). Effective diffusion promotes convergence of income levels and productivity. In the framework of Keller (2002), the costs of R&D are absorbed by only one inventor. It is possible for many firms, domestic and international, to acquire the technology by purchasing intermediate goods. Thus, the discovery is non-rival, which is the source of the spillovers in the framework. Countries gain access to the technology by purchasing intermediate goods. The dataset includes 13 manufacturing industries in eight countries, accounting for 65 percent of world output of manufacturing and 85 percent of innovation in the world measured by R&D. The framework analyzes transmission of technology within and between industries, at home and abroad. The results show that 50 percent of the total effect on productivity is accounted by own-industry R&D with domestic interindustry productivity accounting for 30 percent and foreign technology spillovers for 20 percent.

The political economy of trade

The struggle of interests for benefits from trade policy is as old as its analysis by economists. The theories of economists on self-interest within the private interest view can be complemented with those of political scientists on the social interests of voters and officials. The theory of rent-seeking by Krueger (1974) originated in the analysis of the pressure for protectionism in developing countries. Bhagwati (1982, 1989, 2001) extended the concept with DUP. A new model of protection for sale was developed in the 1990s and found to correspond to observations. There are also measurements of the costs of protection.

There are two approaches to the analysis of the political economy of international trade: the economic self-interest of political agents and the social interests of the electorate and government functionaries (Baldwin 1989). The support or opposition of an individual for a specific trade policy depends on the effects of the policy on the individual's real income.[1] In the case of a good produced with labor-intensive techniques under perfect competition, workers would prefer an import duty and capitalists would support free trade. With majority rule, workers would outvote capitalists. However, if the capitalists that gain from free trade could compensate the workers for their losses, assuming costless income redistribution, free trade would be chosen. The capitalists could include the redistribution in the outcome of voting. If there are costs of redistribution, the majority would choose protection. If the numbers of workers affected by protection are small, many would not be interested in the outcome and the vote is not assured. There are the normal free-rider problems (Olson 1965) that may prevent the vote for protection unless the numbers are small, which favors producers in effective organizations supporting their interests.

The social concern view argues that trade policies depend on the regard of the government for the welfare of specific groups and the promotion of national and international objectives (Baldwin 1989). There are several objectives such as attaining political power by alliances and influencing the distribution of income. The basic principle is that the reelection prospects of politicians depend on the support of the general public for these objectives.

Baldwin (1989) affirms that the trade policies that receive support by voters are influenced by the lobbying of economic interest groups and by the government. At the level of the individual interest, much depends on the impact of the trade policy on the individual's welfare. It is unlikely that workers in the textile industry would vote against textile import quotas. However, in a trade policy with minimal effects on a textile worker, the evaluation of national objectives may be important. Baldwin (1989) concludes that elements of both theoretical approaches are required to design an effective framework of analysis of decisions on trade policy.

The analysis of trade by economists typically follows a "Benthamite" approach, focusing on the optimum interest of the people while ignoring the struggle motivated by the competitive interests of the groups involved (Findlay and Wellisz 1986). There are two distinct but related effects of trade restrictions. The protective

effect consists of an increase in the reward to the factors of production that are used intensively in the import-competing sectors. The second effect consists of potential revenue generation by the policy. The state receives revenue from the tariff. In the case of a quota, there is the rectangle of Tullock (1967) consisting of the domestic premium over the world price times the volume of imports. Foreign exporters receive the rent created by voluntary export restraints. In the case of a mandatory domestic component, the revenue consists of the profit of the producers of the mandatory component generated by revenue from the difference of the domestic consumer price and world price. Findlay and Wellisz (1986) argue that in developing countries with weak government revenue, governments may ally with domestic producers to impose high tariffs. If the alliance includes traders, there will be coexistence of tariffs and quotas. Mandatory domestic content creates benefits for the domestic factor that also receives the revenue created by protection. The issue of awareness may be quite important. The costs of a tariff are more evident than those of a quota: a comparison of the price with tariff with the difficult estimation of the effect of the quota on domestic relative to world prices. The costs that are most difficult to estimate are for voluntary export restraints and domestic-import content. Findlay and Wellisz (1986) argue that there is a "hiding hand" in these restrictions that could be extremely important to the development of the new political economy.

Economists and political scientists analyze political decisions by different models (Baldwin and Magee 2000, 81). Public policies reducing social welfare are explained in economic models by campaign contributions of organized interest groups. The models of political scientists discard the view that campaign contributions are exchanged for political concessions; instead they support the proposition that access to a legislator is the vehicle by which contributions influence congressional voting behavior. Economists and political scientists coincide in the determining role of the interests of the constituency in the vote of legislators (Baldwin and Magee 2000, 82). Ignoring these interests could lead to electoral defeat. Political scientists also include the pressure of leaders in the legislature as well as personal ideology.

The US House of Representatives voted in 1993–4 on three trade bills: the North American Free Trade Agreement (NAFTA), the Uruguay Round agreement of GATT and the MFN status of China. The empirical evidence obtained by Baldwin and Magee (2000, 99) shows that labor and business groups significantly influenced the outcome of voting on the NAFTA and GATT trade bills. There were extra votes obtained by labor contributions or access to legislators by means of these contributions: 67 against NAFTA and 57 against the Uruguay Round of GATT. There were extra votes resulting from business contributions: 41 in favor of NAFTA and 35 in favor of GATT. Had there been no contributions by business, NAFTA would not have passed. The estimate by Baldwin and Magee (2000) is that changing one vote against NAFTA cost $325,000 and changing one vote against GATT cost $313,000. The President exchanged concessions for 11 votes favoring NAFTA. The evidence shows that legislators also respond to the economic and social interests of their constituents in addition to those of their main contributors.

Decisions on economic policy in developing countries were not primarily made by economists and technocrats but were influenced by political pressure often in conflict with the targets of resource allocation initially desired (Krueger 1990, 13). There was uncommon pressure from interest groups. The concession of import licenses, investment licenses and government contracts was influenced by corruption and favoritism. Protection was excessively high in regards to alleged infant industry arguments such as effective rates of protection in Turkey of 200 percent over a 20-year period after initiation of production (Krueger 1990, 14). This protection was also designed to grant monopoly power to related businessmen and maintaining lobbying activity to perpetuate protection. There were no incentives for competition or low-cost outcomes.

Firms may waste real resources in seeking rents from import quotas (Krueger 1974). Under perfect competition, the waste of resources should equal the entire rent from the quotas. In the highly protected environment of the 1960s, the rent from quotas amounted to the equivalent of double-digit percentages of GNP.

Competition for political concessions determines the structure of trade protection policies in the model of protection for sale of Grossman and Helpman (1994). As in the economic theory of regulation, politicians maximize their self-interest instead of the welfare of the population. The special interest groups defend only their interests while the government's objective has both its own interest and the welfare of voters. Contributions are used to influence government policy. The financing of campaigns and parties in democracies generates strong incentives for politicians to sell their favors. The vector of trade policies reflects the interest of the lobbying groups. Grossman and Helpman (1994) derive a formula for the structure of protection as a function of the state of political organization of the industry, the ratio of the industry's output to net trade and the elasticity of import demand or export supply according to whether the favors are sought for exporting or importing industries.

There is a verification of the empirical consistency of the Grossman and Helpman (1994) model by Goldberg and Maggi (1999). The model predicts that there is a positive association between representation by a lobby and trade protection: the higher the representation the higher the trade protection provided by the government. The model also predicts that the lower the import elasticity the higher the trade protection by the government. In the subset of organized industries, the model predicts that trade protection should be higher in industries with lower import penetration; in the non-organized industries, trade protection should be higher the higher import penetration.

Goldberg and Maggi (1999) are careful to state that they do not provide a test of the Grossman and Helpman (1994) model because they do not have a well-specified alternative hypothesis. Their findings verify the consistency of the model with data for the United States in 1983. The regression coefficients are significant and have the signs specified by the model's predictions. There is difference in the pattern of protection between organized and non-organized sectors. Protection increases with import penetration in the non-organized sector but there is

weak evidence on the inverse relation of protection and import penetration in the organized sectors. The addition of more explanatory variables to check the fit of the model to the data does not add to the explanatory power of the model. Goldberg and Maggi (1999) also measure the coefficient for the weight of welfare of the government at 0.98 with only 0.02 for contributions. The high weight of public welfare in decisions by government is consistent with the low relative protection in the United States. They feel confident in rejecting the hypothesis that the government is purely maximizing welfare of the public. Contributions do have a role in decisions on trade policy.

The welfare effect of a tariff is similar to that of a tax analyzed in the section on applied welfare economics. It consists of the loss of consumer surplus measured by the curvilinear triangle *nzm* and producer surplus measured by the curvilinear triangle *zmr* shown in the Hotelling Diagram 5.1. Panagariya (2002, 175) provides the following formula to measure the cost of a tariff as proportion of GNP:

$$\text{Cost of protection/GNP} = (1/2)\alpha\eta\rho^2 \tag{6.1}$$

Where α is the ratio of imports to GNP at the equilibrium with tariff, η is the absolute value of the arc elasticity of demand for imports in the movement from a protected equilibrium to a free-trade equilibrium and ρ^2 is the square of a number less than unity. Panagariya (2002) argues that the calculations with this formula will likely provide low magnitudes. He reports that the numbers found in the early studies of the 1960s were quite low, less than 1 percent of GNP, and other subsequent calculations with GE models also provide relatively low numbers, in the range of 0.5 to 2 percent of GNP. The formula shows that the rate of increase of the cost of protection increases with the tariff. Panagariya (2002, 175) refers to a cost of 2.5 percent for a 50 percent tariff calculated by Harberger for Chile in the 1950s.

There are also costs from rent-seeking activities (Panagariya 2002, 178). Firms may waste real resources in seeking rents from import quotas (Krueger 1974). Under perfect competition, the waste of resources should equal the entire rent from the quotas that is equal to the domestic premium above the world price of the imports times the volume of imports (Findlay and Wellisz 1986). In the highly protected environment of the 1960s, the rent from quotas amounted to double digit percentages of GNP. Bhagwati (1982, 1989, 2001) introduced the concept of DUP. He considers two types of DUP activities (Bhagwati 2001), downstream and upstream. The upstream DUP activities are those that create the distortion, as for example, tariffs and quotas. The downstream DUP activities consist of resources used in seeking rent, revenue and quota evasion as a result of the upstream DUP activities. Bhagwati (2001) argues that only the resources used in the downstream DUP activities should be considered in the calculation of the costs of protection. In addition to the deadweight triangles of applied welfare economics, Tullock (1967) introduces the monopolist's rectangle, a significant part of which may be considered as waste of resources in obtaining government favors, which applies to the case of rents from quotas.

Antidumping and safeguards

A seven-term senator in the United States advocates that the job of Congress is protectionism, which allegedly explains American economic history and progress (Hollings 2004). There is a compelling case by Bhagwati of why Congress should be more friendly to free trade.

The previous sections show that there is an alternative interpretation of the actual effects of protectionism. An important mechanism of protectionism in the United States is by means of laws on antidumping and safeguards. Chapter 1 of Volume II analyzes the detour from free trade by means of preferential trade agreements. This section explains the mechanism of antidumping and safeguards.

The US Congress established the US Tariff Commission in 1916, which changed its name to the current United States International Trade Commission (USITC) (USITC 2007). The USITC is a "quasi-judicial" federal agency, non-partisan and independent that has broad powers to investigate trade matters. In addition, the USITC provides information to Congress and the President for the formulation of US trade policy. However, the USITC is not a court of law and does not negotiate trade agreements or formulate trade policy. The activities of the USITC are the following (USITC 2007):

- *LTFV*. The USITC determines if there is material injury to US industries resulting from pricing of imports at less than fair value (LTFV) or imports that receive subsidies.
- *Unfair trade practices*. The USITC directs actions for approval of the President to correct unfair import practices, including infringement of patents, trademarks or copyright.
- *Relief*. The USITC recommends to the President relief for industries that suffer from increasing imports.
- *Agricultural imports*. The USITC advises the President if agricultural imports affect price-support programs of the US Department of Agriculture.
- *Studies*. The USITC develops research on trade and tariff issues and the monitoring of import levels.
- *Trade data*. The USITC establishes an international harmonized code and develops uniform data on imports, exports and domestic production.

The USITC works in conjunction with the International Trade Administration of the US Commerce Department (USITC 2007). A fundamental function is the determination if foreign products are sold in the United States at LTFV or if foreign products are subsidized by foreign governments in investigations of countervailing duty and antidumping. US industries can petition the government for relief of alleged injury originating in imports sold at LTFV and subsidized by foreign government programs. The Commerce Department determines the existence of dumping and the level, called "dumping margin." The USITC determines if there is material injury to the US industry by alleged subsidies or dumping. If there is positive USITC determination of material injury and affirmative Commerce

Department determination of subsidy or dumping, the US Custom Service is ordered by the Commerce Department to impose duties. There are 5-year (Sunset) reviews in which the USITC and Commerce determine if the termination of the antidumping or countervailing duty is likely to result in continuing dumping or subsidies. The relief measures can be continued for another 5 years or terminated.

In addition, the USITC can evaluate serious injury to US industries by fairly traded imports, recommending to the President relief that could be in the form of tariffs or quotas on imports and/or assistance to the US industry (USITC 2007). The USITC can determine if increasing imports of products from China are causing or threaten to cause disruption of markets. US producers can obtain relief in case of affirmative determination by the USITC. In case of affirmative determination, the USITC proposes a remedy to the President that makes the final decision on whether to provide relief for the US industry and the type and time period of such relief.

The USITC is governed by six commissioners, nominated by the President and confirmed by Congress. Only three commissioners can be of the same political party. The current structure consists of three Republicans and three Democrats. The commissioners have overlapping 9-year terms, with a new term beginning every 18 months. The President appoints the Chairman and the Vice Chairman from the current commissioners for 2-year terms. The Chairman and the Vice Chairman must be from different political parties and the Chairman cannot be of the same party as the preceding Chairman. The USITC has staff of 365 individuals.

Section 201 of the US Trade Act of 1974 provides for temporary re-protection of an industry that has suffered injury because of trade liberalization (Brown and McCulloch 2005, 111). If an industry suffers because of rapid growth of imports, new restrictions can be imposed under Article XIX of the GATT and the WTO Agreement on Safeguards. Section 201 permits the request of safeguard measures by the President, Congress or a US industry. If the USITC finds that the industry has suffered material injury, it can recommend relief to the President that has the option of not doing anything or choosing from a broad range of policy measures, such as import duties, tariffs, quotas, quantitative restrictions and others (Brown and McCulloch 2005, 113). There are several other special safeguards than can be applied when Section 201 does not provide for protection: special agricultural safeguards within the WTO, transitional safeguards under the WTO Agreement on Textiles and Clothing, special transitional safeguards for the entry of China in the WTO and special safeguards in US bilateral and regional trade agreements (RTA).

On August 6, 2002, the President signed into law the Trade Adjustment Assistance Reform Act of 2002 (Department of Labor 2007). This act reauthorized trade adjustment assistance (TAA) through fiscal 2007. The TAA is managed at the US Department of Labor with the objective of assisting workers who lost their jobs because of increased imports or changes in production outside the United States.

During the business cycle, firms with high fixed costs experience high profits during expansions and losses during downturns (Brown and McCulloch 2005, 119). The volatility of profits is compensated by high average profits over a long period. There are reversible changes in profitability caused by variations in

exchange rates and the business cycle. Industry behavior during the business cycle can result in dumping complaints. If the government acts on the complaints, there is a shift of the burden of adjustment of the business cycle to foreigners.

Comparative advantage consists of lower relative costs at home than abroad. The alleged material injuries to domestic industry in US trade laws and their enforcement may originate in changes in comparative advantage (Brown and McCulloch 2005). Industries may be gaining in productivity but still may no longer enjoy comparative advantage because relative costs declined in those industries in other countries. The process of integration of the world economy causes shifts in comparative advantage. Brown and McCulloch (2005) find that the industries seeking remedies under US trade laws are those that experience greater import penetration and likely loss of comparative advantage. The shift of comparative advantage requires rapid adjustment with transfer of resources to other activities. However, US trade laws and remedies may attract more resources in industries that are no longer relatively competitive by insulating them from competition and maintaining their profitability. The renewal of the remedies every few years postpones adjustment indefinitely. The phenomenon is not unique to the United States but is repeated in many other industrial countries.

The US Anti dumping Act of 1921 was inspired by a Canadian 1904 law that authorized the government to prevent the entry of goods sold at LTFV (Mankiw and Swagel 2005). The objective of the Canadian law was to prevent competition with a large American company, US Steel, and the result was to raise the price of steel used in the construction of Canadian railroads, which were essential for development purposes. The consequence of the anti dumping statutes is to prevent reduction of prices by competition. Consumers of food and housing ultimately suffer the most from the anti dumping measures. Mankiw and Swagel (2005) recall that the United States imposed a tariff of 50 percent on imported ball bearings that caused price benefits to producers in the United States but raised the prices to other producers that used them as intermediate products, thus raising prices to consumers. They also find that anti dumping duties are 10–20 times higher than ordinary tariffs, perpetuating themselves: Commerce eliminated the duties in only two of the 314 cases reviewed in 1998–2000. Anti dumping measures in force in April 2005 in steel numbered 158 of a total of 294. Steel prices increased by 45 percent in 2003–05. The steel industry employs only 160,000 workers but over 1.5 million workers are employed by companies that produce metal products, 1.1 million workers in firms that produce machinery and 1.8 million in transportation equipment such as cars and parts. Saving a job in steel caused the loss of three jobs in other occupations, causing distortions valued at $450,000. The United States imposed anti dumping tariffs of 62.7 percent in 1991 on flat-panel displays; producers of computers relocated production to East Asia because there were no similar duties on the finished computer. The loss of the United States was in high tech jobs.

There is an imitation effect of US laws. Mankiw and Swagel (2005) show that several countries – Argentina, Brazil, India and South Africa – use anti dumping laws 5–20 times more frequently than the United States. The strongest anti dumping

measures per dollar of imports are by developing countries. One of the most criticized measures is the Byrd Amendment of 2000 that President Clinton signed but urged that it be repealed (Mankiw and Swagel 2005). A firm will only receive a share of the revenue from the anti dumping tariffs if it backs the initial petition with Commerce and the USITC. There is a double benefit to the companies: the increase in prices resulting from restraint of competition and then the subsidy from the distribution of the increase in revenue by the tariff. The payments under the Byrd Amendment exceeded $1 billion by 2004 and the Congressional Budget Office estimates more than $5 billion in 2005–15 (Mankiw and Swagel 2005). The practice of anti dumping in the United States and other countries is not about extremely rare cases of dumping but rather about protecting specific interests in detriment of the general public. Unfortunately, it is extremely difficult to defeat these practices within the WTO, in international agreements and in the legislature.

The United States made important changes to the anti dumping law with the Trade Agreement Act of 1979. Staiger and Wolak (1994) provide major econometric evidence on anti dumping in the United States in the period immediately following these changes in 1980–5. There is a distinction between outcome and process filers for anti dumping. The outcome filers are actually interested in the anti dumping measures instead of in benefits from the filing alone. The data support the strategy of outcome filing. Filing rates are higher in industries that have higher import penetration ratios, lower utilization of capacity, higher employment and lower proportion of primary factors in total costs. The econometric results imply that an anti dumping unit on a single code of the Tariff Schedule of the United States (TSUS) causes a decline in the annual rate of imports of $10.6 million in 1972 dollars (Staiger and Wolak 1994, 80–1). The increase in output predicted by the equations for the same duty is $7.1 million but there is no sufficient confidence because of the imprecision of the estimate.

Staiger and Wolak (1994) analyzed and measured non-duty effects other than the actual imposition of the duty. The investigation effect is the impact caused by merely the initiation of an investigation; the suspension effect is the impact following suspension of the investigation; and the withdrawal effect is the impact deriving from the withdrawal of the complaint. As would be expected from outcome filers, there is some acceleration of imports with the filing of the anti dumping petition. The preliminary finding of affirmative LTFV determination coincides with major reduction of imports: the results predict a reduction in the annual flow of imports relative to the pre-petition level of imports of $25.36 million ($33.81 less $8.45 million). The suspension agreement predicts lower imports of $29.57 million below the initial base. The actual duties predict a comparable reduction of imports of $24.95 million. The withdrawal of the petition does not have statistically significant change. In general, the results confirm the proposition that the preliminary affirmative determination of LTFV even if it does not cause anti dumping duties results in temporary protection from competing imports and a smaller proportionate increase in output by the US industry. The finding of LFTV is almost equivalent to actually imposing the duties. Suspension effects are comparable in restrictive effects to the actual duties. Although outcome

filers are more common, there are also industries seeking restrictive effects from just the process by itself.

The departure of Stiglitz (1997, 403) is the definition of Viner (1923) that dumping consists of selling a good in the United States at a price that is lower than in some foreign market. Stiglitz (1997) argues that the anti dumping laws sanction conduct that is against the interests of the United States and prevent benefits from trade to the United States. If demand in the United States is relatively elastic, the monopolistic foreign firm that lowers the price in the United States relative to foreign-market prices enjoys higher revenue because the proportionate increase in quantity is higher than the decline in price. That is, the bill to American consumers for the total purchase of the goods is higher. The anti dumping laws prevent this benefit. If demand in the United States is relatively inelastic, the bill to US consumers increases, because the decrease in price results in an increase in the total bill to consumers. The anti dumping laws favor this adverse effect by preventing the decrease in price.

However, Stiglitz (1997) warns about predatory pricing and "new trade theory effects." Predatory pricing occurs when established firms drive others from the market or from entering by lowering the prices below costs. Because the price is lower during the period of predation, consumer surplus increases. However, after the firm captures monopoly power, there is lower consumer surplus, in standard analysis. Thus, predatory conduct results eventually in a permanent welfare loss. Stiglitz (1997, 405) argues that "predatory dumping may thus be a legitimate policy concern" because of new theories showing the possibility of predation. There is a problem here. Most of the anti dumping petitions are by large firms, in oligopolistic markets, with high import penetration, high employment, use of their products as intermediate goods in production of other goods, expensive lobby efforts and possible threat of comparative advantage. In practice, policy may simply deliver domestic consumers and users of the products in anti dumping petitions to the domestic firms with market power. It appears that the organization of the market could be critically important.

There could be dynamic learning advantages and other benefits for a domestic firm to move into an imperfectly competitive market (Stiglitz 1997). Protection need not be optimal relative to subsidies in these cases and there is no assurance of new trade theory effects. Stiglitz (1997) argues that potential gains in some industries generate complexities in policy design.

In the case of subsidies, from the point of view of the world as a whole, countervailing duties may improve world welfare (Stiglitz 1997, 406) even under perfect competition. Interference with comparative advantage may reduce world welfare, which can be corrected by countervailing duties. From the national point of view, countervailing duties may prevent first-mover firms to obtain advantage.

Trade and employment

The departing theory of the effects of trade on employment is the combination of two theorems by Heckscher, Ohlin and Samuelson, on relative factor endowments,

and Stolper and Samuelson, on the effects of tariffs on wages. The initial views of economists were pessimistic that trade with developing countries producing goods intensive in the use of unskilled labor would lower employment of unskilled labor in advanced countries. More recent work focuses on aggregate events and policies in the determination of employment. However, there is still the issue of displaced workers, requiring adjustment programs while the country is reaping the gains from trade. The impact of location of manufacturing overseas must consider the move away from trading in final goods to trading in intermediate products. There are some minimal losses in employment from offshore location of production that also result in costs of displaced workers. These issues are discussed below in turn.

The known theory of trade, employment and wages is the Heckscher–Ohlin–Samuelson Theorem (Heckscher 1919; Ohlin 1933; Samuelson 1948, 1949, 1951, 1953) and the Stolper and Samuelson (1941) Theorem of relative factor endowments, which Sachs and Shatz (1994) consider for the explanation of trade and the employment levels and wages of the less skilled workers. The theory predicts that in two countries producing goods with labor and capital, the capital-rich country will export goods that use intensively in production the abundant factor, capital, and the labor-rich country will export goods that use intensively in production its abundant factor, labor. Assume that the two factors are skilled and unskilled labor. If the United States has relatively more abundant skilled labor and the developing countries more abundant unskilled labor, the United States will export goods that use skilled labor intensively and import from developing countries goods that use more intensively unskilled labor. Sachs and Shatz (1994) emphasize the importance of the pattern of trade and the characteristics of the partner. The United States will import non-skill-intensive goods from countries that have abundant unskilled labor and will export goods that use intensively skilled labor. The trade of the United States with high-wage countries will be in differentiated products instead of on the basis of factor proportions.

The essence of the argument is in the proposition of Stolper and Samuelson (1941). The wage of unskilled labor declines relative to the wages of skilled labor. In addition, the wage of unskilled labor declines relatively to the prices of non-skill-intensive goods and also of skill-intensive goods. Thus, the wages of real labor decline in real terms or after adjusting by inflation. Conversely, the wages of skilled labor increase relatively to the prices of both types of goods and, thus, in real terms (Sachs and Shatz 1994, 14).

The intuitive explanation of the Stolper and Samuelson (1941) theorem is as follows (Neary 2005). Consider the economy producing an export good that is intensive in production in the use of capital and an import-competing good that is intensive in production in the use of labor. The analysis of Hotelling in applied welfare economics, Diagram 5.1, shows that a tax (or tariff) imposed on the import-competing good increases the relative price of that good. The sector of the import-competing good will expand. With the assumption of full employment of both capital and labor, the expansion of the sector of the import-competing good is accompanied by a reduction in the export sector. The combined expansion of the import-competing sector and decline of the export sector causes an

increase in the demand of labor relative to that of capital and thus creates pressure for an increase in the remuneration of labor or wage rate. Because of constant export prices, the reward of capital relative to that of labor declines, implying that the wage rate increases by more than the price of imports. Protection increases the real wage.

The argument by Sachs and Shatz (1994, 14) is summarized in Table 6.2. Trade increases the supply of non-skill-intensive goods in the domestic market, causing a decrease in the relative price of non-skill-intensive goods. The decline of output in the import-competing domestic market because of the inflow of foreign goods causes a decline in the wages of unskilled relative to skilled workers. There is an increase in the output of skill-intensive goods caused by specialization with factors moving away from production of non-skill-intensive goods into production of skill-intensive goods. There is an increase in exports of skill-intensive goods because of higher output and an increase in imports of non-skill-intensive goods. There is an increase in the ratio of unskilled to skilled workers in the skilled sector following the reallocation of resources and provoked by the lower wages of unskilled workers. There is less demand for skilled workers in both sectors as a result of their higher relative wages. In the simple model, the two effects balance

Table 6.2 Prices, wages and real wages after trade

Relative prices		Relative wages		Real wages	
Skill-intensive Goods	Unskilled-intensive Goods	Skilled Labor	Unskilled Labor	Skilled	Unskilled
Increase	Decrease	Increase	Decrease	Increase	Decrease

Variable	**Effect**
Relative prices	
Non-skill-intensive goods	Decrease
Cause: Increase in supply of non-skill-intensive goods by imports	
Relative wages	
Unskilled workers	Decrease
Cause: Decrease in price of non-skill-intensive goods in response to increase in their supply	
Production	
Skill-intensive goods	Increase
Non-skill-intensive goods	Decrease
Cause: Increase of supply of non-skill-intensive goods by imports	
Exports	
Skill-intensive goods	Increase
Imports	
Non-skill-intensive goods	Increase
Ratio of unskilled to skilled workers	
Skill-intensive goods	Increase
Non-skill-intensive goods	Increase

Source: Sachs and Shatz (1994, 14).

each other. The model shows the static gains from trade in the jump of consumption outside the confines of the domestic product transformation curve. Thus, the simple Stolper and Samuelson (1941) model predicts that there would be simply a reallocation of labor within manufacturing.

There was a net job loss in US manufacturing as a result of trading with developing countries according to Sachs and Shatz (1994, 15). They suspect that three factors caused net job losses in manufacturing. The unskilled workers can leave manufacturing for opportunities in services. Labor unions were important in the period in non-skill-intensive sectors and maintained wages above full-employment equilibrium. If the elasticity of supply of unskilled labor is positive, a decline in the wage causes a decrease in labor force participation.

Sachs and Shatz (1994) find evidence that there was decline of relative prices of less skill-intensive goods after 1978 in the United States in accordance with the prediction of the model of Heckscher, Ohlin and Samuelson. Productivity change favored non-skill-intensive sectors as total factor productivity (TPF) increased in low-skill activities. Sachs and Shatz (1994, 40) argue that "the evidence points more toward shifts in trade and market prices than toward shifts in TFP growth as the relevant factor in widening wage inequalities after 1978."

A common argument explains the decline in employment of the unskilled by technical change. There were innovations reducing the amount of unskilled labor required in production. Sachs and Shatz (1994) provide data showing that the proportion of non-production workers in total employment in manufacturing increased from 16.6 percent in 1947 to 31 percent in 1990. They argue that the decline in unskilled workers implies that the current unskilled workers have stronger labor power than before, being able to close the gap in their relative wages. In 1960–78, the increase of the ratio of skilled to unskilled workers was accompanied by a reduction in the gap of their wages. According to this argument, technical change and imports of non-skill-intensive goods explain both the increasing use of skilled relative to unskilled workers and the increasing differential of their wages. Imports worked to reduce the prices of non-skill-intensive goods and thus the wages of workers employed in those sectors.

The model assumes that there is no factor mobility. Sachs and Shatz (1994, 16) introduce capital mobility in the form of FDI by the United States in the production of goods with unskilled labor in the developing country. The assumption requires openness to trade and foreign investment in the developing country and to trade and outward flows of capital in the United States. The non-skill-intensive imports would flow from the developing country to the United States, causing a reduction in the wages of unskilled labor, without necessarily lower employment as workers continue to work for a lower wage. The trade deficit of the United States would be paid by the services account surplus resulting from dividends and other payments on FDI. The flow of capital from the United States to developing countries would reduce the capital stock of the United States and increase that of the developing countries (Sachs and Shatz 1994, 42). The productivity of labor depends on the amount of capital used per unit of labor. There would be a

wage-depressing change in relative marginal productivities of labor in the United States relative to developing countries.

In 2001–04, US manufacturing employment declined by 2.8 million, reaching the lowest level since 1950 for the strongest cyclical decline since 1960 (Forbes 2004, 30–1). These job losses are not unique: Japan experienced a decline of employment in manufacturing of one-sixth in 1995–04 and China had a loss of 15 percent, or 15 million jobs, in the same period. Part of the sharp drop in US manufacturing jobs originated in two short-term factors: the sharper than usual decline of business investment and the decline of exports. Forbes (2004, 32) also emphasizes the long-term trend of increasing productivity: manufacturing productivity increased in the United States at 2.8 percent per year on the average in 1950–2000, such that an hour of work in manufacturing in 1950 produced four times more output in 2000. Another common misunderstanding is that the flood of imports from China has caused the loss of manufacturing jobs in the United States. Forbes (2004, 33) shows that imports from China increased only recently, thus not being responsible for earlier losses in jobs. In addition, Forbes shows that the heavier losses in manufacturing jobs in the United States have not been in sectors competing with Chinese imports and that imports from China merely replaced imports from other countries.

Trade causes job losses because it occurred in imports of textile and furniture from developing countries. However, trade also increases jobs such as by importing inputs that are cheaper and/or of higher quality, lowering domestic costs of production and increasing productivity (Bernanke 2004). There is theoretical reasoning and empirical evidence showing that the net impact of trade on employment creation is minor. Bernanke (2004) argues that long-term factors – population growth, education, training, changes in labor force participation and labor market institutions – determine employment creation. There does not appear to be a long-term impact of trade on employment.

The fallacy of fixed number of jobs is the belief that the protection of specific jobs is the same thing as protecting the number of jobs in the economy (Mussa 1993, 374). The error consists of focusing on the specific job losses without taking into account that most workers will find other employment. A new form of this fallacy is that Americans are losing their jobs to workers in China. Mussa (1993) finds that in the long-term economic growth is what truly drives employment. The labor movement claims that the revival of American organized labor occurred during the Great Depression because the United States realized that the dynamism of its economy depended on internal factors (Chaikin 1982, 836). However, in the 1960s workers in labor-intensive industries began to experience job loss and wage reduction. A new phenomenon threatened the focus on the domestic market: "the specter of deindustrialization is not only apparent but has continued to grow at a geometric pace" (Chaikin 1982, 837). According to this view, trade policy in the United States moved from the autarky of the 1930s to free trade. In addition, foreign investment abroad decreased investment in the US economy. The climax was in the 1980s with deindustrialization and the waste lands of the industrial rust belt.

Deindustrialization consists of the decline of the share of manufacturing in total economic activity in the advanced countries from 28 percent in 1970 to 18 percent in 1994 (Rowthorn and Ramaswamy 1999). The debate focuses on whether deindustrialization occurred as the result of domestic factors in the advanced countries or because of the integration through trade and FDI with the developing countries. Output grew at similar rates in manufacturing and services but labor productivity in manufacturing increased at a much faster yearly average rate. The driver of manufacturing growth rates was the increase in labor productivity. Thus, the dynamism of manufacturing was caused by the increase in productivity. The reduction in the share of output in manufacturing was caused by its dynamism. Employment in services increased because of the lower rate of labor productivity in that sector relative to manufacturing. Clark (1957) postulates in a classic work that the income elasticity of food and manufacturing is lower relative to that of services. The process of economic growth would tend to concentrate income and employment generation in services.

The empirical research of Rowthorn and Ramaswamy (1999) shows that deindustrialization is explained by interaction of the shift of demand from manufacturing to services, the higher growth rate of productivity in manufacturing relative to services and the resulting decline in the prices of manufactures relative to services. Their econometric research shows that less than 20 percent of the decline in manufacturing employment in advanced countries is caused by trade with developing countries. The contribution of trade with developing countries was in stimulating labor productivity in manufacturing in the advanced countries where import-competing firms used labor more efficiently and shifted production to goods with higher value.

There is an important, original contribution by Groshen *et al*. (2005) to the measurement of job losses caused by trade. There are gains and losses of jobs through trade flows from the United States and to the United States. Table 6.3 illustrates this argument. Suppose there is loss of a job in computer programming to a foreign country. If the gain of a job overseas is used to export programming services to the United States, there is an increase in imports by the United States by the amount of the programming services imported. If the programming job in the

Table 6.3 Jobs and trade flows

Job	Imports	Exports
Loss	Increase US job is used to import to the United States	Decrease US job is used to export from the United States
Gain	Decrease US job is used to produce in the United States	Increase US job is used to export from the United States

Source: Groshen *et al*. (2005).

United States was used to export, there is a loss of exports by the United States. In the second part of Table 6.3, if a job is created in the United States to provide marketing services in a foreign country, there is a decrease in imports of marketing services in the United States. If the new job is used to export to a foreign country, there is an increase in exports by the United States.

The objective of Groshen *et al*. (2005) is to measure the net impact of trade flows on the number of jobs in the United States. The measurement is the number of US jobs embodied in net imports, which is:

> US jobs embodied in net imports = number of US workers required to produce imports of goods and services less number of US workers that produce exports of goods and services = change in US output required to replace US net imports X the ratio of US employment to US output

The second portion of the equation shows the actual method used in calculation. The first term is obtained from the input-output tables of the United States. The conclusions are revealing (Groshen *et al*. 2005, 7):

> Our analysis suggests that offshoring has been a limited phenomenon – and one that has contributed only marginally to the labor market's weak performance in recent years. Through year-end 2003, the number of jobs embodied in net imports did not exceed 2.4 percent of the country's total employment. Moreover, the jobs lost to net trade flows grew at a slower pace after the recession than they did before – dropping from 45,000 jobs per month in 1997–2001 to 30,000 in 2001–3

The share of merchandise trade in GDP for the United States declined from 5.6 percent in 1890 to 6.1 percent in 1913, 3.4 percent in 1960 and then increased to 4.1 percent in 1970, 8.8 percent in 1980 and 8 percent in 1990, according to calculations by Feenstra (1998). There was comparable trade and economic integration in the OECD in the past few decades. Feenstra (1998, 31) affirms that "if one focuses on merchandise trade relative to value added, the world is *much* more integrated today than at any time during the past century." He also observes that integration among nations has been accompanied by "disintegration" in production. That is, it is profitable for companies to outsource parts of the process of production, internally or abroad, resulting in vertical specialization. Feenstra (1998) argues that this is a departure from the American model of vertical integration, or production as in the automobile industry by Henry Ford. The location of production or parts of the production process is constantly shifting according to criteria of profitability. Feenstra (1998) argues that this breakdown of production in various locations, or trade in intermediate inputs, is equivalent in impact on employment and wages to technological change. The optimal worldwide allocation of production by companies is extremely important.

There are gains from globalization of production resulting from efficiency gains by trade in intermediate inputs that are equivalent to an outward jump of the production transformation curve. However, the analysis concludes that outsourcing of production would lower wages beyond the impact of trade in final goods. The globalization of production, or vertical specialization, causes changes in the distribution of income through effects in the wages of unskilled labor. Feenstra (1998) considers a policy of wage subsidies for low-skilled workers.

Imports from non-OPEC low-wage nations into the United States were about 2 percent of GDP in 1971–91. The number of workers in prime-age 25–49 in the United States in jobs requiring a high school degree or less increased at a higher rate than the rate of increase of jobs for all workers in that age bracket (Pryor 1999; Pryor and Schaffer 1999). In the final decades of the twentieth century, trade as percentage of US GDP doubled and imports of developing countries increased at a higher rate. The rate of employment of men with a high school degree or less education declined; the wages of workers in prime-age 25–49 fell while the wage differential of the less educated relative to the more educated increased.

The argument for declining employment of low-skilled workers alleges labor market imperfections (Pryor 1999, 473). Imports of goods using intensively low-skilled labor cause declines in the US prices of those goods. The price declines cause pressure for lowering wages of low-skilled workers in the domestic import-competing sectors. If wages are downwardly sticky, producers cannot maintain profitability and may not be able to retain workers. The wages of low-skilled workers could fall below their reservation wages, resulting in their exit from formal employment. Displaced workers may not find employment if wages are sticky in other sectors.

There are three hypotheses supporting the impact of trade on employment of workers in US industries that use low-skilled labor intensively. Pryor (1999) finds that the hypotheses are not confirmed by the evidence. Except for some cases, there has been no general tendency in US manufacturing for net import penetration in industries that use a high percentage of unskilled workers. There is no empirical evidence supporting the claim of long-term decline of prices of industries with high import penetration of goods that are intensive in unskilled labor even allowing for changes in productivity differentials. There is no empirical support for the proposition that productivity has increased to meet foreign competition in industries heavily using unskilled labor.

The effect on employment of trade with developing countries is also a concern in Europe. In 1975–95, the share of trade of the newly industrialized Asian economies (NIAE) in world trade increased by a factor of three. At the same time, the share of the four major European economies – Germany, France, Italy and the United Kingdom – remained the same (Bentivogli and Pagano 1999, 166). In contrast with the United States, the relative wages of unskilled to skilled workers were unaltered, with the exception of the United Kingdom that experienced the same decline in relative wages. With the exception of Germany, the ratio of low-skilled males in total employment declined by more than in the case of high-skilled males. There was decline in the relative share of unskilled workers in total

employment. The debate in Europe has focused on the role of trade with developing countries in the increase in unemployment and the decline of employment of unskilled workers. Wages in Europe are downwardly rigid such that a decline in demand for unskilled workers results in an increase in unemployment.

However, the econometric research of Bentivogli and Pagano (1999) shows that the problems of European labor markets cannot be explained by the growth of trade with the NIEAs. Job destruction in the major European countries is independent of trade with the NIEAs. There is less clear evidence on the impact on job creation. There are sector-specific aspects – sector of last employment, sex and education – that are more important in explaining the situation of individuals in labor markets.

The conventional economic model assumes that labor reallocates from less productive to more productive activities. In practice, there is the problem of displaced workers (Kletzer 2001, 1998). The Heckscher, Ohlin and Samuelson model does imply problems of distribution resulting from imports, lowering wages in unskilled occupations and the need of reallocating workers to jobs in skilled sectors. Kletzer (2001) emphasizes the neglect of the costs to workers instead of the focus of the literature on the numbers of jobs lost to globalization because total jobs depend on macroeconomic events and policy. Kletzer (2001) calculates that there was displacement in 1977–99 of 17 million workers in manufacturing and 6.4 million in import-competing industries. The losses in import-competing industries were concentrated in a few sectors: electrical machinery, apparel, motor vehicles, non-electric machinery and blast furnaces.

There are important characteristics of the displacement of workers in import-competing activities. Although there is no difference except for age between manufacturing and import-competing workers, women comprised 45 percent of displaced import-competing workers compared with 37 percent for all of manufacturing. Women workers were quite high in percentage among the total displaced workers in some industries where they are heavily employed: 80 percent in apparel, 66 percent in footwear and 76 percent in knitting mills (Kletzer 2001). The lower reemployment rate of women in overall manufacturing explains their lower rate of reemployment in import-competing industries of 63.4 percent versus 65.8 percent for men. There is significant employment and displacement of women in import-competing activities. Kletzer (2001) measures significant decline of 13 percent of average weekly earnings of displaced workers in import-competing industries. There is wide dispersion: 36 percent of displaced workers in import-competing industries earned the same or more in the new job while 25 percent experienced losses of 30 percent or more. The workers with less education in low-skilled occupations with long period of service had losses above 30 percent. The largest portion of displaced workers, 50 percent, is reemployed in manufacturing; the lowest wage losses are for those reemployed in import-competing sectors.

Empirical research on the effectiveness of the TAA concludes that workers would have earned about the same wage without the retraining and job search extension of the federal program (Marcal 2001). The TAA did provide the opportunity to

find more stable jobs. An important policy problem is that it is more difficult to retrain and reallocate workers that are older and have been in an industry for a long period (Kletzer 2001). The policy should focus not only on losses caused by trade but in overall job displacement in the economy. Foreign competition is only one factor of job displacement together with technological change and downsizing resulting from organizational innovations and changes in market demands. It is quite difficult to separate the effects of all these factors in job displacement.

The definition of globalization can be narrowed to increasing trade openness and FDI to analyze its impact on employment, inequality and poverty in developing countries in the past two decades, which is the approach followed by Lee and Vivarelli (2006). They interpret the standard Heckscher, Ohlin and Samuelson model to predict that trade and FDI will result in specialization in labor-intensive sectors, causing an increase in domestic employment. In practice, there are job losses in firms that benefit from protection. There are also supply rigidities such as insufficient infrastructure, limited availability of skilled labor, inefficiencies in the labor market and underinvestment. Because of these rigidities, the growth of productivity can exceed output growth, reducing job creation, even in the export sector. There may also exist hidden unemployment in the public service, construction and non-traded services and underemployment in the informal labor market (Lee and Vivarelli 2006, 170). There are labor-saving effects of more advanced technology brought by FDI, losses of jobs by previously protected companies and elimination of jobs by M&As. Trade and FDI may crowd out local production in previously protected industries or beginning activities. There is not, according to Lee and Vivarelli (2006, 171), a valid theoretical proposition based on standard trade theory that trade and FDI are beneficial to employment creation.

There are a pessimistic and an optimistic view of the impact of globalization on labor markets (Rama 2003). The increase of employment and the incentives to foreign capital may require a reduction in wages and restriction of labor rights. Few would benefit from increasing productivity, leaving behind those without skills. The theory of trade provides more optimistic predictions. The decline in tariffs and transportation costs will result in gains of efficiency by specialization according to comparative advantage. In the Heckscher, Ohlin and Samuelson model, greater trade integration will increase the demand for skilled labor in advanced countries and also the demand for unskilled labor in developing countries. Deregulation and openness will drive growth in labor-intensive activities.

In reality, econometric results show that there is a mixed impact of trade openness on wages in developing countries (Rama 2003). Increasing trade is associated with lower wages but FDI has positive association. In the medium term, trade integration has a positive effect on wages. There are job losses in protected sectors. The returns to education already exist in the short term and significantly increase in the long term. There is a distributional problem. Skilled workers are evident winners and young workers gain in the long term. Unskilled workers, especially in protected industries, do not benefit from globalization.

Trade and wages

The employment effects of trade could be beneficial but the wages of unskilled labor may decline because of trade. The issue is related as to whether employment and wages are affected by trade or by labor-saving technological change. The Stolper and Samuelson (1941) theorem is again an important argument for consideration that trade with developing countries could reduce the real and relative wages of unskilled labor. Another important factor is the relocation of intermediate production to other countries, or offshoring of production, which could have adverse effects on employment and wages of unskilled labor. Exporting activities could provide compensation by paying higher wages than production for the domestic market and import-competing industries.

There is the argument that globalization diminished the bargaining power of workers. Bhagwati (2007a) argues that only 10 percent of US workers are unionized such that most bargaining occurs directly between employers and workers. In addition, he recalls that unionization has been declining in the United States for a long period, well before the recent globalization of the past two decades. The provisions of the Taft-Hartley act that eliminated the ability to strike caused the decline of unionization. The argument that FDI could have remained in the United States, providing sources of employment and strong demand for labor with better wages, ignores the large inflow of foreign capital into the United States (Bhagwati 2007a).

The prime factor of downward pressure on wages of unskilled workers is technological change. Innovations have been saving the quantity of labor used in production, according to Bhagwati (2007a), thus exerting pressure on the wages of the unskilled. However, he uses past experience to propose the existence of a J-curve: the effects of productivity increases will eventually lead to higher wages. Productivity is the marginal product of labor, or the amount of output contributed by the use of one more unit of labor. The combination of more capital and better capital because of technology raises the marginal product of labor. Under perfect competition, labor is paid the value of its marginal product, or the marginal product times the market price of the product. The entrepreneur earns normal profits, that is, the level of profits required for the start and maintenance of production. There would be distortions only in extreme labor market imperfections. The argument by Bhagwati (2007a) is persuasive: technical change will eventually raise productivity and wages.

There is a puzzle in that statistics do not reflect the effects of productivity increase on wages after two decades of globalization. The explanation by Bhagwati (2007a) is the impact of displacement of unskilled labor by the rise of IT. In addition, innovations in historical periods occurred in bunches; there were long periods of few or no innovations. The current innovation process is continuous, what leads to a succession of J-curves that delay the effects of productivity on wages. Bhagwati (2007a) also corrects the erroneous view that technical change is driven by globalization. It is hard to conceive a model of endogenous innovation within worldwide integration of trade and capital flows.

The premium of wages of a college education relative to a high school education increased by 20 percentage points in the 1970s and 1980s (Borjas and Ramey 1994). There appears to have been an increase in demand for workers with more education and a reduction in the growth of supply. There are two hypotheses explaining the increase in demand: a bias of technological change favoring highly educated workers and the lowering of wages of the unskilled resulting from trade with developing countries. Sachs and Shatz (1996) analyze the trade channel.

The Heckscher, Ohlin and Samuelson model and the Stolper and Samuelson (1941) model provide an explanation that the price of goods using unskilled labor intensively in production will decline after trade. In the simple model with two sectors, producing goods intensively with skilled and unskilled labor, there is a one-to-one relationship between output prices and factor prices (Sachs and Shatz 1996, 234). The wage of unskilled labor relative to skilled labor declines if and only if the price of the good using intensively unskilled labor declines relative to the price of the good using intensively skilled labor. The one-to-one relationship does not exist in more complex models with multiple factors of productions, goods, specialization and so on. Once the United States ceases production of goods intensive in unskilled labor that are imported from developing countries, further imports of those goods will not have an effect on the wages of unskilled American workers.

There are three examples showing that imports from developing countries can lower the wages of unskilled workers (Sachs and Shatz 1996, 235). Assuming trade and capital integration, US firms invest in the developing country to relocate production of the good intensive in unskilled labor. The sector in the United States producing goods with unskilled labor experiences a reduction in size, causing unemployment of unskilled workers. The larger pool of unskilled labor sets downward pressure on their wages. There need not be a reduction in the relative price of the good using unskilled labor intensively. The Sachs and Shatz (1996) argument is close to the model of outsourcing of intermediate products developed by Feenstra and Hanson (1999).

The second example of Sachs and Shatz (1996, 235) assumes a monopolistic sector in the market of the good using intensively unskilled labor in production. The incumbent firm in the market maintains price at the highest possible level that still does not encourage entrants. The developing country exports to the advanced country the good that is intensive in unskilled labor. The monopolist desires to discourage domestic entrants and maintain the price at the highest possible level consistent with this objective. The monopolist reduces output, with unchanged price, causing unemployment of unskilled labor. The higher supply of unemployed labor depresses the wage rate of unskilled labor. Here again the wage rate declines without a reduction in relative price of the good using intensively unskilled labor.

Globalization may provide the sufficiently large market for a shift to technology that is biased in skills, providing the third example by Sachs and Shatz (1996). The initial technology uses both skilled and unskilled labor with constant marginal product. Production with a higher marginal product can be attained by using

technology that requires fixed investment of highly skilled workers such as engineers. This high technology process requires sufficiently large markets to pay for the fixed investment. The opening to trade provides the size of market required for the profitability of the fixed investment technology that uses more intensively skilled labor. Unemployment of unskilled labor depresses their wages.

Although theory and some data provide support for the argument that trade lowers wages of unskilled workers, Sachs and Shatz (1996) conclude that there is no conclusive quantitative evidence. They argue that even if it were proved that there is an empirical relation it would not provide a case for trade restrictions. The theory and evidence that are available support the view that trade is beneficial for the majority of the US population. Labor responds in the United States to the widening differential in rewards to schooling by investing in education. They argue that the policy could consist of increasing investment in education and job training with assistance to workers displaced by trade shifts.

Globalization has diverse impacts on labor, according to Feenstra (2007). There is the issue of whether trade has an impact on labor and if affirmative of what magnitude. Research is also focusing on the impact of free trade on the productivity of firms. Migration is another area of concern and research, with focus on labor flows within the expanding EU and within North America.

Feenstra (2007) charts the data of the relative wage of non-production to production workers in US manufacturing from 1958 to 2000, using the productivity database of the NBER. There is virtually no trend observable in the data until about 1982 when there is a significantly high rise in the relative wage of non-production workers relative to production workers. The non-production workers typically have higher education than production workers, with some exception of clerical staff and so on. There is the circumstantial evidence that the deterioration of the wages of the unskilled in the United States sharply accelerated in the past two decades, when globalization through trade integration and FDI accelerated. Feenstra (2007, 3) also observes similar trends of relative wages in Mexico during the same period.

The plot of wages of non-production workers against employment of production workers in 1979–90 shows positive association, an increase in wages accompanying an increase in employment (Feenstra 2007). That is, both wages and employment of more educated workers in US manufacturing increased in the 1980s. It appears in eyeball econometrics that the data correspond to points on an upward-sloping supply curve that were traced by upward displacements of demand. A common explanation is labor-saving technological change, such as the rise in information technology with more and better computers, requiring technicians to use them (Bhagwati 2007a). The other explanation is offshoring. Skepticism on this view is warranted by the similar development in Mexico and other developing and industrial countries (Feenstra 2007, 4).

Feenstra (2007, 5) advocates a new paradigm to understand structural changes in worldwide production:

> We need to adopt a new paradigm, which emphasizes how tasks or activities can be sent across borders, as with outsourcing. In this new paradigm, it is

fairly easy to predict that more-skilled workers will gain in all countries due to increased outsourcing.

His approach ranks activities, for purposes of analyzing offshoring, in the value chain of production according to the type of labor skills required. At one extreme is assembly of vehicles that uses low quantities of skilled relative to unskilled labor, followed by intermediate use of skills such as in components and then on to R&D that is rich in skills. The firm will try to offshore to other countries that have ample supplies of low-cost unskilled labor those activities that are more intensive in unskilled labor while producing at home the activities that are more intensive in skilled labor. There is thus a rise in demand for skilled labor, increasing its employment and wages, consistent with the behavior in US manufacturing in the 1980s. It also explains the behavior of the labor market in Mexico: the offshored activities from the United States in assembly and especially components require more intensive skills in Mexico. The offshoring process increases the relative demand for skilled labor in both countries.

The critical issue is whether trade or labor-saving technological change explains the increasing employment and wages of skilled labor in US manufacturing. Feenstra and Hanson (1999) researched the argument that offshoring and technology caused the increase in the share of skilled labor in total wage payments in US manufacturing and the increasing relative wage of skilled labor. The data are available for non-production (skilled) and production (unskilled) workers. The results vary according to the type of measurement for high technology equipment: the proportion of total installed capital in every industry or the proportion of computers and similar high technology products in new investment in capital. Offshoring provides a stronger explanation for the wage and employment behavior in the measurement relative to total installed capital while technology almost explains the entire behavior in the measurement as proportion of new investment in capital.

Offshoring and technological change did not have much of an impact on real wages of production workers in the United States in 1979–90 as measured by Feenstra and Hanson (1999). There was an increase in real wages of nonproduction workers by 1–2 percent because of offshoring and by 3 percent because of high technology. In addition, while the real wages of non-production workers declined from the mid-1980s to the mid-1990s, they significantly increased from the mid-1990s to 2004 (Feenstra 2007, 10).

An important issue in the debate on trade is whether exporting firms in the United States are better than non-exporting firms. Bernard and Jensen (1995) provide significant and wide empirical information on this issue by focusing on the individual plant level. There are numerous characteristics of performance in which exporters excel relative to non-exporters. The exporting plants use capital more intensively, being more productive and larger in size. The wages paid by exporters are 14 percent higher than those of non-exporting firms and the benefits are a third higher in exporting plants than in non-exporting ones. In 1976–87, the production workers in an exporting plant with size of 250–499 employees had earnings on the average higher by $3429 than a production worker in a plant of

the same size that did not engage in exporting and non-production workers earned $2479 more in the exporting plants of the same size than in the non-exporting plant. Successful companies engage in the exporting business.

Econometric research shows that there is no empirical relation between exporting and an increase in productivity of individual manufacturing plants in the United States (Bernard and Jensen 1995). There is high correlation between exporting and plant productivity. However, the high correlation is explained by the fact that there is greater likelihood that high productivity plants will enter the exporting business. There is an increase in plant productivity for exporters before and during entry into exporting but no change after entry into the exporting business. Another important finding of Bernard and Jensen (2004) is that the rates of growth of employment and output are higher for exporting plants. Moreover, the rates of growth of employment and output continue to increase after entry. The combination of higher productivity and faster growth of employment and output is an important vehicle by which exporting increases growth of aggregate productivity of the US economy. These effects are of significantly high magnitude. The change of shares of output across plants caused more than 40 percent of the growth of TFP in US manufacturing. Most of these effects originated in the faster growth of high-productivity exporters than of lower-productivity non-exporters. Trade does not increase the productivity of plants after they enter the export business but it affects welfare by permitting the growth of high-productivity plants engaged in exporting.

Offshore employment

There is a discrepancy between the major public coverage of offshoring and the little available research, surveyed by Olsen (2006). In particular, the literature focuses on labor market effects, because of the fears of job losses, with little effort on measuring the productivity effects of offshoring. Research and data gathering are only beginning but new studies show that the issue has been distorted in the public debate. The job losses are minor and the benefits much higher than what appeared in the media.

The allegation of job losses from offshoring became a campaign issue in 2004 with many distortions of the economic analysis and the actual extent of the losses in jobs. There was significant support by professional economists for the benefits of trade. Mankiw and Swagel (2006), who were accidentally caught in the political cross-fire, argue that there are virtually no reliable data on jobs lost to offshoring. The available data claim that the job losses amounted to 830,000 jobs by 2005 and the forecast was a loss of 3.4 million by 2015. Mankiw and Swagel (2006, 25) compare the forecast of loss of jobs of 3.4 million with the estimate of job creation of 160 million jobs by 2015 by the US Bureau of Labor Statistics (BLS). Even inflated forecasts are insignificant compared with the more technical and transparent projections of the BLS. In the decade ending in 2005, the job gains of 35 million jobs were immensely larger than the alleged loss of 830,000 jobs to offshoring. Unfortunately, the issue became politicized. In addition, the US net

surplus of exported services has been growing (Mankiw and Swagel 2006, 37). There have not been major impacts of trade flows on labor marketing resulting from job offshoring (Mankiw and Swagel 2006, 39).

The policy on offshoring should focus on the real issues and not on foregoing the gains from trade. The measured impact of offshoring is apparently not large while the dislocation of economic activity resulting from protectionism and the loss of gains from trade could be significant. However, the problem of job displacement should not be ignored. Mankiw and Swagel (2006, 45) propose an improvement in adjustment assistance of displaced workers and an environment of robust economic and job growth.

There are two confusions of definition and applicability of conventional theory in the political debate on offshoring in 2004 (Bhagwati *et al*. 2004). The definition of offshoring is that of trade in Mode 1 of the WTO in which the supplier and buyer of the services remain in their respective locations. The confusion of the definition is to include in offshoring all types of trade in goods. The second issue is whether offshoring can be analyzed with the tools of trade in goods or whether another set of tools is required. Bhagwati *et al*. (2004) argue that the same tools of the gains from trade apply to the analysis of offshoring. The concern should be on possible displacement of workers because of offshoring. The magnitudes of offshoring are not very large such that there could be threats of unemployment for many workers.

There could be an industrial revolution in systems manifested in offshoring of production tasks (Blinder 2006). As in past similar cases, the industrial revolution in England and the more recent revolution in services, there are likely to be profound changes in the way of working and living of people across the world. Blinder (2006) argues that there are no accurate data but that the jobs lost to offshoring in the United States could amount to a little less than one million, which is about 2 weeks of job growth in economic expansions. He sees that offshoring will continue in impersonal services, consisting of services that can be provided by electronic transmission over long distances without loss of quality. Blinder (2006) does not believe that the United States and other industrial countries should stop future growth of offshoring because of their ability to reap significant gains from trade in the past. However, he foresees major reorganizations in politics, social welfare programs, education, trade policies and systems of national data. In the systems revolution, the characteristics of goods will be determined by whether they can be transmitted electronically or not. The level of skills of the job may not be the differentiating characteristic (Blinder 2006). There can be offshoring of low-skill jobs such as typing and high-skill jobs such as security analysis. Jobs at risk of offshoring are likely to grow, creating job insecurity for many more people than before. The new distinction is between what Blinder (2006) refers to as personal and impersonal services. Personal services must be delivered directly in a specific geographic setting, such as the waiter in a restaurant or the police officer patrolling. Impersonal services can be transmitted electronically without any loss of quality and are the ones that are at risk of offshoring. The available studies show that 11 percent of US jobs are in this risk category.

There has been a revolution in trade away from trading goods toward trading production tasks. The insight of Adam Smith (1776) was to analyze the specialization in tasks occurring within factories during the Industrial Revolution. There were costs of communication and transportation of intermediate inputs that localized production. According to Grossman and Rossi-Hansberg (2006b, 4), "the economic geography of the time pointed to agglomeration in production not fragmentation." In contrast, with the communication and transportation innovations: "Increasingly, international trade involves not only complete goods, but also individual tasks, or relatively small numbers of them" (Grossman and Rossi-Hansberg 2006b, 4). Specialization no longer requires geographical concentration. Offshoring consists of trading in tasks.

The decline in worldwide tariffs since the 1960s with the various rounds of trade negotiations has been of only 11 percentage points on manufactured goods while the share of world manufacturing exports in GDP increased by a factor of 3.4 (Yi 2003, 53). The data of export shares in GDP imply a tariff elasticity of exports of 20 that contrasts with the limited decline in tariffs, constituting a quantitative puzzle. In addition, Yi (2003) argues that in 1962–85, the tariff elasticity of trade was seven but in 1986–99, the elasticity is 50. He argues that vertical specialization explains the process. Various countries specialize in different parts of the production sequence. For example, in earlier periods, US steel was used to produce US farm products, part of which was exported. Currently, Japan exports steel to Mexico where it is stamped and pressed for exporting to the United States that uses it to produce farm equipment, part of which is exported. The trade involved in producing goods has increased. Vertical specialization accounts for one-third of growth of trade in the past few decades.

Yi (2003) provides an extreme case to illustrate the argument. At every crossing of borders a good is levied a tariff. The reduction of tariffs worldwide reduces the cost of production of the good. In the example, a good is produced by small increments of value added in N sequential stages in a different country. If the tariff declines by 1 percent, the cost of producing the good cumulatively declines by N percent. The reduction in cost causes an increase in trade. In addition, the reduction in costs stimulates trade by sequential production in multiple countries. Thus, trade in vertically specialized goods grows more than trade in non-specialized goods.

The theory of offshoring by Grossman and Rossi-Hansberg (2006a, b) provides strikingly different analytical and empirical results from the popular characterization of offshoring, typically incorrectly labeled as outsourcing, compressing wages and creating unemployment of US workers. Offshoring occurs when there are opportunities for performing abroad certain tasks of the production chain that are produced less costly than at home. Firms locate the production of tasks where they can be performed at lowest cost. The firms that make this optimization are the ones that have the largest gains from the trade in tasks. These firms enjoy higher profitability that leads them to grow relative to firms that use different types of labor. Labor demand grows as a result of the expansion of the firms benefiting from offshoring. Part of the growth of labor demand is for local workers performing

tasks that are not easy to move offshore. Grossman and Rossi-Hansberg (2006b, 5) argue that the gains from offshoring tasks are very similar to the gains in worker productivity. Although fewer workers are required to produce a certain amount of output, the increase in output caused by the new technology may increase the demand for the type of labor experiencing higher productivity.

Grossman and Rossi-Hansberg (2006b) consider three types of effects on wages resulting from offshoring. The popular effect is the labor-supply effect that offshoring is equivalent to an increase in supply of less-skilled labor. The price effect consists of the improvement in the terms of trade, or price of exports of goods intensive in skilled-labor relative to the price of imports of goods using unskilled workers. The ignored productivity effect consists of the increased demand for unskilled labor resulting from the increased output of firms caused by the increased productivity of unskilled labor. Grossman and Rossi-Hansberg (2006b) measure the productivity effect as the residual of the increase in low-skill wages in 1997–2004 after adjusting for the combined effects of changes in the terms of trade and improvement of TFP. The existence of a positive result suggests that the labor productivity gains resulting from offshoring by US firms was higher than the combined effects of improvements in the terms of trade and gains in TFP, supporting low-skill wages.

The increase in productivity caused by offshoring can occur because of compositional or structural changes (Amiti and Wei 2005). A company can reallocate the composition of its production by shifting part of the production process to other countries because it can be produced at lower cost. The change in the composition of the workers, in favor of more skilled labor, causes an increase in productivity. In addition, there can be structural changes increasing the productivity of the remaining workers. New types of input obtained through offshoring services and materials can increase the productivity of the remaining workers. There are benefits of reorganizing companies derived from offshoring service inputs than can provide measurable gains in productivity.

There are various types of impacts on the labor force from offshoring (Amiti and Wei 2005). The gain in productivity means that fewer inputs are required to produce the same output, which can result in job losses. The lower price of imported inputs may cause substitution of local labor. However, demand for labor may increase because of higher output resulting from increasing productivity.

Amiti and Wei (2005) find that the theoretical results are ambiguous, requiring careful empirical estimation. Their econometric research shows that service offshoring accounted for 11 percent of the growth of labor productivity of US manufacturing in 1992–2000. The less robust measurement for material offshoring shows that they accounted for 5 percent of labor productivity growth in 1992–2000.

In a study by the McKinsey Global Institute (MGI), Farrell and Rosenfeld (2005) show that the current and future dimensions of the offshoring of services are not very significant. Worldwide labor offshore in 2003 was 1.5 million, of which about 0.9 million originated in US companies. The estimate of McKinsey is for 4.1 million offshore jobs in 2008 of which 2.3 million is offshored by US firms.

In May 2005, McKinsey finds that 4.7 million Americans found jobs with a new employer. The dimensions of job offshoring are not sufficiently large to expect meaningful impacts on wages and employment.

In contrast, the gains to companies from offshoring are significant (Farrell and Rosenfeld 2005). Companies invest in advanced technology with savings from offshoring that cause creation of jobs in the United States and abroad. The United States has a surplus in trading of services. Measures to prevent services offshoring could result in retaliation and diminishing FDI. A trade war could be costly for the United States. The proper measures appear to be on adjustment assistance to the limited number of workers that lose their jobs to offshoring of services. The United States would continue to obtain larger gains from freer trade in services.

Jobs in services account for 80 percent of total jobs in the United States. However, Farrell and Rosenfeld (2005) estimate that only 11 percent of services jobs in the United States could be transferred abroad. The actual estimate by McKinsey is that US companies will create 200,000 to 300,000 offshore jobs per year in the long term. This estimate does not take into account that there are no net job losses in sectors subject to offshoring in the United States and the United Kingdom because those sectors create more new jobs than those sent abroad. Employment in the US computer industry has been growing at 2 percent per year, higher than 0.4 percent for the entire economy. Growth in positions for systems analysts and software engineers has grown more rapidly than the loss of jobs for programmers (Farrell and Rosenfeld 2005, 7). The new jobs created in the United States are better paid and more productive than the jobs sent abroad, such that average wages in the sector have increased. US companies create value of $1.14 for every $1 of costs of moving services abroad.

There are significant cost savings for companies in offshoring, as calculated by the McKinsey Global Institute (2003). There are major differences in the compensation of labor such as $60 per hour for a programmer in the United States versus $6 per hour in India. However, the MGI shows that there are other costs in telecommunications and the operation of the offshore office. They estimate that the savings on the original cost could be 35–45 percent but can reach as high as 65–70 percent with restructuring of the process routine. The MGI also finds that many companies obtain more benefits from higher revenues than from cost savings, such as in tracking delinquent accounts and offering more services. There are numerous benefits for the US economy from offshoring, according to the MGI. Offshoring increases the demand for exports by around 5 percent of offshore services in purchases of equipment and services. Various providers have incorporated in the United States, remitting about 4 percent of their earnings. Finally, the MGI estimates that offshoring releases services employees who find employment rapidly; the new jobs generate another 45–47 percent of value. The MGI estimates that the offshoring of $1 of US labor cost generates value of $1.45–$1.47 of which the United States receives $1.12–$1.14 while the foreign countries only receive $0.33.

The data of the Bureau of Economic Analysis (BEA) for trade in services are provided in broad categories. Jensen and Kletzer (2005) circumvent this constraint

Table 6.4 United States, trade in services US$ billion

	Exports	Imports	Balance
1992	164	103	61
1993	171	109	62
1994	187	120	67
1995	204	129	75
1996	222	139	83
1997	238	151	87
1998	244	166	78
1999	265	183	82
2000	294	207	87
2001	273	204	69
2002	279	209	70
2003	289	221	68
2004	328	257	71
2005	360	280	80
Δ%	119	172	31
Average Δ%	6.2	8.0	2.2

Source: Bureau of Economic Analysis http://www.bea.gov/international/intlserv.htm.

by classifying US services activities that are traded internally as possible of being traded internationally. They estimate the workers in the United States who are in services activities could be traded internationally. The estimates permit the analysis of employment growth, risk of job loss and other characteristics. Their results show that the potential for tradable jobs in services is higher than previously believed. The number of tradable jobs in services is larger than in manufacturing. Workers in tradable activities have higher wages and skills. Job displacement is higher in tradable services activities than in non-tradable activities and the displaced workers in tradable services have more education and higher earnings than in non-traded activities. They conclude that the United States is moving toward comparative advantage in services.

The data on trade in services of the United States are shown in Table 6.4. There has been remarkable growth of both exports and imports of services over the past 15 years. The balance has remained positive and even increased to $80 billion in 2005. Foreigners contract more services in the United States than the services contracted by Americans offshore. There are minor job losses resulting from offshoring. In addition, offshoring creates new and better-paid jobs. There could be heavy losses for the United States in a services trade war.

Summary

There is an unusually strong theoretical case for the proposition that trade is better than no trade. The existence of gains from trade is widely believed by many professional economists, at least those in mainstream economic research. However, as

in all issues in economics, there is dissent of what appears to be a majority view on the gains from trade. There is an equally strong case for the correction of domestic distortions with domestic policy instruments to reap the benefits of trade.

Economists have been more successful in convincing themselves than politicians and the public. The political economy of trade could combine the propositions of the private interest view with the political influence of political science to explain the politics of trade policy. Antidumping and safeguard policies are detrimental to trade and of dubious merit for domestic welfare.

There is not a strong case that trade lowers employment and wages of less skilled labor. However, there are costs of displacement of workers that can be addressed more effectively by domestic policy. The allegations of major losses of jobs because of offshoring do not have merit. In fact, there is new evidence that offshoring increases better-paid jobs at home.

Conclusion

Introduction

The definition of globalization is elusive, spreading over multiple dimensions. There are important social, cultural, gender, ethnic and political determinants of the nation states and their relations. Some of these dimensions are considered in Chapter 2 of Volume II. This book abstracts for analysis the economic, financial, business and legal issues. Thorough examination of the economic and financial issues dictates the focus on IEI: the analysis of increasing cross-border flows of goods, capital, ideas, people and technology. The results from IEI assist in determining IEFP, consisting of the policies of individual nation states and IOs with the objectives of preserving the welfare of countries and the world as a whole. IEI consists of the analytical framework of economics. IEFP is the application of the analytical framework to the normative or policy issues.

The role of the state in IEFP

Economists have created numerous approaches to the intervention of the state in economic affairs. It is possible to relate almost all the economic issues and policies on globalization to these approaches or theories of the state. Complete analysis awaits the integration of these ideas with political science and sociology.

Some economists propose a continuum moving from the left with state ownership of nearly everything in the economy, similar to the collective solution proposed by Marx and Engels (1848) and Lenin (1916), to the invisible hand of Adam Smith (1776) on the right with hardly any intervention by the state. A typical typology[1] is to consider inner limits in this continuum: the public interest view on the left and the private interest view on the right. In this typology, there would be a one-to-one mapping of nearly every position on state intervention to points somewhere inside those open interval limits.

The public interest view and the private interest view depart from the model without frictions allegedly proposed by Adam Smith (1776). Under restrictive conditions, it is possible to prove the two fundamental theorems of welfare economics. The first fundamental theorem enunciates that every Walrasian allocation

is Pareto optimal. The second theorem states that with suitable lump-sum transfers it is possible to convert every Pareto-optimal allocation into Walrasian allocation.

The public interest view postulates that the breaking of assumptions of the first-best outcome requires intervention by the state to ensure attaining Pareto-optimal outcomes. Economists have been aware from Adam Smith (1776) to the present that the assumptions of the fundamental theorems are ideal conditions unlikely to be found in reality. Thus, the potential number of broken assumptions or market failures is extremely large, bound only by the limitless theoretical imagination of economists. The theory of second best reveals the practical difficulties of finding a second-best solution even at the theoretical level. The policies designed to bring about a Pareto improvement require knowledge about the functioning of the economy, in particular the reaction of economic agents to policy impulses. The state has the same limitations of information as the market. Thus, it is possible that the correction of a market failure may lead to government failure. There is no guarantee, as Pigou realized, that the corrective policies can be designed appropriately. The existence of high transaction costs for both the government and private markets creates an added complexity, making effective implementation doubtful. The problem of mapping public interest views on the continuum is finding what market failures deserve priority and can actually be ameliorated by the government.

The private interest view argues that the regulated economic activities capture regulation. The politicians and regulatory officials design regulation for their own benefit and not for that of the society as a whole. There are problems with explaining the entry into regulation. However, there are numerous cases in reality of restraining competition to benefit the regulated economic activities. There is even an ethical concern here that the purpose of regulation is to ensure competitive markets. The environment following the USSR was characterized by an extreme form of an obvious grabbing hand, such as in financing privatization of SOEs to cronies.

The ISI process in Latin America was conducted for the benefit of the politicians, officials and regulated economic activities to the detriment of the society as a whole. Industry concentrated in southern Brazil, creating a significant loss for the exporting agrarian north and all consumers of expensive products of inferior quality. A policy response was to create subsidies to inefficient producers in the north of Brazil. The population of the north lost in both ways, in consumption of expensive inferior goods and in misallocation of resources. Moreover, the government subsidized financing to the private sector for the development of the ISI activities. Fiscal and monetary policies were used to maintain internal demand and financing for ISI, causing uncontrolled inflation and external debt default. The granting of rents to ISI created powerful political and economic interests opposed to sound economic policy. The model of ISI failed to blend activities for export markets with those for the internal markets. Countries implementing ISI in Latin America lagged Asian countries with more adequate blend of exports and internal market activities. Trade distortions were more effective in Asia.

An important analysis of the private interest view focuses on the Nirvana proposition of market failures, which requires omnipotent and omniscient government that always attains Pareto improvements even with the same deficiencies of markets in the form of imperfect information and resource constraints. In reality, there is strong documentation showing that regulation often results in outcomes opposite to those of the intended policy measures. Alleged natural monopolies can be eroded by competition such as telephone services by the Internet. Regulation can consolidate market power, preventing welfare improvement by competition. The assumptions of success of Pareto-improving regulation are arguably as unrealistic as those required to prove the fundamental welfare theorems of the first best.

There is a modified private interest view that proposes the combination of regulation with sufficient incentives for the market to attain efficient outcomes. This alternative view in finance emphasizes the need of transparency by financial institutions for effective monitoring by the market and prudential supervisors and regulators. Proponents of this view may differ on the relative proportion of market and regulatory monitoring. Regulation should not be used to protect the market power of incumbents but rather to break their power by allowing entry, in particular of international financial institutions. There is significant empirical research that augurs promise on this view.

Mapping of contributions on the economic role of the state to a continuum is not feasible. There are multiple dimensions in policy proposals. Examples illustrate this principle. Economists may subscribe to the private interest view but would be inclined to accepting the need of intervention in markets to ameliorate the effects of climate change. There are now three dimensions: private interest view, climate change and carbon price. In fact, a fourth dimension creeps in the analysis: ramp approach of passing on costs to future generations or low SDRT to measure high present value. There could be accelerated ramp climb as well as moderate or higher SDRT.

Consider another source of multiple dimensions. Many economists favor multilateral free trade. Others favor restricted trade. The proponents of multilateral free trade can favor a wide range of alternatives on capital flows: tight restrictions, milder restrictions or entirely free flows. The problem of dimensions truly becomes complex once the type of exchange regime is introduced.

The determination of the continuum requires acceptance of the first best as the ideal model. There is a school of economics disagreeing with the use of analyzing market failures with the model of perfect competition as a framework on which to base social policy. It is difficult to persuade non-economists of the benefits of the first best as the yardstick to design intervention by the state and no successful political economy to explain the skepticism of the uninitiated. There is also the doubt that the model may not be operational in finding the policy mix for Pareto improvements. There are many views that do not even map in simplified form to the continuum.

In short, there is no unique continuum of the role of the state from Karl Marx to Adam Smith in which all views of economists could be mapped. Summarizing the role of the state in economics in broad categories is quite difficult,

requiring multiple dimensions. The only available approach is to consider each view in isolation, requiring major intellectual efforts in laborious piecemeal investigation. The effort frustrates patience in the form similar to the analysis of transaction costs.

Diversity of views

The analysis of globalization is characterized by significantly divergent views. The theories of the state help to analyze these views but do not provide a theoretical and empirical yardstick with which to measure, discriminate and rank them. The historical analysis of globalization raises the critical issue if IEI has the seeds of its own destruction or reversal.[2] As in much historical analysis, the conflicts that seem to be currently unique occurred already in the past. There must be caution in this analysis as to whether the process is IEI or actually economic change in a broad sense. Change does not simultaneously benefit all members of society, even in nation states closed to international trade and foreign investment. Thus, there is nothing inherent in globalization that is different from the closed-regime process of growth in nation states.

There is no unique value in the argument that some economic agents are better positioned for globalization than others.[3] Under technological change in an economy closed to external relations there would still be gainers and losers. The values of attachment to the nation state add an important emotional element, such as the example of the South Carolina workers in a textile factory deploring the loss of their jobs to "sweat shops" in foreign countries. If the US economy were closed to trade with other countries, the workers in South Carolina would lose their jobs to machines, as it happened in the industrialization of Britain. The choice is quite difficult, preserving some jobs made obsolete by technology versus depriving the possibility of advancement through higher productivity in other sectors. There is not even a capitalist versus socialist alternative. The long-term viability of social democracy would also require technological change and increases in productivity. The political element in IEI is that the workers lose their jobs to foreigners sometimes working for subsidiaries of US companies abroad.

There are two alternative parables of globalization and the state similar to those of competitive capitalism and socialism. In competitive capitalism, there is progress by financing innovations that generate change through creative destruction in the sense of Schumpeter (1942). Change creates imbalances in income distribution and social standing that eventually lead to improvements. The incentives of secure and defined property rights are required for economic and social progress. In socialism, the imbalances are not accepted. Collective action replaces property rights. Progress is only acceptable if there is fair distribution of gains from the very beginning. The state provides goods with positive externalities such as education and technology. The conflicts of globalization are not unique to IEI but rather would exist even in a world without nation states. The social and economic institutions would differ significantly under various types of state intervention. Globalization is a camouflage for the actual choices of economic and social institutions described by the parables of competitive capitalism and socialism. Views

on globalization ultimately differ on the preferences for the nature and extent of state intervention in social and economic affairs.

The issues of fairness, conflicts and inclusion are not specific to globalization. There are proposals to provide a human face to globalization.[4] These issues would still occur if there were only one world without frontiers. Progress would still result in gainers and losers. The theoretical proposition of gainers compensating losers would not eliminate the conflict. Adjustment of displaced workers through programs such as TAA has not been very effective. Workers with years in their profession are reluctant by human nature to change. There is pain and costs of displacement in all changes. Eventually, change could be worthwhile but sometimes it is unrewarding. The emotional attitudes in change relative to globalization originate in the unwillingness of individuals to change that originates in another country and culture.

Another major conflict in IEI is the development of financial markets and institutions.[5] IEI is incomplete without financial integration. It is difficult to explain financial markets to the public because these markets are more complex and fast moving than the markets for goods. The essence of market allocation is the channeling of savings to productive activities that create long-term economic growth and employment. However, the public perception is that financial markets do not engage in directly productive activities but rather benefit from unnecessary premiums on intermediation. The bias against financial markets exists even in closed economies. It is exacerbated when foreign financial institutions dominate local financial markets. This is not a developing country syndrome. The United States restricts the access of foreign financial institutions to its markets at the federal and state levels. Globalization adds the suspicion that foreign financial institutions merely use domestic savings to obtain profits repatriated to their home countries. Financial globalization faces even tougher hurdles than trade openness, considered in Chapter 3 of Volume II.

The dimensions of the world economy raise significant doubts on the distribution of world resources and output. The group of high income countries has $34.7 billion of the world's GDP of $44.6 billion, or 77.8 percent, but only 1 billion of the world's population of 6.4 billion, or 15.6 percent. It is unlikely that this reality will be reversed in several generations. Thus, nation states and their population feel the hopelessness that they will remain behind. It is difficult to explain to the population in poorer countries that they have little or no hope. It is equally difficult to explain to the poor in advanced countries that they have to sacrifice their prospects to help poorer countries. There is no simple economic or ethical position on these issues.

International institutions

The twentieth century had the unfavorable experience of two world wars and numerous regional and national wars. The interwar period experienced deep contraction of economic activity during the Great Depression of the 1930s. The wars and the Great Depression motivated the creation of IOs to cushion international conflicts and promote cooperation among nations and regions. There is significant

intellectual and policy conflict on the role of the IOs and their governance. These conflicts are unlikely to diminish in the future.

Grandiose plans never move too far beyond their paper formulation. The Bretton Woods institutions, the IMF and the WB, were designed to respectively provide the GPG of international financial stability and the reconstruction and financing of infrastructure. A third institution, the ITO, never went beyond plans, becoming an informal agreement, GATT, and after decades the WTO, coexisting with PTAs that process most of world trade.

There is no doubt that the IOs provide essential services and cushion conflicts. However, reality is far from the grand design that created these institutions. In part, the hurdles of the IFIs derive from the lack of verifiable economic and financial principles. Local and international financial crises motivate reforms and regulation that are changed again after other crises. There may be an advantage in the IFIs in their ability to mutate relative to changing needs because there is no framework of theory anchoring unique functions and organizational structures. The missions of the IOs change because the theories on which they were created did not predict and explain economic crises and political emergencies. Unexpected crises led to reform of the missions. IFA is dynamic, changing with circumstances.

The advanced countries created and dominate the IFIs. Developing countries feel deprived of the opportunity to contribute to the management and structural change of the IFIs. These countries are the ones that use these institutions more frequently. The focus on global imbalances is changing the nature of these relations. There is no forum for the solution of the imbalances other than the IFIs.

The IFIs provide significant GPGs, hosting many of the standard-setting institutions. The information on the world economy and individual countries provided by the IFIs is a highly valuable GPG. Article IV consultations of the IMF provide critical information and an important dialogue and opportunity to consider vulnerabilities. Another GPG is hosting a forum for conciliation and agreement.

The ILO (2007) and the UN differ from the IFIs in their governance and services. The ILO is a humanitarian institution of unique representation of government, labor and business. Its standards are essential to human dignity and can play a major role in softening the conflicts created by IEI. The UN is the only cushion available for multilateral conflicts in the world. It also leads in generating GPGs such as the avoidance of unfavorable climate change and the eradication of poverty by means of the MDGs.

Private institutions

Private institutions promote the allocation of capital to productive activities within nations and in the world economy. Deficiencies in this process can affect the long-term path of development of countries and the world.

Commercial banks were the pioneers in IEI and continue to play a key role. They reduce the major transaction costs of IEI with trade finance and commercial links. Banks raise funds from individual investors and allocate them to the best projects.

They also provide unique expertise and knowledge to international transactions. The BOE played a key role in the IEI at the end of the nineteenth century because of its information on global economic and financial affairs, a role similar to the IFIs. Modern banks have spread throughout the world, connecting their clients through important banking relationships. The initial process of investing abroad occurs through the investors' banks and legal advisors. World trade moves through lines of trade finance provided by banks that are highly responsive to changes in country risk. Banks lower transaction costs of private firms in venturing abroad.

Investment banks also became global in their operations. The leading investment banks in the world are located in NYC but increasingly derive most of their earnings from foreign operations. The essence of investment banking is assisting in the capital structure of clients. Innovation in Schumpeter's creative destruction is the process by which countries jump ahead. Investment banks are the leaders in financial innovation, introducing, managing and making markets in sophisticated products. Investment banks lead in corporate restructurings by providing advice and financing of M&As. The process of innovation or creative destruction requires corporate restructuring. The legal framework is essential to preserving trust in the process and has worked effectively in the United States.

HFs constitute partially a response to excessive regulation of financial markets. Fears of correlation of positions of several HFs of the dimensions of LTCM have not materialized. HFs are essential in price discovery, making markets in distressed securities and companies. The largest HFs are tied to investment banks and do not engage in careless activities. The LTCM episode has been exaggerated as shown by its liquidation without losses to the counterparties. There is no compelling argument for high correlation of HF exposures. Risk taking has outcomes of profits as well as losses.

PE can ameliorate the principal/agent problem in the management of public companies. The optimal allocation of resources in an economy requires a two-way traffic between public and private incorporation. The continuing success of PE reveals that it provides a rewarding service.

Regulators continue to express concern about the faster development of complex financial products relative to the technology of risk management. The measurement of risk has become challenging. There is significant lag of credit risk measurement relative to fixed income. In fact, there is a VaR standard for fixed income but multiple alternative modeling techniques for credit risk.

Stress tests are used to evaluate high-risk situations even with low probability of occurrence. These tests started with individual positions in balance sheets of financial intermediaries. Macro stress tests are increasingly used to shock entire financial systems. The results of stress tests may discourage taking most exposures in financial institutions. However, they reveal the nature of the risk of the exposures and can provide advance warning of capital losses.

World trade has been growing at extremely high rates in the past half century. There has been comparable growth of financial flows, investment and equities. Derivatives have grown in volume and complexity. Notional values are not indicative of risks. However, the actual exposures have rapidly increased.

International trade

There is compelling theoretical support for the proposition that trade is better than no trade. An important result is that domestic policy should ameliorate market failures while maintaining the opportunity to benefit from trade. There is significant consensus among economists for these propositions with dissent by notable mainstream-trained economists.

There have been numerous efforts to test the relationship between trade openness and economic growth. As with significant part of empirical economic research, the results are mixed and contradictory. There appears to be consensus on the view that trade openness is not sufficient on its own for economic progress. The social and economic determinants of progress are more complex. However, there is no evidence that trade inhibits growth, except in very special circumstances.

Free trade is popular among economists but it is unpopular with the public in general and politicians and policymakers. Economists have turned to tools of political economy to understand the process of decisions on trade policy. The United States applies antidumping and safeguards as an instrument of protectionist trade policy. These measures do not likely promote the welfare of the United States or of its trading partners.

The Heckscher, Ohlin and Samuelson model and the Stolper and Samuelson model lead to the conclusion that opening to trade in an advanced country with a labor-abundant trade partner could lead to less employment for unskilled labor at a lower wage. This is related to the contention that trade and globalization in general benefit the highly skilled or the very poor in developing countries without benefiting the large class in the middle. There does not appear to be empirical support for the adverse effects of trade on employment. Wages appear to be influenced more by technological progress than by trade itself. In fact, wages and employment would be affected by technological progress even without trade. However, the public perception and the views of politicians tend to support the claim of adverse impact of trade on employment and wages.

The United States experiences fear of job losses to foreigners in services sectors such as telemarketing, IT, accounting and others. The empirical evidence here is more conclusive. The United States has significant surplus in services. Possible job losses are not significant and offshoring can actually increase the number of better-paid jobs in the United States. There is again significant difficulty in changing public perceptions and political views.

There are pressures to include environmental and labor standards in trade agreements. The various stages of development of countries in the world cast doubts on the merit of these proposals.

Notes

1 Globalization, the world economy and growth

1. Rodrik (2003) provides an analysis of the high-level principles of neoclassical economics. Ankarloo and Palermo (2004) provide a critique of the NIE and Williamson (1985).
2. There is a sample of the money stock of Brazil and its proximate determinants, yearly since 1809 and quarterly since 1852 (Peláez and Suzigan 1978, 1981; Peláez 1974, 1975, 1976a, b, 1979). There are other independent measures of income and prices dating to 1861. There was long-term acceleration of growth of money and inflation.
3. For different views on financial repression, see Rajan and Zingales (2003a–d) and Hellmann *et al*. (2000).

2 The official institutions

1. For a bibliography see, http://www.g7.utoronto.ca/bibliography/g8_bibliography_rev.pdf.
2. See http://www.group30.org/home.php.
3. See http://www.imf.org/external/np/exr/facts/glance.htm.
4. For issues of governance, see Stiglitz (2002b) and Woods (2006). On the WC, see Rodrik (1996, 2000) and Williamson (1990, 2004, 2006). On the reforms, see Fanelli (2007a, b) and Fanelli and McMahon (2005, 2006).
5. See http://www.imf.org/external/np/sec/memdir/members.htm.
6. Ibid.
7. See http://www.imf.org/external/pubs/ft/aa/aa04.htm.
8. See http://www.worldbank.org/.
9. See www.bis.org.
10. See http://www.iadb.org/.
11. See http://www.adb.org/.
12. See http://www.eib.org/.
13. See Rose (2004) for econometric analysis of the WTO.
14. See Associated Press (2007) and Beattie (2007Jun).
15. For an evaluation, see Bean (2007) and BOE (2007Q1). On exchange rates, see Eichengreen (2000).
16. See the UN Millennium Project (2005a, b).

3 Private institutions

1. See Jensen (1986, 1988, 1993), Jensen and Meckling (1976) and Fama and Jensen (1983a, b).
2. References on HFs include Adrian (2007), Chan *et al*. (2006), Fung and Hsieh (2006), Gieve (2006) and Shadab (2007).
3. For HF regulation, see Atkins and Barber (2007a, b), BCBS (1999, 2001), Bernanke (2006), ECB (2006), FSF (2000), FT (2007May17), PWGFM (1999) and Trichet (2007).
4. On venture capital, see Gompers (2002), Gompers and Lerner (1998, 1999, 2001), Lerner (2002), Lichtenstein (2006) and Triantis (2001).

6 International exchange of goods and services

1. Import restrictions were replaced in various cases by voluntary export restraints (VER) negotiated bilaterally by countries. Hillman and Ursprung (1988, 1994) extend the analysis of self-interest in trade policy, surveyed by Hillman (1988), to the combination of foreign and domestic interests in the decisions on VERs.

Conclusion

1. Stiglitz (2003, 2002c).
2. See Bernanke (2006Aug), Bordo (2002), Bordo *et al*. (2005), James (2002, 2004a, b), Eichengreen (1992, 2002a, b), Irwin (1996), Lal (2001, 2004, 2006) and O'Rourke and Williamson (2001).
3. See Furman *et al*. (2007), FT (2007Jun20), Rodrik (1997), Scheve and Slaughter (2007), Summers (2006), Wessel (2007) and Wolf (2001, 2004a, b). These issues are analyzed in the context of development by Birdsall (2003, 2005), Birdsall *et al*. (2005), Ocampo (2005), Rodrik (2006) and Weisbrot *et al*. (2005).
4. Bhagwati (2005, 2007b), Giddens (2002), Stiglitz (2002b, 2005) and Wolf (2005).
5. Boughton (2002), Fischer (2003), IMF Staff (2002), Krueger (2006), Mishkin (2006a, b) and Wolf (2007Jun).

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Index