MORTGAGE REVENUE BONDS

Current Issues in Real Estate and Economics

Editors:

James B. Kau
Department of Real Estate
University of Georgia
Athens, Georgia

C.F. Sirmans
Center for Real Estate and
  Urban Economic Studies
University of Connecticut
Storrs, Connecticut

Other books in the series:

Chinloy, Peter
REAL ESTATE: INVESTMENT AND FINANCIAL
STRATEGY

MORTGAGE REVENUE BONDS

Housing Markets, Home Buyers and Public Policy

Edited by Danny W. Durning
Carl Vinson Institute of Government
University of Georgia

Printed on acid-free paper.

TABLE OF CONTENTS

CONTRIBUTORS

John D. Benjamin, Department of Finance and Real Estate, Kogod College of Business Administration, The American University, Washington, D.C.

Terrence M. Clauretie, Department of Finance, College of Business and Economics, University of Nevada, Las Vegas, Nevada

Richard L. Cooperstein, Executive Office of the President, Office of Management and Budget, Washington, D.C.

Danny W. Durning, Research and Services Division, Carl Vinson Institute of Government, University of Georgia, Athens, Georgia.

David J. Gross, Human Resources Division, United States General Accounting Office, Washington, D.C.

L. Jide Iwarere, Department of Finance and Insurance, School of Business and Public Administration, Howard University, Washington, D.C.

Kirk McClure, Graduate Program in Urban Planning, School of Architecture and Urban Design, University of Kansas, Lawrence, Kansas.

John T. McEvoy, Executive Director, National Council of State Housing Agencies, Washington, D.C.

Hugh O. Nourse, Department of Insurance, Legal Studies and Real Estate, College of Business Administration, University of Georgia, Athens, Georgia.

James C. Ratzenberger, Resources, Community, and Economic Development Divison, United States General Accounting Office, Washington, D.C.

J. Sa-Aadu, Department of Finance, College of Business Administration, University of Iowa, Iowa City, Iowa.

C. F. Sirmans, Center for Real Estate and Urban Economic Studies, University of Connecticut, Storrs, Connecticut.

David Stebbins, Department of City and Regional Planning, University of North Carolina, Chapel Hill, North Carolina.

Michael Stegman, Department of City and Regional Planning, University of North Carolina, Chapel Hill, North Carolina.

PREFACE

This book brings together much of the best policy-oriented research on state and local mortgage revenue bond (MRB) programs. Most of this research was conducted to evaluate the impact of MRB subsidies on housing markets and potential home buyers. All of the research is concerned with the "so what" question often ignored by economists: it addresses the implications of the research results for public policy decisions concerning MRBs.

The need for this book becomes apparent when reading the transcripts of congressional hearings on MRBs. At those hearings, the policy debate seems underinformed. Aside from discussions of the General Accounting Office's periodic evaluations of MRB programs and impassioned rebuttals by MRB proponents, the hearing testimony consists mostly of assertions and anecdotal evidence, with some "yes MRBs work" and "no they don't" exchanges.

Although the research in this book may not improve the level of the policy debate on MRBs, it can inform decision makers, experts, and citizens interested in housing policy about issues that should be examined when considering the future of MRBs. Also, it can point other researchers interested in housing policy in the direction of the questions about MRB programs that need additional attention.

It should be clear that the purpose of this book is not to marshal evidence either against or for MRB programs. Some of the research does raise questions about the effectiveness of MRB programs, at least as they were operated in the past. And some research suggests that, if MRB programs are not structured carefully, at least part of the value of MRB subsidies may be captured by house sellers rather than the intended beneficiaries. However, other research concludes that MRB programs yield important benefits, and in one chapter the executive director of the National Association of State Housing Agencies explains the value of MRBs, especially in a time of falling home-ownership rates.

The book is divided into four parts. The first part consists of two chapters. In the first, I trace the creation of MRBs and their bumpy evolution. Then I discuss the political forces that have shaped them over the years and identify the arguments and evidence used by both the supporters and opponents of MRBs in the debate about MRBs.

In the second chapter, James Ratzenberger looks at state and local MRB programs to determine how they have allocated or rationed MRB subsidies. The careful rationing of the subsidies is essential if HFAs want to assist households that could not buy houses.

In the second part of the book, the authors of five chapters present evidence about the efficiency and effectiveness of MRB programs. This

evidence tends to support the conclusion that MRB loan subsidies have not been effective policy instruments, though some evidence indicates that the subsidies have become increasingly effective as they have been targeted more narrowly. Whatever their effectiveness, the loan subsidies are highly valued by their recipients. L. Jide Iwarere and Hugh Nourse found in their research that households receiving MRB loans place values on the subsidies that are greater than the actual values.

In this part, the authors of one chapter, Michael Stegman and David Stebbins, examine the effectiveness of a program created as a direct alternative to MRBs, mortgage credit certificates (MCCs). This program is operated by several state housing finance agencies, and it provides them with an additional tool for targeting subsidies to needy households.

The third part of the book consists of four chapters concerned with the effect of MRBs on housing markets. In three of these chapters, the authors address the question of whether house sellers are able to capitalize all or part of the value of MRB subsidies into house prices. In my chapter, I show evidence of partial capitalization. The chapter by J. Sa-Aadu, John Benjamin, and C. F. Sirman indicates full capitalization in a situation in which a developer controlled access to MRB loans. However, the chapter by Kirk McClure shows that capitalization does not occur if an MRB program is designed so that builders or realtors have no control over who gets the subsidies.

In another chapter in this part, Terrence Clauretie and C. F. Sirmans report evidence of how MRB financing affected the prices of all houses sold in one local housing market. They found that the infusion of a moderate amount of MRB loans into one housing market resulted in significantly higher sales prices for houses that were not financed with MRB loans. Thus, under some circumstances MRBs may have negative impacts for house buyers (positive impacts for sellers) in some markets.

The final part of this book consists of three perspectives on the future of MRBs. Richard Cooperstein argues that MCCs, if made refundable, would be much preferable to MRB loans. However, he doubts that the "housing lobby" will push to make MCCs refundable because most members of the lobby make more profits from MRBs. John McEvoy maintains that MRB programs are producing the results they are supposed to, and as the only federal incentive targeted to first-time home buyers, MRBs should be retained as an important part of the arsenal for solving the nation's housing problems. I suggest that supporters and opponents of MRBs negotiate a truce agreement that would allow MRB programs to continue in return for acceptance of the present targeting provisions, including the recapture requirement, governing MRB programs.

The task of putting together a book, even an edited volume, is an awesome one that leaves the author owing many favors. To start repaying some of those favors, I would like to acknowledge the help I received in preparing my chapters and in assembling the book. Beginning almost a decade ago, Tom Herrin, LaJuana Herrin, and Charles T. Crow started helping me collect data on Arkansas' MRB programs, and for many years they assisted me by updating the data and discussing with me what it meant. Also, Wooten Epes, former director of the Arkansas Housing Finance Agency, was generous in his responses to my requests for data, though I am sure that he disagreed with most of the results that came from my analysis.

Much of my research was completed while I was at the Graduate School of Public Policy, University of California, Berkeley. It was guided and assisted by John Quigley, an economist who can formulate whiz-bang theoretical models with the best of them, but still cares about the "so what" questions. Also, the research was moved along by Arnold Meltsner who often asked me another important, though painful, "so what" question: "So what have you done lately?" A portion of this research was supported by a grant from the Center for Real Estate and Urban Economics at Berkeley.

The preparation of this book would have been impossible without the hard work of the support staff of the Research and Services Division of the Carl Vinson Institute of Government. When I boasted to Becky Hill, head of the support staff, that I had edited a chapter so well that she probably could not find anything wrong with it, she would invariably return it covered with red ink, often noting that I misadded most of the numbers in most of the tables and that the numbers in some tables did not match those in the text. Her excellent copy-editing assistance was invaluable to the completion of this book. The task of turning manuscripts into polished chapters fell on Melanie Hardman and Joni Bertsch, who performed it with skill, patience, and magnanimity. I greatly appreciate their contribution to this undertaking.

Some of the material included in this book was published elsewhere. Chapter 9 was originally published in the *Journal of Policy Analysis and Management*, Fall, 1987, volume 7(1), and it is copyrighted by John Wiley & Sons. In chapter 8, tables 1, 2, and 3 were published in *The Journal of Financial Research*, Spring, 1989, volume 12(1). In chapter 10, tables 1, 2, and 3, and footnote 6 were published in the *National Tax Journal*, March, 1989, volume 42(1). And in chapter 11, tables 1, 2, and 3 appeared in the *Housing Finance Review*, 1986, volume 5(3), and is copyrighted by Elsevier Publishing Company. All are used with permission.

Part 1

The Background of Mortgage Revenue Bonds

1
BONDS FOR THE AMERICAN DREAM:
A POLITICAL HISTORY OF SINGLE-FAMILY
MORTGAGE REVENUE BOND PROGRAMS

Danny W. Durning

INTRODUCTION

Single-family mortgage revenue bonds (MRBs) first inspired furious controversy in 1978 when state and local governments started selling them in huge amounts. The supporters of MRBs asserted that the bond programs effectively helped renters become owners. MRB opponents disagreed: they claimed that the bond programs wasted tax money, helping mainly the real estate industry and families that could already afford to buy houses.

More than a dozen years later, the controversy continues, and the debate has, if anything, grown harsher. The opponents and supporters of MRBs have clashed in heated congressional battles over almost continuous attempts to end the use of MRBs.

And the controversy is not likely to die soon. MRB opponents have been unable to kill them, but have persuaded Congress to restrict their use and set a date for their end. In fact, the end of MRB programs has been scheduled several times; however, each time a program termination date has approached, MRB supporters have rallied Congress to extend it. At present, MRB programs are scheduled to disappear—to have the "sun set" on them—at the end of 1991. However, that date may well be extended, which would assure future fights over MRBs.

The continuing controversy over MRBs is the focus of this four-part chapter. In the first part, I discuss the context of the policy debate, briefly describing how MRB programs work. In the second part, I examine the political history of MRB programs, identifying the coalitions that support and oppose MRBs, and describing how they have clashed on the national level. Also, I discuss the essential elements of the continuing policy debate about MRBs, paying special attention to the debate about the costs and benefits of MRBs. In the third part of the chapter, I discuss new direction of state housing finance agencies, the major issuers of MRBs. The final part of the chapter is a short conclusion.

HOW SINGLE-FAMILY MORTGAGE REVENUE BOND
PROGRAMS WORK

Through single-family MRB programs, state and local housing finance agencies (HFAs) have provided since 1974 mortgage loans to over a million households. In all, from 1974 through 1990, these households received about $60 billion in mortgage loans that carried interest rates below the prevailing market rates.

State and local HFAs can provide these below-market-rate mortgage loans because they can borrow money using tax-exempt revenue bonds. After selling their tax-exempt MRBs, the agencies reloan the funds, usually through lending institutions, to selected house buyers, charging them an interest rate that will pay the principal and interest on the bonds and will finance the sale of the bonds and the operation of the HFA. Typically, the agency charges the house buyer from one to three percentage points less than the market rate for mortgage loans.

The monthly value of each MRB loan subsidy is the after-tax difference of the house payment a family would make if it had a market-rate loan and the payment it makes with an MRB loan. For example, suppose we wanted to figure out the value of a subsidy for a family that needed to borrow $63,000 to buy a $70,000 house, and it would have to pay 11 percent ($600 per month) for a 30-year market-rate loan or 9.25 percent ($518 per month) for an MRB loan. With the MRB loan, the family's monthly subsidy (if it has a 28-percent marginal tax rate) would be $59 (.72 times the payment savings).

The total value of the MRB loan subsidy would be the sum of the present discounted values of the after-tax monthly subsidies. So, the total subsidy would depend on how long the family lived in the house, its marginal tax rate, and its discount rate. For example, if the family were to live in the house for seven years and the discount rate were the market mortgage interest rate, the present discounted value of the subsidy would be $3,446.[1]

In addition to the subsidy, MRB programs may assist selected house buyers in other ways. For example, they may allow a house buyer to make a very low down payment on the house it wants to purchase. This reduced down payment can help first-time buyers who have difficulty accumulating money for a down payment.[2] Also, MRB programs may help buyers by applying less strict underwriting standards than private lenders, thereby permitting some first-time house buyers to qualify for MRB loans when they would not qualify for market-rate loans. For example, they may provide a family with a home loan even if it would have to pay more than 28 percent of its monthly gross income for its mortgage loan payment.[3]

The tax-exempt MRBs sold by HFAs are purchased by investors. While they earn less interest from MRBs than from taxable investments, they may

increase their after-tax income because the interest payments they receive are not taxed. Investors will be attracted to tax-exempt bonds as long as the bonds add to their after-tax income, and they receive an after-tax return that reflects the bond risk.

MRB programs are financed through lost federal and state tax revenues; the programs deprive the federal and state treasuries of taxes that would be paid if the program did not exist. Because these taxes are not collected, other taxes must be paid, or services cut, to make up for their loss. Thus, MRB subsidies are financed largely by additional taxes paid now or in the future, or by reductions in other services.

POLITICAL HISTORY OF SINGLE-FAMILY MRBs

Since their creation, MRB programs have gone through four distinct periods: (1) limited use by state housing agencies (1974-77); (2) explosive, unregulated growth (1978-80); (3) regulated programs (1981-86); and (4) post-tax reform changes (1987-present). In the following sections, I examine the background and program characteristics of each of these periods, then discuss the political controversy that the program has inspired.

Limited Use of Single-Family MRBs: 1974-1977

MRB programs began as modest and tentative state experiments. In many ways, they were a logical, incremental extension of the bond subsidy programs for renters that had long been operated by the state HFAs.

Background

The first state housing finance agency (SHFA) was created by New York in 1960 to finance and develop rental housing. This innovation was slow to spread: it was six years later when the second SHFA was created. However, after the Housing Act of 1968 was enacted, state interest in SHFAs accelerated, and by the end of 1970, SHFAs had been set up in 11 states (see table 1).

The 1968 Housing Act allowed SHFAs to participate in selected federal housing programs that provided funds for rental housing. Using federal and state funds, plus their access to the bond market, SHFAs operated programs to expand rental housing available for low-income households.

SHFAs' activities began to broaden in 1974. That year, the Virginia SHFA sold the first tax-exempt MRBs to finance the purchase of owner-occupied

houses (Glen 1979, 697). Soon after, small amounts of MRBs were being sold
by several SHFAs to provide mortgage financing for the purchase of modest
houses.

Table 1. Creation of State Housing Finance Agencies
(By Year)

1960-1969	1970-1978	1978-1983
	Maryland (1970)	
New York (1960)	S. Carolina (1971)	Indiana (1978)
Michigan (1966)	Minnesota (1971)	Nebraska (1978)
New Jersey (1967)	Alaska (1971)	Hawaii (1979)
Illinois (1967)	Pennsylvania (1972)	Texas (1979)
Massachusetts (1968)	Virginia (1972)	Iowa (1979)
Delaware (1968)	Wisconsin (1972)	Alabama (1980)
West Virginia (1968)	Idaho (1972)	Florida (1980)
Connecticut (1969)	Kentucky (1972)	Louisiana (1980)
Maine (1969)	Colorado (1973)	Mississippi (1980)
Missouri (1969)	Rhode Island (1973)	N. Dakota (1980)
	Oregon (1973)	Ohio (1983)
	S. Dakota (1973)	Washington (1983)
	Tennessee (1973)	
	Georgia (1974)	
	Vermont (1974)	
	California (1975)	
	Montana (1975)	
	Nevada (1975)	
	New Hampshire (1975)	
	New Mexico (1975)	
	Oklahoma (1975)	
	Utah (1975)	
	Wyoming (1975)	
	Arkansas (1977)	

SOURCE: Hartwell (1986, 439).

The shift by SHFAs into financing house purchases encouraged other states
to create SHFAs (Betnum 1976, chap. 2; Rasey 1985). States were further
enticed to set up SHFAs by the enactment of the 1974 Housing and

Community Development Act, which made states eligible to administer some new federal housing programs. By 1983, every state except Kansas and Arizona had an active SHFA.

When SHFAs first issued single-family MRBs in 1974, they exercised authority provided them by the Revenue and Expenditure Control Act of 1968. This act prohibited the use of tax-exempt industrial revenue bonds for most private purposes, but permitted these bonds for, among other things, "residential real property for family units." Under this law, specifically Internal Revenue Service Code sections 103(a) and 103(b)(4), the interest paid on MRBs was exempt from federal taxation. In addition, these interest payments were exempted from taxable state income in all but five states (How Exempt Are Tax-Exempt Bonds? 1985).

Program Characteristics

During this period, state MRB programs had these characteristics in common:

Independent agencies with an appointed board of directors and a full-time staff. Most SHFAs were set up as independent agencies with appointed boards of directors who made the basic policy decisions and a full-time staff to administer the programs (Betnum 1976, 186).[4] The SHFA structure insured that the agency's debt was not a debt of the state. Instead, an SHFA's revenue bonds were legally backed only by mortgages on the houses financed with the MRB funds, plus reserves and insurance. The bonds were repaid from the mortgage payments on houses financed by MRB loans. Usually, the staff and the agency operations were financed totally out of funds from the bond issues.

Limits on the amount of bonds to be issued. SHFAs could issue no more than the maximum amount of bonds authorized by the state legislature. This restriction on bond volume reflected state legislators' fears that defaults on MRBs, even though the bonds were not obligations of the state, would harm the state's credit rating, driving up the cost of other borrowing. Also this restriction was imposed in some states because elected leaders agreed that the state government would assume a "moral obligation" for repayment of MRBs. This "moral obligation" was an informal understanding that the state government would not allow its SHFA to default on the repayment of its bonds (Rasey 1985).

•*Gubernatorial influence and legislative oversight.* Although it might be insulated from politics by its status as an independent agency, each SHFA was still influenced by the governor and the legislature. In every state, the governor appointed members of the SHFA board of directors and, in some states, selected its executive director (subject to varying requirements for legislative confirmation and other restrictions). Also, SHFA programs operated under normal legislative oversight. The legislature had to approve the budget of the agency. In addition, the legislature usually required the agency to comply with normal state government accounting and audit controls, and, in some states, to comply with civil service, state personnel, and purchasing regulations (Betnum 1976, ch. 9).

•*A small set of programs.* SHFAs usually operated two types of single-family housing-purchase programs, both requiring close cooperation with local mortgage lending institutions. In one program, the capital obtained through MRB issues was loaned to lenders who, in turn, loaned the funds to eligible mortgage borrowers. The second type of program established the SHFA as a secondary market for mortgage loans. It purchased mortgages from lenders if those mortgages met the criteria set by the HFA, but let the lending institution that originated the loan service it.

•*A clear public purpose.* The SHFA MRB programs from 1974 to 1977 met high standards for fulfilling a public purpose by targeting its loans to households with below-median incomes. They set the income limits for households receiving the subsidized loans low enough so that a substantial portion of the loans were made to modest-income households.

•*Federal government approval of the MRB programs.* During this period, state MRB programs were viewed by the federal government as inexpensive tools in the struggle to improve the nation's housing. The amount of MRB bonds issued by SHFAs was small during this period: in no year did the total sale of single-family MRBs exceed $1 billion.

Factors in the Creation of SHFAs

Early on, SHFAs were created at a slow pace for three main reasons. First, states traditionally had played a minor role in housing policy. As a result, states were not being pressured by interest groups or ordinary citizens to become more active participants in housing markets. Secondly, the most powerful interest groups concerned with housing policy had long opposed

most government intervention into housing markets. The trade groups for realtors, builders, and bankers had long battled against public housing and other federal housing assistance for low-income families. In the early 1960s, most of the groups did not favor creation of new state governmental housing agencies. Thirdly, increased government efforts to provide rental housing for poor households was not popular among some home owners, especially those who feared that multi-family or modest-cost rental houses would be built in their neighborhoods.

In the 1970s, the creation of SHFAs became politically acceptable for several reasons:

●*The federal government facilitated their creation.* It financed the research and staff work needed to prepare the way for these agencies, it provided states with incentives to create them, and it brought together interest groups and government professionals who became the driving force behind SHFAs.

The federal government paid for studies that showed the extent of the state housing problems, often concluding that the state faced a housing crisis. This research was financed by the planning provisions (Section 701) of the Federal Housing Act that gave states money for community, regional and state planning work. In many states, the studies concluded that an SHFA was needed to solve the problems.

Also, the federal government set up incentives for SHFAs in the 1968 Housing Act and the 1974 Housing and Community Development Act. These two acts made SHFAs eligible to participate in federal rental housing programs and made them a useful vehicle to obtain federal money for multi-family housing (Milward 1978; Paine, Webber, Jackson, and Curtis 1974; Rasey 1985).

●*SHFAs were strongly promoted by some state agencies.* Most of these state agencies were concerned with community development and intergovernmental relations issues. They had the expertise to research the issue of whether the state needed an HFA, to put together a coalition supporting the creation of an HFA, and in other ways to lay the groundwork for the legislation to set up such an the agency.

The creation of an SHFA in Ohio shows how this process worked. In Ohio, the catalysts for setting up an SHFA were the Department of Economic and Community Development and the Housing and Community Development Advisory Committee.[5] They commissioned a study by McKinsey and Company, a consulting firm, that recommended establishing an SHFA, then gathered support for legislation to implement the recommendation. Also, they conducted a "mobilization" campaign to generate

support for an SHFA by groups with a direct interest in housing and by the public. This campaign included speeches, meetings with editorial writers, press releases, and calls and letters to representatives of key groups. In his study of the process of creating an SHFA in Ohio, Milward (1978) concluded:

> The Ohio case itself shows clearly that the bureaucratic component of the policy community together with allies interested in housing was able to force the state into a relatively new area of public policy with almost no pressure from the consumers of that public policy or for that matter from the likely forces that could benefit, the developers, lenders or the building trades, all of whom are traditional interest groups that are supposed to be the policy innovators of pluralist democracy.

•*Supporters of an SHFA could claim it would produce benefits without few direct costs.* Supporters could tell a state legislature that it would have to appropriate little or no state tax money to create and operate an SHFA because its programs would be financed with funds generated from the sale of MRBs. For example, in Arkansas, the people who wanted an SHFA argued that it would help everyone by furnishing houses to those who could not afford them and by stimulating the economy. One legislative proponent urged, "Help the little people of Arkansas help themselves and help the rich get richer."

SHFA proponents could point out that states with SHFAs had received benefits from them or, at least, had suffered no harm. This experience provided evidence that creating an SHFA was not a reckless risk.

•*The interest groups that had opposed government intervention in housing markets changed their views beginning in the late 1960s.* As the federal government pumped up housing construction in the late 1960s and early 1970s, most real-estate interest groups that had opposed government financing of housing changed their position on this issue. Influential groups such as builders and municipal bond underwriters became sympathetic toward a government role in housing construction and finance, and they began to support housing bond programs, especially after 1974 when SHFAs began issuing MRBs to subsidize house buyers.

The Period of Explosive Growth: 1978-1980

The second period in the history of MRBs came abruptly. During this period, MRBs were not issued only by SHFAs, but also by local housing

finance agencies (LHFAs). As a result, MRB programs were altered both quantitatively and qualitatively.

Background: Local Governments Change the Rules

In a few short months in 1978, single-family MRB programs changed from a modest state-government undertaking to the hottest form of municipal underwriting. Unfettered by many restrictions on SHFAs, local governments issued MRBs at a heart-pounding pace. As shown in table 2, the amount of MRBs sold by state and local governments increased from about $1 billion in 1977 to almost $8 billion in 1979. And the amount was expected to increase rapidly: the U.S. Treasury Department estimated that by 1984, if MRB programs were not reined in, they would provide over half of all mortgage financing (U.S. Congress 1979, 7).

Preparing local governments for MRBs. The groundwork for local government MRBs was laid in the early 1970s by at least two underwriters: W. James Lopp of E.F. Hutton and Glen R. Schulz of Stephens Inc., a firm located in Little Rock, Arkansas (Smith 1979). They had concluded that local governments could legally issue revenue bonds to finance the purchase of single-family houses, and they worked to make it happen.

Working separately and, apparently unknown to each other, Loop and Schulz each allied themselves with prominent law firms. Loop, based in New York City, joined forces with bond lawyer Robert J. Kutak of Kutak, Roch and Huie of Omaha, Nebraska. Beginning in the mid-1970s, Loop "made contacts around the country and lobbied for state laws allowing localities to issue their own housing bonds" (Glen 1979, 697). Also, he and Kutak reviewed the legal obstacles that would stop local governments from issuing MRBs, then they drafted state legislation to overcome these obstacles. For example, they helped prepare and pass bills in Arizona and Florida to permit local governments to issue MRBs (Mortgage Money from City Bonds 1978, 71).

In Arkansas, Schulz worked with Herschel Friday, a nationally prominent bond lawyer and head of a prestigious Little Rock law firm, to draft a bill for the state legislature authorizing local governments to issue MRBs (Smith 1979, 88; Matlack 1979). The bill was quietly enacted in 1975.

Table 2. Mortgage Revenue Bonds Sold by
State and Local Governments
1975-1985
(in billions)

Year	Single-Family MRBs			Total Long-Term Tax-Exempt Bonds	TotalMRBs/ Long-Term Tax-Exempt Bonds
	State	Local	Total		
1975	*	0	*	$30.5	>1.0%
1976	$ .680	0	$ .680	35.0	1.9
1977	.959	0	.959	46.9	2.0
1978	2.792	.619	3.411	49.1	6.9
1979	3.333	4.491	7.824	48.9	16.2
1980	4.890	5.049	9.939	54.4	18.3
1981	1.874	1.550	3.433	55.1	6.2
1982	4.888	3.609	8.497	84.9	10.0
1983	9.407	3.183	12.590	93.3	13.5
1984	10.070	4.662	14.732	114.3	12.9
1985	12.179	4.519	16.698	170.9	9.8
1986	5.548	.624	6.172 (4.66)[a]	148.1	4.2
1987	6.290	2.057	8.247 (4.15)[a]	102.1	8.1
1988	9.853	2.507	12.362 (2.15)[a]	115.5	10.1
1989	6.400	2.310	8.710 (1.86)[a]	125.0	7.0
1990	8.577	3.803	12.380 (1.28)[a]	126.4	9.8

*Less than $50 million

[a]Bonds issued to refund earlier bond issues.

SOURCES: Office of the Secretary of the Treasury, Office of Tax
Analysis, published in Joint Committee on Taxation (1985a). Also
unpublished data from the Securities Data Company and various
issues of *Muni Week and Credit Markets*.

Local-government MRB programs were launched in 1978. The time for
them seemed propitious: the legal foundation for them existed in several

states and concern about high mortgage interest rates was growing. In addition, underwriters were encouraged by the success of a 1977 experiment in Minneapolis with local government MRBs. As authorized by the state legislature, the city had sold $17.5 million in single-family MRBs (Glen 1979, 697).

The timing was also right for another reason: the major underwriting firms were losing revenue because the Internal Revenue Service had stopped the profitable refunding of many types of bond issues. As a result, underwriters were searching for new markets for their services, and they found that MRBs offered them a lucrative new profit opportunity (Glen 1979, 697; Let's Hear It for E.F. Hutton 1978).

Chicago leads the way. In early 1978, Lopp and Kutak suggested to the Chicago city government that it issue single-family MRBs. They argued that the MRBs would "stimulate public/private sector cooperation for the benefit of the city" (Levatino 1978). The idea appealed to the Chicago mayor, Michael Bilandic, who explained, "There is a great void in the amount of [mortgage] money available to middle-income people [in Chicago]" (Mortgage Money From City Bonds 1978). He said Chicago should use MRB loans to retain moderate-income households who might otherwise move to the suburbs (Chicago's Bond Plan to Entice Homebuyers 1978, 27).

The city council authorized a $100-million MRB issue, and the bonds were sold in August 1978. This highly publicized bond issue "worked": it was highly rated (AA+) by the Standard and Poor's Corporation, all of the bonds sold on the day they were offered, and the mortgage loans were snapped up by borrowers. After that, it was clear that almost any city or county could issue these bonds (Glen 1979, 697; Levatino-Donoghue 1979, 307). And it was unmistakable that MRBs could supply underwriters with enormous profits: E.F. Hutton, the underwriter of the Chicago issue earned about $2.35 million in fees on the issue (Mortgage Money From City Bonds 1978, 70).

The publicity of Chicago's single-family MRB issue spurred the use of MRBs by other cities and counties. The sale of MRBs grew geometrically as cities and counties discovered that they could generate capital for cheap mortgage loans at trivial or no cost to the local treasury. Soon after the Chicago issue, other local government MRB issues were completed in Denver and Pueblo, Colorado. In late 1978, MRBs were sold by Pine Bluff, Arkansas; that issue, underwritten by Stephens Inc., had been in the works before the Chicago issue (Smith 1979, 89).

Although most local governments had not previously operated (or spent money on) single-family housing-finance programs, in 1978 and 1979 many enthusiastically embraced the idea that financing the purchase of "affordable" single-family housing is a local concern. This new local-government interest

in affordable housing was often ironic because some cities wanting a role in providing "affordable" housing were forcing up the cost of houses with outdated building codes, inflexible zoning, and high property taxes.

Local governments were able quickly to set up MRB programs because most had experience selling revenue bonds for such things as sewers, streets, and public buildings. The difference between selling MRBs and selling sewer revenue bonds was minor: in both cases, the bonds were usually sold by an independent agency established by the city and were backed by revenues paid by the users of the facilities. The city finance department could contract with the same underwriters for all of the services it needed to complete the bond deal and administer the program.

The threatened deluge. In the first few months after the Chicago bond issue, the sale of local government MRBs was constrained mainly by two factors: a shortage of underwriters with enough experience to set up local government MRB programs and legal limitations or ambiguities that stopped local governments in all but 15 states from issuing MRBs. These constraints were quickly reduced as underwriters developed their expertise and state legislatures passed legislation to enable their cities to issue the bonds. Glen (1979, 698) observed that the profits to be made from MRB programs led to "some heavy statehouse lobbying and a wave of legal research."

The entry of local governments into single-family housing finance stirred a fast reaction by SHFAs. After seeing the huge amounts of MRBs being sold by individual city or county HFAs, many SHFAs asked to be given legislative authority to issue more MRBs, and they were. The bond limits authorized by state legislatures were quickly raised (see table 3).

Program Characteristics

Local governments structured their MRB programs like those of the state HFAs, but restricted them less. As in the state single-family housing finance programs, in the local government MRB programs:

●MRBs were usually sold by an independent agency created by a city or county government;

●the city or county did not back the MRBs with its full faith and credit; most programs were set up so that the local government only lent its name to enable tax-exempt bonds to be issued;

•the MRBs were backed by mortgages on the houses purchased with the mortgage loans; by Federal Housing Administration, Veterans Administration, or private mortgage insurance; and by reserves set aside from the bond issues; and

•the MRB programs were costless to the local government because all expenses of the program were paid out of the bond proceeds. Until 1981, many local (and state) governments actually made money from the programs. Each MRB program set up reserve funds to insure the safety of the bonds for investors. These reserve funds (plus bond proceeds that had not yet been loaned out) were invested at market rates, creating an arbitrage that the government could put in their treasuries.

Table 3. Comparison of Bond Limits Authorized by State Legislatures
1973, 1984, and 1986 (in millions)

State	1973 Bond Limit	1984 Bond Limit	1986 Bond Limit
Illinois	$ 500	$1,700	$2,700
Kentucky	200	1,125	1,125
Louisiana	50	Unlimited	Unlimited
Maine	20	635	935
Massachusetts	1000	2,200	2,980
Michigan	600	1,800	3,000
Minnesota	100	1,550	1,990
Missouri	100	Unlimited	Unlimited
New York	800	1,650	3,200
North Carolina	200	750	1,500
Vermont	20	400	500
West Virginia	130	900	1,250
Wisconsin	150	1,791	1,600

SOURCES: Subsidized Mortgage Insurance Division, U.S. Department of Housing and Urban Development, published in The Research Group (1974) and the National Council of State Housing Agencies (1984, 1990).

Despite the similarities, the loosely regulated local-government MRB programs differed from the original state MRB programs in both structure and operation. The differences included the following:

● *Local programs were usually administered by private sector firms with little local government involvement.* Unlike state programs that had permanent staffs to administer their MRB activities, most local governments contracted for program administration and were minimally involved in the sale of the bonds (Tax Exempt Housing Bonds 1979, 7). Instead, the local government depended upon private sector underwriters and lawyers to issue the bonds and upon banks or thrift institutions to administer the program (Levatino-Donoghue 1979, 306). As a result, the overhead costs were higher.

Using the mantle of local government, the underwriters and bond counsel would proceed with the issue. Then, after the bonds were sold, the loan program would be implemented by lending institutions or other firms that contracted to be the program administrator and trustee of the bond proceeds. Within broad guidelines set by the local government, mortgage lenders decided on who would receive the loans.

● *Managing boards operated under few constraints.* The local-government MRB programs lacked the oversight and restrictions that had been placed on state MRB programs. Local governments usually had neither the interest nor expertise to monitor the programs closely. Because the programs were at least self-supporting, the local governments had few incentives to worry about keeping down the costs of issuing and administering the bonds (Smith 1979; Zimmerman 1986, 510).

● *In several cities, the per capita amount of housing bonds issued was high.* Local governments that could issue MRBs typically sold more MRBs per capita than SHFAs had. States had been cautious with their programs, issuing a volume of single-family MRBs that represented only a small portion of the total amount of mortgage loans made in the state. Unlike states, several local governments issued large dollar amounts of bonds. For example, East Baton Rouge sold $100 million of MRBs in 1979 for its 366,000 residents. Other large issues of MRBs in 1978 and 1979 included those in Chicago ($100 and $150 million); Pulaski County, Arkansas ($100 million); New Orleans ($85 million); Albuquerque ($79 million).

● *The income and loan amount limits were high.* The local MRB programs typically had easier eligibility standards (i.e., higher limits on incomes, house prices, or loan amounts) for loans than did state MRB

programs. Often, the limits were so high that two-thirds or more of all
households in the city or county could qualify for an MRB loan. The pat-
tern of high income limits was started by Chicago in 1978 when it per-
mitted households earning up to $40,000 to be eligible for MRB loans. A
comparison of eligibility limits is shown in table 4.

**Table 4. Income Limits for MRB Subsidy Recipients
Average for States and Local Governments**

Year	State Average	Local Average
1979	$20,700	$30,420
1981	27,270	37,800
1982	33,260	37,500

Note: MRB programs with no income limits were excluded
from the averages. In cases where a range of incomes was
reported as the limit, the range average was used as the
income limit.

SOURCES: For 1979, the state income limit is the average
for all states as of April 1979. The local limit is a weighted
average of income limits for all bond issues between March
1978 and March 1979. The averages are calculated from
data in Peterson and Cooper (1979, 8-9, 33).
   The 1981 averages are the unweighted averages for
selected bond issues, both state and local, reported in
Gensheimer (1982).
   The 1982 averages are the unweighted averages for all
bond issues, both state and local, as reported in congression-
al testimony by the Congressional Budget Office (U.S. Con-
gress 1983a, 76-79).

• *The Definition of Public Purpose Was Expanded.* Local governments
claimed the MRBs would fulfill a public purpose by helping urban areas
revitalize, expanding local economies, and stimulating community develop-

ment in poorer neighborhoods. They asserted that MRB programs were
a useful tool to address urban problems (U.S. Congress 1979).

Also, they argued that helping affluent households purchase houses in
a central city would serve a public purpose by improving low-income neigh-
borhoods, increasing the local tax base, and providing additional jobs
(Calkins and Aronson 1980, 114).[6] By expanding the definition of public
purpose in this way, local governments could justify subsidizing the house
purchases of middle- and higher-income households.

Incentives for Large MRB Programs

The large amount of MRBs issued by local governments and the high
income limits for local MRB loans reflected the incentives facing program
participants. *Bond underwriters and lawyers* favored the higher amounts at
least in part because their compensation was a percentage of the bond issue.
The larger the bond issue, the larger were their fees. Because the feasible
size of bond issues increased with the income limits (the higher the income
limits, the greater the number of loans that could be made), they preferred
the highest possible income limits.

Similarly, most *lenders* involved with the program wanted large bond issues
and high income limits, especially after 1979 when they were suffering
disintermediation of deposits. They earned fees from the loan originations
and servicing. Because these fees were a percentage of the loan amounts, the
more MRB loans they made and the larger the loan amounts, the more fees
they earned.

Also, *real estate brokers* liked MRB programs because the MRB subsidies
increased the number of houses sold, increased short-term market prices
through higher market demand (see chapter 11), and may have increased
prices by capitalization of the subsidies (see chapters 8, 9, and 10). Each of
these effects would increase brokers' sales commissions.

The maximum use of MRBs was also favored by most *local government
officials*. The MRB programs cost a local government little or nothing. As
previously mentioned, these programs often generated profits through arbi-
trage of the reserve funds. And while the benefits were local, the program
costs were borne by state and national taxpayers. The enthusiastic response
of local officials was captured by a quote in the *Wall Street Journal*: "'The
[MRB] concept is beautiful,' gushes Charles Graham, assistant city manager
of Pueblo Colorado, 'Everybody wins on this except the IRS'" (Seib 1979, 1).

Policymaking on the Local Level

In a city or county, a proposal to create an MRB program usually generated little controversy. In most jurisdictions, the bond underwriters, some lenders, and local officials, often supported by builders and real estate agents, formed a strong pro-MRB coalition that faced only weak opposition.

The symbiotic relationship of bond underwriters, some lenders, and local elected officials began when the underwriters carried to cities and counties the message that they had much to gain and little to lose with MRB programs. For example, in Arkansas, large national investment banking firms and state-based underwriters competed for the business of underwriting MRB programs. An observer at the time wrote, "E.F. Hutton has got its men in the field everywhere. . .It's the hottest game in town right now and they've got everyone excited" (*Arkansas Gazett October 4, 1978, 8a*). Another observer noted, "Like the coral-eating starfish of the South Pacific, housing-bond promoters in Arkansas seem to have no natural enemies" (Smith 1978).

In both Little Rock and North Little Rock, Arkansas, the ordinance creating an MRB program was written and promoted by a team of investment bankers and bond lawyers (Hoffman 1978, 19a; Woodruff 1978, 13a). The *Arkansas Gazette* described the North Little Rock City Council meeting that created that city's MRB program:

> The meeting was attended by a large crowd of mortgage bankers, real estate salesmen and others in related businesses who cheered and applauded the action. The audience frequently erupted in applause as aldermen spoke against adopting restrictions on. . .[MRB] loans. . . .[One council member] proposed an amendment to give families of incomes of no more than $14,200 a year of priority on mortgages that would be available. Several spectators laughed at that (Woodruff 1978, 13a).

Local-government MRB programs were sometimes opposed by conservatives who thought local government should have no role in financing the purchase of private homes. However, the philosophical opposition was surprisingly small. And the public paid little attention to proposals to create local MRB programs (Stover 1978, 1a).

Even after some local governments initially refused to create an MRB program for philosophical or political reasons, they later set up programs, largely in self-defense. If subsidized mortgages were available from nearby cities or counties, they feared that without their own subsidy they would lose housing construction or desirable new residents (Levantino 1978, 589).

The strongest opponents on the local level were savings and loan associations (S&Ls), which traditionally supplied mortgage credit to house buyers.

Many S&Ls saw MRB programs as creating unfair competitors. However, the S&L opposition was muted by several developments. First, S&Ls had fallen on hard times. Many were so preoccupied with their own financial problems that they were unable to oppose MRBs with much vigor. Second, several S&Ls participated in MRB programs to earn fees without taking interest-rate risks. Thus, the S&Ls were split in their views of MRBs. Third, the S&Ls that did oppose MRB programs were often assailed as selfish businesses with no concern about housing for low- and moderate-income families.[7] They were vulnerable to such criticism even if it were unfair. An *Arkansas Gazette* editorial writer—who disliked MRB programs—observed, "Anyone who is heartless enough to oppose efforts to upgrade the general level of shelter would denigrate apple pie and make derogatory remarks about baseball.... The robe of righteousness can be a useful garment" (January 17, 1979, 10A).

Political Battles on the Federal Level

Although MRB programs were popular in local governments, they disturbed federal "budget guardians," who included key Congressional leaders such as the chairs of the House Ways and Means Committee and the Senate Finance Committee, influential congressional staff members, the Treasury Department, and members of President Jimmy Carter's cabinet (Davie 1981). These budget guardians provide leadership in budget-making, and they are concerned with losses of tax revenue over which they have no control.

The budget guardians became increasingly alarmed about the potential cost of MRB programs as they realized that a large number of cities and counties would want one. As more local governments set up these programs, the tax expenditures would skyrocket. The Congressional Budget Office (CBO) and the Treasury Department estimated that by 1984 MRB programs would cost the federal government over $11 billion per year (U.S. Congress 1979, 7). Donald Lubick, then assistant secretary of the Treasury for tax policy, explained, "Put simply, no one wants ten-percent mortgage money when eight-percent money is available. Thus it is not unreasonable to expect that close to 40 or 50 percent of all home mortgages could eventually be financed with tax exempt bonds."

The federal government attack on MRBs began when President Carter pledged in his 1979 State of the Union address to "limit the use of tax-exempt funds for mortgage financing to low-and-moderate income families or to other narrowly targeted public policy objectives" (Levatino-Donoghue 1979). He formed an interagency task force, with members from the Treasury Department, the Department of Housing and Urban Development, and the Office

of Management and Budget, to prepare legislation to restrict the use of MRBs (Glen 1979, 698).

Rep. Al Ullman (D-Oregon), chairman of the Ways and Means Committee, who also disliked MRBs, explained why he objected them:

> Despite its popularity, the use of tax-exempt revenue bonds to finance these private investments is poor public policy. The primary goal of federal housing policy has been to provide shelter for low-income families. Any additional federal resources for housing should be for priority purposes and subject to the discipline of the budget process (U.S. Congress 1979, 3)

Impatient with the inaction of Carter's interagency task force, Ullman rendered it irrelevant on April 25, 1979. He stopped MRB programs in their tracks by proposing legislation that would make taxable the interest earned on MRBs sold after April 25, 1979 (Bill Curtailing Tax-Exempt Mortgage Bonds Jolts Housing Industry 1979; Furor Over Tax-Free Bonds to Buy Homes 1979). By simply introducing this bill, Ullman made it impossible for local or state HFAs to issue new MRBs. Because of the bill would be retroactive, MRBs were no longer certified by bond lawyers (who are liable for wrong opinions) as tax-exempt securities. Without a legal opinion that the interest on MRBs is tax-exempt, the bonds could no longer be sold to investors.

Ullman's bill temporarily halted the stampede of new MRB programs; however, it did not stop them. Ullman and his Ways and Means Committee responded to an outcry by cities, states, and underwriters by permitting them to complete bond issues they had started prior to April 25, 1979.

In June 1979, the effects of Ullman's bill were neutralized by a resolution sponsored by Sen. Russell Long (D-La.) and signed by a majority of senators. The Long Resolution pledged that the Senate would never pass legislation that retroactively made taxable the interest on MRBs. This resolution reassured bond lawyers that the interest earned on MRBs would remain tax exempt and that if the tax exemption were removed, its removal would affect only bonds issued after a specified date in the future. Thus, they could certify MRBs as tax-exempt, and MRB programs were revived in the middle of 1979.

The first legislative fight over MRBs. The MRB battle of 1979 and 1980 was between MRB supporters who claimed that MRB programs provided large, diverse benefits and opponents who said they were a taxpayer rip-off. The battle opened in April 1979 with Rep. Ullman's legislative proposal and lasted until legislation was enacted in December 1980. The final product of the battle was the Mortgage Subsidy Bond Tax Act (MSBTA), whose provisions reflected the inability of either side to gain full acceptance of its views.

The coalition of MRB supporters. The coalition of MRB supporters included potent interest groups that were experienced in lobbying and that could deploy impressive resources to influence congressional policy decisions. The MRB coalition comprised four types of groups: (1) a home-ownership lobby consisting of most of the old anti-public housing lobby of previous decades, (2) the municipal-bond lobby led by the Public Securities Association (PSA); (3) an intergovernmental lobby made up of groups representing local and state interests, and (4) a few organizations that supported expanded housing for low-income families. These groups are discussed below.

The members of the *home-ownership lobby* had fought housing battles together for decades. The lobby had first formed in the 1940s to oppose public housing and other government intervention in the housing market. The members of this anti-public housing coalition included the National Association of Realtors (NAR), earlier known as the National Association of Real Estate Boards; the National Association of Homebuilders (NAHB); the American Bankers Association (ABA); and trade groups for lumber dealers and other building suppliers (Wolman 1971). However, organizations in this coalition changed their views during the late 1960s, and by the late 1970s most were supporting a government role in financing the purchase of private housing (Oleszak 1983). Within two decades they had changed from primarily an anti-public housing to a home-ownership lobby.

Two regular members of the home-ownership lobby were not part of the pro-MRB coalition. These two groups were the National League of Savings Institutions and the Mortgage Bankers Association (MBA), which had parted with their allies to oppose MRB programs. However, even without them, this group brought formidable political resources and lobbying expertise into the political fight over MRBs. The NAR, NAHB, and ABA have affluent and educated members spread throughout all states and congressional districts, giving them grassroots access to elected officials. In addition, the national organizations have long been active, generous contributors to political campaigns for many decades.[8]

The home-ownership lobby was joined in the MRB coalition by other interest groups with which they had rarely allied. One of their new allies was the *municipal-bond lobby* led by the Public Securities Association (PSA), which also has extensive lobbying resources and experience. For both the PSA and the home-ownership lobby, keeping MRBs was a front-burner issue.

Another important part of the MRB coalition was the *intergovernmental lobby* consisting of state and local interest groups such as the National Governors Association and the National League of Cities. The intergovernmental lobby is influential because it is skilled in Washington politics and has another powerful resource: legitimacy bestowed by voters. Become many of

them represented elected officials, they were less vulnerable to charges that they were simply pleading for their own self interests.

The intergovernmental lobby included the state and local HFAs and their trade organizations, the National Council of State Housing Agencies (NCSHA) and the Association of Local Housing Finance Agencies (ALHFA). These organizations were fighting for their survival and thus brought zeal to the battle. Also they housed experts on MRB programs who could speak knowledgeably about them.

Added to these three coalition members were a few groups that believed MRBs could help *low-income households*. These supporters included the AFL-CIO (Dowling 1979, 12), the National Association of Housing and Rehabilitation Organizations (NAHRO)(Cooper 1979, 573), and civil rights groups that testified for keeping MRB programs alive (Carter Backing Bill to Halt Tax-Free Mortgages 1979). However, these groups supported regulating MRBs to make sure they were carefully targeted to low-income households.

MRB program opponents. The most powerful MRB opponents included the *President and congressional leaders* who held strategic positions in the congressional policy maze. If they had decided to end MRBs and had been willing to fight without restraint for that goal, they held the personal, political, and organizational resources to achieve the goal. However, the future of MRBs was just one of many issues that concerned them, and killing MRBs was not a top priority.

The Carter Administration supported action to end MRB programs because it believed MRBs were adding to the growing budget deficit. When the Reagan Administration took office, its stance against MRBs was even stronger: it wanted them stopped immediately. The Reagan Administration opposed MRBs not only because of their cost, but also because it preferred reduced government intervention in all markets, including housing markets.

Within Congress, MRBs were unpopular with the leaders of key budget committees. In their leadership roles, these leaders considered not only the benefits of a program for their constituencies, but also the program cost. Because of their responsibilities, they had to worry about keeping federal revenues and expenditures in some reasonable balance. So, many wanted to end the use of MRBs because it threatened to reduce future federal tax revenues by billions of dollars.

The views of both administration and congressional leaders were probably influenced by *tax experts* in the Treasury Department and on congressional staffs. Most of these experts opposed all private-purpose bonds, including MRBs. Their opposition flowed from both institutional self-interest (private-purpose revenue bonds drive up the cost of other government securities, in-

cluding treasury bills and bonds) and their economic training. With a know-
ledge of public-finance economics, they could quickly determine that private-
purpose bonds were likely inefficient ways to address public problems.[9]

MRBs were opposed also by two major interest groups, *the U.S. League of
Savings Institutions and the Mortgage Bankers Association (MBA)*. These
groups represented the lenders that traditionally had supplied almost all of the
home mortgages in this country, and they feared that MRBs would cut deeply
into their business. The League was especially active. It published a series
of articles on the problems with MRB programs (thygerson and Parliment
1979a, 1979b, 1979c), and league speakers frequently testified against MRB
programs.

The MBA had opposed multi-family state housing-finance programs during
the 1970s and opposed MRBs as "an inappropriate substitution of public funds
in the private marketplace" (Pope 1979, 22). Despite the resolute opposition
of these two groups, the force of their opposition was reduced by a division
within their ranks: many S&Ls and mortgage banks were participating in
MRB programs and wanted them to continue.

Middle ground. While some supporters and opponents of MRB programs
staked out polar positions (don't touch MRBs versus end their use), others
were open to compromises that would regulate them.   For example, a
legislative compromise was proposed by the U.S. League of Savings Institu-
tions that suggested MRB subsidies be provided only to households earning
less than 80 percent of median income (Levatino-Donoghue June 1979).

Targeting MRB loans strictly to low-income households was favored by
some MRB supporters, such as NAHRO and the AFL-CIO. Also, some less
restrictive limits on MRBs were supported by the NCSHA which adopted a
policy statement saying MRB loans should be limited to low- and moderate-
income housing and "other public policy objectives," and that bonds should be
issued only by HFAs with a permanent staff (Levatino-Donoghue 1979). Even
the bond lawyer who was one of the fathers of MRBs, Lopp, suggested that
the program be limited to middle-income households that earned less than 140
percent of the area median (Dowling 1979).

The idea of regulating use of MRBs gained support as the sale of the
bonds surged in 1979 and 1980. It became clear that MRB programs were
facing a "commons" problem. According to Gillette (1983, 1055), a bond
market is a commons that can be overused by governments if they have an
unregulated access. The market for MRBs would have been overused if the
sale of MRBs had increased as predicted. As a result of its overuse, the
interest rates on MRBs would have risen, thereby lowering their benefit to
loan recipients. If the overuse had escalated enough, the interest rates of the
MRBs would have reached a level where they no longer provided home buy-

ers with loan subsidies. To avoid a dissipation of the subsidy, access to the
MRB market had to be restricted.

In a timely report on MRBs, options to regulate MRB programs were
suggested by the Congressional Budget Office (1979). Several of these policy
options were included in the legislation enacted to limit MRB programs.

The MRB Policy Debate: A Clash of Beliefs, Interest, and Knowledge

The debate about MRBs was a clash between claims that MRBs were good
policy and some evidence that they were not. The testimony at two hearings
on MRBs conducted in 1979 consisted largely of supporters asserting that
MRBs were producing important public benefits followed by opponents who
cited studies showing MRBs were ineffective policy instruments (U.S.
Congress 1979). Calkins and Aronson (1980, 118) noted, "At the hearings,
there was only a limited discussion of their substantive merit in terms of
housing policy, urban policy, and intergovernment relations."

MRB proponents make their case. According to MRB supporters, the
benefits of MRBs included increasing home ownership, creating social and
economic improvements in hard-pressed cities (Chicago's Bond Plan to Entice
Homebuyers 1978), and upgrading neighborhoods (Arndt 1979). These
benefits were created because MRB programs enabled households to change
from renters to home owners, and owners behave better than renters. So, as
a result of the tenure change, neighborhoods, cities, and society are better off.

In the legislative fight, the supporters of MRBs extensively invoked beliefs
about the value of home ownership and used the home-ownership symbol.
For example, E.F. Hutton invoked the symbol of home ownership in an adver-
tisement it used in 1979 to generate public and legislative support for MRBs.
This two-page ad was published in the *Wall Street Journal* and *Washington
Post*. In it, E.F. Hutton defended MRB programs and linked them to the
needs of "forgotten" families who yearn to own homes:

> E.F. Hutton is concerned about providing affordable housing for the largely
> forgotten moderate- and middle-income class—the family earning from
> $14,000 to $25,000 annually, which today finds it difficult, if not impossible,
> to purchase a home.
>   Home ownership has always been a part of the American Dream. The
> pride of every community is safe and decent housing for its citizens. Yet,
> too frequently mortgage money has been unavailable or available at very

high interest rates and down payments (E.F. Hutton Talks About Forgotten American Families 1979).

The value of MRBs for economic and community development was asserted by various local-government representatives. For example, the executive director of the National League of Cities, Alan Beals, defended MRB programs by arguing that halting the use of MRBs would make it impossible for some households to buy houses and that "to deny these people the opportunity for home ownership and to deny cities the opportunity to bring stability to their neighborhoods add up to redlining by the federal government" (Arndt 1979, 1).

Several city and county representatives described MRB programs as tools for community development that were effective only if MRB subsidies were provided to high-income as well as moderate-income households. They defended bond programs such as Chicago's, which provided MRB loans to households earning up to $40,000 per year, as a means of attracting affluent households to the central city.[10] Kaup (1982, 288) explained:

> While the basic justification for a mortgage revenue bond is clearly the assisting of low-and-moderate income families to become home owners, the Chicago program involved the use of MRBs to finance upper class home buyers. The original stated purpose of the Chicago program was to keep upper- and middle-class homeowners in the central city area.

Though MRB loans were not restricted to first-time or marginal buyers, the officials of local governments with MRB programs insisted that the programs helped "low- and moderate-income families" who could otherwise not have afforded a home. The following are two examples of their assertions:

> What we are doing is putting people into home ownership that could not get into home ownership before. (Statement of Louis DeMars, president of the Minneapolis City Council in U.S. Congress 1979, 616).
> For many persons of low and moderate income, a tax-exempt mortgage revenue bond program offers the only hope for the foreseeable future—and perhaps for a lifetime—of owning their own homes. (Statement of Enrique Bustamante, executive director of the Housing Authority of El Paso, Texas in U.S. Congress 1979, 506).

Despite the frequency and fervor of such assertions, no MRB supporters explained how an untargeted subsidy of about $30-$60 a month would produce the vast positive outcomes attributed to it. And, more importantly, few supporters backed their assertions with empirical evidence or research.

Although MRB supporters contributed little hard evidence about or independent evaluations of MRB programs, they did devote much attention to the research of the CBO and the Urban Institute. This research contradicted many of their assertions about the beneficial role of MRB programs, so in order for their assertions to be convincing, the empirical research had to be discredited or refuted. At the Congressional hearings on MRBs, several speakers denounced the research and explained why they thought it was misleading (U.S. Congress 1979, 31, 79, 304, 337).

MRB opponents use economic research. MRB opponents used the research of reputable organizations to back their contention that the programs should be ended. A flurry of economic research in 1979 and 1980 provided strong evidence against the programs. Using plausible models, several economists (Congressional Budget Office 1979; Tuccillo and Weicher 1979; Forbes, Fischer, and Frankle 1979; Peterson and Cooper 1979; Hendershott 1981) concluded that (1) most MRB funds simply displace mortgage capital that would otherwise be available; according to Tuccillo and Weicher (1979, v), only 15-to-20 percent of MRB loans represented new mortgage lending; (2) MRB loans increased the cost of other tax-exempt bonds; (3) MRB subsidies provided few benefits to lower income households; (4) the subsidies were inefficient, wasting 65 cents of every $1 of MRBs; and (5) MRBs cost the federal treasury between $22 and $30 million per year for every $1 billion of the bonds (CBO 1979).

Other researchers and MRB opponents said the MRBs were inflationary, inequitable, harmful to long-term mortgage lenders, provided to households that become home owners without the subsidy, and ineffective. Some claimed that the most of the value of MRBs went to realtors and builders who raised the price of houses financed with MRB subsidies (Smith 1979; Pope 1979; (Thygerson and Parliment 1979a, 1979b, 1979c).

This research was used by the MRB opponents to counter the claims made by the pro-MRB lobbyists about the impacts of MRB loans. However, the research was dismissed by the supporters. In its two-page newspaper advertisement, E.F. Hutton argued:

It is well recognized, even in economic circles, that models are of limited effectiveness in predicting the behavior of the market. And for every model that is devised to justify government intervention, the free market school will devise one to predict a contrary result. The point is that the market is too complex to be measured by economic equations.

A number of theoretical criticisms can and have been brought against the programs. . . but home ownership for the forgotten families of Amer-

ican Society is not a theoretical matter (E.F. Hutton Talks About Forgotten
American Families 1979).

Debating the costs of MRB programs. The E.F. Hutton advertisement
caught the flavor of the arguments about the impacts of MRB programs.
While the policy research on MRBs indicated that they were not good public
policy, the research was attacked by MRB advocates as being inconclusive,
biased, and wrong. And, indeed, the research was vulnerable to criticisms and
challenges because the economists doing the work had to model extremely
complex housing and mortgage markets to predict the effects of the subsidy
on buyers and sellers in those markets.

Because of the complexity of the markets and the policy instrument, the
task of sorting out the effects of MRBs on housing markets, mortgage
markets, and potential house buyers is a daunting one. To estimate the costs
and benefits of MRBs, economists had to construct mathematical models that
greatly simplify reality, thus requiring extensive, sometimes heroic, assump-
tions. Of course, such quantitative modeling is a standard tool of economists,
and these models build on previous models and are based on tested theories.
Nevertheless, the models and their underlying assumptions are rightly subject
to questioning and challenges.

Such scrutiny of models helps in the academic world to improve and refine
models. However, in the world of policymaking, these challenges to economic
models are intended not as an attempt to further the search for knowledge,
but as a means to discredit disliked research results.

Much of the research in 1979 and 1980 centered on the costs of MRBs.
The CBO (1979, 47) estimated that MRB programs cost about $22.5 million
per year for the term of the bonds for each $1 billion of bonds issued. The
Urban Institute (Peterson and Cooper 1979) concluded that the cost might be
as much as $30 million per $1 billion.

This estimate of lost revenue was based on a model of portfolio adjustment
that incorporated the expectation that investors purchasing MRBs would set
off a chain of portfolio adjustments that ultimately would result in funds shift-
ing from taxable (or partially taxable) to nontaxable investments. In this
model, the researchers assumed that the marginal income-tax rate of the
households shifting funds from taxable to nontaxable instruments was 30 per-
cent. As a result of this shift of funds from taxable to nontaxable investments,
the federal treasury lost tax revenue equal to 30 percent of the interest that
would have been earned on a taxable investment. (For a description of this
model, see U.S. Congress 1983a; Peterson and Cooper 1979, 118-123; and
Galper and Toder 1981).

The CBO predicted that without additional regulation of MRB programs, up to 50 percent of the mortgage market soon would be funded with tax-exempt securities. Based on this prediction, CBO estimated that MRBs would cost the Treasury about $1 billion in 1980, but the costs would increase to $11 billion in 1984 and $22 billion by 1990.

In addition to their direct costs, economic researchers said MRBs have various indirect costs. One of the largest of these costs is an increase in the cost of other tax-exempt bonds. The CBO (1979) and Peterson and Cooper (1979, 103-115) estimated that for each $1 billion in new MRBs sold, the price of all other private-purpose bonds increase by four to seven basis points. These additional basis points would be paid annually for the life of the bonds, averaging about 18 to 20 years.

If the sale of $1 billion of MRBs increases the cost of all other private-purpose bonds sold by four basis points, the $9.94 billion in MRBs sold during 1980 raised the cost of the other $44 billion of tax-exempt bonds sold during the year by $1.75 billion per year for the life of the bonds. According to the CBO and the Urban Institute, this $1.75 billion is a hidden cost of MRBs.

These cost estimates were challenged by MRB proponents. They said the model used to estimate costs was based on an erroneous assumption that biased the estimates upward:

> It is an oversimplification to assume that those who have purchased housing bonds. . . would have used their money to buy taxable securities had these bonds not been available, and thus the Treasury has suffered an income loss equal to the loss of taxation on the interest of these bonds. Municipal bonds are purchased, by and large, by sophisticated investors and so many tax shelters are written into the tax laws. . . that I believe the vast majority would not invest their money in taxable securities but would seek other types of tax-avoidance income (Letter from Hugh Lane, chairman, South Carolina State Housing Authority in U.S. Congress 1979, 304).

Further, MRB supporters said the estimates of the effect of MRBs on the borrowing cost of other state and local programs were mistaken:

> [The CBO study]. . . fails to consider that efficient adjustments in integrated capital markets will mitigate considerable effects on tax-exempts relative to taxable interest rates. A more appropriate analysis would show that both lenders and borrowers shift their attention to adjust to a greater supply of tax-exempt bonds. . . . (Testimony of Gedale Horowitz, chairman, Public Securities Association in U.S. Congress 1979, 334).

The MRB supporters claimed that any lost tax revenues caused by MRB programs would be counterbalanced by tax revenues created by the activity stimulated by the investment of MRB proceeds in housing (Cooper 1979, 573). As one bond lawyer testified:

> It is interesting that opponents claim Federal tax loss to the Treasury; the opposite is true. Not only do housing revenue bonds stimulate the construction of homes at a time when high interest rates could idle the home building industry, but the stimulative economic effects produce extra tax dollars to the Treasury. It produces tax gain, not tax loss (Testimony of Arthur Abba Goldberg, U.S. Congress 1979, 342).

Goldberg's assertion ignored another one of the indirect costs of MRBs: the opportunity cost of the MRB capital. With a fixed amount of savings, only a fixed amount of investment is possible each year. If the MRB programs had not procured capital for housing, the capital would have been invested in industry or other government programs. For example, the capital may have been borrowed by an industrial firm to purchase new equipment; this use of the capital would have created employment for people who built the equipment. Also, the expenditures would have had multiplier effects and would have increased industry productivity, raising real incomes. This economic activity would have generated income and profits that would be taxed.

Do the opportunity costs of MRBs exceed the economic benefits from MRB programs? An assistant secretary for tax policy at the Treasury Department has suggested that the alternative uses of capital would generate roughly the same economic activity and taxable income as MRBs (U.S. Congress 1983b. Others (Toder and Neubig 1985, 402) agree. If so, the net opportunity costs and the net economic gains of MRBs would equal zero. However, Hendershott (1981) concluded that MRBs attract investments away from alternatives that would increase productivity and real income. If so, MRBs would have a net opportunity cost.

The value of ambiguity in policy debates. When policymakers are making decisions, they can be influenced by their perceived knowledge, beliefs, and interests (which may be determined by asking themselves which decision would be better for me, my constituents, or my political career?). Knowledge is usually the decisive factor only when it is clear and unambiguous, and when interests or beliefs are not the dominant factor.[11]

When considering the fate of MRBs, policymakers were confronted with strongly stated opinions about the positive effects of MRBs and with forceful pressure from interest groups supporting the programs. In addition, they were

presented with policy research showing MRB policies were not effective nor efficient. However, this research was vigorously challenged by the interest groups supporting MRBs.

Through their attacks on the evaluations of MRBs, the MRB supporters were able to cast doubt on the research results. In short, they were able to exploit the inevitable complexity of research about MRBs to reduce its credibility. Because researchers were unable to prove definitively that their research was correct or even roughly accurate, their research had a reduced influence on policymakers. In the absence of definitive knowledge, interests, and beliefs could have a stronger effect on the policy decisions about the future of MRBs.

The Regulated Program: 1981-1986

The first congressional fight over MRB programs lasted more than 18 months. A decision on MRBs was not reached until late December 1980, when Congress enacted the Mortgage Subsidy Bond Tax Act (part of the Omnibus Budget Reconciliation Act). This compromise agreement permitted MRB programs to continue while restricting their use.

Program Characteristics

While retaining the same MRB program structure, the HFAs had to operate under the following new restrictions:

Limit on the amount of MRBs each state could issue annually. In each state, the total amount of bonds issued by state and local agencies could be no greater than $200 million or nine percent of the average amount of single-family mortgage loans made in the state during the previous three years. This limit meant that the maximum amount of MRB loans that could be made in the nation in 1983 was about $16 billion and in 1986 was $20 billion.

One impact of this restriction was that SHFAs were designated as the only HFA in most states. The amount of MRBs that could be issued in each state was to be divided evenly between state and local HFAs, unless the governor or state legislature changed the distribution. In 28 states, they decided that MRBs would be issued only by the SHFA. In two states, Arizona and Kansas, the entire MRB allocation was given to local government HFAs. MRBs could be issued by either state or local government

HFAs in the remaining states. In 1984 and 1985, MRBs were sold by local government HFAs in only 16 states.

●*MRB loans had to be targeted primarily to first-time buyers for houses that did not exceed a specified price.* Ninety percent of all MRB loans, except those made in "target areas" (which are discussed next), had to be made to households that had not owned a house within the past three years. The loans could be made only to households that were purchasing houses that cost no more than 90 percent of the average house price in the area where it was located. (That limit was increased by a 1982 amendment to 110 percent of the average house price.)

These restrictions were intended to direct the MRB mortgage subsidies to households that needed them to purchase a house. Such restrictions helped insure that MRBs were fulfilling a public purpose. However, these targeting restrictions were mild and ineffective compared to alternatives suggested by MRB opponents: they wanted MRBs narrowly targeted through guidelines that set low income limits (e.g., 80 percent of the area median household income) for MRB loan recipients or that required proof that each applicant for an MRB loan could not obtain a market-rate loan. However, attempts to set federal income limits were fought off by MRB supporters, who argued that most HFAs had set their own income limits in response to their own special circumstances. They contended that federal limits would be intrusive and unwarranted.

●*MRB programs could give special treatment to people buying houses in "target areas," places with concentrations of low-income households or chronic economic problems.* In target areas, loans could be made to households that already owned homes, not just to first-time buyers. Also, in target areas, the maximum price that a borrower could pay for a house was set at 110 percent (raised to 120 percent in 1982) of the area's average.

Apparently, target areas were created so that MRB loans could be used in places suffering severe economic or social problems to stimulate economic and community development. The presumption behind target areas seemed to be that if MRB loans influenced affluent households to live in these areas, they had served a public purpose.

Because MRB loans made in target areas have fewer restrictions than MRB loans made elsewhere, some HFAs have tried to make the target areas as large as possible. However, because these designations required Treasury Department approval, they were hampered in their efforts. Nevertheless, the target areas in many states are vast. For example, 41 percent of Oklahoma's population lives in the state's target areas. In

southern states, an average of about one-third of all residents live in target areas (NCSHA 1990).

• *The profits that underwriters, HFAs, and others could earn from MRBs were limited.* The fees that underwriters and others could charge for MRB issues were limited by the requirement that the spread between the cost of funds (the interest paid on the bonds) and the amount charged to borrowers could not be greater than one percentage point. (In 1982, in response to numerous complaints, this limit was raised to 1.125 percent.) This requirement insured that borrowers were provided a major portion of the value of the below-market financing.

   Also, complex provisions of the law greatly reduced the arbitrage profits that HFAs could earn on both reserve funds and the unspent balance of their MRB issues. HFAs could no longer keep the profits they made by investing the money raised from tax-exempt bond issues in higher paying instruments. Thus, HFAs could no longer earn large arbitrage profits on new bond issues.

The Mortgage Subsidy Bond Tax Act (MSBTA) was passed as the nation was moving into its deepest post-World War II recession. The recession resulted from action by the Federal Reserve Board to reduce the dangerously high levels of inflation. The Fed's actions pushed interest rates in 1981 and 1982 to levels that were often double the rates of the previous decade. In the summer of 1982, mortgage interest rates peaked at about 18 percent.

   Because of the high mortgage interest rates, rising unemployment, and declining income, house construction and sales plummeted to numbers below half of those in 1978. And HFAs also reduced their activity, even though they could provide mortgage loans with rates substantially below market rates. Even the subsidized MRB loans bore rates well above ten percent. Because of the recession, no state sold its allotted bond amount in 1981 or 1982 (Gensheimer 1982). And in 1981, no MRBs were sold in 22 states.

   HFAs complained that the high interest rates had made it so difficult for enough eligible households to purchase eligible houses (those priced less than 90 percent of the area median) that they—the HFAs—lacked sufficient demand to issue MRBs. They said that this lack of activity threatened the financial health of some agencies that operated without state appropriations.

   In response to these industry complaints, Congress amended the MSBTA in 1982 to make MRB issues more feasible during the recession. The amendments, part of the Tax Equity and Fiscal Responsibility Act, increased the maximum house prices for MRB loans from 90 percent to 110 percent (110 percent to 120 percent in target areas) of the area median, raised the permissible difference between the bond interest rate and the mortgage

interest rate from one percent to 1.125 percent, and permitted up to ten percent of MRB loans to be made to households that already owned a house. At the same time, most HFAs that had set maximum income limits for MRB loan recipients raised them substantially.

These changes increased the pool of eligible MRB loan recipients and made the sale of MRBs more feasible. When interest rates began falling in the last half of 1982, several state and local HFAs quickly issued MRBs.

While the 1982 bond issues stimulated some local housing markets, they proved troublesome for many issuers. Soon after the bonds were sold, market rates fell rapidly, and the decline continued throughout 1983. As a result, market interest rates were soon at or near the same level as the interest rates on available MRB loans. When conventional loan interest rates were the same or less than MRB loan interest rates, few households were interested in taking out an MRB loan. As a result, several MRB programs called their bonds (paid them off early). These abortive programs may have temporarily harmed the reputations of the MRB loan programs involved.

MRB programs regained vigor in 1983 and grew each year until the 1986 tax reform placed more limits on them. However, the policy path during this period was not smooth. MRB programs were threatened with extinction at the end of 1983 by the sunset provision in the 1980 MSBTA. This provision of the act said that MRBs would no longer be tax exempt after December 31, 1983.

"Don't Let the Sun Set On the American Dream"

MRB supporters began in early 1983 to push for legislation to override the "sunset" provision contained in the 1980 MSBTA. The coalition of groups supporting the continuation of MRB programs adopted the slogan, "Don't let the sun set on the American Dream" as part of its lobbying campaign.

Bills to override the sunset provision attracted strong support in Congress. Most popular was a bill that would abolish the sunset provision and set no new sunset date. This bill was the Housing Finance Opportunities Act introduced by Senators William Roth (R-Delaware) and George Mitchell (D-Maine). It had 73 co-sponsors in the Senate; a companion bill in the House of Representatives was signed by 280 co-sponsors (How Tax-Exempt Revenue Bonds Out-Compete Other Loans 1983).

Despite this broad legislative backing of MRBs, the sunset override had a rough journey through Congress. It became a pawn in the game of budget politics. The threatened end of MRBs was used by Dan Rostenkowski (D-Illinois), chairman of the House Ways and Means Committee, and others as leverage to restrict sale of private-purpose industrial revenue bonds and

obtain other tax reforms (Christofferson 1983, 11). Also, the possible end of MRBs was used by Senator Robert Dole (R-Kansas), chairman of the Senate Finance Committee, to get one of his proposals enacted into law: he supported the continued use of MRBs only if HFAs were allowed to substitute for MRBs a mortgage tax credit known as mortgage credit certificates (MCCs)(Shafroth 1983, 2).

The alignment of opponents and supporters of the sunset override was similar to the alignment during the MRB battles of 1979-80, with a few important differences. The opponents still included the Reagan Administration, which adamantly opposed the continuation of MRBs, and the congressional budget guardians, led by Representative Rostenkowski and Senator Dole. MRBs were still disliked by congressional staff members on budget and finance committees and by researchers at GAO and CBO. And opposition to MRBs was still a policy of the League of Savings Institutions.

The coalition of supporters gained the Mortgage Banking Association, but lost the vocal backing of the AFL-CIO, NAHRO, and civil rights groups. Furthermore, zeal for more MRBs had declined in many organizations representing cities, and cities themselves were less active in their support of MRB programs. Nevertheless, the core coalition members—the home-ownership, municipal-bond, and state-government lobbies—were more active than ever. And their activities were coordinated with increasing effectiveness by the National Council of State Housing Agencies and the Association of Local Housing Finance Agencies.

The MRB supporters were again formidable. According to one congressman, the pro-MRB group mounted "the fiercest lobbying campaign I've seen in a long time" (Harney 1983b). And the intensity of the pro-MRB lobby "absolutely amazed" Representative San Gibbons (D-Florida), a member of the House Ways and Means Committee (Harney 1983b).

The Policy Debate Continues

The policy debate on MRBs again featured supporters invoking home ownership symbols, asserting that MRBs produced large public benefits, and trying to discredit the findings of CBO, GAO, and Treasury Department economists. The home-ownership symbol was used in statements like this one by the head of an SHFA:

> This help [MRB subsidies] was an official endorsement of the value of owning a home. It reflected the belief that home ownership was a fundamental right--a part of the American Dream (Ritchie 1983).

Supporters also made assertions such as these:

> . . .[M]ortgage revenue bonds have provided a needed source of affordable
> financing for families who found themselves hopelessly priced out of home
> ownership. (Public Securities Association, quoted in Voinovich 1983, 155)

> [MRB programs in target areas] not only benefit individual home buyers
> but also revitalized declining neighborhoods (Cuomo Responds to Dole in
> Mortgage Subsidy Bond Program 1984).

> Some 700,000 people, most first-time homebuyers, have been able to get
> into the housing market thanks to bonds (Thomas White, executive director
> of the Council of State Housing Agencies, quoted in Tax-Exempt Financing
> in Jeopardy 1983).

MRB supporters in 1983 and 1984 emphasized the economic development
benefits of MRBs more than their community development impacts. John
Ritchie, executive director of the Virginia Housing Development Authority,
stated this in a *Journal of Housing* article:

> It is important to remember, too, that MRB financing generates jobs and
> tax revenue, a total economic impact that should not be ignored. In 1982
> in Virginia alone, for example, our single-family home loan program gen-
> erated 6,600 man-years of employment, $103 million in wages to construc-
> tion and housing industry employees, $21 million in federal income taxes,
> $18 million in state income taxes, and $5 million in local property taxes
> (Ritchie 1983).

In his defense of MRBs, Wallace Ford 2nd, executive director of the New
York Mortgage Agency, asserted that the economic activities generated by
MRB subsidies "far exceed the initial investment cost of the tax-exempt status
[of the bonds]. . . .The economic benefits are clear and undeniable" (Ford
1983).

The existence of these economic benefits was denied by MRB opponents
who said that MRBs do not provide large economic benefits because they are
given mostly to households that would have bought houses without the
subsidies and that if the capital raised for housing through MRBs had instead
been put to its best alternative use, the economic effects (years of employ-
ment, wages, and taxes) would have been at least as much as those created by
the housing investment (U.S. Congress 1983a, 24).

The continuing debate over costs. As in the 1979 congressional hearings, in the 1983 hearings the cost of MRBs was a focal point of the policy debate. MRB opponents continued to cite the research showing that MRBs cost $22 to $30 million per $1 billion of MRBs issued. Using these figures, they estimated that the cost of extending the sunset for three years would be $15 billion (U.S. Congress 1983a, 33).

MRB supporters stepped up their attack on this estimate. This time they had a counter-theory formulated by Roger Kormendi and Thomas Nagle, University of Chicago economists. According to Kormendi and Nagle (1981; U.S. Congress 1983b, 451-453), the real cost of MRBs was less than one-half of the Treasury Department estimate.

The differences between the Treasury-CBO model and the Kormendi-Nagle model are created through different assumptions about how an increase in tax-exempt bonds affects the behavior of investors. As explained earlier, the Treasury model is based on the assumption that the marginal investor switches money from taxable to nontaxable investments in response to MRB issues. The CBO described this model as follows:

> The underlying assumption is that tax-exempt financing ultimately displaces taxable financing. New issues of tax-exempt securities cause investors to shift their asset holdings. Some investors move from taxable bonds, which are taxed at ordinary income rates, to equity, which is taxed at lower capital gains rates. Others may move from equity to tax-exempt bonds. In determining revenue losses, the significant measure is the net change in all portfolio holdings resulting from tax-exempt bond issues. Accordingly, the relevant marginal tax bracket is a combination of the tax rates of the last investor who switches from partially taxable holdings, such as equity, to tax-exempt holdings and the investor who moves from fully taxed to partially taxed holdings. This combined tax rate roughly corresponds to the spread between tax-exempt and taxable interest rates, which historically has averaged 30 percent (U.S. Congress 1983a, 63).

Kormendi and Nagle argued that the Treasury-CBO model is "based on assumptions about investor's portfolio holdings that do not conform to the facts" (U.S. Congress 1983a, 453). They concluded that an additional supply of MRBs creates a complex readjustment of portfolios as investors consider risk as well as returns. The result of the readjustments is that only a small portion of the MRBs replaces fully taxable investments, while most MRBs are substituted for partially taxable investments, mainly equities. They estimated the relevant tax rate of the marginal investor is ten percent rather than 30 percent. In other words, marginal investors switch from investments that

would be taxed at ten percent to tax-exempt MRBs. Thus, the losses to the Treasury are much less than predicted by the Treasury-CBO model.

These competing models presented a problem for policymakers concerned with the costs and benefits of MRB programs. If they wanted to figure out which model seemed most believable, they had to examine closely the assumptions incorporated in the models and the empirical evidence that had been generated. Even then, they would find no definitive answer, only arguments supporting one side or the other. Thus, the dueling economists left the decision makers unable to decide based on research knowledge.[12]

The supporters and opponents did move closer to some agreement on the effect of MRBs on the cost of other bonds. Treasury economists decided that the best estimate of this cost was one basis point per year per $1 billion of bonds issued, substantially less than the original estimate of four to seven basis points. In their research, Kormendi and Nagel estimated the cost at .6 basis points. Another set of researchers, Toder and Neubig (1985, 413, footnote 22) concluded that the cost would be .37 basis points per $1 billion of MRBs issued.

Costs and benefits according to GAO and its critics. Much of the policy debate concerned an evaluation of MRB programs by the United States General Accounting Office. In its report, the GAO (1983) concluded that, in 1982, MRBs cost four dollars for every dollar of benefits they provided. In addition, it contended that 75 percent of the households receiving MRB subsidies could have qualified for a market-rate loan.

These findings were potentially devastating in the policy debate on the future of MRB programs, so MRB supporters attacked the GAO findings and constructed its own cost-benefit analysis (NCSHA 1983). Predictably, this analysis found MRB programs to be very cost-effective.

The MRB supporters' attack on the GAO report accused the agency of writing an "advocacy document, not an objective analysis" (testimony of Ritchie, U.S. Congress 1983a, 403). They did not explain why the GAO would be biased when it, unlike most of the MRB supporters, had no direct economic interest in the continuation of these programs.

Many of the complaints about the GAO study raised important points. For example, the NCSHA (1983) pointed out that the study used data from an abnormal period, when interest rates were at their highest levels in post-World War II history. It asked if the findings from this period could be generalized to times when interest rates were nearer historical averages. The NCSHA critique also raised questions about the assumptions used to calculate the costs: it accused the GAO of overestimating the percentage of bond issue

funds that was put into reserve funds. It also said that GAO used the wrong
discount rate to calculate the value of MRB subsidies.

The NCSHA disputed the GAO's finding that most households receiving
MRB subsidies could have afforded to purchase their houses with market rate
loans. It cited estimates of national median incomes and median sales prices
to contend that "most American families were priced out of the market in
1982" (NCSHA 1983).

MRB supporters also charged that the GAO report ignored the beneficial
social externalities of creating new home owners. And they said that the
GAO ignored the role of MRBs as a stimulus to the housing industry during
the 1980-82 recession. Further, they complained that the GAO took no note
of their housing rehabilitation programs.

Whatever the flaws of the GAO report, it set the terms of the policy debate
in 1983 and forced the MRB supporters to provide information to back their
assertions about the value of MRB programs. In the end, the supporters
produced and skillfully used counter-research that backed their position.
While the GAO report was probably damaging to MRB supporters, the sup-
porters limited the damage by using arguments and research that countered
many of the MRB conclusions. At a minimum they succeeded in creating
doubt about the validity of GAO's findings, and again the ambiguity of the
knowledge about MRB programs reduced its influence.

New Legislative Provisions

A sunset extension was passed by the Senate in July 1983; however the
extension was killed in a conference committee. A year later, the sunset ex-
tension was finally adopted as part of the Deficit Reduction Act. This 1984
legislation extended the sunset date to December 31, 1987 and changed the
law governing MRB programs in two major ways:

*•HFAs were given the option to substitute mortgage credit certificates
(MCCs) for MRBs.* The MCC is a nonrefundable tax credit of 10 to 50
percent of a household's mortgage interest payments. If the tax credit is
20 percent or more, the maximum annual mortgage tax credit is $2,000.
Each local or state housing finance program may substitute the MCCs for
a portion of the allocated amount of MRB authority.[13]

*•MRB issuers were required to provide more information about the bond
issues.* Each MRB program is required to have a policy statement about
the goals it will achieve with the MRBs, to hold a public hearing on their

policies, to report information about each issue, and to report annually about how the MRB loans helped low- and moderate-income households.

This legislation revived MRB programs from a temporary sunset (during the first half of 1984, HFA could not issue MRBs). Through it, the supporters of MRBs won a clear victory, gaining new life for MRB programs while avoiding new major restrictions on their use.

MRBs After the Tax-Reform Legislation: 1987-Present

With the sunset question resolved for three years, HFA leaders probably expected, for a least a couple of years, a stable political environment for their programs. However, they got no respite from attack: soon after the sunset fight, MRB programs were threatened by tax reformers who wanted to slash individual tax rates and close tax loopholes.

Background: MRBs and the Tax Reform Proposals

The Reagan Administration's first tax-reform plan was formulated by the Treasury Department, long an adamant enemy of private-purpose municipal bonds like MRBs. This plan, known as Treasury I, was designed to purify the tax system. According to the reformers, the tax system should collect taxes and, with a few exceptions required by politics, should not be used for social or economic purposes. Instead, social and economic goals should be pursued through on-budget programs enacted by Congress.

Treasury's initial tax plan included an end to the use of private-purpose bonds, including MRBs. Tax experts at the Treasury Department and in Congress, and also most public finance economists, favored stripping tax expenditures from the tax code because they believe tax expenditures are wasteful and evade democratic controls (Surrey and McDaniel 1985). And, according to many of these experts, among the most wasteful tax expenditures were private-purpose bonds (the testimony of Joseph Minarik and Harvey Galper in U.S. Congress 1985; Zimmerman 1988, 107-113; for a different view, Nagel and Onge 1988).

Private-purpose revenue bonds were disliked for reasons other than their inefficiency. They were unpopular with the Reagan Administration, who saw them as unwarranted interventions in private markets. Also they were not viewed favorably by many members of Congress. According to Margaret Wrightson, who was staff director of the Senate Governmental Affair's Subcommittee on Intergovernmental Relations while tax reform was being considered, many senators and representatives disliked tax-exempt bonds

because the bond financing yields them no political credit. She noted, "Members of Congress prefer traditional funding for pork-barrel projects that give them an opportunity to grandstand and thus enhance their own power" (Stevens 1988).

The experts and officials opposed to private-purpose revenue bonds had been alarmed by their increasing use. In the decade before 1985, several new types of private-purpose bonds had been created and the dollar volume had grown tremendously, costing the federal government an increasing amount of tax revenue. The sale of revenue bonds had increased by more than 500 percent from 1976 to 1984. Then from 1984 to 1985, the volume of revenue bonds had doubled.

The Treasury's initial tax reform proposal caused such an outcry among the harmed special interest groups that it was revised. Its successor, Treasury II, released in May 1985, was the Reagan Administration's official tax-reform proposal. The authors of Treasury II altered many controversial parts of Treasury I, but still proposed elimination of the tax exemption of private-purpose revenue bonds.

As defined in Treasury II, a bond is a private-purpose revenue bond if more than one percent of its proceeds is used (directly or indirectly) or is repaid by any entity (person, organization, or business) other than a state or local government. Treasury II, if enacted, would have stopped HFAs from carrying out their main activity, issuing tax-exempt MRBs. Because most of the funds raised through MRBs is loaned to households to finance house purchases, under Treasury II, MRBs would clearly have been defined as private-purpose bonds. Thus, if Treasury II had been enacted, MRBs would have no longer been tax exempt.

The Legislative Battle Over Private-Purpose Bonds

After receiving the Treasury II proposal, the Ways and Means Committee began considering tax reform. The committee was deluged by single-minded lobbyists trying to protect the advantages given their clients in the existing tax code. Hundreds of lobbyists competed for the ears of committee members and their staff assistants. And the lobbyists fought for high stakes: according to one analyst, businesses and individuals received over $365 billion in tax breaks during 1985 (Makin 1985).

From the standpoint of MRB advocates, their tax-reform lobbying was like trying to be heard in the midst of a hurricane. They were competing with the noise of frantic lobbyists concerned with hundreds of proposed tax changes that would affect millions of people and cost billions of dollars. And the MRB advocates were handicapped because they could not fully mobilize their

usual allies; many members of the MRB coalition, concerned with other tax reform proposals, were fighting several battles. For example, many state leaders strongly opposed a proposal to end the deductibility of state and local tax payments from federal taxes. They, led by Governor Mario Cuomo of New York, labored hard to defeat that proposal. Also, NAR members feared that Congress might end the tax deductibility of mortgage interest paid on houses, including second houses, and it lobbied to stop such an idea from making progress. Their worry about mortgage interest deductions was shared by the NAHB, who was further concerned about the threatened loss of accelerated depreciation for real estate investments. Because of such concerns, members of the MRB coalition could not devote their full energies to stave off the threat to MRBs.

In the political maelstrom created by tax reform proposals, the leading defenders of MRBs were the PSA, the HFAs, and the two trade groups, NCSHA and ALHFA. The PSA vigorously opposed the tax-reform assault on all municipal bonds, including MRBs. In 1985 alone, the PSA spent $1 million to hire one of Washington's top lobbying firms, Charls E. Walker Associates, a big-eight accounting firm for policy research; and a firm, National Strategies and Market Group, that specializes in grass-roots lobbying. This grass-roots lobbying firm hired seven "regional organizers" to help local bond dealers round up local officials to oppose restrictions on municipal bonds (Clark 1986; Garment 1985).

As the representative of Wall Street, the PSA had many assets to support its lobbying, but also some liabilities. According to a well-placed observer, the investment bankers alienated members of Congress by urging that tax-exempt bonds be left alone instead of helping find a middle ground between the status quo and the President's proposals. This observer, Ben Hartley, a senior staff member of the Ways and Means Committee, said that municipal bonds suffered in 1986 "because members of Congress assumed that the only real beneficiaries of the municipal tax exemption were investment bankers and bond lawyers who assist state and local governments" (Pryde 1989a; also Clark 1986).

The NCSHA and ALHFA waged a spirited fight for MRBs, but lacked the resources of wealthier threatened groups such as the insurance, banking, and oil interests. They were among the dozens of smaller, usually potent special interest pleaders trying to stop the momentum of the reform. And they faced a steep uphill fight because, in the peculiar dynamic of this tax reform, their pro-reform opponents had the upper hand: their views on the need for a purer tax system had become the guiding principals of the reform.

Wrightson (1989) has suggested that the MRB supporters—and other previously successful interest groups—could not defeat the new restrictions because the dynamics of tax reform changed the usual rules of budget-making.

She wrote that the tax reform temporarily overturned the old rules that had produced a tax code "strongly favoring smaller, organized interests (including states and localities) at the expense of the broader tax-paying public." Instead, the tax reform's political imperatives caused members of Congress to pay less attention to individual interest groups; these members found themselves pushed and pulled by such things as the need to avoid blame, the demands of party leadership, and the pressures of publicity. In this situation, "norms favoring wholesale purification of the federal tax code" were "elevated to unprecedented levels of influence" (Wrightson 1989).

With the dynamics of tax reform working so strongly against them, perhaps it is should be less surprising that MRBs were further restricted than that they survived with so few new restrictions. The enemies of private-purpose bonds were at full strength in this legislative fight; despite the precarious position of MRBs, they survived.

The Tax Reform Provisions

The tax reform enacted by Congress in September 1986 affected MRB programs in the following ways:

HFAs can issue fewer MRBs. The amount of MRBs that may be issued each year was reduced. Under the old law, each state could issue a maximum of $200 million or nine percent of the average amount of mortgage loans issued in the state during the previous three years, whichever was greater. After tax reform, MRBs are defined as "capped" municipal bonds along with bonds for several other uses, including multi-family housing, small-issue industrial development bonds, student loans, and facilities for sewer and solid waste disposal.[14] The amount of capped private-purpose bonds that each state could issue in 1986 and 1987 was limited to $250 million or $75 per capita, whichever was greater. Beginning in 1988, the cap was set at $150 million or $50 per capita. In 1986, the total amount of capped bonds that could be issued in the United States was about $21.3 billion; in 1988 the amount dropped to $14.2 billion (Solem 1987; *Housing and Community Development Reporter* January 23, 1989, 794).[15] In comparison, in 1984 about $52 billion of bonds that would be subject to the cap were sold (Solem 1987, 420).

If an HFA does not issue the amount of bonds allotted to it for the year, it may "carry forward" its remaining allotment for up to three years. Thus, HFAs are not required to issue all of the bond amount allotted to it within the year of the allotment. They have some flexibility in scheduling the use of their bond authority.

•MRBs have to compete with other types of capped private-purpose bonds.
Given the maximum amount of the capped bonds that may be issued each
year, state legislatures determine what percentage may be issued by the
state government and what percentage by local governments. (If the state
legislature does not distribute the bonds, the state's annual volume is
divided evenly among cities and the state.) After the shares are known, the
state and local governments determine the types of projects they will fund
with their bonds.

• The MRB loans are more targeted. Under new restrictions, MRB loans
may be made only to households buying houses costing less than 90 percent
(or 110 percent in target areas) of the area average house sales price. And
the loan recipients may earn no more than 115 percent of the area or state
median family gross income, whichever is greater. In target areas, up to
one-third of the loans may be made without regard to the income limit and
the other two-thirds of the loans may go to borrowers whose incomes do
not exceed 140 percent of the area or state median.

At least 95 percent of the MRB home-purchase loans must go to first-
time home buyers. However, loans made in target areas are exempt from
this requirement. So, MRB subsidies in target areas may be given to
households that already own a home.

Target areas are favored in another way: at least 20 percent of the
loanable proceeds of an MRB issue must be reserved for at least one year
for households buying houses in the target areas. Whatever portion of this
reserved money is not loaned out during the year can then be used
anywhere in the state.

•MRBs may provide a smaller subsidy. The spread between market-rate
mortgage loans and MRB loans may decline, reducing the loan subsidy.
The major cause of this smaller spread would be the reduction in marginal
tax rates. With lower marginal tax rates, investors must receive higher
interest payments on tax-exempt bonds in order for their after-tax income
to be as high with tax-exempts as with taxable investments. See chapter 3
for a discussion of how the 1986 Tax Reform Act may affect, in the long
run, the value of MRB subsidies. See chapter 6 for evidence that the tax
reform had not reduced the "effectiveness" of subsidies.

•Arbitrage profits were reduced. The tax reform contained a complex set
of rules to prevent issuers of tax-exempt bonds from earning large arbitrage
profits. These rules, in effect, require that excess interest (profits) earned
on the non-purpose investment of bond funds (i.e., bond funds not used for

mortgage loans) be returned to the federal government (Nagel and Onge 1988, 296).

A new sunset date was set. Even with all of the new restrictions on MRBs, HFAs faced another threatened end to MRBs in less than 16 months. The tax reform legislation set December 31, 1988 as the date on which MRBs would no longer be tax exempt.

In addition to these limitations on single-family MRB programs, the 1986 tax reform also clamped even tighter restrictions on the use of tax-exempt bonds for multi-family housing.   These new restrictions have greatly reduced the amount of bonds that HFAs are issuing for multi-family housing. Together with the smaller scope of MRB programs, the reductions in multi-family programs have caused many HFAs to scale back their operations. At a minimum, the changes have ended the growth of these programs.

The 1988 Technical Corrections Act

In October 1988, Congress enacted the Technical and Miscellaneous Revenue Act to correct errors made in the 1986 tax reform act and take care other problems the act had created. This legislation had several provisions that helped issuers of private-purpose bonds, including HFAs. For example, it permitted households with higher incomes to be eligible for MRB subsidies if they live in high-housing-cost areas. In those areas, households earning up to 140 percent of the area median family income may receive the subsidized loans (White 1989). Also, this act extended the tax exemption for interest earned on MRBs—the sunset date—to December 31, 1989.

In addition to these provisions benefitting HFAs, this act added three new restrictions on MRBs:

• A lower income limit was set for smaller households; a household consist-ing of only one or two people is eligible for an MRB subsidy only if it earns less than 100 percent of the state or area median family income. Larger households can still qualify for MRB loans if they earn less than 115 percent of the state or area median income.

• All loans from the proceeds of an MRB issue must be made within three years from the date of the issue.

• A portion of an MRB subsidy may be recaptured for MRB loans made beginning January 1, 1991. After that date, house buyers receiving MRB

loans may be required to repay part of the value of the subsidy out of the
increased value of the house when it is sold. The amount of the repay-
ment, up to 6.5 percent of the original principal amount, will depend on
how long the household remains in the house. No repayment will be re-
quired if the household stays in the house more than ten years, has not
substantially increased its income, or does not get a higher price for the
house than it paid. Also, the household will not have to give up more than
50 percent of the increased value of the house (Pryde and Ahearn 1988 and
White 1989).

The Politics of the 1988 Sunset Legislation

One part of the technical corrections legislation was an extension of the
sunset date for MRBs. The tax reform act had set January 1, 1988 as the date
on which MRB bond issues would no longer be tax-exempt. So, after the tax
reform act was enacted in September 1986, the pro-MRB forces had little
time to rest before gearing up again to fend off the latest attempt to end the
bond program.

In this 1988 sunset fight, the pro-MRB forces faced another formidable
challenge: surviving in the Gramm-Rudman-Hollings era (Allan 1988, 20).
Congress considered MRBs in the context of all revenue decisions to be made.
And congressional leaders, led by Representative Dan Rostenkowski (D-
Illinois), insisted that changes in the tax code had to be tax neutral: any costs
had to be balanced by additional cuts or new revenues. Because overriding
the sunset of MRBs would cost the federal treasury about $400 million over
three years (Joint Tax Committee 1988), its success depended on finding
additional matching savings or revenues.

Though the sunset-override fight was a difficult one, the pro-MRB forces
were in a much better position to lobby successfully in 1988 than they had
been in 1986. The issues on the table were much smaller and public interest
in tax issues had declined. In most ways, budgeting politics had returned to
normal: the small, well-organized interest groups were no longer public
villains. They could concentrate their efforts to retain or extend their tax
privileges without being publicly excoriated as enemies of the people.

The pro-MRB forces, led by the NCSHA, used a "grass roots strategy" to
persuade Congress to extend the sunset override (Pryde 1988 and Falcioni
1988).[16] They mobilized state and local officials to press Congress for the
extension. The NCSHA sent their lobbyists out to SHFAs to encourage them
to persuade state and local leaders in each region to pressure Congress into
extending the exemptions (NCSHA 1987b).

The sunset battle in 1988 was more difficult than the one in 1983. According to an MRB lobbyist, before the 1986 tax reform, asking senators and representatives to support MRBs had been like "Jerry Lewis and the [muscular dystrophy] telethon"; they had been eager to participate (Pryde 1988). But in 1988, because of concern about the budget deficit, MRBs were a harder sell.

The sunset-override legislative fight had the usual faces on both sides. The same coalition of MRB supporters backed the sunset override, and the opposition was again led by Treasury, GAO, and tax committee staff experts. The opposition forces were buttressed by a GAO (1988) study of MRBs that found MRBs to be poor public policy, but supporters had their own academic research showing the value of MRBs (Wrightson 1988).

In the end, the pro-MRB forces won a mixed victory. The House approved a six-month extension of the sunset; the Senate approved a two-year extension (Mortgage Bond, Credit Certificate Program Extended 1988). The conference committee agreed to a one-year extension. Thus MRB supporters got their extension, but only for one year instead of the four they had requested. In addition, a couple of new restrictions (described above) were placed on the bill.

The policy debate revisited. The 1988 sunset debate again featured strong disagreement over a report by the General Accounting Office. In March 1988, the GAO released a report titled, *Homeownership: Mortgage Bonds Are Costly and Provide Little Assistance to Those in Need.* In this report, GAO researchers analyzed a sample of 178,000 MRB loans and concluded that 56 percent of the loan recipients in the sample could have qualified for a market fixed-rate loan. Another 12 percent could have qualified for a market adjustable-rate loan. In addition, GAO found that the recipients of MRB loans resembled closely the socio-economic make-up of all first-time buyers. Based on this analysis, GAO concluded that MRBs have little effect on the number of households that buy houses, but might have a small effect on the timing of the decision to buy a house.

The GAO report estimated that MRBs provide only 12 to 45 cents in benefits per dollar of expenditure. As in its earlier analyses, GAO estimated the cost to be $20 to $30 million per year per $1 billion of bonds issued. And it calculated the benefits as the difference between house payments at the market rate and the MRB rate. It noted that the rate spread—and therefore the subsidy—had declined since enactment of the Tax Reform Act of 1986, and it found that the average after-tax subsidy was about $40 per month. With such a small subsidy, the GAO (1988, 32) observed, "A benefit of this

size cannot be expected to make a material difference for any but the marginally unqualified buyer."

The report evoked strong protests from MRB supporters who accused GAO of again making an unfair and biased analysis of MRBs (GAO 1988, 109; National Association of Home Builders et al. 1988, 1). They protested, "GAO's basic assumptions disavow the nation's belief that home ownership is a desirable public goal."

Their critique of the GAO study asserted that the agency made poor assumptions and used the wrong methodology. And, the critics wrote, "GAO employed its standard approach of calculating efficiency, assuming the highest possible cost to the government and the narrowest definition of benefit" (NAHB et al. 1988, 3).

The MRB supporters cited the research of Wrightson (1988) to show that the population of MRB loan recipients had lower median incomes and bought cheaper houses than the first-time buyers receiving conventional, VA, and FHA shows (NAHB et al. 1988, 5; Wrightson 1988). They concluded that these comparisons "clearly indicate the success that states have had in fitting [MRBs] into the lowest end of the home-ownership market."

The supporters then constructed their own cost-benefit analysis. In it, "the limited GAO type calculation is adjusted to account for more sophisticated investor behavior and economic impact" (NAHB et al. 1988, 19). While the GAO benefit-cost ratio was less than 50 percent, the supporter's "adjusted efficiency model" incorporating "more sophisticated" behavior yielded a different benefit-cost ratio. It showed for every dollar of MRBs issued there were only 46 cents of lost tax revenue and $16.47 of benefits (NAHB et al. 1988, 19).

This benefit-cost analysis included in the benefits such things as the value of new construction, expenditures at the sale of the house, purchases after the sale (including furnishings and repairs), lenders' net income (e.g., origination fees), mortgage insurers' income, state and local taxes, and a multiplier effect. It did not include the opportunity costs of the capital, the best alternative investment that also would yield expenditures, profits, fees, and a multiplier effect.

This policy debate again was not conclusive. The GAO report was the best evaluation of MRBs that had been produced, but the MRB supporters did its best work in its rebuttals. Again, the supporters fended off the GAO research results and other attacks; they obtained another sunset extension.

The Supreme Court Rules on Bond Restrictions

Throughout the legislative battles to restrict use of private-purpose bonds, many bond issuers and bond users maintained that the federal government is prohibited by the doctrine of intergovernment immunity from restricting or regulating the use of bonds. In law articles, as well as in statements before Congress, bond lawyers, state and local officials, and underwriters asserted that federal laws that restrict the use of municipal bonds are unconstitutional (Robinson 1982; Goldberg 1981; US Congress 1979 and 1983A).

The first court challenge to federal restrictions on municipal bonds was made in response to a provision in the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982. This provision removed federal income tax exemption for interest on municipal bonds that were issued in bearer, rather than registered, form. This part of TEFRA was challenged in a suit by South Carolina and the National Governors Association who said it violated the Tenth Amendment and the intergovernmental reciprocal tax immunity doctrine. (For background on the case, see Lesser 1986 and Wrightson 1989)

In 1988, the Supreme Court ruled against South Carolina (*South Carolina v. Baker, Treasury Secretary of the United States*), making it clear that "there is no Constitutional barrier to the imposition of federal income taxes on interest paid to municipal bond holders." The Court said that "the modern theory of intergovernmental tax immunity does not require Congress to provide tax exemption on the bonds that States issue" (Elser 1989, 7). And the court went on to say that Congress has wide latitude in regulating state activities (Wrightson 1989; Davie and Zimmerman 1988)

This decision headed off challenges to parts of the 1986 tax reform affecting municipal bonds. Two tax reform provisions that had been challenged in federal courts were the inclusion of interest earned on tax-exempt bonds in taxable income for the corporate and individual alternative minimum tax and the arbitrage rebate requirements. This court challenge had been filed by the Government Finance Officers Association, the city of Atlanta, the State of Georgia, and the National League of Cities against the Treasury Department; after the South Carolina decision, the suit was withdrawn (*Housing and Development Reporter* July 25, 1988, 220)

The Sunset Fights Continue

Because the 1988 Technical Corrections Act set December 31, 1989, as the new MRB sunset date, MRB advocates had to shepherd another sunset extension through Congress in 1989. This time, they asked Congress to make permanent their right to issue MRBs by setting no new sunset date. This

request was supported by many senators and representatives, but was opposed by the Bush Administration and the Treasury Department. It was approved by the Senate Finance Committee, and reportedly, was nearly accepted by a conference committee. However, it got caught in the politics of deficit reduction and the capital gains tax, and the sunset date was extended only nine months, until September 30, 1990 (Pryde 1989a, 1; 1989b, 1).

MRB activists tried again in 1990 to get Congress to abolish a sunset date for use of MRBs. And again, MRBs were caught in the effort to decrease the budget deficit. As part of that effort, Representative Rostenkowski insisted that new tax expenditures had to be matched by spending cuts elsewhere (Henry 1990, 23; 1991, 26). Caught in the deficit crunch, MRB advocates were able only to get another year extension of the MRB sunset date.

Still again in 1991, MRB proponents were attempting to make MRBs permanent. They were able to get 78 senators to co-sponsor legislation that would accomplish that goal. Similar legislation was supported by 21 of 36 members of the House Ways and Means Committee. Despite this support, they still faced a tough fight because of Congress' "pay as you go" principal that required MRB backers to find budget cuts to offset the future taxes that would be lost because of MRBs (*Muni Week* March 4, 1991, 31).

NEW DIRECTION OF HOUSING FINANCE AGENCIES

Most state housing finance agencies have now been operating for at least 15 years, and almost all state and local HFAs have been issuing MRBs for a decade or more. In their years of operation, a large portion of the HFAs, especially the SHFAs, have progressed beyond their original form and scope of operation; a majority of them now operate programs other than the plain-vanilla MRB program. In fact, several HFAs have pioneered new approaches and instruments to subsidize the purchase or rental of houses by low- and moderate-income households.

As HFAs have aged and matured, many have taken on additional respon-sibilities and become more capable organizations. These organizational changes, the 1986 tax return legislation, and federal housing policy during the 1980's have caused most HFAs to move in three new directions:

• they play an increasingly important role in implementing federal housing programs and in the growing state role in housing policy;

• they have become major, sophisticated participants in financial markets; and

•several have become diversified authorities administering multiple programs, including economic development financing.

Each of these trends is discussed in the following sections.

HFA's Increasing Roles in National and State Housing Policies

In the 1980s, the federal government sharply decreased its expenditures on housing assistance. This decrease began at a time when millions of low-income households still lived in substandard housing, and as the decade progressed, the housing problems of low-income housing multiplied. The most visible evidence of the nation's housing problems has been a rise in the number of homeless households.

As federal government housing subsidies for poor households have declined, state and local governments have stepped up their expenditures on housing. However, not all states and cities spend money on housing assistance: in many states the use of state and local government funds for housing is not accepted as a legitimate, or at least a priority, outlay. Even the state and local governments with housing programs expend, with few exceptions, small sums on them. Nevertheless, an increased role for states and local governments in the housing market is a clear trend.

Administering Federal Government-Financed Programs

While the federal government budget outlays on housing have declined, the number of households assisted by federal funds has risen. The shrinking federal housing expenditures have been concentrated in voucher-like programs, instead of more expensive building subsidies. These programs provide about two million households with rent-payment assistance. They are administered, at least in part, by some SHFAs. For example, the Section 8 rental subsidy program and the federal government's housing certificate and voucher programs are administered by SHFAs in almost half of the states.

Also, most SHFAs also implement the largest federal housing initiative to stimulate new construction or rehabilitation of housing for low-income renters. They play a major role in allocating the low-income housing tax credits (LIHTC) in 45 states (U.S. Congress 1988a).

This initiative, the LIHTC, was created as part of the 1986 tax reform legislation and is the major federal subsidy program designed to increase the supply of low-income housing. It provides tax credits to developers who build low-income housing that meets the policy guidelines. In 1989, the LIHTC

program offered developers tax credits totaling $307,262,000 (*Housing and Development Reporter* January 23, 1989, 794).

In the future, SHFAs will likely play an even larger role in administering federal government housing initiatives.   For example, they are major participants in the Cranston-Gonzalez National Affordable Housing Act, passed by Congress in 1990. Included in this legislation was the HOME Investment Partnership Act that distributes funds for housing assistance, based on a formula, to states and large cities. The federal money must be matched in part by state and local funds.[17] In many states, HFAs will implement the HOPE program, including the requirement that each state prepare a Comprehensive Housing Affordability Strategy.

State and Local Housing Programs

The decline of federal government expenditures on housing has left a void that many state and local governments are trying to fill. In a study of new state and local housing programs, Michael Stegman and David Holden (1987, 3) wrote, "To a greater extent than ever before, housing needs are being recognized as a legitimate area of state and local concern. Thus the legitimacy of housing's claim to a growing share of locally generated revenues is now more widely accepted than it ever has been."

According to Mary Nenno (1989), in fiscal year 1989 local governments spent $10.5 billion and state governments spent $2.1 billion of their own funds on housing and community development programs. These expenditures were a 48 percent increase over such expenditures in fiscal year 1982. Nevertheless, they were still tiny compared to state and local expenditures for other functions of government.

The number of state housing programs has been rapidly rising. Some of these programs are financed by state appropriations, others by surplus funds earned by SHFAs on their bond programs. According to the Council of State Community Affairs Agencies (COSCAA), before 1980 only 44 state-funded housing programs existed, primarily in California, Connecticut, and Massachusetts. However from 1980 to 1987, states created 112 new housing programs (Sidor 1988, 7). Since 1987, the creation of housing programs has probably accelerated. Among the most active states in recent years have been New York, New Jersey, and Maryland. Also, smaller states such as Rhode Island, Maine, and Virginia have been particularly innovative in creating many small programs narrowly targeted to needy groups.

Within state governments, the responsibility for administering these new housing programs has been divided between the SHFAs and the state community affairs or housing agencies. In some states, the SHFA is the main

implementer of housing programs; in others, the community affairs or housing agency is the organization that administers the program; and in still others, the responsibility is shared.

An example of a state housing program administered by an SHFA is the Housing Opportunity for Maine (HOME) trust fund. This trust fund was originally established in 1982 and was funded through state appropriations. However, in 1985 the program changed: it was assigned a portion (45 percent) of the revenues from the state real estate transfer tax. This tax raises about $5 million a year for the trust fund. The trust fund revenue is used by the Maine State Housing Authority (MSHA) for a variety of programs, including a program to lower the mortgage interest payments on MRB loans for some lower income households, a housing rehabilitation loan program, and a variety of innovative rental housing programs.

Another example of a recent state-funded program is found in Tennessee. In 1988, the state legislature, responding to the governor's recommendation, created the Housing Opportunities Using State Encouragement (HOUSE) program funded by an increase in the real estate transfer tax and the mortgage recording fee, plus surplus earnings of the Tennessee Housing Development Agency (THDA). These funds, administered by the THDA, are granted to local governments for housing programs that help low-income households (those earning less than 80 percent of the area median) and very-low-income households (those learning less than 50 percent of the area median). In the 1989 fiscal year, the THDA will have about $6.2 million in the HOUSE fund to grant for local government housing programs (*Tennessee Housing Journal* December 1988 and May 1989).

Several SHFAs use surplus funds from their operations to finance housing programs. These surplus funds consist of the money in excess of the amount needed to repay bond holders or to hold in reserves. An example of a surplus-funded program is a program operated by the Kentucky Housing Corporation (KHC). The KHC transfers "excesses in the debt service reserve funds" to reduce the interest rates on mortgage loans made to some households earning less than 75 percent of the state median family income. This fund provides about $5 million a year to lower the mortgage interest rates for these low-income households to as little as one percent.

An example of an innovative use of surplus funds is found in Virginia where the Virginia Housing Development Authority has established a "Virginia Senior Home Equity Account." This program permits low-income elderly home owners to borrow against the equity they have in their houses. A loan recipient is charged a below-market interest rate and does not have to repay the loan as long as it resides in its house. In most cases, the loan will be repaid from the estate of the borrower.

Major, Sophisticated Participants in Financial Markets

SHFAs have become important participants in financial markets. Over the past decade, they have sold over $150 billion in long-term bonds, including about $80 billion in single-family MRBs. At the beginning of 1989, they had a combined bond debt of about $61.5 billion. They were repaying this debt and financing the operation of the SHFAs through the earnings on a loan portfolio of about $47.8 billion and an investment portfolio of $21.7 billion.

In 1988, the return on their investments substantially exceeded their expenses. That year, SHFAs had net earnings (revenues over expenditures) of about $417 million. In recent years, SHFAs have consistently had net earnings from their programs.

Over the years, SHFAs have increased the size of their operations. In 1982, they had about 2,404 employees. By 1985, the number of employees had grown 29 percent to about 3,080 employees. And in 1988, the number of employees had risen to about 3,660, an increase of 18.9 percent. As the SHFA work force has increased, SHFAs have added people with new expertise in finance, program administration, analysis, and other specialties. And they have trained a large corp of professionals in housing program administration. In recent years, SHFAs have become reservoirs of skills, expertise, and experience in housing that did not exist a decade ago.

As experienced participants in financial markets, SHFAs have adapted to the rapid changes in the market and their own unstable political environment. For example, several SHFAs have been aggressive in the use of taxable bonds to tap foreign capital markets. In fact, the Alaska Housing Finance Corporation (AHFC) has been a leader in the use of taxable bonds. The AHFC was the first public agency to sell taxable bonds (AHFC 1988 Annual Report), completing its bond issue in 1981. And in 1988, the AHFC is still issuing taxable bonds to finance one of its major programs, the Home Owners Assistance Program (HOAP). Through this program, the AHFC loans funds raised with taxable bonds to house owners who want to replace their existing mortgage loans with new mortgages bearing lower interest rates or longer loan terms.

SHFAs have remained competitive in financial markets by structuring their bond issues to attract investors. When needed, they have used an assortment of credit enhancements, offered various variable rate and convertible option bonds, and tried other innovations. For example, the Virginia Housing Development Authority (VHDA) discovered that if it sold bonds with terms of 40 and 50 years, instead of the traditional 30 years, it could make additional low-interest mortgage loans. With the longer term bonds, it could recycle the principal payments and prepayments, using them to make subsidized loans. The VHDA found that it could make 50 percent more mortgage funds

available by selling MRBs with 50-year terms rather than 30-year terms (*Housing and Development Reporter* December 26, 1989).

Diversified Authorities

During the 1980s, several SHFAs have expanded their operations beyond housing finance. They have been given powers by state legislatures to issue bonds and operate programs to finance economic development, agricultural, and other activities. Examples of these expanded, diversified agencies are as follows:

• The *Colorado Housing and Finance Authority* (CHFA) has a commercial division that administers programs for industrial and small business financing. The CHFA not only issues industrial revenue bonds, but also owns 48 percent of Colorado Invesco, Inc., a firm that provides capital for minority and other disadvantaged entrepreneurs, and it recently invested $1.5 million in a new venture capital company, the Colorado Strategic Equity Funds.

• The *Wisconsin Housing and Economic Development Authority* (WHEDA) was changed from a strictly housing finance authority in 1983 to an authority that also operates an economic develop program. The 1983 legislation gave the authority the power to issue up to $105 million in bonds to finance business development loans. WHEDA issues industrial development bonds, plus manages other smaller, targeted business and agricultural programs. One of its agricultural programs was the 1988 Drought Assistance Loan Program. This program provided state-funded loan guarantees and interest-rate reductions for loans that farmers needed to help finance drought-related costs. Farmers could obtain loans of up to $10,000.

• The *Nebraska Investment Finance Authority* was created in 1983 by combining the Nebraska Mortgage Finance Fund, the Nebraska Development Finance Fund, and the Nebraska Agricultural Development Corporation. It has the authority to issue bonds for housing, business, and agriculture.

• The *Arkansas Development Finance Authority* (ADFA) was created in 1985, and the state legislature gave it the responsibility for issuing bonds to stimulate economic development and to finance a variety of other activities, including agriculture and student loans. The ADFA also

continued the housing finance role of its predecessor, the Arkansas Hous-
ing Development Agency. One initiative of the ADFA has been the cre-
ation of an Industrial Development Bond Pool. The ADFA pools loans
needed by several small industries who wish to borrow money, backs the
pool with a state loan guaranty, and obtains money for the loans by selling
bonds. Because the pool is large and state-backed, it is favorably rated,
allowing smaller firms in Arkansas to borrow money at lower rates than
they could obtain if they had borrowed on their own (Epes 1988).

These examples show that many state governments have decided that one
way to foster economic growth is to have a multi-purpose finance agency that
can design and implement bond programs for a variety of programs, including
housing. Such a multi-purpose agency can concentrate financial market
expertise so that it is able to participate more effectively in global financial
markets (Daniels and Crockett 1988).

CONCLUSION

This chapter has traced the history of single-family MRB programs from
their humble start in the middle 1970s to the tumultuous times in 1979 and
1980 through the increasingly tight regulations of the 1980s. It has described
the on-going political clashes over the future of MRB programs which have
featured supporters of the programs—largely interest groups whose members
profit from MRBs or have jobs that depend on them—insisting that the
programs help society by increasing home ownership, but providing little
rigorous evidence of the efficiency of the programs. On the other side MRB
opponents use economic studies to back their claims that the programs are
inefficient and produce few results.
    The chapter describes this continuing confrontation of strongly asserted
beliefs about the effects and value of MRBs with empirical studies. The as-
sertions about the beneficial effects of MRBs have retained credibility because
the empirical research—given the complexity of housing and mortgage finance
markets—cannot be definitive. As long as the research results are not con-
clusive and strong interest groups have a stake in policy outcomes, knowledge
will not play a decisive role in policymaking.
    The political confrontations have yielded compromises that have kept MRB
programs alive, but have narrowed their use mostly to first-time buyers whose
incomes are less than 120 percent of the area or state median income. The
compromises have left both sides unhappy—supporters say MRB programs are
too constrained, opponents say the programs are still wasting money—but they

have doubtless made MRB programs are more effective than they were a decade ago.

Most observers would probably agree that MRB programs are going to survive for many years into the 1990s, if not longer. And even strong opponents of the programs would probably agree that as MRB programs have matured, many have increased the direct benefits they provide through better subsidy targeting. Nevertheless, the opponents would probably say that even though MRB programs are more efficient than they were, they are still less efficient than several alternative programs and therefore should be abolished.

Whatever the benefit-cost ratio of MRB programs, many of them have been providing leadership in housing policy during the past decade. They have created a multitude of new programs and have used their skills as a housing lobby. In addition, they have become a source of ideas and policy research about housing, filling a void left by a demoralized U.S. Department of Housing and Urban Development.

The balance sheet on MRB programs can best be summarized as follows: Even the best MRB programs very probably have costs that substantially exceed their direct benefits; the worst MRB programs provide almost no benefits to society. Nevertheless, despite the excess of direct costs over direct benefits, MRB programs have generated substantial intangible noneconomic benefits. They have become laboratories for testing small-scale housing programs, they have developed expertise in creating and administering housing programs, and they have developed the potential to be part of the delivery system for new federal and state programs. Also, MRB programs have enticed more states to assume a role in housing policy, adding new funds for housing programs.

When judging if MRB programs are worth their price, it seems important to ask, what would housing policy look like now if MRBs had never come along? Would lower-income households be better off or worse off? How that question is answered is the crux of determining whether MRB programs have earned their keep.

ENDNOTES

1. The value of the subsidy would be reduced if any of it is capitalized into the house sales price. See the discussion in chapters 8, 9, and 10.

2. Because loans insured by the Federal Housing Authority or guaranteed by the Veterans Administration require very low down payments, MRB loans would reduce down payments only for households that could not qualify for these types of loans.

3.   Housing finance agencies administering MRB programs would usually not have the option
     of relaxing its underwriting standards. Because most MRB loans are insured by the FHA,
     VA, or a private mortgage insurer, they must meet the underwriting standards of these
     insurers.

4.   In 29 states, the state MRB program is administered by an independent authority. In 16
     states, the MRB program is managed by a state agency. In three states, the MRB program
     is run by an "independent agency" (NCSHA 1990).

5.   The first legislation creating the Ohio Housing Finance Agency was ruled unconstitutional
     by the state supreme court. A state housing finance agency in Ohio was legally constituted
     only after the state's constitution was amended to permit one to exist.

6.   They did not explain why MRBs would help central cities attract households that could
     receive the same loan subsidies from suburban cities. See the discussion of this rationale
     for MRBs in chapter 2.

7.   For example, in the House Ways and Means Committee hearings on MRBs, Representative
     Heftel told Lawrence Green of the Savings and Loan League, "I am sure Mr. Green never
     said a word about the tax-free bonds in America until he saw it potentially reflect adversely
     on his P and L statement to the betterment of the people on a whole. We are here to
     defend the people as a whole. We let you take care of profits on your own (U.S. Congress
     1979, 596).

     Heftel told the head of the Mortgage Banking Association, "It is apparent that we are
     fighting to provide individual housing for people who can't otherwise qualify, and you are
     fighting for profit. Your motives are contrary to the interest of the nation we must serve
     (U.S. Congress 1979, 367).

8.   The NAR calls itself the largest national trade organization. It has about 600,000 members
     and a Washington staff of about 35 lobbyists (Clark 1985). In 1982 and 1984, the NAR
     Political Action Group (PAG) was the single largest contributor of federal election
     campaigns. In 1984, the realtor's PAC donated $2.3 million in volunteer work in political
     campaigns. In addition, NAR encourages and assists the 1,800 local realtor boards to
     become involved in local campaigns (Grier 1984).

9.   See Lurie (1982), U.S. Congress (1985, 53), Surrey and McDaniel (1985), and Zimmerman
     (1991) for explanations of the inefficiencies of private-purpose bonds.

     The following is an example of one inefficiency. If an investor put $1,000 in a taxable
     instrument with a 10 percent interest rate, she would earn $100 in annual interest. With
     a 28 percent marginal tax rate, the investor would end up with $72. If the investor instead
     used the $1,000 to buy an MRB with an 8.5 percent interest rate, she would earn and keep
     $85 each year, ending up with 13 more dollars.

     The issuer of the 8.5 percent MRB would save $15 a year in interest payments because he
     could issue bonds at an 8.5 percent rate instead of a 10 percent rate. However, the cost
     to government is $28 in taxes that the investor will not pay. Thus, it costs the government
     $28 in lost taxes each year to give the bond issuer an annual savings of $15.

2
RATIONING ELIGIBILITY FOR
MORTGAGE BOND LOANS

James C. Ratzenberger

INTRODUCTION

The "output side" of mortgage revenue bond (MRB) assistance has been studied extensively.[1] That is, much has been written about the financial and demographic characteristics of first-time buyers who receive MRB loans and the extent to which this assistance materially affects home ownership. However, less is known about the "input side" of the equation: how the housing-finance agencies that issue these bonds ration eligibility for MRB loans. Information from this perspective can provide insight into how state and local housing-finance agencies manage these high-demand programs that have had extensive statutory flexibility to determine who may be served.

This chapter describes how bond issuers—the state and local housing-finance agencies—ration MRB loans to prospective buyers and suggests that these agencies have had mixed results with their rationing methods. It also explains that a perceived lack of targeting has led to legislation setting tighter eligibility standards and may lead to even stricter standards in the future.

FEDERAL HOME BUYER ELIGIBILITY REQUIREMENTS
AND CONGRESSIONAL EXPECTATIONS

In 1980, to stem the loss of tax revenues due to the huge amount of tax-exempt MRBs being issued, the United States Congress passed legislation that restricted the volume of these bonds that could be issued each year. It also imposed the first federal eligibility requirements for buyers receiving MRB loans. Since then, in response to congressional concerns that many buyers receiving MRB loans have not been households who truly needed the assistance to purchase their first home, Congress has continued to tighten eligibility requirements.

In establishing MRB loan eligibility standards in the Mortgage Subsidy Bond Tax Act of 1980, Congress stated that lower-income households should be the primary beneficiaries of MRB loans, but it permitted bond issuers to determine what proportion of MRB loans would be made to lower-income households. Specifically, the legislative history of the 1980 act speaks of

directing assistance to those households "with the greatest need for the subsidy" and "those of low or moderate income who have difficulty in obtaining mortgage money." However, the legislative history did not define what those terms meant.

In its final 1980 deliberations, Congress declined to set eligibility standards based on household income. Instead, it required that most MRB loans be made to first-time home buyers who purchase homes that cost no more than 90 percent of the average purchase price of homes in the area.[2] Through this eligibility requirement, Congress targeted MRB loans but also recognized that the loans are made in housing markets that have considerably different house prices. (In 1982, to aid the depressed housing industry, Congress amended the 1980 act to raise the purchase-price limitation to 110 percent of the area average purchase price.)

Congress' next MRB-related legislative action, the Deficit Reduction Act of 1984, included a "statement of congressional intent" that MRB-loan programs serve lower-income households. It also required for the first time that bond issuers submit "policy reports" to the Internal Revenue Service describing the characteristics of the assisted buyers and the agencies' efforts to serve lower-income buyers before higher-income buyers.[3] However, the act did not otherwise modify the discretion that MRB program administrators had to determine who would receive MRB loans.

The population to be served by MRB programs was further defined by Congress in the Tax Reform Act of 1986. This act repealed the 1984 reporting requirement, but it imposed an income eligibility standard, requiring that households receiving MRBs have an income not exceeding 115 percent of the applicable area median income (except in targeted areas).[4] In this 1986 act, Congress defined for the first time in explicit terms which households have low or moderate incomes and therefore should qualify for MRB loans. The act also lowered home-purchase price limits to the level set in 1980.

Next, the Technical and Miscellaneous Revenue Act of 1988 (P.L. 100-647) tightened the eligibility requirements once again. Section 4005 of the act modified the uniform 115-percent income eligibility requirement by adjusting the eligibility level to take into account high-cost housing areas and by establishing different income eligibility levels based on household size; also it provided for a recapture of a portion of the subsidy if a home buyer who received an MRB loan disposed of the home within ten years. Explaining the recapture provision, the conference report stated:

> The conferees believe that in those [MRB-assisted] households where income has risen rapidly since acquisition, the special subsidy

provided by the program was not necessary in order to become or remain a homeowner.[5]

Congress' latest legislative change to the MRB program, the Omnibus Reconciliation Act of 1990 (P.L. 101-508), modified the recapture provisions somewhat, but did not otherwise change eligibility requirements for MRB loans. Thus, while Congress has periodically expressed its intent that assistance be directed to more needy home buyers, it moved only in the 1986 and 1988 legislation to incorporate that intent into law through income eligibility requirements.[6]

**Table 1: Methods Used by Finance Agencies to
Ration Eligibility for MRB Loans**

- Lower income limits. Set household income limits at levels lower than required by federal law.

- Lower purchase price limits. Set home-purchase price limits at levels lower than required by federal law.

- Household-size adjustments. Adjust income limits by household size to encourage participation of larger households (e.g., families rather than single-person households).

- Queuing methods. Establish queuing methods for accepting buyer applications to encourage lower-income household participation.

- Affordability tests. Select only those buyers who could not otherwise afford to purchase the house they intend to buy with a MRB loan.

  SOURCE: Survey conducted in 1988 by the General Accounting Office (GAO 1988).

HOW AGENCIES RATIONED ELIGIBILITY

In a 1988 study, the U.S. General Accounting Office (GAO) examined the operation of MRB programs using a sample of 25 state and local agencies selected out of a universe of about 250 agencies (see appendix 1). One aspect of this study was a detailed review of how these agencies structured their programs to ration eligibility for MRB loans (GAO 1988).[7] The rationing mechanisms described below were in effect in early or mid-1987.

As discussed above, federal law has given state and local MRB programs wide latitude to determine whom they will serve. In deciding who will be eligible for their MRB programs, housing-finance agencies consider the requirements imposed by federal law, state laws or local ordinances, and their own charters, plus they take into account the target populations they wish to serve. Considering these factors, the agencies then set the home-buyer eligibility criteria for their programs. These agency-set eligibility standards change over time as one or more of the above factors change.[8]

The surveyed agencies used five different methods to ration eligibility for MRB loans even more than required by federal statute. For a summary of these five methods, see table 1.

Table 2 shows the use of these methods in the 25 agencies surveyed by the GAO.

**Table 2: Use of Methods by Finance Agencies
to Ration MRB Loans
1987**

Method	State Agencies	Used by Local Agencies	Not Used (%)
Lower income limits	7	2	16 (64)
Lower purchase price limits	4	2	19 (76)
Household size adjustments	4	1	20 (80)
Queuing methods	5	2	18 (72)
Affordability tests	2	0	23 (92)

SOURCE: Survey conducted in 1988 by the General Accounting Office (GAO 1988).

The first three methods are straightforward in their application. The first two set tighter numerical standards for incomes and home-purchase prices than are required by federal statute. Stricter income and purchase-price eligibility standards were used by nine (36 percent) and six (24 percent) agencies, respectively. For example, both Indiana and Maryland had established lower-than-required limits on income. The Maryland Community Development Administration had administratively set its income limit at $28,000 for single persons (about 87 percent of the state median income) and at $33,000 for households of two or more (about 103 percent of state median income). The Indiana Housing Finance Authority income limit was set, in part, by a state statute requiring that 40 percent of loans be made to buyers with incomes of less than 80 percent of the applicable area median income.

The third method is to adjust the income limits by household size. Such adjustments are common when allocating assistance in social programs. However, prior to 1988, household-size adjustments were not required by federal law for determining eligibility for MRB loans. Of the 25 agencies surveyed in 1987, only five agencies had chosen to make such adjustments. The Maryland example cited above shows how one agency adjusted its income limits based on family size.

The fourth method is to establish a buyer queue that reflects agency priorities for distributing MRB loans. This type of queue differs from the "first-come, first-served" queue created when MRB loans are provided to any household meeting the income and purchase-price standards (and other loan-origination standards), as long as bond funds are available. Under this first-come, first-served process, households with higher incomes displace prospective lower-income buyers if the higher-income buyers apply for the MRB loans first. This problem is ameliorated by a targeted queuing that reserves loans for those households the agency believes should have first priority.

Seven of the surveyed housing-finance agencies used some sort of queuing mechanism to rank some buyers ahead of others. For the most part, these agencies set aside a portion of the bond funds for a specific or an indefinite time. Usually, they reserved funds for a set time (typically one to four weeks) for buyers at the lower end of the income spectrum, and then made the balance of the loan funds available to the remainder of the eligible population on a first-come, first-served basis.[9] For example, the Illinois Housing Development Agency accepted applications during the first three weeks of its program from households with incomes less than $25,000, and then opened up the application process to all other eligible buyers.

The final method—and the one that would seem the most direct rationing device—is to determine whether a buyer applying for an MRB loan could purchase the same home with a market-rate loan. To make this

determination, a housing finance agency could use either conventional affordability test or a different, agency-derived test. When an agency finds a prospective borrower could afford a market rate loan, it could disqualify that household and instead direct its MRB loans to households that need the reduced interest rate to purchase a home.[10]

A conventional affordability test was used by only 2 of the 25 agencies surveyed, the Maryland Community Development Administration and the Virginia Housing Development Authority. Both agencies required the participating mortgage lender to certify that, according to the information submitted, the mortgagor could not qualify for conventional financing. To support that statement, Maryland required the lender to complete a conventional affordability calculation if the buyer's cash assets were 20 percent or more of the purchase price. Virginia required the lender to submit both the lender certification and a net worth estimate (GAO 1988, 45).[11]

**Table 3: Extent That Housing Finance Agencies Used One or More Rationing Methods
1987**

Number of methods used (percent of row)

Agency	0	1	2	3
State Agency	3 (19)	8 (50)	1 (6)	4 (25)
Local Agency	5 (56)	2 (22)	1 (11)	1 (11)
Total	8 (32)	10 (40)	2 (8)	5 (20)

SOURCE: Survey conducted in 1988 by the General Accounting Office (GAO 1988).

Coupling Rationing Methods

Table 2 suggests that, for the most part, eligibility rationing methods were not being used in 1987 to a great extent, since each method was *not* being used by 16 to 23 of the 25 agencies (64 percent to 92 percent). On the other hand, another way of looking at the prevalence of use is to determine how many of the agencies were using one or more of the five mechanisms. This analysis presents a more positive picture: 17 of the 25 (68 percent) surveyed

housing-finance agencies were using at least one method to ration MRB loans more rigorously than required by federal law, and 7 (28 percent) were using two or three of the rationing methods. None used more than three (see table 3).

Why Some Housing Finance Agencies Did More and Some Did Less

By imposing stricter or additional eligibility requirements for MRB loans, housing-finance agencies demonstrated either that they were trying to target assistance better or that they were required by their charters to have tighter restrictions. Those agencies with few or no rationing methods in place had rejected them because (1) their leaders believed that eligibility levels set by federal law provided sufficient targeting, (2) the agencies' boards of directors had no interest in additional rationing, or (3) they saw no harm in helping the "regular guy."

Limitations of This Study

This approach to identifying eligibility rationing has some limitations. First, it uses a cross-sectional sample of bond programs operating at the time of the survey. A longitudinal sample might show a different pattern of use of rationing methods. The methods may change over time because state and local housing-finance agencies alter eligibility requirements to adjust to changes in market conditions, government requirements, or agency policies. Thus, each of the 25 surveyed agencies may have changed its rationing methods soon after the GAO survey was completed. Second, the analysis does not control for housing market conditions that make it easier or harder for a housing-finance agency to impose stricter rationing of MRB loans. For example, a housing-finance agency serving an area with less expensive housing might be able to target its loans more precisely than an agency in an area with expensive housing. Third, exogenous changes, such as the changes in marginal income tax rates and the expanded alternative minimum tax as set out in the 1986 Tax Reform Act, may reduce the difference in market interest rates for mortgage loans and MRB loans, thus reducing the subsidy. As a result, housing-finance agencies may find it more difficult to target lower income households because the subsidies are too small to induce them to purchase houses. Finally, no consideration is made as to whether the federal eligibility restrictions are set at the "right" levels to exclude buyers who would have been likely to purchase homes in the absence of a MRB loan and could have afforded to have done so.

OBSERVATIONS

This survey has shown a mixed result in the use of rationing methods to serve a narrower segment of the buyer population than required by federal law. Each of five rationing methods was used only by a small number of the surveyed housing-finance agencies, but two-thirds of the agencies used at least one method.

Examining the restrictions on who may receive MRB loans is, of course, quite different from looking at the attributes of the buyers who ultimately receive them. That is, one could ask (as stated elsewhere in this book) if MRB programs do not increase home ownership rates, then does better rationing make a difference? Similarly, if one takes the other side of the argument, that MRBs do, indeed, positively affect ownership rates, then one could ask why is better rationing needed since, by that very result, the program is deemed effective?

The answer to these questions may be two-fold. The first part relates to social goals. With limited bond funds and a subsidy that is in great demand, an MRB program can achieve a higher public purpose by helping households with greater need for a housing subsidy before it helps those with a lesser need. The second part of the answer is more pragmatic: each time Congress considers whether it should extend authority for state and local housing-finance agencies to issue MRBs, the question is raised of whether the benefits of MRB programs are worth the tax-expenditure costs. To help lower costs and increase benefits, Congress has set increasingly stricter standards to determine who is eligible for MRB loans. In future years, as Congress struggles to reduce the federal deficit, it will face additional pressure to reduce tax expenditure costs associated with tax-exempt securities. To increase the probability that MRB programs will survive these pressures, MRB proponents may want to ration MRB loans even more carefully.

Appendix 1
State and Local Housing Finance Agencies Surveyed

STATE AGENCIES

California Housing Finance Agency
Florida Housing Finance Agency
Illinois Housing Development Authority
Indiana Housing Finance Authority
Iowa Finance Authority
Maryland Community Development Administration
Michigan State Housing Development Authority
Ohio Housing Finance Agency
Oklahoma Housing Finance Agency
Oregon Department of Commerce, Division of Housing
Pennsylvania Housing Finance Agency
State of New York Mortgage Agency
Texas Housing Agency
Virginia Housing Development Authority
Washington State Housing Commission
Wisconsin Housing and Economic Development Authority

LOCAL AGENCIES

California
Sacramento Housing and Redevelopment Agency

Illinois
Cook County (Comptroller's Office)

Maryland
Montgomery County Housing Opportunities Commission

Pennsylvania
Allegheny County Residential Finance Authority
City of Philadelphia Redevelopment Authority

Texas
Corpus Christi Housing Finance Corporation
Dallas Housing Finance Corporation
Harris County Housing Finance Corporation
Houston Housing Finance Corporation

ENDNOTES

The views expressed in this chapter are those of the author and do not necessarily reflect those of the General Accounting Office.

1. "Mortgage Revenue Bonds" is the popular name of "qualified mortgage bonds."

2. See GAO (1988, 10-13); the Omnibus Reconciliation Act of 1980, Committee on the Budget, House of Representatives, U.S. Congress (Report No. 96-1167, July 21, 1980), p. 447; and the Omnibus Reconciliation Act of 1980, Conference Committee, House of Representatives, U.S. Congress (Report No. 96-1479, Nov. 26, 1980), pp. 171-2.

3. Deficit Reduction Act of 1984 (PL 98-369), July 18, 1984, Section 611 (b)(5)(ii)(II).

4. Some exceptions exist. Under certain circumstances, a bond issue could retain its tax exemption if home buyer eligibility and other requirements are not met for five percent of the mortgages made. Also, bond issuers are required, generally, to set aside 20 percent of the bond proceeds for use in one year in poorer areas, the so-called "targeted areas." For these areas, income and purchase-price limitations in the Code are more lenient. This chapter deals with the general requirements, as set out in the body of the act.

5. Technical and Miscellaneous Revenue Act of 1988, Conference Committee, House of Representatives, U.S. Congress, Report No. 100-1104, vol. II (Oct. 21, 1988), p. 85.

6. The household-size adjustments discriminate among households based on the number of members in the households. Household size affects the maximum income that a household can earn and still be eligible for MRB loans. As household size increases, the income limits are higher. As a result, a household with, say, five members may be eligible for an MRB loan, but a single-person household with the same income would be ineligible. The recapture mechanism can be viewed as an eligibility rationing device because those households who could afford now or in the near future to buy a conventionally mortgaged home might not do so to avoid being subject to the recapture.

7. The state agencies were selected primarily on the basis of bond issuance volume (primarily larger volume issuers), the diversity of geographic location, and the existence of local issuers. Local issuers were selected within the sampled states primarily on the basis of large issuance volume. Nothing was known about the individual bond programs in the agencies selected, although the general reputation of several of the agencies, as leaders and innovators, was known. At the agencies, senior officials were interviewed, and agency reports and documents were reviewed to determine how the agencies structured their programs to serve first-time buyers.

8. MRB assistance may be used for new and existing home purchases and home improvement, rehabilitation, construction, bridge loans, and other temporary financing. This survey deals only with home purchase loans because they make up an overwhelming majority of the MRB assistance provided to borrowers of assistance used. See Table II.6 of GAO (1988, 82) and agency profiles presented in the Council of State Housing Agencies' report, Production Activities of State Housing Finance Agencies 1985 and Cumulative.

3
ECONOMIC POLICY ANALYSIS OF
MORTGAGE REVENUE BONDS

Richard L. Cooperstein

INTRODUCTION

State and local housing finance agencies (HFAs) issued over $50 billion of
mortgage revenue bonds (MRBs) from 1982 to 1986 to finance subsidized
mortgages for first-time home buyers. The funds from these bonds financed
several hundred thousand mortgages and cost the federal government about
$7.5 billion (measured in present value) in lost tax revenue. Since 1986, when
a volume cap was placed on private-activity tax-exempt bonds, including
MRBs, HFAs have issued over $25 billion of new-money MRBs, depriving the
federal treasury of additional revenue. According to the President's 1992
Budget, outstanding MRBs cost taxpayers about $1.7 billion in fiscal 1992.
This revenue loss did not include the efficiency loss from diverting capital
from other uses to housing.

Tax-exempt bonds like MRBs reduce income-tax revenues because
investments in these bonds generate income that is not taxed. Were the
investments yielding taxable interest, they would provide revenue for the
federal treasury. To assess whether the revenue loss resulting from the sale
of MRBs is worthwhile, the MRB program must be evaluated to determine
if its stated goals are being met.

To evaluate the benefits provided by MRBs, the General Accounting
Office (GAO) recently studied the MRB program (GAO 1988). The agency
collected extensive data on 178,000 bond-assisted loans made from 1983
through June 1987 in 18 states. Along with other information, these data were
used to evaluate the neediness of the population served by the MRB program
and the program efficiency.

In this chapter, I report my use of the GAO data, plus other information,
to evaluate MRBs. First, I assessed whether MRB loans serve a needy
population. To do so, I compared the households receiving bond financing
with a national sample of first-time buyers living in metropolitan areas. Then,
I calculated how much MRB loans increased the probability that different
types of households would become first-time home buyers (Cooperstein 1989).
Second, I performed a conventional affordability test to determine how many
assisted households did not need the below-market rate MRB financing to

qualify for a mortgage loan. Finally, I conducted a cost-benefit analysis of the MRB program.

PROFILE OF THE ASSISTED BUYERS

MRBs are expected to serve a public purpose in return for the reduction in federal tax revenues they cause. The most frequently cited benefit of MRBs is that they enable purchasers who could not otherwise buy houses to do so. Related to this benefit, other cited benefits of MRBs include stimulating construction (thereby creating jobs) and encouraging community development (see chapter 4).

The fundamental question to answer in determining the benefits generated by the program is whether the assisted households would have become home owners without the subsidy. If most assisted buyers would have bought houses anyway, then MRBs have little impact on home ownership rates. Consequently, other putative program benefits, such as stimulating the construction industry and improving community quality, are suspect.

Previous studies, such as Cooperstein (1989) and Chambers and Diamond (1988), found that first-time buyers tend to be young, white, married, and middle-income, and to have small families. First-time buyers purchase houses that are priced substantially below the average market purchase price because of the combination of the buyers' relative youth, their comparatively lower incomes, and their lack of wealth. For example, the national average house price in 1986 was about $95,000, while the average price of homes purchased by metropolitan-area first-time buyers was about $70,000. The large price difference can be attributed to the fact that the national average price includes mostly repeat buyers who are older, have higher incomes, and have accumulated equity, allowing them to purchase more expensive houses.

How did the general population of first-time buyers in the 1980s compare to buyers who received MRB loans? To answer that question, I compared the characteristics of first-time buyers who purchased homes in metropolitan areas in 1983 with first-time buyers who bought houses from 1983 to 1986 with the assistance of MRB subsidies. Data on metropolitan first-time buyers came from the 1983 Annual Housing Survey (AHS), and the data about MRB-assisted buyers was collected by the GAO. Both sets of data include large samples.[1]

As shown in table 1, MRB-assisted buyers looked much like other first-time buyers in metropolitan areas. They had social and economic characteristics like those households that had demonstrated they did not need bond-subsidized financing to buy homes. Accordingly, it is reasonable to assume that even without their MRB subsidies the assisted households would

have become home owners—if not when they did, then soon after.

Table 1. Bond-Assisted Buyers Compared with
All Metropolitan First-Time Buyers
(Median Values)

Characteristic	MRB-Assisted Buyers	All First-Time Buyers
Median Income	$26,000	$27,000
Median Purchase Price	$58,000	$64,000
Median Age	28	29
Median Family Size	2	2
Percent Black	7%	8%
Percent Married	66%	64%
Less than a 5% Down Payment	20%	35%

SOURCES: GAO Survey and Annual Housing Survey, 1983.

For the comparisons, household incomes were adjusted to 1986 dollars using the urban wage deflator. House prices were indexed using the Census C-27 index of new house prices. However, the price indexes were adjusted to reflect that most first-time buyers did not purchase new houses and that newer houses are, on average, larger and have higher-quality construction than existing houses that make up the bulk of the housing stock. A separate house-price index was used for each of the four census regions, with houses built in 1982 as the base.

For both samples, the distributions of the variables in table 1 tended to be normal and bell-shaped. Thus the median value is a meaningful measure of the distribution. In general, the distributions of the variables for the sample of MRB-assisted households tended to be more tightly clustered about the mean than for the national sample.

The largest differences between the two groups are that MRB-assisted buyers purchased less expensive houses and a smaller share of assisted buyers paid down less than five percent of the purchase price. Part of the difference in purchase price can be explained by the fact that only five percent of the MRB-assisted buyers used FHA or VA financing, while 35 percent of metropolitan-area first-time buyers did.

Because 35 percent of the metropolitan-area buyers used FHA or VA financing, many of them were able to purchase houses with down payments of less than five percent. On the other hand, most MRB-assisted mortgages required private mortgage insurance (PMI), and to qualify for PMI, buyers must make a down payment of at least five percent. Therefore it is not surprising that one-third of the assisted buyers put down exactly five percent, and 80 percent put down five percent or more. Thus, while assisted buyers benefitted from a slightly lower interest rate, they generally did not avoid the large up-front costs of buying a house, one of the major obstacles to changing from rental to owner-occupied housing (Cooperstein 1989).

IMPACT OF THE SUBSIDY ON THE PROBABILITY OF BECOMING A FIRST-TIME HOME BUYER

Using price, income, and demographic information from a five-year sample of the Annual Housing Survey, Cooperstein (1989) estimated the probability of households becoming first-time home buyers. That study suggested a probit equation that can be used to measure the impact of lowering the relative price of ownership on the probability of becoming a first-time home buyer.

As discussed in Cooperstein (1989), a probit model estimates an S-shaped cumulative distribution function (CDF) that is asymptotic to zero and one because the dependent variable—such as buy a house, or do not buy a house—is dichotomous. Of course, this method of estimation differs from ordinary least squares (OLS) that estimates a straight line and is not bounded by zero and one.

The slope of the S-shaped CDF must be continuously evaluated in order to measure changes in probabilities, that is, movements along the CDF. The first derivative of the CDF is the bell-curve normal-density function. Thus:

(1) $T = F(BX)$,

and

(2) $F'(.) = f(.)$.

The change in the probability of becoming a first-time home buyer is

(3) $dT/dX_i = f(BX)B_i \, dX_i$,

where,

T   is the estimated probability of tenure change,
F(.) is the S-shaped cumulative distribution function,
f(.) is the bell-shaped normal-density function, and
BX is the matrix of coefficients and independent variables.
The new probability for a given vector of characteristics is

(4) $T_i = F(BX) + f(BX)B_i\ dX_i$.

The impact of the price change on the probability of becoming a first-time buyer is not constant because f(.) changes as the probability of buying, F(.), changes. The impact is largest for probabilities near .5 and smaller otherwise. This is because the slope of the S-shaped CDF is greatest at a probability of .5. Because the impact of the interest rate is not constant, the subsidy is evaluated at a few relevant points in the distribution.

Cooperstein (1989) estimated the probability of becoming a first-time home buyer for the mean vector of independent variables to be 3.2 percent. This estimate corresponds to the share of the sample that actually became first-time buyers. Thus F(.)=.032. At this point f(.)=.035, which is relatively small because F(.) is so far from .5. Also, Cooperstein (1989) estimated the coefficient on the relative cost of owning to renting, B_i=-.4271, and the mean value of the relative monthly cost of owning (defined as the net-of-tax mortgage payment) to renting, X_i=2.1.

With this information, equation 4 can be evaluated, and the change in probability can be calculated by determining the change in X_i, the relative cost of owning to renting. The average bond-assisted mortgage was about $50,000 and the average interest-rate reduction was just under 150 basis points. Thus, assuming a conventional interest rate of 11.5 percent, the subsidized rate was ten percent. The unsubsidized net-of-tax monthly payment was $423, which implies a rental cost of $202 at the mean value of X_i = 2.1. The subsidized monthly payment was $376, and the new relative price term was 1.87. Thus,

$dX_i = 1.87 - 2.1 = - .23$.

Evaluating equation 4 for the average renter household with the above changes gives

$T = .032 + .035(-.4271)\ (1.87 - 2.1) = .035$.

Thus, the 150 basis-point reduction in the mortgage rate increased the likelihood of becoming a first-time buyer about .3 percent (.035-.032) for a renter with average characteristics. However, the assisted buyers look much more like the typical first-time home buyer than they do like renters.

Therefore we can estimate the impact of the interest-rate reduction for the typical first-time buyer. From Cooperstein (1989), the mean probability for first-time buyers is 36.5 percent, ten times higher than for the average renter: $F(.) = .365$, $f(.) = .31$.

Evaluating equation 4 for the typical first-time buyer gives

$$T = .365 + .31(-.4271)(1.87-2.1) = .396 .$$

The three percentage-point increase (.396-.365) in the probability of becoming a first-time buyer for this group is proportional to the increase simulated above. For both groups, MRB subsidies raise the likelihood of buying a first house about nine percent above what it was to start with. In contrast, Cooperstein (1989) calculated that marrying doubles the probability of becoming a first-time buyer. Removing interest deductibility reduces the probability by 20 to 30 percent. A ten-percent increase in wealth, which is only $600 to $900 in Cooperstein's sample, increases the probability four to eight percent.

THE CONVENTIONAL AFFORDABILITY TEST

The above approach is used to assess the likelihood that buyers receiving MRB loans would become owners without the assistance and to calculate the magnitude of the assistance's impact on the decision to buy. A more immediate test of the efficacy of MRBs is determining how many MRB-assisted households could have qualified for mortgages if they had had to pay the market interest rate. Because these households qualified for MRB loans under the standard underwriting criteria (private lenders made the MRB loans and most of the assisted buyers put at least five percent down), it is reasonable to assume they met the detailed requirements of income stability and credit worthiness. So, we can assume that if they had incomes that qualified them for nonsubsidized loans, they would have been approved for them.

The affordability test uses the standard qualifying criteria that a household should pay no more than 28 percent of its income for its monthly principal, interest, taxes, and insurance (PITI) payments. To estimate whether MRB-subsidized households could have qualified for market-rate loans, I calculated for each household in the GAO sample how much it would have paid in PITI if it had a conventional fixed-rate mortgage or, alternatively, if it had an adjustable-rate mortgage. I estimated payments based on the prevailing mortgage interest rates at the time of sale.

Table 2 shows the share of MRB-assisted buyers who could have qualified for the different loans. It indicates that two-thirds of the assisted buyers could have immediately qualified for either a conventional fixed-rate or adjustable-rate mortgage. Another 11 percent could have qualified for an adjustable-rate loan if the buyers had borrowed up to ten percent less than they actually did, which in this case means a reduction in mortgage amounts from $1 to $5,000.

**Table 2. Share of MRB-Assisted Buyers
Qualifying for Conventional Mortgages**

Loan Type	Percent Qualifying
Fixed-Rate Mortgage	56%
Adjustable-Rate Mortgage (ARM)	12
ARM with a Mortgage 10% Smaller	11
Those Who Could Not Qualify	21

Note: The "percent qualifying" is the percent of MRB-assisted buyers who would have qualified for the specified type of mortgage, but not for the mortgages listed earlier. Thus 56 percent of MRB-assisted buyers would have qualified for a fixed-rate mortgage; an additional 12 percent of the buyers would have qualified for an adjustable-rate mortgage (but not a fixed-rate mortgage); and 11 percent more would have qualified for an ARM if they had borrowed ten percent less than they actually did (but not for an adjustable-rate or fixed-rate mortgage for the full amount they actually borrowed).

The households that could not have qualified for a market-rate mortgage were quite similar to the other first-time buyers with the exception that almost half of them were single. However, they were generally young, white, and middle-income households. Thus, even without the MRB loans, it seems likely that most of these households would have become owners in the near future.

FEDERAL COSTS EXCEED BENEFITS TO HOUSEHOLDS

A cost-benefit analysis of MRBs should compare their costs, which consists largely of lost federal income-tax revenues, with their benefits, in the form of subsidies that reduce mortgage payments. To make this comparison, the costs and benefits must be adjusted to reflect factors that affect them. These factors include the following:

  • The cost of issuing bonds and administering the MRB programs reduces the amount of a bond issue that is available for distribution as reduced-interest loans. These costs reduce the benefits of MRB programs.

  • If the seller is able to capture some of the value of the MRB subsidies, the benefits provided to first-time home buyers are reduced by the same amount. Some studies have shown that when developers control the subsidized financing, the present value of the households' subsidy may be reduced by ten to 100 percent as house prices are bid up because attractive financing is associated with the house (Durning and Quigley 1985, and chapters 8, 9, and 10 in this volume).

  • The value of the subsidies is determined by the spread between the interest rates of MRB loans and market mortgage interest rates. This spread has been affected by changes in the tax code. If the spread of the interest rates increases, the value of the MRB subsidies rises, and if it decreases, the subsidy value falls.

My comparison of the costs and benefits of MRBs programs shows that MRBs cause a loss of federal income-tax revenue that exceeds the benefits that households gain from MRB-financed loans. I describe the comparison in the remainder of this section.

MRB-Program Costs

Many studies have analyzed the costs of MRBs (for example, Kaufman 1981 and Peterson 1980). Most have estimated that every $1 billion of MRBs cost the taxpayers between $20 and $30 million annually (Congressional Budget Office 1979; Hendershott 1981; Peterson and Cooper 1980). If so, over the life of a $1 billion bond issue, the treasury will lose a present value amount of $150 to $200 million.

The tax-loss calculation depends on assumptions about the marginal tax rates of investors who absorb the increase in tax-exempt bonds at the expense

of holding fully or partially taxable investments. The studies mentioned above assume investors have average marginal rates between 20 and 30 percent. By reducing their holdings of taxable investments and increasing the share of income they receive from tax-exempt sources, investors pay less tax and the federal government receives less tax revenue.

For our comparison of costs and benefits, we estimate that MRB costs will be those for a typical $1 billion bond issue, about $25 million annually (Kaufman 1981).

MRB-Program Benefits

The subsidy received by the borrower is calculated as the after-tax difference in monthly house payments for an MRB-financed loan and a market fixed-rate loan. Earlier in this chapter, this difference in monthly payments was used to calculate how much the MRB subsidy increases the likelihood a renting household will become a first-time home buyer.

Program Costs Reduce Benefits by Reducing Loanable Funds

As noted earlier, some of the bond proceeds are not loaned out. Instead, some or all of the costs of issuing bonds and administering the MRB program are paid for out of bond proceeds, reducing the amount of money available for home financing. As noted in chapter 12, this "free" money to the state or local housing finance agencies is an important reason for popularity of this program.

Developer Set-Asides Can Reduce MRB Benefits

House prices may be increased, reducing the benefits home buyers receive, if MRB financing is set aside for developers. When MRB funds are reserved, or set aside, for particular developers by issuers or lenders, developers can market the reduced-rate financing as a feature of their units. In so doing, they may raise the selling price of their units, just as they charge a premium for a desirable location. Prospective buyers who are considering comparable units in two developments are expected to prefer the units with subsidized financing, other things being equal, because the monthly payments would be lower, even though the selling price of the units is higher.

This transfer of a portion of the financing benefit to sellers is called capitalization. Researchers have shown that some or all of the benefits of

financing subsidies provided through means such as owner financing and loan assumptions are capitalized into house prices (see chapter 8 for a summary of this literature). In the case of MRB subsidies, some researchers have found that the capitalization of MRB subsidies has reduced the present value of the home buyers' benefit by ten to 100 percent (Durning and Quigley 1985, and chapters 8, 9, and 10).

In the GAO sample of MRB-loan recipients, about 39 percent of the assisted buyers purchased new houses. In comparison, new houses were bought by only 22 percent of the first-time buyers in metropolitan areas. Thus, it appears that MRBs were used to encourage buyers to purchase new houses.

Likely, many of the loans made to new-house buyers were the result of developer set-asides. The GAO survey showed that 19 of 25 HFAs allowed developers to reserve some MRB funds through participating lenders or directly through the agency. As discussed, permitting developers to control MRB-loans is likely to result in at least partial capitalization of the subsidies and thereby to reduce the benefits provided by MRB programs.

While set-asides may stimulate some developers to produce more houses in a certain price range than they would have otherwise, competing suppliers without subsidized financing may find that they can sell fewer houses or must take longer to sell their units. Therefore, it is unclear whether developer set-asides increase the supply of moderately priced homes. It does seem clear, however, that at least some of the subsidy is lost by home buyers through higher home prices.

Interest-Rate Spreads Affect the Value of MRB Subsidies

The 1986 Tax Reform was expected to affect the spread between the interest rate on MRBs and the mortgage loans financed from MRB funds. The spread change is not precisely known. However, if the spread was reduced, as many expected, the value of MRB subsidies has declined in recent years.

A smaller interest-rate spread would be caused by three changes in the tax code that reduced the demand for tax-exempt bonds, increasing the interest rate that HFAs have to pay to investors who purchase MRBs. First, the 1986 tax reform decreased the value of tax-exempt bonds relative to the after-tax value of taxable investments by lowering the marginal tax rates of higher-income investors. Second, it reduced the value of all tax preferences, including tax-exempt bonds, through the expansion of the alternative minimum tax. Third, it reduced commercial banks' demand for tax-exempt bonds by eliminating a special tax benefit that they had received through the purchase

of these bonds.[2] The combined effect of these three changes was to lower demand for tax-exempt bonds, thus increasing their yield, relative to taxable investments (assuming a constant bond volume).

However, the factors reducing the demand for tax-exempt bonds may be mitigated by changes in the tax code that increased the demand for tax-exempt bonds: the loss of other tax preferences. Among the lost tax preferences is the preferential tax treatment of capital gains. The change in capital gains taxation should have caused a shift of investment funds from equity investments (e.g., stocks) to both taxable and tax-exempt debt investments. At the same time, the loss of this and other tax preferences may had led investors to increase their participation in the tax-exempt bond market to reduce their tax burden.

In short, the 1986 tax code changes produced opposing pressures on the interest rates of tax-exempt bonds. Because we do not yet know the magnitude of the opposing pressures, we can reach no firm conclusions on whether the yields of MRBs have increased relative to the yields on long-term taxable investments and, relatedly, whether the value of MRB subsidies have declined.

Estimating the Costs and Benefits

In table 3, I show a comparison of the costs and benefits of MRBs for scenarios that vary by market interest rate, the spread between the interest rates on MRB loans and market-rate loans, the amount of bond-issue proceeds that are used for loans, and the capitalization rate. I present a "typical case" and a "best case," showing that for each dollar cost to the federal government, MRBs yield only 12 to 45 cents of benefits. These benefits increase proportionally with the spread: when the spread is three times larger, 150 basis points instead of 50, benefits are three times larger as well.

In the best-case scenarios for bond efficiency, 95 percent of the bond issue proceeds are loaned and no capitalization occurs. Under those conditions, the benefits increase by about ten percent over the benefits in the typical-case scenarios. Nevertheless, the benefits remain small in relation to costs.

Table 3. Hypothetical Benefits Per Dollar of Lost Federal Revenue

Conventional interest rate	Typical Case 90% of proceeds loaned 25% capitalization rate on 30% of proceeds Spread[a]			Best Case 95% of proceeds loaned No capitalization occurs Spread[a]		
	50	100	150	50	100	150
10%	$0.12	0.24	0.36	$0.13	0.26	0.39
14%	0.14	0.28	0.41	0.15	0.30	0.45

[a]In basis points.

Note: The benefit calculations were made using the following assumptions: (1) the household marginal tax rate is 15 percent (1988 bottom rate), (2) households live in bond-assisted houses for ten years, (3) benefits are discounted at the conventional rate shown, and (4) mortgages are 30-year fixed-rate loans.

CONCLUSION

MRBs result in a sizeable revenue loss for the federal government. For example, the $50 billion of bonds issued between 1982 and 1986 cost the government about $1.5 billion in lost tax revenue each year. This study found that this revenue loss generally did not convey equivalent benefits to home owners. Less than 40 cents of benefits were delivered to home buyers for every dollar of lost federal revenue.

In the GAO's large sample of MRB loans, the average MRB loan had an interest rate less than 150 basis points lower than market-rate mortgage loans and provided a monthly subsidy worth about $40 per month. This modest reduction in housing cost is unlikely to affect significantly the home buying

4
POLICY INSTRUMENTS AND POLICY
OUTCOMES: COMPARING THE ARGUMENTS
FOR MORTGAGE REVENUE BONDS
WITH THEIR POLICY RESULTS

Danny W. Durning

INTRODUCTION

In this chapter, I examine whether mortgage revenue bond (MRB) pro-
grams during the first half of the 1980s effectively provided the desired policy
results. To do so, I identify the outcomes that MRB programs were supposed
to produce and determine, for one state program, if the expected outcomes
did occur.

The chapter is organized as follows: first, I identify the arguments for
MRB programs by analyzing the content of two congressional hearings. Then,
I discuss the causal relationships (how the policy instrument is supposed to
produce the expected outcomes) implicit in the justifications of MRB sub-
sidies. Following that, I use data from one state to measure the results of a
statewide MRB program. Finally, I compare the arguments for MRB subsi-
dies with their economic outcomes in this state.

ARGUMENTS FOR MRB SUBSIDIES

To obtain a systematic understanding of the arguments used to justify
MRB programs, I analyzed the content of testimony at two congressional
hearings, one in 1979 and the other in 1983. The 1979 hearing was conducted
by the House Ways and Means Committee on Representative Al Ullman's
proposal to terminate MRBs. The 1983 hearing was held by the Senate
Finance Committee's Subcommittee on Taxation and Debt Management on
whether the mandated end (or "sunset") of MRB use should be overridden
(see chapter 1 for a discussion of the context of these hearings).

The content analysis counted the number of times that interest groups
made various claims about MRB programs as justifications for these
programs. The methodology of the content analysis is described in appendix
1 and the results are presented in table 1.

**Table 1. Content Analysis of Reasons for Supporting
MRB Programs, Congressional Testimony in 1979 and 1983**

Reasons for MRB Programs	1983 Hearing	1979 Hearing
Home Ownership		
Helps low- and mod.-income hshlds.	16	14
Helps meet demand for afford. hsg.	5	-
Increases home ownership	3	1
Helps young people buy houses	3	-
Helps middle class families	1	2
SUBTOTAL	28 (36%)	17 (18%)
Economic Effects		
Stabilizes tax base	6	6
Creates jobs	5	-
Stimulates urban economy	3	6
Stimulates home building	2	3
Revives housing market	1	-
Increases wealth	1	-
Helps S&Ls	1	1
Provides needed credit	-	3
SUBTOTAL	19 (25%)	19 (20%)
Improves Housing & Neighborhoods		
Conserves housing stock	5	4
Increases housing supply	2	2
Stabilizes neighborhoods	2	10
Upgrades quality of housing	1	2
Eliminates blighted areas	-	4
Attracts richer people to city	-	6
Helps low-income housing	-	2
SUBTOTAL	10 (13%)	30 (32%)
Other		
Gives power to cities & states	11	5
Involves private sector	2	5
No administrative cost	3	4
Increases fed. tax collections	4	1
Housing is govt. function		4
Other	10	
SUBTOTAL	20 (26%)	29 (30%)
TOTAL	77	95

Note: See appendix 1 for a discussion of methodology.

This content analysis showed four major types of arguments for MRB programs:

•The MRB subsidies *increase home ownership* by helping low- and-moderate income households purchase houses. Over one-third of the justifications in 1983 concerned the ability of MRBs to help households become home owners.

•The subsidies provide an important *economic stimulus*. MRB programs are presented as a means to generate taxes and jobs.

•MRB subsidies have a *positive effect on housing and neighborhoods*. Supporters of MRB programs maintain they help improve neighborhoods and the housing stock.

•The programs *give state and local governments power* to assist households wanting to own houses. Among the "other" arguments, supporters of MRB programs praise them as a way to foster federalism by giving state and local governments the ability to address housing problems. They also maintain that MRB programs make good use of private-public sector cooperation.

These arguments changed from 1979 to 1983. Speakers at the 1979 hearing emphasized the community development aspects of MRB programs. In 1979, many of the enthusiastic MRB supporters were representatives of local governments that viewed the programs in terms of the traditional community development mission of cities. In 1983, the emphasis of the testimony shifted to the importance of MRB subsidies as help for needy home buyers. The different thrust in 1983 testimony seems related to two things: more representatives of state governments and state housing finance agencies testified than did local government spokesmen, and the extraordinary high interest rates in 1981 and 1983 had made the cost of house financing more of a public concern.

THE CAUSAL RELATIONSHIPS OF POLICY AND OUTCOMES

While supporters of MRB programs insisted that the programs produce positive effects, they rarely explained how the policy instrument (the subsidies) would produce the imputed outcomes. As the following discussion shows, the expected cause-effect relationships are sometimes problematic.

The Policy Instrument and Its Implementation

MRB programs have one prime policy instrument: below-market rate mortgage loans provided to selected households. The rates on MRB loans are usually one to four percentage points less than market-rate loans. Each MRB loan provides the recipient with a subsidy that reduces his or her monthly house payment. The total value of each subsidy is the after-tax present discounted value of the payment savings.

MRB loans offer another advantage over most conventional loans (but not FHA-insured, VA-guaranteed, or high loan-to-value ratio conventional loans): they typically require a down payment of five percent to ten percent of the house purchase price instead of 20 percent. The smaller down payment can be especially important for young, first-time home buyers who have accumulated only a small amount of savings.

The subsidies are usually distributed by private lenders operating under contract to a public agency. The lenders originating MRB loans usually select the loan recipients based on the institution's loan underwriting standards, lender preferences, and guidelines established by the MRB program.[1]

The Predicted Policy Outcomes

As shown in the content analysis, proponents of MRB subsidies said that MRBs contributed primarily to three types of beneficial outcomes: they helped households become house owners, stimulated the economy, and improved housing and neighborhoods.[2] Each of these outcomes and the implicit cause-effect models are discussed below.

Outcome 1: Help Renters Become Home Owners

The most frequent argument for MRB programs was that the subsidies help low- and moderate-income households and first-time home buyers to become home owners.[3] The question is, how do these subsidies produce increased home ownership? What is the causal relationship? Senator William Roth (R-Delaware) offered the following explanation:

> Why is there such strong support for the MRB programs? I think it is because it is a people program which attempts to address the problems of housing affordability and enable people to purchase their own homes—a longtime national goal. The program accomplishes the objective by

providing capital for mortgages at below-market rates. This differential can provide enough of a savings on a home owner's monthly payment to make home ownership possible. It is a program which has been targeted (U.S. Congress 1983b).

Other explanations used average or median figures as evidence that the MRB subsidies make a difference:

> In my home city of St. Paul, Minnesota, over 2,300 households have purchased homes through our city's single-family mortgage revenue bond program. . . .These mortgages went to households with incomes averaging $26,087—only 87 percent of the area's median of $30,000. I believe it is fair to say that without exception, the purchasers of these homes could not afford to buy a house without the MRB program. Their incomes are limited, over 90 percent of them had been renters and most of them had been looking for a home for some time (Kenneth Johnson, Board of Directors of the Association of Local Housing Finance Agencies, U.S. Congress 1983b, 229).

The implicit model is that subsidies reduce the required monthly payment enough to enable households that otherwise could not afford the payment to purchase a house. For example, if a buyer could qualify for a loan with $500 monthly payment, but not for a loan with a $550 payment, the MRB subsidy increases home ownership (at least in the short run) if it pays the $50 difference.

According to this model, for any given market interest rate, potential buyers can be classified according to two categories: (1) those who could obtain market-rate loans for a particular house and those that could not, and (2) the households who could qualify for an MRB loan and those that could not. The MRB program, at a minimum, should target households in the third group of the matrix shown in figure 1 if the program goal is a short-term increase in home ownership. Further, if the goal is a long-term increase in home ownership, a specific portion of the third group must be assisted: the households permanently unable to finance houses at the market interest rate.[4]

Critics of MRB programs (Mortgage Money from City Bonds 1978; GAO 1983, 1988; California Legislative Analyst, 1985) have concluded that MRB subsidies have a small effect on home ownership because they are given largely to households that could have purchased houses even if they did not receive a subsidy. A Treasury Department economist, Anthony Sulvetta (U.S. Congress 1983a, 24-28), has argued that the subsidy is too shallow to change decisions by households that could not purchase without subsidies. He

contended the major effect of MRB subsidies is to change slightly the timing
of purchases.

**Figure 1. Classification of Households by Ability to
Qualify for Market Rate and Mortgage Bond Loans**

		MRB Guidelines:	
		Qualifies for MRB loan	Doesn't qualify for MRB loan
Market Rate Loan:	Qualifies	1	2
	Doesn't Qualify	3a-temporary 3b-permanent	4

Outcome 2: Stimulate the Economy

MRBs were described by supporters as a means to stimulate the urban
and national economies by increasing house construction and sales, thereby
adding jobs and tax collections. For example, Wallace Ford 2nd (1983),
claimed that about 7,000 MRB loans in New York created 2,000 new
construction jobs and had a billion dollars net impact on the state. Also, the
National Association of Home Builders (NAHB) has published a summary of
the multiplier effect of home construction that indicates that the houses built
because of MRB subsidies generate a vast amount of economic benefits (U.S.
Congress 1983b, 255).

The implicit model used here has two key assumptions: (a) MRB loans
generate a large amount of house construction, and (b) the opportunity costs
of the subsidies are less than the benefits of the activity generated by using the
money for house finance. The validity of the first assumption depends on
whether most buyers would have bought new houses without the subsidy and
whether MRB mortgages add to or replace mortgage capital available in an
area. The validity of the second assumption depends on the comparative
economic activity generated by housing construction. Some housing econo-
mists have concluded that housing adds less to the economy than a com-
parable investment in business because housing is not labor intensive over the

life of a housing unit. Once built and furnished, it yields little more to the GNP. For example, Downs (1985) believes that too much capital is invested in housing rather than industrial capacity that would generate jobs and increase wealth through higher productivity. Hendershott (1981) has concluded that the sale of a large amount of MRBs leads to large losses in society's productivity and wealth.

Outcome 3: Improve Housing and Neighborhoods

Supporters maintained that MRBs helped stabilize neighborhoods and increased the housing supply. This argument tied MRBs to community development goals.   The following are excerpts from testimony before the House Ways and Means Committee (U.S. Congress 1979):

> [MRBs enable] a developer to build central city housing at a price comparable to the suburban areas. . . . The private sector cannot provide affordable housing for low- and moderate-income people nor can it provide competitive housing in the downtown areas of our cities without some kinds of subsidies (Mayor Daniel Whitehurst, Fresno, California).

> [An MRB program] encourages persons of all social and economic positions to reinhabit older urban areas, thereby rendering these areas more socially balanced and economically self-sufficient. . . . [It] reduces the pressures for suburbanization and thereby mitigates many problems caused by urban migration. . . .[It] stimulates urban building and construction activity (Mayor Merle Mergell, Inglewood, California).

This community development model is based on the following assumptions: (1) subsidies are directed to urban target areas with special needs, (2) the subsidies increase home ownership in these areas, (3) the housing maintenance behavior of subsidy recipients is better than the behavior of the households who would have lived in the houses without the subsidy, and (4) externalities are created by having home-owning households in the neighborhood. A key premise is that the MRB subsidies are sufficient to induce middle-income households to choose to live in older urban areas rather than suburbs.   One necessary condition for this premise is that subsidies be provided for houses in the declining central city, but not suburbs.

THE ECONOMIC RESULTS OF MRB SUBSIDIES

In this part of the chapter, I examine the economic results of MRB subsidies in one state, focusing on questions that help determine whether they provided the benefits claimed by their supporters. I address three questions:

●What were the socio-economic characteristics of MRB loan subsidies recipients?
●Did these households need the subsidies; i.e., could they have qualified for market rate loans?
●Were the subsidies targeted to the worst neighborhoods?

Who Got MRB Loan Subsidies?

Did MRB loan subsidies go to households that lacked the resources to obtain adequate houses without government assistance? Evidence that an MRB subsidy program was targeted to needy households is that the households with the greatest housing problems received at least their proportional share of the subsidies.

Some segments of America's population have greater difficulty paying for adequate housing than do others. Different studies (Follain, Katz, and Struyk 1978; Kain and Quigley 1975; Struyk 1976; Aaron 1972; and Cooperstein 1985) have shown that housing problems are concentrated in low-income, minority, large (five or more persons), and female-headed households. These groups are more likely to live in substandard housing, and they have much lower home ownership rates than other households. For example, the home ownership rate of black households is 43.9 percent compared to 69 percent for white households. Households with incomes less than $10,000 per year have an ownership rate of 48.2 percent, compared to an ownership rate of over 80 percent for households with incomes greater than $20,000 per year.

The Method of Investigation

Determining the distribution of the benefits from MRB loans was straight-forward. I collected and examined in detail a sample of loan transactions from one state. These individual data permitted an in-depth look at the characteristics of subsidy recipients compared to state population characteristics.

The after-tax nominal value of each monthly MRB subsidy was calculated as follows:

(1) $S_a = (1 - t)(P_m - P_b)$,

where S_a is the after-tax monthly subsidy, P_m is the monthly mortgage payment for the principal amount at the market interest rate, P_b is the monthly mortgage payment for the principal amount at the interest rate for a mortgage bond loan, and t is the household's marginal tax rate.

The after-tax value of the subsidy is its present discounted value (PDV):

$$(2) \quad V_a = (1-t) \sum_{n=1}^{N} \frac{S_a}{(1 + r)^n} \; ,$$

where V_a is the after-tax PDV of the subsidy, S_a is the after-tax nominal monthly subsidy, r is the discount rate, and N is the number of months the loan payments are made.

To calculate V_a, the discount rate (r), the length of time the household will keep the house (N), and the marginal tax rate (t) must be estimated for each household. While r and N are not known for each buyer, the values of these variables can be estimated. Also each household's marginal tax rate can be estimated if income and household size are known.[5]

The discount rate, assumed to be the same for all households, was specified as the market interest rate for conventional mortgages.[6] The discount rate used in this paper was the three-month moving average of the market interest rate for fixed-rate mortgage loans made during the month the MRB loan was completed.

Two assumptions about (N) were used to estimate the value of MRB subsidies. The first assumption was that all MRB loans would be held for their full terms, thus the subsidies would be received for the 30 years. The second assumption was that all loans would be terminated at the end of seven years.[7]

The Data

The data used in this section came from the Arkansas Housing Development Agency (AHDA), now the Arkansas Development Finance Authority. This agency was created in 1977 to sell revenue bonds to finance both single-family and multi-family mortgages.

The Arkansas housing market is similar to housing markets outside of the metropolitan centers on the east and west coasts. While the median house price in Arkansas during 1983 was only about two-thirds of the national

median, this difference reflected mainly the impact of expensive housing in the nation's coastal metropolitan areas on national averages. Arkansas' house prices were near those of other states in the South and other areas outside coastal metropolitan centers.

The average price of houses financed by the AHDA were close to the national average of single-family houses purchased with MRB loans. In the 1984 fiscal year, the average price of a house financed with an AHDA MRB loan was $49,365. Nationally, the average was $51,569 (National Council of State Housing Agencies 1984). Thus, the Arkansas MRB program served roughly the same segment of the housing market as MRB programs in other states.

The AHDA data consist of detailed information about 340 loans made from April to October 1983.[8] The information for each loan includes details about the characteristics of buyers, the mortgage finance transaction (for example, sales price, mortgage amount and total payment), and the house that was purchased.

The AHDA completed two bond issues during this time. The first, in April, was a $26.4 million bond sale. It came as the state was beginning its recovery from a devastating recession. The agency timed its bond issue well, selling bonds as market rates fell to their bottom for the year. As a result, the AHDA offered during the summer of 1983 fixed-rate mortgage loans with an interest rate of 9.625 percent, about four percentage points—instead of the usual two to three—below market rates.

A second bond issue is also represented in this sample. In June, the state sold $50 million of single-family mortgage revenue bonds. The mortgage loans financed by this issue had an interest rate of 10.20 percent. Of the 340 loans in the sample, 56 were loans with this interest rate.

The MRB loans required a minimum down payment of five percent of the sales prices. In addition, a payment of 5.5 points (5.5 percent of the mortgage amount) had to be made to the lender when the loan was made. The program restrictions were as follows:

●A loan recipient could have a maximum income of $40,000, plus $2,000 for each dependent. Thus, a household consisting of husband, wife, and two children could have a maximum income of $44,000.

●Ninety percent of the loans had to be made to first-time home buyers (buyers who had not owned houses in the past three years), except in the targeted areas. Loans in target areas could go to any household meeting other requirements.

•The maximum purchase price was $65,670 for existing houses and $73,150 for new houses in nontarget areas. In target areas, the maximums were $71,640 for existing and $79,800 for new houses.

The average sample values of the most important characteristics of the purchased houses, financing, and borrowers are shown in appendix 2. The average price for a house financed with an MRB loan during this period was $46,481, with a mortgage of $42,641. Total monthly house payments (including principal, interest, taxes and insurance) were $422.22. Borrowers had an average income of $26,917 per year ($2,243 per month). The total house payment averaged about 19.5 percent of gross monthly income.

The Results

The 340 MRB loans provided $14,421,615 to borrowers. The total after-tax value of the loan subsidies was $2,729,814 if the loans were kept for their full terms. If the loans were held for only seven years, the total after-tax subsidy value was $1,685,663. Table 2 shows the estimated before- and after-tax value of the MRB subsidies for the 340 loans. These subsidy values were calculated using equations (1) and (2).

Table 2. Estimated Present Discounted Value (PDV) of MRB Loan Subsidies
Loans Made by the Arkansas Housing Development Agency
April-October 1983

		Before-Tax Subsidy	After-Tax Subsidy
Years Loans are Held by Borrowers:	7 years	$2,210,614 ($6,501)*	$1,685,663 ($4,682)*
	30 years	$3,580,038 ($9,945)*	$2,729,814 ($8,029)*

*average subsidy per borrower.

The distribution of the after-tax subsidy by economic and social character-
istics of households is presented in tables 3 and 4. Table 4 also shows the
distribution of state population by the various economic and social categories,
permitting a comparison of the characteristics of MRB subsidy recipients with
the characteristics of the state's population.

In table 3, the state income decile categories allow a comparison of the
income of loan recipients with the income of state residents. However, this
comparison may be misleading because it does not account for intrastate
differences in incomes and house prices. With the higher cost of housing in
urban areas, households living in these areas need higher incomes than
households in rural areas to purchase identical housing services.

The clearest finding is that the loans and subsidies went predominantly to
higher income households. The state median family income in 1983 was
$19,737. Only about 15 percent of the loans and subsidies was provided to
households with incomes below the state median. Roughly half of the loans
and subsidies went to households with incomes in the seventh or greater
decile.

The county income category in table 3 corrects for the differences in
intrastate income distribution, comparing the income of loan recipients with
county median income. It shows that over 60 percent of the loans and
subsidies went to households with incomes greater than 120 percent of the
median income in the county in which each loan recipient lives. Only about
six percent of loans and subsidies were provided to households earning less
than 80 percent of the county median.

While a debate continues over the definition of "low- and moderate-
income households," the meaning of this term has been defined in federal
housing assistance programs that provided direct subsidies. "Low-income
households" have typically been households earning less than 80 percent of the
area median income. "Moderate-income households" have had an upper
income limit of about 120 percent of the area median. If the definition of a
low-or-moderate income household is a household earning less than 120
percent of the area median family income, the results in table 3 provide
evidence that more than half of the MRB loan subsidies were provided to
households that did not have low or moderate incomes.

Did Households Receiving MRB Subsidies Need Them?

Just as MRB loans were not targeted primarily to households with
incomes less than 120 percent of the area median income, neither were they
targeted to other "needy" households in proportion to their numbers in the
state's population (see table 4). About ten percent of the loans and subsidies

Table 3. Distribution of Subsidies
By Income Range, Decile, and Category

INCOME RANGE	Pct. of Subsidies
Less than $15,000	4.6
$15,000-16,999	3.0
$17,000-18,999	4.0
$19,000-20,999	8.4
$21,000-22,999	8.5
$23,000-24,999	6.4
$25,000-26,999	11.3
$27,000-29,999	16.4
$30,000-35,999	22.3
$36,000 or more	15.1
STATE INCOME BY DECILE	
1st Decile	0
2nd Decile	.1
3rd Decile	3.9
4th Decile	2.6
5th Decile	8.4
6th Decile	15.6
7th Decile	20.7
8th Decile	27.7
9th Decile	21.0
10th Decile	.7
COUNTY INCOME CATEGORIES[a]	
Low Income	6.3
Moderate Income	32.1
Above Moderate	27.7
Upper Income	34.0

[a]Low income is less than 80 percent of the county family median. Moderate income is between 80 percent and 120 percent. Above moderate income is between 120 percent and 150 percent. Upper income is above 150 percent of the county median.

SOURCES: 1983 state and county income estimates from the U.S. Department of Housing and Urban Development, Little Rock Office 1984.

Table 4. Socio-Economic Characteristics of Households
Receiving MRB Loans Made By Arkansas Housing
Development Agency, April-October 1983

	Pct. of Subsidy	Pct. of State Population
Sex of Householder		
Male	90.3	85.0
Female	9.7	15.0
Household Size		
1 person	13.4	21.2
2 persons	39.0	33.1
3 persons	24.4	17.8
4 persons	17.5	15.5
5 or more	5.8	12.4
Race		
White	95.5	82.7
Other	4.5	17.3
In SMSA?		
Yes	52.6	39.2

SOURCE: U.S. Department of Commerce, 1983 and author's
calculations.

went to female-headed households, but about 15 percent of all families in the
state in 1983 were headed by females. Although about 17 percent of the
households in Arkansas were racial minorities, minority households received
only about five percent of the loans and subsidies.

These results show that households falling in the categories with the lowest
home ownership rates were not specially targeted by the MRB program.
These households did not get their share of the subsidies based on their
proportion of the population.

This section addresses the question of whether the households that
received MRB subsidies could have purchased houses without them. A
central argument for MRB programs is that the loans enable buyers to pur-
chase houses that they could not have afforded in the absence of the subsidies.
This section examines whether, in fact, this argument was supported by the
data from the AHDA.

The Approach

Determining whether a household receiving an MRB loan could have purchased its chosen house without an MRB loan subsidy was done by calculating if the household could have qualified for either an FHA-insured or conventional loan. These steps were followed:

•Step 1: I calculated the monthly mortgage payments the buyer would have paid if he or she had received an FHA-insured or conventional loan.

FHA loans: The monthly payment for an FHA-insured loan was calculated as the payment that would be required if the MRB loan mortgage amount had been financed with a fixed-rate FHA loan for an identical term. The principal and interest payment was determined by using the three-month moving average of the FHA interest rate for same term as the MRB loan. The loan principal amount was the actual mortgage amount for the MRB loan.

Conventional loans with no mortgage principal adjustment: The mortgage payment for a conventional loan was calculated as the monthly payment for the MRB loan amount for the same term. In this calculation, I assumed the buyer would pay the same sales price as with an MRB loan, obtain a 95 percent loan, pay 5.5 points and closing costs.

•Step 2: I calculated the total house payments for the FHA-insured and conventional loans. I assumed that the insurance and property tax payments would be the same for FHA-insured and conventional loans as they are for the MRB loans. So, I added these payments to the mortgage interest payment to obtain the total house payment.

•Step 3: I determined the house payment-income and total debt payment-income ratios for the FHA-insured and conventional loans. Since the monthly house payments for FHA-insured and conventional loans had been calculated and household income was known, the house payment-income ratios were determined simply by dividing the monthly house payment by the monthly income.

From the available data for MRB loans, I could determine for each household how much of its income it was paying for non-housing debt. I added that amount to the total house payment to obtain each household's total debt payment. Dividing the total debt payment by income, I obtained the total debt payment-income ratio.

●Step 4:   I determined if each household would meet the minimum underwriting criteria for a conventional mortgage loan.

The house payment-income and total debt payment-income ratios were two key criteria for mortgage loan underwriting.   During 1983, the standard mortgage loan qualification criteria for a conventional loan were a payment-to-income ratio of 28 percent or less and a total debt payment-to-income ratio of 36 percent or less.[9]   These underwriting criteria were widely used because they were the standards set by the secondary market mortgage purchasers.

The Results

Table 5 presents the results of these calculations using the data on 340 mortgage loans in Arkansas.   For purposes of comparison, the number of households who qualified for an MRB loan using these underwriting standards

Table 5.   Number and Percentage of Borrowers Qualifying for Mortgage Loans Using Standard Underwriting Criteria[a]

	MRB LOANS No. (Pct.)	FHA LOANS No. (Pct.)	CONV. LOANS No. (Pct.)
Do Not Qualify Because:			
House Payment/Income Ratio Exceeds 28%	7 (2.1)	23 (6.8)	39 (11.5)
Total Payment/Income Ratio Exceeds 36%	24 (7.1)	61 (17.9)	68 (20.0)
Both Ratios are Too High	10 (2.9)	64 (12.9)	64 (18.8)
SUBTOTAL	41 (12.1)	128 (37.6)	171 (50.3)
Do Qualify for Mortgage Loan	299 (87.9)	189 (62.4)	169 (49.7)

[a]The underwriting standards are that a household qualifies for a mortgage loan if its total monthly house payments do not exceed 28 percent of its monthly income and its total monthly debt payments do not exceed 36 percent of its income.

is shown in the first column. About 88 percent of households receiving MRB
loans qualifed for them using the standard underwriting criteria. The
remainder of the households either had co-borrowers that did not appear in
the AHDA data or qualified under more liberal criteria.

If the households receiving MRB loans had been forced to obtain
FHA-insured or conventional loans, more than 60 percent would have qual-
ified for the FHA loan and about half would have qualifed for a fixed,
market-rate conventional loan. These results indicate that at least half of the
households receiving MRB subsidies were not marginal buyers.

Table 6 shows the percent of households that qualified for the different
types of loans even if more conservative underwriting criteria were used. In
order to qualify, a household must have a house payment-income ratio of 25
percent or less and a debt payment-income ratio 35 percent or less. Using
these criteria, about 44 percent of the households qualified for FHA-insured
and 34 percent for conventional loans.

**Table 6. Number and Percentage of Borrowers Qualifying
for Mortgage Loans Using Conservative Underwriting Criteria***

	MRB LOANS No. (Pct.)	FHA LOANS No. (Pct.)	CONV. LOANS No. (Pct.)
Do Not Qualify Because:			
House Payment/Income Ratio Exceeds 25%	22 (6.7)	50 (14.7)	55 (16.2)
Total Payment/Income Ratio Exceeds 35%	17 (5.0)	68 (20.0)	63 (18.5)
Both Ratios are Too High	27 (7.9)	71 (20.9)	105 (30.9)
SUBTOTAL	66 (19.4)	189 (55.6)	223 (65.6)
Do Qualify for Mortgage Loan	274 (80.6)	151 (44.4)	117 (34.4)

[a]The conservative underwriting standards are that a household qualifies for a
mortgage loan if its total monthly house payments do not exceed 25 percent
of its monthly income and its total monthly debt payments do not exceed 35
percent of its income.

What Were the Community Development Impacts of MRB Subsidies?

Did MRB subsidies contribute to the improvement of the housing stock and neighborhoods of urban areas? To gain insight into this question, the distribution of MRB subsidies by location in the city of Little Rock was determined. Data were available for 147 MRB loans made in Little Rock in 1983 and 1984.[10] A total of $6,878,623 in mortgage loans were included in this sample.

The key question was whether the MRB loans were made to households living in the areas of the city with the worst housing problems. To find out, census districts were ranked on the basis of the 1980 median value of owner-occupied houses.[11] The census districts with the lowest house values and incomes were expected to be the ones with the greatest housing and neighborhood problems.

As shown in table 7, no MRB subsidies were provided in the central city of Little Rock. Only four of 147 mortgage loans were made to households in the ten census districts with the lowest house values. On the other hand, 54 MRB loans (36.7 percent of the loans; 40.6 percent of the total loan amount) were provided to households buying houses in the eight census districts with the city's highest house values. The single largest number of loans (21) was made to households buying houses in the census district with the highest median house values and median household per capita income.

The distribution of MRB loans shown in table 7 provides evidence that the subsidies were not targeted to the areas of the city needing community development assistance. A major portion of the loans went to buyers in the affluent suburban neighborhoods of the city. These data do not support the conclusion that significant community development objectives were served by the MRB subsidies in Little Rock.

CONCLUSION

An examination of the distribution of MRB subsidies in Arkansas during 1983 indicates that most MRB subsidies were not provided to needy households likely to be permanently excluded from the home ownership market: they were not targeted to low-income, minority, female-headed, or large households. Nor did a major portion of the subsidies go to households that could not have qualified for FHA or conventional loans. The evidence suggests that over 60 percent of MRB subsidy recipients were qualified to receive FHA loans and half were qualified for conventional loans.

Subsidies were granted for the most part to households that likely would have purchased a house sooner or later; they were provided mainly to house-

Table 7. Distribution of MRB Loans By Census Tracts

Census Tracts with Lowest Median 1980 House Values

Census Tract Number	Median House Value	Median Household Income	Number of MRB Loans
2*	$18,800	$ 8,235	0
3*	21,600	8,798	0
4*	18,100	8,986	0
5*	21,500	8,966	0
7*	25,400	7,505	0
8*	22,400	8,631	0
10*	21,900	9,196	0
12	21,200	10,424	0
13	21,000	11,501	0
19	24,400	12,010	4
SUBTOTAL			4 (2.7%)

Census Tracts with Highest Median 1980 House Values

Census Tract Number	Median House Value	Median Household Income	Number of MRB Loans
20.01	$63,100	$23,490	2
22.01	61,300	23,876	6
22.04	79,400	28,231	0
22.05	61,000	20,696	7
41.06	55,600	16,941	⅃
42.03	81,100	35,303	21
42.04	75,500	24,964	0
16	72,000	23,302	3
SUBTOTAL			54 (36.7%)
City Median	$42,800	$15,796	
# MRB Loans			147

*Located in central city.

SOURCE: U.S. Department of Commerce 1983.

holds with socio-economic characteristics similar to the types of households
with high home ownership rates. Likely, the main impact in Arkansas of the
MRB subsidies was, as Anthony Sulvetta of the Treasury Department
suggested, a change in the timing of decisions to purchase houses. The small
home ownership increase associated with MRB subsidies casts doubt upon the
economic benefits of the program. The subsidies might have been useful as
a countercyclical measure to reduce the effects of a recession, but seem
unlikely to have had a substantial long-term effect on the amount of house
construction.

    The evidence also indicates that MRB subsidies did not contribute to the
revitalization of central city neighborhoods. A large portion of the subsidies
were distributed in the most affluent suburbs of the city. No subsidies were
provided to households making purchases in the central city, and less than
three percent of the subsidies were distributed in the neighborhoods with the
poorest housing.

    These conclusions about the small benefits of MRBs raises a difficult
question: why did so many people at the time, governors and mayors
included, insist so adamantly that MRB loans were having a large beneficial
impact? The following quotes indicate the strength of the beliefs about the
value of MRBs:

> As a Governor, I can assure you that the tax-exempt revenue bond
> program at the state level is successful because it provides more than
> affordable mortgage money for our deserving citizens. Tax-exempt bonds
> for home ownership serve a larger role in relation to state economic
> development strategies (Governor Bill Clinton, U.S. Congress 1983b, 146).

> . . .[T]hose who know us best, the Governors, the state legislators, the
> mayors, the builders, the realtors, are all here testifying in support of this
> program. They have seen the program, they know it works (John Ritchie,
> president of the National Council of State Housing Agencies, U.S.
> Congress 1983b, 403).

> This program is an excellent example of using a private-sector mechanism
> for a public purpose objective. Once the facts are viewed with dispassion
> and objectivity and with an economic development perspective, the choice
> [about whether to allow MRB programs to continue] will be immediately
> clear (Wallace Ford, 2nd in Ford 1983).

    No doubt, the supporters of MRB subsidies were sincere in their beliefs
about the value of MRB subsidies. However, while we have no way of know-
ing how they formed their opinions about MRB programs, it seems clear that

their "knowledge" about them was influenced by self interest and their belief
in the importance of home ownership (see the discussion of the interaction of
self interest, beliefs, and knowledge in chapter 1). Given the small direct costs
of MRB programs, the arbitrage profits that local and state government
earned on MRB programs in the late 1970s and early 1980s, and the
significant political benefits created by giving mortgage loan subsidies to house
buyers, it is understandable that MRB issuers did not want to see MRB
programs end.

Appendix 1
Content Analysis Methodology

The analyzed documents were committee hearing transcripts (U.S.
Congress 1979, 1983b). The 1979 hearings were held on May 14 and 15, 1979
to address legislation to curb the use of mortgage revenue bonds. The 1983
hearings were held on June 15 and 16, 1983 to discuss whether mortgage
revenue bond programs should be permitted to continue after December 31,
1983.

The content of the entire record of both hearings, both oral and written
statements, was analyzed. The purpose of the analysis was to determine the
frequency of assertions about the outcomes of MRB subsidies. The purpose
of these messages (encoding) was the same at both hearings: to persuade and
inform.

The unit of observation was the phrase. Thus one or more messages
could be found in a single sentence. The observed phrase was some statement
(observation, assertion or conclusion) about the outcomes (the results pro-
duced by) MRB subsidies. The counting of the frequency of individual
phrases was constrained so that each group (even if it had more than one
person representing it) could be counted as using a particular phrase only
once.

The coder identified phrases that completed the following sentence: "I
support MRB programs because they . . . ." The 1979 hearing was coded
independently by two people: I read and coded both hearings, and a research
assistant replicated the coding. The research assistant was given instructions
to identify messages completing the above sentence and to assign them to
categories. A list of categories was provided, but the coder was also told to
create additional categories if messages did not fit into the existing ones.

I integrated the content analyses for the 1979 hearings. Since more than a year passed between the time I first completed my coding and integrated the two content analyses, I had an opportunity to reevaluate my coding and compare it to the coding by the research assistant.

The 1983 hearing was coded by a research assistant who was provided with instructions and a list of categories. She was also told to add more categories if they were needed.

Coding bias is possible in both content analyses since one person was responsible for assigning messages to categories. The bias would affect inter-category assignment of messages.

The coding is consistent since there is no inter-coder error in the interpretation of categories. According to Janis (1965, 59), the frequency count of manifest phrase should have few internal validity problems. The categories of the phrases appear to measure the constructs they are intended to measure.

The internal validity is more difficult to assess. A review of newspaper and magazine articles on MRBs does indicate that the arguments used to support MRBs in the congressional hearings are the common arguments used in other forums.

Since the purpose of the content analysis is modest, to identify major categories of assertions about the outcomes of MRB subsidies, the content analysis methodology seems sufficient. The bias might cause mistaken conclusions about the relative importance of various assertions about the results of MRBs, but should not lead to mistakes about the categories.

**Appendix 2. Arkansas Mortgage Revenue Bond Program
Characteristics of Financing, Houses, and Borrowers
1983 Averages**

Characteristics	All Houses (N=340)	Resale Houses (N=232)	New Houses (N=108)
FINANCING			
Sales Prices	$46,481	$43,157	$53,621
	(13,287)	(12,768)	(11,487)
Mortgage Amount	$42,461	$39,530	$48,618
	(12,561)	(11,999)	(11,487)
Monthly House	$363.81	$339.32	$416.41
Payment (P&I)	(108.18)	(103.24)	(99.86)
Total Pymt. (in-	$422.22	$390.61	$490.12
cludes insur.	(124.50)	(116.84)	(113.21)
and taxes)			
Total Pymt.-to-	19.47	18.89	20.72
Income Ratio	(5.16)	(5.47)	(4.51)
HOUSES			
Living Space	1350.20	1370.00	1307.65
(square feet)	(350.24)	(382.90)	(263.55)
House Age	13.23	19.37	0
(years)	(14.43)	(13.65)	0
No. of Bedrooms	2.79	2.81	2.75
	(.51)	(.51)	(.51)
BORROWERS			
Annual Income	$26,917	$25,897	$29,108
	(7,702)	(7,672)	(7,834)
Age of House-	29.4	29.6	29.1
hold Head	(7.7)	(8.4)	(5.9)

(Standard deviations are in parentheses.)

ENDNOTES

1. State and local governments ration MRB subsidies in various ways, including the use of a lottery to select which qualified households will receive the subsidies. See chapter 2.

2. The other arguments for MRB subsidies identified in the content analysis are more concerned with process rather than outcomes.

3. In fact, at both hearings a large minority of speakers justified MRB subsidies on the basis of home ownership beliefs (the putative externalities of home ownership) and the home ownership symbol.

4. Households that are temporarily unable to obtain a market rate loan are those that fit the profile of home owners based on income, family size, age, and race. Many such young households are in the early part of their life cycle and will become home buyers within a few years. Households permanently out of the home ownership market are those households who because their socio-economic characteristics are likely to be unable to afford a house purchase even if interest rates decline significantly.

5. For each household, the income, number of dependents, and mortgage interest payment is known. It is possible to estimate the marginal income for each household based on these data and income tax tables.

6. While selecting the correct discount is critical for estimating the amount of individual subsidies, it has no effect on the percentage distribution of the subsidies. Since the same discount rate is used for every household, a different discount rate would still result in the same distribution of subsidy benefits even though it changed the amount of the subsidies.

7. The distribution of subsidies is not sensitive to assumptions about the length of time the household will hold the loan as long as the holding period is the same for each household.

8. The 340 loans were all of the loans purchased by the AHDA during this period.

9. The 28- and 36-percent limits were used by the Federal National Mortgage Association in 1983 as the maximum for the mortgage loans it would purchase. Thus, for a lender quickly to sell mortgage loans into the secondary market, these limits had to be met.

10. This sample consists of all MRB loans made in Little Rock and purchased by the Arkansas Housing Development Agency from April 1983 through March 1984. The sample is comprehensive for this period, and should be representative of all MRB loans in Little Rock. The results should not be biased by the sample.

11. The house values are the user-specified values in the 1980 Census of Population and Housing (U.S. Department of Commerce 1983).

5
THE VALUE OF MORTGAGE INTEREST SUBSIDIES TO PARTICIPANTS IN THE SINGLE-FAMILY MORTGAGE REVENUE BOND PROGRAM OF A STATE HOUSING FINANCE AGENCY

L. Jide Iwarere
and
Hugh O. Nourse

INTRODUCTION

State housing finance agencies (SHFAs) have emerged over the last two decades as state governments' major vehicles for promoting subsidized low- and moderate-income housing. The agencies use the net proceeds from their tax- exempt bond issues to make both multi-family and single-family mortgage loans at subsidized interest rates to developers and low-to-moderate income, first-time home buyers.[1] In the 1980s, SHFAs issued large amounts of mortgage revenue bonds (MRBs) to finance the purchase of houses. The large-scale use of MRBs has attracted the attention of scholars and policymakers to issues of the efficiency and equity of these bonds.

In our study, we evaluate the benefits of the MRB program by measuring the utility of the interest subsidy (the "explicit benefits") of MRB-financed loans to their participants. For the measurement, we use the economic concept of consumer surplus, ignoring all external effects. The interest subsidy is one of two of the "direct benefits" provided by the MRB program. The second consists of the "implicit benefits," the tax advantages of home ownership status induced by the program.

The implicit benefits arise from the program requirement that, with few exceptions, all MRB-loan recipients be first-time home buyers or households that have not owned a home during the previous three years. If MRB-loan subsidies persuade renters to become buyers, the home-buying households receive the tax benefits of home ownership that they otherwise would not have received, or would have received later when they purchased homes. We assume that the subsidies do induce home ownership.[2]

While tax benefits from home ownership induced by MRB loans may be expected to accrue to some of the program participants, they are difficult to measure. Their measurement is complicated by the fact that the benefits flow

only as long as households receiving MRB loans would have remained renters in the absence of the loans. Likely most households assisted by MRB programs would have eventually purchased a house.[3] So, to figure the value of the home ownership tax benefits, we have to determine when each household receiving an MRB loan would have bought a house without the loan. Because we lack this information, we ignore these implicit benefits.

In this chapter, we estimate the direct benefits accruing to participants in the Georgia Residential Finance Authority's (GRFA) MRB program using data on all the 1,225 households that received subsidized loans from its 1984 (serial B) revenue bond issue.[4] In the next section, we discuss the institutional background of GRFA, then we specify the models we use to measure program benefits. Following an analysis of the data, we present the results of our estimation and conclude the paper by mentioning some implications of our study for the MRB program.

THE GRFA: INSTITUTIONAL BACKGROUND

The Georgia Residential Finance Authority (GRFA) has been operating since 1976. Its charter envisioned it as a vehicle for funnelling cheap capital into the housing mortgage market. To do so, the GRFA issues MRBs and provides most of the bond proceeds to private lending institutions that use the capital to make below-market rate mortgage loans to low- and moderate-income households purchasing homes. The lending institutions originate and service the subsidized mortgages.

The GRFA issued a total of $446 million in single-family MRBs between 1976 and 1984. Of that amount, 85 percent (or $380 million) was used to fund subsidized mortgage loans for over 10,000 households. Since 1984, the GRFA has issued another $480 million in MRBs (including refundings).

METHODOLOGY FOR ESTIMATING PROGRAM BENEFITS

We assume that each household receiving a single-family MRB is a rational consuming unit seeking to maximize its utility from home ownership. It has a budget for meeting its consumption basket that consists of home ownership (H) and a composite set of nonhome ownership goods (Q). This budget constitutes the household's income (Y) that is fully spent on its consumption basket. In general, the home ownership component includes mortgage payments, property taxes, and maintenance and repair expenses. However, we shall assume that the home ownership expenditure consists solely of mortgage payments while the nondebt aspects of home ownership are included in the

composite goods (Q). In essence, we assume that (H) includes only the mortgage debt.

Under these assumptions, the utility function can be written as

(1) $U_o = U_o(H,Q)$

with a budget constraint

(2) $Y = P_h H + P_q Q,$

where P_h and P_q represent unit prices of home ownership (mortgage debt) and composite goods respectively.

Assuming a fall of α (where $\alpha < 1$) in the unit price of mortgage debt realized through a mortgage subsidy from tax-exempt single family MRBs, the new price becomes $(1-\alpha)P_h$. The household may now attain a higher level of utility represented by

(3) $U_1 = U_1(H,Q).$

The new budget constraint becomes

(4) $Y = P_q Q + (1-\alpha)P_h H.$

Solving for Q yields

(5) $Q = \dfrac{Y - \phi P_h H}{P_q}$,

where $\Phi = 1 - \alpha$.

Our task is to determine the explicit benefits accruing to the household as a result of this change. We measure this with the aid of the consumer surplus notion of equivalent variation. This equivalent variation is the amount of money (cash equivalent) that must be paid to an eligible household not enjoying the mortgage subsidy to put it at the level of satisfaction attained by the household enjoying the subsidy. This cash equivalent compensation is represented by the distance BA on the graph in figure 1.

In order to establish an analytic form of the equivalent variation, we have assumed a Cobb-Douglas Utility function[5], $U = H^\beta Q^{1-\beta}$. Hence, the higher order utility, U_1 (equation 3), may now be restated as follows:

$$(6) \quad U_1 = H^\beta Q^{1-\beta} = [H]^\beta \left[\frac{Y - \phi P_h\, H}{P_q} \right]^{1-\beta}$$

where $\beta = Mc/Y$ is the marginal budget share of home ownership or the ratio of mortgage payment at the market interest rate (Mc) to income (Y).

Figure 1.
Graphical Illustration of Equivalent Variation
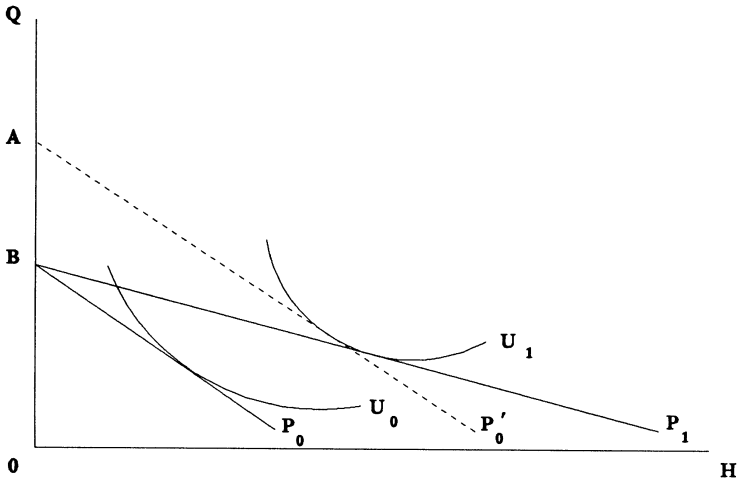
BA	=	Equivalent variation
P_0	=	Budget constraint at market price given household income, Y
P_0'	=	Budget constraint at market price given income, Y*
P_1	=	Budget constraint given mortgage subsidy
U_i	=	Utility function

The indirect utility function U^* under a Cobb-Douglas specification for a household not enjoying the mortgage subsidy may be obtained as

$$(7) \quad U^* = \left[\frac{\beta Y}{P_h}\right]^{\beta} \left[\frac{(1-\beta)Y}{P_q}\right]^{1-\beta}$$

We will determine the equivalent variation by equating the two utility functions established above (equations 6 and 7) for the household enjoying the subsidy (U_1) and the eligible household that is not (U^*).

$$(8) \quad [H]^{\beta} \left[\frac{Y-\phi P_h \; H}{P_q}\right]^{1-\beta} = \left[\frac{\beta Y}{P_h}\right]^{\beta} \left[\frac{(1-\beta)Y}{P_q}\right]^{1-\beta}$$

Solving equation (8) for income yields Y^* and

$$(9) \quad Y^* = \left[\frac{P_h \; H}{\beta}\right]^{\beta} \left[\frac{Y-\phi P_h \; H}{1-\beta}\right]^{1-\beta}$$

$$(9a) \quad Y^* = \left[\frac{Mc}{\beta}\right]^{\beta} \left[\frac{Y_i-Ms}{1-\beta}\right]^{1-\beta}$$

where
   Mc = P_hH (mortgage payment at the conventional market interest rate), and
   Ms = ΦP_hH (mortgage payment with MRB subsidy).
   The equivalent variation (EV) or explicit benefit is then obtained as EV = Y^* - Y, which is equal to the distance BA on the graph. Both Mc and Ms may be calculated from the loan terms under the conventional and subsidized mortgage market financing conditions respectively. Income (Y) is obtained for MRB subsidy recipients from their loan records. The mortgage payments are calculated as level annual payments that would fully amortize the principal and interest on a fixed rate mortgage over the loan period. However, we assumed an average holding period of ten years, based on Federal Home Loan Bank Board's estimate for conventional mortgages.
   The effective interest rate used to calculate mortgage payments in both cases reflected all loan-origination fees and discount points, assuming a ten-year holding period. Using information from the loan records of the

recipients of subsidies from the Georgia Residential Finance Authority's 1984-B Mortgage Revenue Bond Program (see table 1), we calculated the conventional (Mc) and subsidized (Ms) mortgage payments as follows:

Ms_i = .114282 $(LOAN_i)$

Mc_i = .133986 $(LOAN_i)$,

where

$LOAN_i$ = mortgage loan amount for household i,

Ms_i = the mortgage payment for household i that received a 30-year MRB loan with an effective interest rate of 11 percent, assuming a ten-year holding period, and

Mc_i = the mortgage payment for household i that received a 25-year conventional mortgage loan with 12.85 percent effective interest rate, assuming a ten-year holding period.

Reflecting these computations, the explicit benefit (the equivalent variation) for household i is calculated as

$$(10) \quad EV_i = \left[\frac{(.134)\ (LOAN_i)}{\beta_i} \right]^{\beta_i} \left[\frac{Y_i - (.114)\ (LOAN_i)}{1 - \beta_i} \right]^{1 - \beta_i} - Y_i$$

The variables are defined as earlier in this chapter.

THE DATA USED TO ESTIMATE MRB LOAN BENEFITS

The data employed for our study consist of income, demographic, and loan characteristics of the households that obtained mortgage loans from the proceeds of the GRFA's sale of $65 million of MRBs in 1984 (serial B). The proceeds were made available by the GRFA to private lending institutions responsible for originating and servicing the subsidized mortgage loans. They began taking loan applications from eligible households in January 1985, and shortly thereafter they started closing the loans. All the loans made under the 1984-B serial bonds were non FHA/VA loans, unlike earlier loans made by the agency.

Using the MRB funds, lenders provided 30-year fixed-rate mortgages with a 10.5 nominal interest rate to a total of 1,225 households. We show in table 1 a comparison of the MRB-loan terms and recipients with the terms and recipients of conventional, nonsubsidized loans.

Table 1. Loan and Borrower Characteristics: MRB Loans from the GRFA 1984-B Bond Issue and Conventional Mortgage Loans, 1985

Characteristic	GRFA 1984-B Subsidized MRB Loans (PMI)	Conventional[b] Nonsubsidized Loans
Contract Interest Rate	10.5%	12.34%
Origination Fee	1.0%	2.58%[c]
Discount Points	2.0%	
Effective Mtg. Interest Rate[a]	11.00%	12.85%
(Assume ten-year Holding Period)	11.42%	13.40%
Mortgage Term	30 years	25 years
Average Loan Amount	$45,000	$63,700
Average Purchase Price of Home	$49,000	$89,000
Average Loan-to-Value Ratio	92%	75%
Average Income of Participating Households	$26,000	N.A.
Average Household Size	2.41	N.A.

[a]We calculated the effective mortgage interest rate for GRFA's MRB loans. The effective rate for conventional, nonsubsidized loans was calculated by FHLBB Statistics and Analysis Division.

[b]These figures were calculated from the monthly averages for the period from February to June 1985, the time when most of the loans from proceeds of GRFA's 1984-B bond issue were extended.

[c]This figure represents a combined mean for both the origination fee and discount point in the conventional mortgage market.

SOURCES: Federal Home Loan Bank Board, *NEWS*, Nov. 5, 1985, table 3. Georgia Residential Finance Authority Working File and Annual Publications.

RESULTS OF THE ANALYSIS

We derived the MRB-loan recipients' valuations of the interest subsidy (the explicit benefits) by evaluating equation (10) for three broad income categories among the households.[6] The first group represents low-income households, those generally recognized as those earning less than 80 percent of the state median income. Group II comprised moderate-income households, those earning between 80 and 120 percent of the state median income. And households in the third group earned above 120 percent of Georgia's 1984 median income.[7]

The general characteristics of these groups are depicted in table 2. Two-thirds of the participants reported incomes above 120 percent of the area median while only about five percent were in the "low-income" category.

**Table 2. Some Economic Attributes of Participants
in GRFA's Mortgage Revenue Bond Program (1984-B issue)**

Group	Household Income	N	Mean Group Income	Mean House Price	Mean Debt Service	Payment/ Income Ratio[a]
I	Below $16,000	55	$14,024	$33,659	$3,543	.250
II	$16,000-$24,000	359	20,815	39,399	4,143	.199
III	$24,000-$38,000	809	29,439	52,470	5,520	.187
ALL		1,223	26,214	48,794	5,131	.196

[a]This parameter (ß) was computed as the ratio of the annual debt service paid by the participating household at the subsidized, effective interest rate and the household's annual income.

SOURCES: GRFA; Authors' Computations.

The mean values of the interest subsidy (EV) of 1.85 percent per household in each category are as follows: For Group I, the EV is $578; for Group II, the EV is $684; and for Group III, the EV is $900. For all groups, the EV is $843. (Note that 1.85 percent is the difference between the effective interest rates for MRB and conventional loans as indicated in table 1.)

The result shows that an eligible nonparticipant (a household eligible for a 1984-B MRB loan that did not receive one) would have been as equally well off as any of the participants if given $843 per year. When summed over all

participants, the benefits were slightly over $1 million annually from the bond issue of $65 million.

The GRFA's MRBs cost the federal government about $1.788 million per year in foregone taxes. (This cost is calculated using Hendershott's (1981) estimate that MRBs cost annually between $0.026 and $0.029 per dollar of bonds issued.) This comparison of benefits and costs indicates a ratio of 0.56, or 56 cents of benefits for every dollar of lost tax revenue.

We compared the equivalent variation (EV) with the face value of the interest subsidy (FV) obtained as the difference between the debt service under the conventional (12.85 percent) and subsidized interest rates (11 percent). This comparison is presented in table 3.

Table 3 shows that the participants tend to place a premium on the face value of the interest subsidy. This might be partly a result of a 13 percent reduction in the debt service, which substantially enhances loan eligibility and, hence, a household's ability to buy the property.

**Table 3. Comparing the Face Value of the Interest Subsidy
With the Equivalent Variation**

Group	Annual Debt Service Per Household Conventional (a)	Subsidized (b)	Difference FV = (a)-(b)	EV	EV/FV
I	$4,071	$3,543	$528	$578	1.095
II	$4,761	$4,143	$618	$684	1.107
III	$6,344	$5,520	$824	$900	1.092
ALL	$5,897	$5,131	$766	$843	1.100

SOURCE: Computed by the authors.

CONCLUSION

We set out in this chapter to determine the value consumers place on the interest subsidy afforded by an MRB program. We showed that the consumer attaches a value higher than the face value of the interest subsidy by about ten percent.

Other studies (see chapters 8 and 9) have shown that a large bond issue or developer-controlled access to MRB loans has resulted in partial seller capitalization of the subsidy benefits into a higher selling price. While we did not test for this capitalization effect, we should note that the GRFA's 1984-B issue created neither of these conditions that produced capitalization. However, a third condition did exist that, according to Durning (1987), may lead to capitalization. It is possible that there were inefficient searches for optimum house prices. In fact, the consumer's evaluation of the MRB subsidy may have contributed to an inefficient search: the premium placed by the consumer on the MRB subsidy (that is, placing a higher value on the subsidy than its face value) could have curtailed his motivation to search for an optimum price, thus enabling the seller to capture part of the subsidy benefits.

Our study also indicates that, using Hendershott's method of estimating costs, the MRB program is inefficient if we consider only the direct benefits accruing to the participant from interest subsidy. However, this view of benefits does not take into account the possible spillover effects of the program or its tax implications from the consumers' vantage point (which we ignored here for conceptual reasons).

ENDNOTES

1. See a description of the MRB program and its scope in chapter 1.

2. The potency of this assumption is weakened by recent studies that have increasingly indicated the contrary position for some participants. Hence, representing explicit benefits for the i-th participant by E_{ik} where

   $K = 1$ for households induced to ownership by program.
   $K = 0$ if otherwise.

   For $K = 1$, $E_{i1} > 0$.
   For $K = 0$, $E_{i0} = 0$.

   That home ownership provides benefits was lent credence by Henry Aaron (1970, 789) who stated that "tax benefits may be regarded as a cash payment conditional on housing purchase." White and White (1977) also posited that home owners enjoy a welfare gain over renters through a decrease in the cost of housing consumption and an increase in consumer surplus.

6

PROGRAM EFFECTIVENESS OF MORTGAGE REVENUE BONDS IN A CHANGING ECONOMIC ENVIRONMENT

David J. Gross

INTRODUCTION

In a 1988 study, the U.S. General Accounting Office (GAO) reported that mortgage revenue bonds (MRBs) had not been, in recent years, effective instruments for providing interest rate subsidies that issuers felt would be required to make the program effective. In addition, GAO reported that two factors might hinder improvement of MRB effectiveness: (1) the Tax Reform Act of 1986, which might increase the yield of MRBs relative to tax-exempt bonds; and (2) the trend away from the high nominal interest rates that made the bonds so successful in the early 1980s (GAO 1988).

This chapter analyzes how these two factors have affected the ability of MRB programs to provide significant mortgage rate subsidies. The method of analysis is to develop a simple model of the financial market, based on the relationships of yields of long-term, risk-free taxable investments (i.e., Treasury bonds) to yields of (1) MRBs, (2) MRB-financed mortgages, and (3) conventional mortgages. This model will be used to show how the potential spread between MRB-financed and conventional mortgage rates is affected by an exogenous change in the ratio of tax-exempt to taxable bond yields and by changes in prevailing interest rates.

Following this analysis is an estimate of how these factors have affected the size of MRB-financed mortgage subsidies in the three years since the release of GAO's study. This examination suggests that the 1986 tax reform did not change the magnitude of MRB mortgage subsidies because it apparently did not affect the marginal tax rate of the marginal investor in tax-exempt bonds. However, the examination also suggests that the relatively low nominal interest rates that have persisted since 1988 likely have not contributed to substantially reduced MRB-financed mortgage rates.

ESTIMATING POTENTIAL MRB SUBSIDIES: A SIMPLE MODEL

MRB subsidies are subject to great variation, and they are not always large enough to attract targeted households to the prospects of home ownership. According to a 1988 report by the U.S. General Accounting Office (GAO), most housing finance agencies with MRB programs seek to use MRBs to finance mortgages that bear interest rates of between 150 and 200 basis points (1.5-to-2 percentage points) less than conventional fixed-rate mortgages (FRMs).

These spreads were prevalent during the high interest rate environment of the early 1980's. As shown in figure 1, the spread between the average interest rate on conventional mortgages[1] and the average rate on MRB-financed mortgages[2] was between 150 and 250 basis points from mid-1983 to late 1984, when the program was approaching its peak level of activity. However, these spreads fell substantially in 1985, generally running at between 50 and 100 basis points (GAO 1988, 11).

Figure 1.
Spread Between FRM and Estimated
MRB-Financed Mortgage Rates, 1981-1988

Year/Quarter
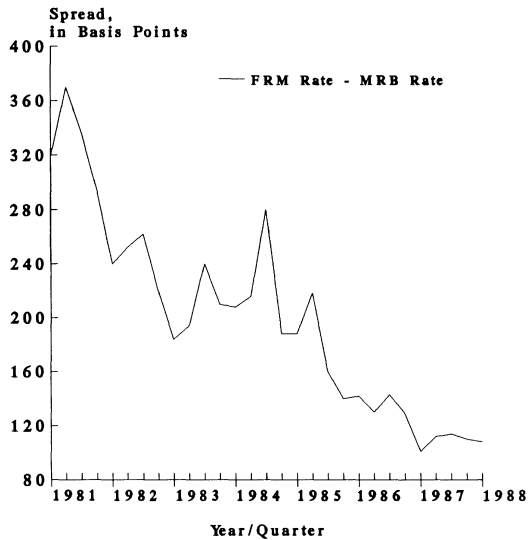
Observations on the relationship of changes in these interest rates can be used to develop a model that shows how an exogenous change in interest rates, or in one of the yield ratios (that is, the ratio of yields between two securities) affects an issuing housing authority's ability to use MRBs to provide a significant interest-rate subsidy. To understand the development of this model, suppose, for example, that the coupon rate on MRBs is a constant 90 percent of the yield on 30-year Treasury notes. Thus, if the Treasury notes are being offered with a ten-percent coupon rate, then MRBs would have to yield a nine-percent coupon rate to be attractive to the marginal investor. Assuming that the issuing agency collects the maximum allowable arbitrage fee allowed by law, 112.5 basis points (to cover issuing costs), then the nine-percent MRB could be used to finance mortgages at rates no lower than 10 1/8 percent.

Whether the MRB program can successfully provide mortgage subsidies depends on the difference between the mortgage rate on MRB-financed loans and rates on conventional FRMs. Assuming that the yield ratio of FRMs to 30-year Treasury notes is 1.13 (its average from 1983 through 1990), then a ten-percent rate on Treasury notes would correspond to an FRM rate of about 11 1/8 percent. Thus, the 10 1/8 percent mortgage financed by MRBs would provide home buyers with a subsidy of 100 basis points over the conventional mortgage rate.

The mortgage subsidy offered by MRB financing falls if there is an exogenous increase in the ratio of tax-exempt and taxable bond yields. Suppose that such an increase (say, perhaps, because of a change in tax laws), causes an increase in the yield ratio between MRBs and Treasury notes from 0.9 to 0.95. Assuming that the taxable-bond yield remains unchanged at ten percent, then the yield on the special-purpose revenue bond would have to rise to 9.5 percent to make them equally attractive to the marginal investor. This higher MRB rate would allow participating housing agencies to issue subsidized mortgages at a rate no greater than 10 5/8 percent.[3] This higher rate is only 50 basis points below the conventional rate—far below the 150- to 200-basis point spread sought by housing finance agencies. Thus, if the bond market faced conditions similar to those mentioned in the above examples, issuers might be reluctant to issue MRBs .

This analysis can be used to develop a model that simulates the impact of changing financial market conditions on MRB effectiveness. Mathematically, the model can be expressed through the following system of equations:

(1) $r_{MRB} = (A)(r_{TAX})$

(2) $r_{SUBS} = r_{MRB} + ARB$

(3) $r_{CONV} = (B)(r_{TAX})$

(4) $S = r_{CONV} - r_{SUBS}$,

where:

r_{MRB}	=	yield on MRBs,
r_{TAX}	=	yield on long-term, taxable bonds,
r_{SUBS}	=	interest rate on subsidized mortgages funded by MRBs,
r_{CONV}	=	interest rate on 30-year conventional fixed-rate mortgages,
ARB	=	issuing costs and arbitrage fee for MRB issuers,
A	=	parameter representing ratio between yields on corporate bond and special purpose revenue bonds (i.e., MRBs),
B	=	parameter representing ratio between corporate bond yields and conventional mortgage rates, and
S	=	spread between conventional mortgages and those subsidized mortgages funded through the use of MRBs.

Equation (1) relates the prevailing rates on MRBs to the prevailing rates on long-term taxable bonds. The parameter A represents the ratio of MRB yields to the returns on taxable bonds. Equation (2) shows how MRB rates are translated into subsidized mortgage rates through the addition of the arbitrage fee to cover issuance costs. Equation (3), in a manner similar to that of equation (1), relates the rates on conventional-rate mortgages over time to those on taxable bonds. Equation (4) simply relates the subsidy that can be provided to home buyers through the use of MRBs.

By combining the four equation system in one equation, it can be shown that the likelihood of achieving a desirable rate spread S (i.e., a spread of 150 to 200 basis points) is a function of the yield ratios A—the ratio between tax-exempt revenue bonds and taxable bonds—and B, the ratio between conventional mortgage rates and taxable bonds. For instance, equations (1) and (2) can be combined to express the rate on subsidized mortgages as a function of the taxable bond rate:

Similarly, equations (3) and (5) can be inserted into equation (4) to obtain

(5) $r_{SUBS} = (A)(r_{TAX}) + ARB$

$S = (B)(r_{TAX}) - (A)(r_{TAX}) - ARB$,

or

(6) $S = (B-A)(r_{TAX}) - ARB$.

ESTIMATES OF MRB SUBSIDIES UNDER DIFFERENT SCENARIOS

Table 1 shows how changes in the ratio between tax-exempt and taxable bond yields affect the ability of the bond program to operate under different economic conditions. Calculations in the table rely on the market assumptions presented above--in particular, that interest rates on conventional mortgages are, on average, 13 percent higher than the yield on 30-year Treasury notes[4]; that the arbitrage fee on MRB-financed mortgages is 112.5 basis points; and that the yields on MRBs and 30-year Treasuries are proportional. Calculations are provided for three different tax-exempt/taxable bond yield ratios: 0.90, the average ratio from 1983-1986, 0.95, which could occur if a subsequent exogenous factor lowered the tax advantages of MRBs to the marginal investor, and 0.85, which could occur if an exogenous factor raised the tax advantages of MRBs to the marginal investor.

The top panel of table 1 shows the correspondence of estimated interest rates on MRB-financed mortgages that would exist with any given FRM rate, using the relationship derived in equation (6). For instance, assuming that the yield ratio between MRBs and Treasury notes was 0.90, then eight-percent subsidized mortgages might be expected to co-exist with nine-percent FRMs; 8 7/8 percent subsidized mortgages with ten-percent FRMs, and so forth. The lower panel of the table shows the size of the potential mortgage subsidy—roughly 100 basis points at a nine-percent FRM, 125 basis points at a ten-percent FRM, and so on.

According to these estimates, as long as the MRB/Treasury note yield ratio stays at 0.9, issuers could achieve the desired 150 basis-point subsidy when conventional mortgage rates reached about 11 percent, and a 200 basis-point subsidy for conventional rates of 13 percent. In recent financial history,

conventional mortgage rates were over 11 percent from the late 1970's to late 1985. According to bond data collected by the GAO, from mid-1983 to mid-1984, when fixed-rate mortgage rates ranged between 12 and 13 percent, the rates on MRB-financed loans were 150-or-more basis points less.

Table 1. How the Ratio Between Taxable and Tax-Exempt Bond Rates Affects the Potential Subsidized Mortgage Rates

FRM Rate	Subsidized Mortgage Rate if the Ratio Between MRB and 30-Year Treasury Bill Rates Is:		
	0.85	0.90	0.95
9%	7.6%	8.0%	8.4%
10%	8.3%	8.8%	9.2%
11%	9.0%	9.5%	10.0%
12%	9.8%	10.3%	10.8%
13%	10.5%	11.0%	11.6%

FRM Rate	Subsidy in Basis Points If the Ratio Between MRB and 30-Year Treasury Bill Rates Is:		
	0.85	0.90	0.95
9%	139	101	63
10%	167	125	82
11%	195	149	102
12%	223	172	121
13%	251	196	141

Assumptions: (1) Average FRM rate is 118 percent of the yield on 30-year Treasury notes, and (2) interest rates on MRB-financed mortgages are 112.5 basis points above average MRB yield.

Achieving a 150-to-200 basis-point subsidy becomes even more difficult when the ratio between tax-exempt and taxable bond rates increases. The far right column in table 1 shows how potential subsidized mortgage rate spreads are affected when the yield ratio rises from 0.9 to 0.95. At every level, issuers have to offer a higher tax-exempt yield to make their bonds marketable. Assuming the same arbitrage fee, this increase is felt through the lower subsidy that can be offered at every interest rate. According to this model, issuers cannot reach a 150 basis-point subsidy even at conventional rates of 13 percent. Such high rates have not been charged since interest rates peaked the middle 1980s; since then, mortgage interest rates have remained substantially under 13 percent. As a result, if the yield ratio has been 0.95, the spread between MRB-financed loans and conventional loans has been far less than the desired level.

Alternatively, MRB programs can more easily provide the desired subsidy if the MRB/taxable bond yield ratio falls. This situation is shown in the far left column of table 1, which corresponds to a yield ratio between tax-exempt and taxable bonds of 0.85. As can be seen, a 150 basis-point subsidy can be achieved when conventional mortgage rates are about 9.5 percent. A 200 basis-point spread can be obtained when conventional mortgage rates are about 11 percent. Thus, if the ratio of tax-exempt to taxable bond yield fell, issuers seeking to provide a 150 basis-point mortgage subsidy could provide such a subsidy under the interest-rate environment that existed in late 1988.

FACTORS AFFECTING SUBSIDY LEVELS

The size of the subsidy offered by MRB programs may be affected by exogenous changes either in the nontaxable/taxable bond yield ratio or by changes in market interest rates. In this section, I examine whether the 1986 tax reform likely effected the yield ratio and, thereby, changed the size of MRB subsidies. Then, I discuss how changes in nominal interest rates have affected the magnitude of MRB subsidies.

Tax Reform

The Tax Reform Act of 1986 had the potential to reduce the effectiveness of MRBs to the extent that they reduced the marginal tax rate of the marginal investor in tax-exempt bonds. Tax-exempt bonds must offer the marginal investor a yield identical to the after-tax return on comparable taxable investments (Ayanian 1983; Peek and Wilcox 1986). If the new tax policy lowered the marginal tax rate of the marginal revenue-bond investor, then

issuers have to offer a higher yield in order to make the bonds competitive with taxable investments. By contrast, if the tax policy raised the marginal tax rate of the marginal investor, then the issuer could lower the bond yield while remaining competitive with taxable investments.

The available evidence suggests that tax reform likely has had little impact on MRB effectiveness: it has not reduced the spread between MRB-financed loans and conventional mortgage loans. Despite predictions by some researchers (for example, Galper, Lucke, and Toder 1986) that tax reform would increase the ratio between yields on general-purpose tax-exempt bonds and taxable bonds, the yield ratio between these bonds has not increased since 1987. For example, the ratio between special-purpose revenue bonds and 30-year Treasury notes has remained at about 0.90—the same average ratio that persisted from 1983 through 1986. This unchanging ratio confirms the prediction of Petersen (1987b), who suggested that the effects of lower tax rates for some investors might be completely offset by an increase in the demand for tax-exempt bonds caused by the elimination of other tax loopholes for other investors.

Low Prevailing Interest Rates

The analysis in the previous section showed that low interest rates reduce the magnitude of the MRB subsidy. This reduction occurs because the yield ratio is applied to a lower base; for example, a 0.9 yield ratio will yield a greater subsidy when prevailing mortgage interest rates are at 13 percent than when they are at nine percent.

Interest rates have remained low since 1986, relative to rates in the early 1980's. Given that the ratio between tax-exempt and taxable bonds has not changed, MRB programs should have difficulty achieving substantial subsidies with MRBs. As table 1 shows, when conventional mortgage interest rates are in the nine- to ten-percent range, MRB subsidies are likely to be in the range of 50-to-100 basis points, rather than the 150-to-200 basis points sought by housing finance agencies.

It should be noted that the timing of bond issuance can be as important a factor as current interest spreads when attempting to maximize a MRB-loan subsidy. The preceding analysis makes a simplifying assumption that bond issuance and mortgage availability occur simultaneously. Of course, this is not the case. Because of the timing involved in bond issuance, a lag of two to three months generally occurs between the time when the decision is made to issue bonds and when funds are available for the mortgages. When interest rates are rising or falling, this delay has an effect on spreads. In particular, if conventional rates are falling, as they did from 1984 to early 1987, and again

in early 1988, it becomes more difficult to use funds from a bond issued two to three months ago to compete with a conventional mortgage issued at currently low rates. Likewise, if rates rise sharply, a larger subsidy can be offered, as yesterday's cheaper MRB funds are used to compete with today's more expensive money.

CONCLUSION

This chapter provides an empirical framework for evaluating the circumstances under which MRBs can be used to provide significant mortgage rate subsidies. The analysis suggests that under current market conditions, MRBs are unlikely to provide subsidies of 150 to 200 basis points over conventional mortgage rates. Such subsidies are unlikely to be obtained unless conventional rates rise to their pre-1985 levels, or unless there is a change in the relationships between tax-exempt and taxable bond rates, or between conventional mortgage and taxable bond rates.

MRBs would be even less effective if issuers were forced to raise MRB rates relative to rates offered on taxable bonds. Alternatively, they might be effective at current interest rates if the yields fell relative to taxable bonds— something that might occur if there were an increase in federal income taxes for higher income households.

Similarly, MRBs might be temporarily effective if interest rates rise sharply over a brief period of time, as issuers could use cheaper funds to make mortgages in a high interest rate environment. However, such periods are difficult to forecast and it would not be good policy to plan issuances based on predictions of interest-rate movements.

A caveat for this evaluation is that the model is based on a very simple proportional relationship between bond rates. The true relationship is probably much more complex, being dependent on lagged interest rates, and possibly other factors as well. As such, the results from this model should be treated with some caution. However, it does provide a framework for evaluating bond effectiveness, and provides general guidance on the predictability of the potential size of MRB-provided subsidies.

ENDNOTES

Michael Gutowski, Patrick Doerning, and James Bothwell, who commented on an earlier draft of this chapter.

1. For the purpose of this analysis, conventional mortgages are defined as 30-year, fixed-rate mortgages. Elsewhere in this chapter, these mortgages may be referred to as FRMs.

2. The average rates on MRB-financed mortgages are drawn from a GAO survey of over 177,000 MRB-financed mortgage loans. While this sample is selective and therefore not necessarily statistically valid, it covers over 1/3 of the total loans made during the period 1984-1987 and covers a wide distribution both of regions and of housing market size. See GAO 1988, 16.

3. 9 1/2 percent plus the 112.5 basis-point arbitrage fee.

4. 30-year Treasury notes are being used as a proxy for taxable bond rates.

7
AN ALTERNATIVE TO MORTGAGE REVENUE BONDS: AN EVALUATION OF THE MORTGAGE CREDIT CERTIFICATE PROGRAM IN NORTH CAROLINA

Michael A. Stegman with the
assistance of David Stebbins

INTRODUCTION

In this chapter, we present our findings about the operation of the North Carolina Housing Finance Agency's (NCHFA) Mortgage Credit Certificate (MCC) Program, and we recommend how the program could be changed to serve better first-time buyers who need financial assistance. Our findings and recommendations are based on the analysis of data from four sources:

● NCHFA regulations regarding the Mortgage Credit Certificate Program;

● NCHFA files containing detailed data on the characteristics of nearly 800 buyers and the homes they purchased with the assistance of an MCC;

● telephone interviews with 34 participating lenders who, collectively, have originated more than 80 percent of the MCCs that NCHFA has issued under its initial allocation of mortgage credit authority; and

● a mail survey of a representative sample of 250 first-time home buyers who received MCC-assisted mortgage loans.

This chapter has six sections. We begin by discussing Congress' rationale for creating a federal MCC option for housing finance agencies in 1984; then we examine why the NCHFA implemented its own MCC program in late 1987. In section two, we briefly describe the characteristics of MCC-assisted mortgage loans in North Carolina, the housing units financed under the program, and the buyers who acquired them. Where comparable data exist, we present MCC program characteristics along with data for home loans

originated in 1986-87 under NCHFA's larger and better known mortgage
revenue bond (MRB) program.

Section three details results of a survey of MCC recipients, and in section
four we discuss the experience of lenders with the MCC program. Section
five presents a set of tax simulations in which we determine the ability of
various household types to take maximum advantage of the tax credit available
under the MCC program. Section six contains the conclusions and policy
recommendations.

HOW THE MCC PROGRAM WORKS

Mortgage credit certificates reduce the federal income taxes of home
purchasers by an amount equal to a specified portion of the interest they pay
for market-rate mortgages obtained through private lenders. However, the
reduction in taxes is partially offset by another tax change: home owners with
MCCs must reduce the amount of their home mortgage interest deduction by
the amount of their mortgage tax credit. So, the subsidy provided by an MCC
equals the tax credit minus the lost mortgage interest deduction. Compared
to households receiving MRB loans that reduce interest payments, recipients
of an MCC pay the market mortgage interest rate, but have lower federal
income taxes (Sunley and Walz 1985, 3-4).

Any household eligible for an MRB loan is also eligible for an MCC. To
qualify for an MRB or MCC, a household must be a first-time buyer, which
federal law defines as an individual or family who has not had an ownership
interest in a principal residence during the previous three years. The
household's income must be no higher than 115 percent of the area median,
and the household must purchase a house that costs no more than 90 percent
of the area average. If the household lives in a "targeted area" (lower-income,
economically distressed neighborhoods), these restrictions are relaxed .

Under an MCC program, state and local housing finance agencies (HFAs)
may grant federal income tax credits at rates ranging from ten percent to 50
percent of the mortgage interest paid per year. However, if the HFA selects
a credit rate for its MCC program that exceeds 20 percent, the maximum tax
credit per home buyer is limited to $2,000 a year. Furthermore, the tax credit
is not refundable; that is, the credit may reduce a home owner's tax liability
to zero, but any additional unused credit is not refunded. However, MCC
credits in excess of the current-year tax liability may be carried forward for
three years.

With these limitations, the effectiveness of the program's subsidy depends
in large part on the ability of the typical first-time home buyer to actually use
the tax credit. As Sunley and Walz (1985) note, "Despite the benefits of

limited carry-forward provisions, when a taxpayer does not have sufficient federal income tax liability to absorb the credit, the subsidy cannot have its full intended effect."

Other things being equal, the higher the MCC credit rate, the greater are the tax savings and, as a result, the greater is the reduction in the after-tax costs of mortgage payments. Therefore, as the MCC credit rate increases, the MCCs can benefit more households with lower incomes, as long as the households have enough federal income tax liability to use the full value of the credit.

Higher MCC credit rates do have a major disadvantage: as the credit rates rise, the subsidy per household rises and the number of households assisted declines. For example, if an HFA set the credit rate at 25 percent, it could use $10 million in MCC authority to subsidize $40 million in home mortgages. If the average mortgage were $56,000, the $40 million in mortgage loans, with the $10 million in tax subsidies, would be distributed to more than 700 households to help them acquire their first home. If the credit rate were 50 percent, the $10 million of MCC authority could support only $20 million in mortgages, helping just over 350 home buyers.

How the MCC Allocation Process Works

The Deficit Reduction Act of 1984 permits HFAs to trade in some or all of their unused MRB authority each year for authority to issue MCCs. In North Carolina, the trade-in rate is 25 percent, which means that the NCHFA can convert $10 million of unused tax-exempt MRB authority to $2.5 million in MCC authority.

In October 1987, NCHFA introduced its MCC program by electing to convert $100 million in unused MRB authority into $25 million in MCC authority. At a mortgage credit rate of 25 percent, the finance agency could use its initial allocation of mortgage tax credit authority to subsidize $100 million of market-rate mortgages for first-time home buyers.

In North Carolina, the process of distributing MCCs has three phases. The initial *reservation phase* starts when a participating lender calls to request that the NCHFA reserve an MCC for a potential home buyer. At that time, the lender has already approved the buyer's preliminary mortgage loan application and has checked the household's eligibility for an MCC. Upon receipt of a reservation, the NCHFA deducts the amount of MCC credit requested by the lender (generally, 25 percent of the first year's mortgage interest) from its remaining balance of unobligated MCC authority. Under NCHFA policy, an MCC reservation is good for 60 days. So, a lender has approximately two months to verify the buyer's income, employment history,

and eligibility for an MCC, and to forward a completed loan package to NCHFA for final review.

The completed loan package is accompanied by the lender's request to NCHFA for a *conditional commitment*, which represents the second phase of the MCC processing system. The request for a conditional commitment must be accompanied by a nonrefundable processing fee of $125 that covers the agency's administrative costs of reviewing the loan documents and program certifications. If the NCHFA makes a conditional commitment, it will issue an MCC to the buyer when the mortgage loan is closed as long as no changes affect eligibility. The final administrative phase in the program is the actual *issuance* of the MCC.

Why Start an MCC Program?

The creation of a state MCC program was a two-step process. First, Congress had to pass legislation setting up the program. Then, each state HFA had to decide whether it would use the MCC option. In this section, I discuss the reasons for decisions by Congress and HFAs to offer the MCC alternative.

The Federal Perspective

Congress created MCCs as an alternative to MRBs, responding to the alleged inefficiency of MRB programs and the upward pressures they create on interest rates in the overall tax-exempt market[1] (General Accounting Office 1983, 1988). According to the General Accounting Office (1988, 66-68), home buyers receive only 12 cents to 45 cents in direct benefits for every dollar in lost tax revenues foregone. Other studies identified high indirect costs. For example, in 1982, researchers at the Urban Institute estimated the extent to which the increased demand for tax-exempt MRBs increased interest rates on other state and local tax-exempt issues_the so-called crowding out phenomenon. They found:

> [E]ach $1 billion of mortgage subsidy bonds raised interest rates on all other tax-exempt bonds by four to seven basis points. In 1982, states and localities issued $10 billion of mortgage subsidy bonds, and $40 billion in traditional public purpose tax-exempt bonds. The $10 billion worth of mortgage subsidy bonds drove up interest payments by $165 to $380 million per year on the $40 billion of other state and local borrowing (Congressional Record 1983, S9710).

According to government analysts, MCCs are better than MRBs because they are more efficient and do not crowd out other borrowers. "The efficiency is improved because the amount of the subsidy does not automatically increase with the income of the borrower or the price of the house; instead the subsidy depends on the MCC credit rate set by the HFA. An HFA can give the largest subsidies to lower-income households for mortgages on less expensive homes and shallow subsidies to more affluent households for more expensive homes. . . ." (Congressional Record 1983, S9710).

When properly structured, MCC programs should have higher benefit-cost ratios than MRBs because every dollar of lost federal revenue represents a full dollar's benefit to the home buyer in the form of (after-tax) savings in mortgage interest payments. None of the subsidy is extracted by bond underwriters, investors, or lending institutions.

The State and Local Perspective

Although Congress introduced MCCs as efficient alternatives to MRBs, HFAs have based their decisions to implement an MCC program on more pragmatic grounds. The reasons for setting up MCC programs include:

* to make full use of annual bond authority;

* to avoid the high transaction costs of issuing MRBs;

* to help more households without enlarging the HFA staff size; and

* to take advantage of program characteristics that make MCCs attractive to some lenders.

One reason HFAs have set up MCC programs has been to *maximize use of their annual bond authority*. Prior to the Tax Reform Act of 1986, HFAs were not permitted to carry forward unused bond authority from one year to the next. Instead of letting unused bond authority expire, several HFAs created MCC programs. According to the GAO (1988, 96), nine of the ten HFAs identified as having operational MCC programs in 1988 implemented them, at least in part, "to avoid losing bond authority during periods when they could not achieve a large enough spread between tax-exempt and conventional interest rates to issue bonds." The GAO (1988, 91) reported:

When conventional rates are low, agencies cannot, some of these agencies explained, provide a tax-exempt mortgage rate that is far enough below the

conventional mortgage rate and still cover their bond sale costs. Certificate programs, on the other hand, can be run regardless of the spread between conventional interest rates and bond-assisted mortgage rates and provide benefits to first-time home buyers when bond programs are not available or not competitive.

Some HFAs, including the North Carolina Housing Finance Agency, were motivated by a second reason to begin MCC programs: *the high transaction costs of issuing MRBs*. In many cases, the transaction costs of MRBs have been higher than the expenses that can, by law, be paid from the bond issue. Under the tax laws regulating MRBs, arbitrage is restricted: the differences between an agency's net borrowing costs and the rate at which it makes mortgage loans available to home buyers cannot exceed 1.125 percent. As a result, many HFAs must now use their own funds to help defray bond issuance costs, including the creation of adequate loss reserves and providing mortgage pool insurance and other forms of credit enhancement.

According to A. Robert Kucab, Executive Director of NCHFA, the agency's costs of issuing one single-family bond issue in 1988 was approximately 1.6 percent of the aggregate value of the mortgages that would eventually be originated from the bond proceeds. In that case, the NCHFA had to set aside more than $780,000 of its own funds to originate around $50 million of tax-exempt mortgage loans. This expense limits the ability of the NCHFA to issue bonds because it operates with virtually no direct appropriations from the state and has only a modest amount of unencumbered reserves. Due to these costs, the NCHFA can afford to enter the tax-exempt bond market only once or twice a year, even when interest rates are favorable.

HFAs have a third reason for setting up an MCC program: *it enables them to assist additional first-time buyers without enlarging their staff*. Because an MCC program does not require the administering HFA to do credit underwriting, it can operate the program without increasing its number of employees.

HFAs have set up MCC programs for a final reason: *some lenders find them attractive*. They are able to participate in an MCC program without paying a nonrefundable forward commitment fee, which, for example in North Carolina, amounts to two percent of the aggregate principal amount of the mortgages they reserve from a given NCHFA MRB issue.[2] Moreover, with an MCC program, neither lenders, home builders, nor the HFA itself are subject to the kind of interest-rate risk that affects an MRB program. With an MRB program, a rise in interest rates reduces the attractiveness of MRB loans, and may cause lenders and builders to lose their commitment fees.

CHARACTERISTICS OF MCC-ASSISTED MORTGAGES AND HOMES

In this section, we examine the characteristics of the mortgages financed with the NCHFA'S MCC program, and we identify the some of the characteristics of the houses bought by buyers receiving the MCCs.

Houses Purchased With MCC Assistance: Location, Type, and Financing

Our analysis of the MCC program is based on the nearly 800 MCCs that the NCHFA issued from October 1987 through the end of June 1988. From these transactions, we can generalize as follows: The typical recipient of an MCC purchased a two- or three-bedroom (94.1 percent), single-family detached (80.6 percent) house, that is located in a metropolitan area (85.9 percent) in the central (Piedmont) part of the state (82.9 percent). Most home buyers received FHA-insured (75.3 percent), fixed-rate mortgage loans (87.0 percent) at an average interest rate of 9.78 percent. Information on these characteristics of the MCC program is presented in table 1.

Approximately one out of every five families who acquired their houses with the aid of an MCC bought either a condominium or a townhouse. In comparison, condominiums or townhouses were purchased by just four percent of all first-time home buyers who obtained an MRB loan under NCHFA's most recent single-family bond issue. More higher-density, attached homes were purchased under the MCC program because fewer North Carolina lenders currently offer MCCs than MRBs, and a large portion of those who do are located in the state's higher cost, metropolitan areas. Only 14.1 percent of households that received MCCs live in nonmetropolitan areas. In comparison, 29.1 percent of MRB loan recipients live outside metropolitan areas. Presumably, more MCCs will be distributed to people living in rural areas as lenders in nonmetropolitan areas become more familiar with MCCs.

Purchase Prices of Houses Purchased with MCC Assistance

In 1987, the average purchase price of houses bought by households with MCCs was $58,301. The price was nine percent higher than the average purchase price of houses financed with MRB loans, $53,323 (see table 2). The higher average cost reflects, at least in part, the higher house costs in the

Table 1. Selected Characteristics of NCHFA's Mortgage Credit Certificate Program, 1987-1988

MCCs and MRBs Issued by Region[a]

Location	MCCs	MRBs	Location	MCCs	MRBs
West	2.7%	7.5%	Metro	85.9%	70.9%
Central	82.9	66.4	Nonmetro	14.1	29.1
East	14.5	26.1			

Type and Size of Purchased House

House Type	MCCs	MRBs	# of Bedrooms	MCCs	MRBs
S-F Detached	80.6%	94.3%	1	3.3%	NA
Town-House	4.0	2.1	2	30.7	NA
Condo	14.9	2.2	3	63.4	NA
Other	0.6	1.5	4	2.6	NA

Mortgage Characteristics

Type	MCCs	MRBs	Rate	MCCs	MRBs
Conventional	15.1%	100.0%	Fixed Rate	87.0%	100.0%
FHA	75.3	0	Variable Rate	13.0	0
VA	9.4	0			

[a]For loans financed by MRBs issued March 1985, September 1985, and August 1986. The data are based on 753 MCC loans and 3,684 MRB loans.

SOURCE: North Carolina Housing Finance Agency, 1988.

**Table 2. Comparison of Houses Bought under
NCHFA's MCC and MRB Programs, 1987**

Purchase Price

House Type	MCC	MRB	Percent Difference
Total	$58,301	$53,323	+ 9.3%
New	$65,198	$58,005	+12.4
Existing	$54,975	$49,371	+11.9
N	1,506	7,308	

Mortgage

	MCC	MRB	Percent Difference
Total	$56,837%	$48,335	+17.6%
New	$63,194	$52,129	+21.2
Existing	$53,765	$45,157	+19.1
N	1,504	7,362	

Loan-to-Value Ratio

	MCC	MRB	Percent Difference
Total	97.7%	90.7%	+ 7.7%
New	96.9	89.7	+8.0
Existing	98.0	91.5	+7.1
N	1,504	7,341	

SOURCE: North Carolina Housing Finance Agency, 1988.

metropolitan areas of North Carolina, where most MCCs were distributed. Also, the higher cost may reflect some differences in the origination of the MCC and MRB loans: the data consist of loans made during slightly different time periods, but are not adjusted for inflation.

New houses, which account for one-third of all MCC loans, had an average purchase price of slightly more than $65,000, and only one-third exceeded a price of $71,000. Ten percent of all new houses were bought for less than $51,000.

An even more heavily skewed price pattern is evident for existing houses that account for two-thirds of all MCC loans. The average purchase price was slightly less than $55,000, or approximately 16 percent lower than for new houses. Only 13 percent had a price in excess of $71,000, while 15 percent cost less than $41,000, and 42 percent cost less than $51,000.

Houses purchased with MCC-assisted loans cost an average of nine percent more than those acquired under NCHFA's MRB program, while MCC-assisted mortgages are about 18 percent higher (refer to table 2). The disparity exists because MCC loans have a higher loan-to-value ratio than MRB mortgages. The loan-to-value ratio of MCCs is nearly 98 percent of purchase price, compared to around 91 percent for mortgages originated under the MRB program. The ratios differ because three-quarters of the MCC loans in the analysis are FHA-insured, while the particular MRB issue under study was structured for use only with privately insured, conventional loans that require a greater down payment.

WHO PARTICIPATES IN THE MCC PROGRAM?

Although HFAs are frequently criticized for not sufficiently targeting their programs to those in need, NCHFA's home ownership programs meet that goal. The average income of home buyers receiving MCCs was just $25,442, and for those households receiving mortgages under NCHFA's MRB program, it was $500 lower (see table 3). Nearly 17 percent of all MCC recipients had a household income under $20,000, and 29 percent had an income between $20,000 and $25,000. In contrast, just 20 percent of MCC-assisted home buyers had an income between $30,000 and $35,000.

HFA programs are also criticized because of a perception that they assist young, childless households who, presumably, would be able to afford a home in the not-too-distant future without a public subsidy. However, this criticism is losing some of its relevancy because "continued high housing costs have resulted in a steady decline in the home ownership rate since 1980, particularly among young households" (Apgar 1988, 22). Nationally, for example, in "households with heads aged 25 to 34, the home ownership rate fell from 52.3 percent in 1980 to 45.1 percent in 1987. Households aged 35 to 44 suffered similar sharp declines" (Apgar 1988, 22-23).

NCHFA's MCC and MRB programs are heavily used by those same age groups that suffered disproportionate declines in home ownership rates during the past several years. The average age of a household head who received an MCC-assisted mortgage loan in 1988 was slightly less than 30 years, while one out of four MCC recipients were under age 25. In contrast, fewer than ten percent were over 40 years old.

Nearly 60 percent of all households who bought a house with an MCC-assisted mortgage were unmarried at the time of the purchase, and three-quarters had just one or two members. The proportion of very small house-

**Table 3. Size, Age, Composition and Income of Households
Participating in the Mortgage Credit Certificate and
Revenue Bond Programs of the NCHFA.
(MCCs and MRBs as Pct.)**

Age of Household Head			Marital Status		
Age	MCC	MRB	Status	MCC	MRB
<25	24.6%	23.0%	Married	41.2%	NA
25-29	35.1	38.1	Unmarried	58.8	
30-34	21.2	21.8			
35-39	9.6	9.4			
40-44	5.3	3.5			
45+	4.2	4.3			
Average	29.7	29.3			
N	746	2,638	N	746	3,638

Household Income			Household Size		
Income	MCC	MRB	Size	MCC	MRB
<$20,000	16.6%	17.4%	1-2	77.1%	84.9%
$20-24,999	28.7	31.6	3-4	21.0	14.6
$25-29,999	34.6	29.8	5+	1.9	0.5
$30-35,000	20.1	21.1	Average	1.9	1.6
>35,000	0	0.1			
Average	$25,442	$24,944			
N	746	3,676	N	747	3,692

SOURCE: North Carolina Housing Finance Agency, 1988.

holds participating in NCHFA's MRB program was even greater (84.9 percent), although the percentage of unmarried buyers was much lower.

Seventy-one percent of all MCC recipients had no children when they bought their house, 14.7 percent had one child, and another 14.1 percent had two or more children. According to our mail survey of MCC recipients, the household size of 14.8 percent of the recipients increased within 12 months after buying their houses, but the reasons for the change were not sufficiently detailed for us to attribute them to marriage, birth, or other causes. The household size of 3.2 percent of the recipients decreased.

The GAO also criticizes HFA programs because the financial assistance provided through MRB and MCC programs lasts for the life of the mortgage, usually 30 years, or until households sell their homes, whichever comes first. According to the GAO (1988, 19):

> Because first time buyers, both assisted and unassisted, are typically young, they can often expect their real as well as nominal income to rise over time. Therefore, even though buyers may require assistance to buy their home, they may not need it beyond the initial years, if their income increases sufficiently. However, they still receive the benefit of the lower [effective] mortgage interest rate.

Consistent with GAO's assertion, our survey does indicate that a substantial majority of households receiving MCCs increased their incomes within the first 12 months of buying their homes. Of the 61.4 percent of survey respondents who indicated that their gross incomes had increased, nearly half (27.3 percent) had gained at least $2,000 a year (see table 4). In contrast, just 7.9 percent of all MCC survey respondents experienced a decline in income, with more than half of those households realizing an annualized loss of $1,500 or more.

The Importance of the MCC in the Home Purchase Decision

Economic literature on home ownership suggests that financial motives frequently drive a household's decision to purchase a house. Our survey shows these motives were important for MCC recipients, who cite an investment-related reason for buying a house, more than 20 times more often than they cite a nonfinancial reason (see table 5).

According to our survey (see table 6), most MCC recipients first learned about the MCC program from a real estate agent (58.7 percent) or from their mortgage lender (23.2 percent). This information suggests that many of them

had decided to enter the housing market before learning of their eligibility for assistance.

Although nearly 70 percent of surveyed recipients indicated that the MCC made their house purchase more affordable, nearly half indicated that they would have bought the same house had they not received an MCC and 23 percent said they would have bought a smaller house (see tables 7 and 8). However, at the same time, 52 percent indicated that the MCC made qualifying for a mortgage loan possible, while 22 percent said that they would not have bought a house without such assistance. This finding is consistent with GAO's (1988, 16) conclusions that "[M]ost persons served [by MRB

**Table 4. Change in Household Income within the First
12 Months of Receiving an MCC-Assisted Mortgage,
North Carolina, 1987-1988**

Income Change	% Gaining Income	% Losing Income
Less than $500	6.0%	0
$500-$999	12.7	1.3%
$1,000-$1,499	10.7	1.3
$1,500-$1,999	4.7	2.0
$2,000 or More	27.3	3.3
Subtotal	61.4%	7.9%
N = 105		

SOURCE: Survey of MCC Recipients, 1988.

**Table 5. The Most Important Reason for Buying a House,
MCC Recipients, North Carolina, 1987-1988**

Good financial investment	66.0%
House and yard is the way I like	2.0
To live in a better neighborhood	6.5
To have a good place to raise children	10.5
To have something to leave to my children	2.6
Other	12.4

N = 153
SOURCE: Survey of MCC Recipients, 1988.

programs] would have been likely to become home owners if qualified mortgage bond assistance had not been available, and most could have probably bought the same house without bond-assisted financing."

Table 6. Home Buyers' First Source of Information about MCC Program, North Carolina, 1987-1988

Information Source	Percent
Real Estate Agent	58.7%
Mortgage Lender	23.2
Housing Finance Agency	0.6
Homebuilder	2.6
Newspaper	8.4
Tax Advisor	0
Other	6.5
N = 155	

SOURCE: Survey of MCC Recipients, 1988.

Table 7. Effect of MCCs on Home Purchase Decisions, North Carolina, 1987-1988.

Purchase Decision	Percent
Would have bought at same	47.4%
time without MCC	22.1
Would not have bought	30.5
Don't know	
N = 154	
Effect of MCC	**Percent**
MCC made a big difference in	
affordability	68.4%
Made a small difference	23.7
Made no difference	7.2
Don't know	0.7
N = 152	

SOURCE: Survey of MCC Recipients, 1988.

**Table 8. How MCC Recipients View the Importance of their MCCs,
North Carolina, 1988**

(Multiple Responses Permitted)

View of Importance	Percent
It allowed me to buy a more expensive home	42.9%
It made possible a smaller down payment	21.4
Saved me some money but would have bought a smaller house	23.4
Lowered my monthly mortgage payments	37.0
Increased my monthly take-home pay so that I could qualify for a mortgage	51.9
Enabled me to buy a house sooner	25.3

N = 154

SOURCE: Survey of MCC Recipients, 1988.

Clearly, it is in NCHFA's interest that the MCC program be as highly targeted as possible to the population of income-eligible households who would not be able to buy a house without assistance. Successful targeting depends on decisions by financial institutions that make initial requests to the NCHFA to reserve an MCC on behalf of a potential first-time home buyer. The role of the lender in MCC programs is discussed in the following section.

HOW LENDERS VIEW THE MCC PROGRAM

For this study, we interviewed 34 lenders who underwrote 641 MCC-assisted mortgages in 1987-88, nearly 87 percent of all MCCs issued by NCHFA as of July 1, 1988. Consistent with NCHFA rules, these lenders employed the same underwriting standards, loan-to-value ratios, and charged

the same fees that they normally charge for originating similar, non-MCC loans (tables 9 and 10).

Our interviews showed that lenders who participated in the MCC program like it. One reason they like the program is that it requires no forward commitment fee, and the fee for a conditional commitment of an MCC is just $125. Another reason is that MCC-assisted loans are easily sold in the secondary market. The purchase of MCC-assisted loans is not subject to special restrictions by mortgage-purchasing institutions like Fannie Mae and Freddie Mac. As a result, MCC-assisted loans are sold by most lenders into the secondary market: nearly nine out of ten lenders we interviewed had sold one or more of the loans to secondary market institutions.

Lenders incorporate MCCs into their operations in two ways. They insure that borrowers amend their W-4 forms (which specify personal tax exemptions) so that their monthly after-tax income is increased; by changing the number of exemptions, a household with an MCC does not have to wait until it files its tax returns before it receives its subsidy. Also, they factor the subsidy into the underwriting standards used to determine whether the buyer is an acceptable risk.

Two-thirds of all lenders we surveyed require buyers to file amended W-4 withholding certificates as part of the MCC-loan underwriting process, but few assist buyers to prepare these certificates. Yet it is not a simple matter to equate the size of the applicable mortgage tax credit to an increase in a taxpayer's number of personal exemptions (Sunley and Waltz 1985, 24-25).

Despite complicated withholding forms and little assistance from lenders, a large majority of MCC recipients (81.7 percent) did file amended W-4 forms, increasing their average monthly take-home pay by $102. Although an understanding of how to convert the MCC credit into additional income seems widespread, most MCC recipients were not aware that the law permits them to carry forward for three years any unused mortgage tax credit.

Many lenders incorporate the MCC subsidy in their credit underwriting. For the few MCC-assisted mortgages that were high loan-to-value ratio, conventional, privately insured loans, lenders adhered to the credit underwriting policies of private mortgage insurance companies (PMIs) whose treatment of MCCs varies widely. Some PMIs instruct the lender to deduct only the usable portion of the mortgage credit from the home buyer's proposed housing expense; others count either the full or usable tax credit as an addition to income. Surprisingly, still others ignore the affordability-enhancing effects of MCCs altogether and instruct lenders to underwrite MCC-assisted loans as if the mortgage credit didn't exist. In such a case, if the borrower still qualifies for the loan, he or she did not need it to purchase the house, and the household receives a substantial windfall gain from the MCC subsidy.

Table 9. Responses from a Survey of Lenders Participating in the Mortgage Credit Certificate Program, North Carolina Housing Finance Agency, 1987-1988

Question	All The Time	Most of The Time	Half of The Time	Occasionally	Never	Don't Know
Do Borrowers Know About MCC Program Before Applying for Loan?	17.6%	61.8%	8.8%	8.8%	0.0%	2.9%
Eligible Borrowers Understand Program?	5.9	35.3	29.4	17.6	11.8	0.0
MCC Necessary to Qualify for Loan?	8.8	41.2	29.4	14.7	5.9	0.0
Could Qualify With Lower MCC Rate?	3.2	19.4	9.7	16.1	32.3	19.4
Frequency of $2,000 Maximum Credit?	6.1	6.1	39.4	33.3	15.2	0.05
Assists Buyer File New W-4?	7.4	3.0	3.7	7.4	81.5	0.0
Verifies Holder's W-4 Adjustment?	48.5	3.0	0.0	0.0	48.5	0.0

SOURCE: Survey of Lenders Participating in MCC Programs, 1988.

Table 10. How Lenders Underwrite and Administer Loans Subsidized By MCCs

Policy Issue	Yes	No
Issued MCCs for both Conventional and FHA/VA Loans	79.4%	20.6%
Issues Only FHA/VA Loans	8.8	91.2
Issues Only Conventional Loans	11.8	88.2
Adjusts Underwriting Standards for MCCs	2.9	97.1
Are MCC Loan Same L/V Ratio?	88.2	11.8
Underwrites Full Value of MCC (Conventional)	87.1	12.9
Underwrites Full Value of MCC (FHA/VA)	0.0	100.0
Considers Future Years' Interest in Underwriting an MCC Loan	0.0	100.0
Special Servicing Required of MCC Loans	5.9	94.1
Requires MCC Buyers to File New W-4	66.7	33.3
Pass on $250 Application Fee to Buyers	100.0	0.0
Charge More Points for MCC Loans	0.0	100.0
Are MCC Loans Accepted in Secondary Market?	100.0	0.0
Sold MCC Loans in Secondary Market	86.7	13.3
Lender Also Participated in MRB Program	88.2	11.8
Lender Prefers MCC to MRB Program	61.3	34.7

Note: 34 lenders were interviewed
Lenders issued a total of 641 MCCs (86.5 percent of MCCs were issued before June 30, 1988).

SOURCE: Survey of Lenders Participating in MCC Program, 1988.

According to our survey, the vast majority of conventional lenders who originate MCC-assisted loans (87.1 percent), underwrite the full value of the mortgage credit for which the buyer is potentially eligible, regardless of whether the buyer's ultimate income-tax liability is great enough to use it. Should a household's tax liability be less than the full value of its mortgage tax credit, its effective housing expense/after-tax income ratio could exceed prudent levels.

In contrast to conventional loans, which are typically underwritten using a buyer's gross household income, underwriting regulations for FHA/VA loans require lenders to use after-tax income. This requirement means that in underwriting MCC-assisted FHA loans, lenders typically convert only the usable amount of the year-end mortgage tax credit into regular increases in take-home pay. The modified after-tax income is then used to determine whether a mortgage loan of a given size is affordable. Because FHA loans are underwritten using after-tax income, lenders are less likely to overvalue the buyer's usable amount of a mortgage tax credit.

Lenders confirm what MCC recipients reported to us: home buyers who receive MCCs generally have some knowledge of the program by the time they apply for a loan. Eighteen percent of the surveyed lenders indicated that buyers knew about the MCC program all of the time, while 62 percent indicate that buyers knew about the program most of the time. More importantly, half of all surveyed lenders said that the MCC was not necessary for the home buyer to qualify for a loan either all or most of the time. Nearly 30 percent of the lenders said the MCC was needed to qualify the buyer half of the time, while another 20 percent said it was never or only occasionally needed.

THE DIFFICULTY OF TARGETING THE MORTGAGE TAX CREDIT

Although the MCC and MRB programs have identical eligibility criteria, they cannot always be effectively targeted to the same types of home buyers because of the different ways their subsidies are delivered. Under NCHFA's MRB program, a buyer's savings in monthly mortgage costs *will always* be lower by the full amount of the difference between the agency's below-market interest rate loan and the interest rate on a market-rate mortgage. However, in the case of the MCC program, with its tax reduction subsidy, the extent of a home buyer's savings depends upon its ability to utilize fully the mortgage tax credit. And, as we illustrate below, not all income-eligible families and individuals will have sufficient federal income tax liability to make maximum use of the tax credit. Therefore, despite their identical eligibility criteria, from

the standpoint of targeting assistance to priority populations, the MRB and MCC programs are not perfect substitutes.

To determine the effective value of an MCC to various types of home buyers, we divided MCC recipients into seven income groups and five household types. In computing pre-and post-MCC tax liabilities, we used actual buyer incomes, purchase prices, and mortgage terms for loans that were originated under NCHFA's MCC program. For example, the average income of MCC-assisted households with incomes under $20,000 when they purchased their homes, was $17,617 (see table 11). These buyers paid an average of $48,065 for their houses, obtained market-rate mortgages at an average interest rate of 9.79 percent, and received MCCs that had an average first-year value of $1,124, or slightly less than $94 a month. On average, purchase prices, mortgage amounts and the resulting value of their respective MCCs were higher for home buyers with higher incomes. MCCs had a first year average value of $1,304 ($109/mo.) for buyers with incomes between $20,000 and $24,999; $1,443 ($120/mo.) for buyers with incomes between $25,000 and $29,999; and, $1,637 ($136/mo.) for buyers with incomes between $30,000 and $34,999.

We carried out our after-tax analyses of the value of MCCs for the following seven classes of taxpayers:

- single individual;

- married couple, no children;

- single parent, one child (with child care credit);

- married couple, one child (with and without child care credit); and

- married couple, two children (with and without child care credit).

Because NCHFA's MCC program began at the end of 1987, we were unable from our survey of MCC recipients to determine the actual value of the first full-year's worth of MCC tax credits. It was, therefore, necessary to simulate the after-tax value of MCCs, assuming that all purchases took place on the first of the year, and that each household had an income equal to the average of the group to which it belongs.[3]

Table 11. Selected Characteristics of Home Buyers and MCC–Assisted Mortgages, North Carolina, 1987–1988

Income Group	Average Buyer Income	Average Purchase Price	Average Mortgage Amount	Monthly Average Interest Rate	Principal and Interest	Interest Year One	25% Mortgage Tax Credit
Less than $20,000	$17,617	$48,065	$45,943	9.79%	$395.94	$4,496.02	$1,124.01
$20,000– $24,999	22,630	54,816	53,235	9.80	459.37	5,217.55	1,304.39
$25,000– $29,999	27,400	60,124	59,108	9.77	508.57	5,773.09	1,443.27
$30,000– $34,999	32,557	68,490	67,027	9.77	576.80	6,547.88	1,636.97
N	746	753	752	740			

SOURCE: North Carolina Housing Finance Agency, 1988.

In general, (before application of the mortgage tax credit):

•Tax liability will vary with income, marital status, the division of earnings between husband and wife, the number of dependents, the amount of qualified child care expenses, and the amount of other deductible expenses.

•A lower income family generates a lower tax liability and thus a lower capacity to absorb income tax credits.

•A single person pays relatively more in federal income tax than a married couple with equal income; accordingly, single persons are more likely than married persons with equal income to have sufficient income tax liability.

•Among married couples with the same combined income, the deduction is largest—and tax liability is least—when earnings are split evenly between the spouses (Sunley and Walz 1985, 10-12).

The Tax Simulation Results[4]

Using the actual incomes and mortgages of buyers who received MCCs from NCHFA in 1987, and average levels of "other" deductions taken by taxpayers (as reported by the U.S. Treasury), we simulated the ability of each of the seven classes of taxpayers to utilize a full year's mortgage tax credit. The results of our analysis can be summarized as follows:[5]

1. *For no combination of income and household type does the average MCC credit exceed the maximum limit allowed by law of $2,000 per year.* As expected, the highest average mortgage credit is earned by the highest income buyers, those with incomes above $30,000. For this group, however, which represents 20 percent of all MCC-recipients, the average first-year mortgage tax credit ($1,637) is still nearly $400 below the maximum.

2. Across all income groups, single individuals have a sufficiently high average pre-MCC tax liability to utilize fully their mortgage tax credit within the year it is earned. For single buyers in the lowest income group, however, average pre-MCC tax liability exceeds the applicable mortgage credit by nearly $300. It is likely that a certain number of these low-income buyers will be unable to take maximum advantage of the MCC program. In contrast, pre-MCC tax obligations of the

highest income individuals are, on average, more than $2,200 greater than the applicable mortgage tax credit. It is reasonable to conclude, therefore, that *few single buyers with incomes above $30,000 will have difficulty utilizing their entire MCC credit*.

3. Because they are entitled to a greater number of deductions, average pre-MCC tax obligations of married couples with no children are lower than those for single individuals at all income levels. Therefore, *married couples will be less likely to be able to use their full mortgage tax credits*. This is particularly true for couples with incomes below $20,000, whose average pre-MCC tax liability ($1,054) falls $70 short of their average mortgage credit ($1,124).

4. *Unless their incomes approach $30,000, single employed parents with one child and married couples with a working spouse who take the child care tax credit make poor prospects for the MCC program.* At an income of $17,617, the average for all MCC recipients whose incomes are less than $20,000, the pre-MCC tax liability for single parents is nearly $700 less than the average applicable mortgage credit, while for married couples it is nearly $1,000 less. The comparable shortfall for buyers in the $20,000-$25,000 range is $167 for single parents and $472 for married couples.

5. *Regardless of income, married couples with working spouses who are eligible for the federal child care tax credit will almost always have too little tax liability to make maximum use of an MCC.* After accounting for their child care credit, two-children families with incomes below $25,000 typically have no remaining tax liability against which to deduct their MCC credits. Moreover, the shortfall in pre-MCC tax liability persists for higher income buyers.

6. Obviously, not all families with children contain two wage-earners, pay for child care, or have child care expenses that are tax-deductible. While a larger proportion of these income-eligible buyers might be able to fully utilize an MCC credit, for many it is not much help. Credit underwriting for this group as well as for other marginal prospects for MCC-assisted loans must be done very carefully. *Should participating lenders adjust the effective incomes of buyers with modest pre-MCC tax liabilities by the full value of the mortgage credits for which they qualify, those households may end up with a greater housing cost burden than they can manage.*

CONCLUSIONS

Our analysis of NCHFA's MCC program leads us to conclude that it has been a great success in facilitating the purchase of modest-price homes. Given its metropolitan bias, which will decrease as more lenders across North Carolina offer MCCs, the program's $58,301 average purchase price is substantially below the agency's acquisition cost limits. However, at the same time, by virtue of how an MCC subsidy is delivered, we have shown that the program is capable of fully assisting only a subset of income-eligible families and individuals. It is especially well-suited to helping single individuals of all incomes within the eligible range to buy a home, as well as many higher-income families with one child, or larger families with a single wage earner who does not take the federal child care tax credit.

Our tax simulations also suggest that, depending upon their tax status, some MCC recipients may not be receiving all the financial assistance to which they are otherwise entitled. These are the home buyers whose pre-MCC tax obligations are less than their MCC credits and who may be spending more of their after-tax income on housing than they can reasonably afford. It is interesting to note that only a small percentage of recipients were aware that federal law permits them to carry forward for three years any unused mortgage credit.

Finally, on the basis of our surveys of MCC recipients and participating lenders, we can conclude that the MCC program is not delivering assistance in the most cost-effective manner possible. Too many buyers would have been able to buy a house without the benefit of any mortgage tax credit, or could have used a smaller credit than they received. The following discussion offers recommendations on how MCCs program can be better targeted and made more cost effective.

Broaden Public Awareness of the MCC Program

More than three-quarters of all MCC recipients first heard of MCCs from either a realtor or a lender—probably well into their housing search process. This fact implies that many households receiving MCCs may have learned about them after they had already decided to buy a house.

The possibility of qualifying for an MCC and, thereby, for a mortgage loan, should be sufficiently attractive to draw otherwise marginally qualified potential home buyers into the market. However, they cannot apply for an MCC-assisted loan if they have never heard of the program. So, the general public's awareness of the MCC program should be broadened through an expanded public relations effort.

In addition, the MCC program should be boosted by work with community-based housing programs of local governments, nonprofit organizations, and public-private partnerships. These organizations are struggling to increase the supply of affordable housing in their jurisdictions, and they are in touch with those households that have been priced out of the local housing markets. The HFAs should hold workshops for these organizations to explain how the MCC program (and other agency initiatives) work and how they can be integrated into local affordable-housing efforts.

First, Underwrite the Loan Without the MCC

To make the NCHFA's MCC program more cost-effective, two changes are needed. First, the NCHFA should replace its single 25-percent MCC rate with a three-tiered program that offers tax credit rates of 10, 15, and 25 percent. Second, rather than simply requiring lenders to certify the buyers' eligibility for an MCC, the agency should require them first to underwrite a requested mortgage loan at the market interest rate, and then, only if the buyer fails the market test, to underwrite it again using the lowest MCC rate necessary to make the loan feasible.

While these policy changes would allow the NCHFA to assist more buyers with a given amount of mortgage credit authority and diffuse charges that it provides unnecessary assistance, they would also increase the administrative burden on lenders. The NCHFA should discuss with lenders alternative methods to limit the use of MCCs to cases where home buyers require the assistance. Because lender participation in the program is strictly voluntary, it would be counterproductive to impose unacceptable burdens on lenders, causing them to decline to take part in the program.

One way of encouraging lenders to accept the greater administrative burden would be to increase allowable origination fees for MCC-assisted loans. Also, the NCHFA would need to assure lenders they will be held harmless should a buyer be inadvertently certified for a higher-than-necessary mortgage credit rate. If lenders were still reluctant to underwrite loans using variable mortgage credit rates, this task could be carried out by the NCHFA and incorporated into its MCC processing guidelines.

Make the Tax Credit Refundable

Perhaps the best change in the NCHFA's MCC program would be for the federal government to make the mortgage tax credit refundable. This change, more than any other, would improve the ability of the NCHFA to direct

financing assistance to families who could not buy a house without an MCC. If refundable, the tax credit would always retain its full value, even for households whose incomes are too low to itemize deductions or whose tax liabilities are insufficient to utilize all of the mortgage credit because they have large tax-deductible expenses, such as child care expenditures.

The original MCC bill introduced in the Senate by Senator Robert Dole in 1983 provided for a refundable mortgage tax credit (Congressional Record 1983, S9710). By rejecting that proposal and making the MCC a non-refundable tax credit, Congress reduced from the start the potential effectiveness of the MCC program. Therefore, it is inappropriate for the Administration, Congress, or the GAO to criticize state and local HFAs for not targeting their MCC programs as the program's original sponsor had intended. Within the limitations imposed on it by the outcome of an obviously flawed legislative process, the NCHFA has implemented a highly successful and cost-effective MCC program to assist first-time home buyers.

ENDNOTES

1. We used the term "alleged" advisedly, since the agencies that issue mortgage revenue bonds strongly disagree with these criticisms. See, for example, National Association of Home Builders et al. (1988) and Wrightson (1988).

2. This fee is needed to help defray the HFA's bond issuance costs as well as to ensure that the lender makes a maximum effort to use his allocation to originate mortgage loans.

3. A somewhat similar analysis was completed by Koebel in 1985 for the Kentucky Housing Corporation (KHC). While our results are consistent with his, Koebel simulated the effects of MCCs on effective mortgage interest rates using a sample of actual MRB mortgage and mortgagor characteristics which were drawn from KHC's 1983 mortgage originations (Koebel 1985, 2).

4. Contact the author for a complete description of the simulation and its results.

5. It makes financial sense for most home owners with mortgages—even those with modest incomes—to itemize deductions for tax purposes. Perhaps, out of force of habit or because they might not know how to complete the "long form," some first-time buyers with MCC-assisted mortgages might continue filing their federal income taxes using the short form and standard deduction. Even though using the standard deduction increases the home buyer's pre-MCC tax liability over what it would otherwise be, the differences for specific household groups are generally not great enough to alter our basic conclusions about the ability of various classes of taxpayers to utilize fully a mortgage tax credit.

8
CAPITALIZATION AND MORTGAGE REVENUE BONDS: METHODOLOGY, EMPIRICAL EVIDENCE, AND POLICY IMPLICATIONS

J. Sa-Aadu
John D. Benjamin
C. F. Sirmans

INTRODUCTION

An important part of the U. S. mortgage-origination system is creative or below-market financing. In recent years, the quantitatively dominant type of below-market financing has been mortgage loans financed by tax-exempt mortgage revenue bonds (MRBs). From 1975 through 1990, over $125 billion of these tax-exempt bonds were issued by state and local governments across the country, with the resulting funds used to provide mortgage financing, primarily to first-time buyers, at below-market interest rates.

For creative financing provided by home sellers, theory suggests that sellers capture part or all of the subsidies in the form of a higher sales prices. However, because the subsidy inherent in MRBs comes *not* from home sellers, but rather from taxpayers, it is not clear whether the MRB subsidy is capitalized into higher sales prices. Thus, a key issue connected with MRBs is whether or not the intended beneficiaries—home buyers—benefit from the taxpayer subsidy provided by the bond-financed loans.

To the extent that capitalization of the taxpayer subsidy occurs, it may affect the distributional equity and market efficiency of MRBs. For example, capitalization of the subsidy could lead to overpayment of real estate taxes, creation of a "locked-in" effect, and overpayment of capital-gains taxes. To understand better the effects and consequences of MRB financing, one first must determine how much of the subsidy is capitalized into house prices.

In this chapter, we examine the circumstances under which the subsidy from MRBs is capitalized into house prices, and using a new methodology, we analyze the extent of such capitalization. In section one, we review the literature on capitalization of creative financing, identify some methodological problems with past research on the topic, and discuss how these problems affect estimates of the magnitude of capitalization. In section two, we present a new methodology to estimate the capitalization of MRB subsidies. Application of the new methodology is demonstrated in section three. Finally, in

the last section we discuss the policy implications of the MRB-subsidy capitalization.

THE CAPITALIZATION LITERATURE

To measure the extent to which mortgage financing subsidies are capitalized into house prices, researchers typically regress the actual house sales prices (SP) on two groups of variables: a set of housing characteristics (H) that describe the properties that are sold and on a set of creative financing terms (CE). The empirical model is of the form:

(1) $SP = \alpha H + \beta CE + \epsilon$,

where ϵ is a stochastic error term.

In equation (1), the term H controls for variations in house prices (SP) due to variations in structural and locational characteristics. The term CE is the present value of the benefit of the below-market financing; in other words, it is the value of the subsidy. Assuming for the moment that CE has been calculated appropriately, its coefficient ß in equation (1) is then interpreted as the percentage of the present value of the below-market finance benefit that is capitalized into the house price (SP).

The Cash Equivalence Model

The present value of the below-market financing benefit (CE) in equation (1) is often calculated using the cash equivalence adjustment (CEA) technique. The CEA is expressed as:[1]

(2) $CEA = \sum_{t=1}^{T} \dfrac{P^{*}_{t} - P^{c}_{t}}{(1+I^{*})^{t}}$,

where
P^{*}_{t} = monthly payment at the current market rate at time t,
P^{c}_{t} = monthly payment at the below-market financing rate at time t,
I^{*} = the current market interest rate, and
T = the term-to-maturity of the below-market financed loan.

This traditional approach to estimating the present-value benefit of below-market financing incorporates several basic assumptions: (1) below-market financing is always advantageous; (2) the mortgage is held until maturity; (3) the current market interest rate is the best estimate of interest rates over the life of the mortgage; (4) the financing premium, or CEA, value equals that dollar amount at which the buyer is indifferent when choosing from among the financing alternatives; and (5) tax effects are disregarded.[2]

To demonstrate how the CEA is calculated, take for example an MRB loan of $75,000 for 30 years with below-market financing rate of nine percent. The monthly payment on this loan would be $603.75. At a market rate of 12 percent, the corresponding mortgage payment on a conventional fixed-rate mortgage would be $771.75. Thus, a buyer with the MRB loan benefits from a monthly payment savings of $168.00. Using equation (2), the CEA for this loan is

$$(3) \quad CEA = \sum_{t=1}^{360} \frac{771.75 - 603.75}{(1 + .12/12)^t} = \$16,326.$$

Therefore, if one assumes 100 percent capitalization, the CEA method suggests that the house price has been increased by the present value of the subsidy, $16,326. Implicit in this analysis is the assumption that a conventional mortgage is the financial instrument of choice for marginal home buyers.

Application of the Cash Equivalence Model

Several studies have used the CEA approach to estimate the extent to which the benefit of different types of creative or below-market financing is capitalized into house prices. Examples of examined creative financing techniques include assumable mortgages with below-market interest rates, seller financing at below-market rates, and builder buydowns. Selected empirical studies of capitalization are summarized in appendix 1. The summary indicates that, despite the similarity in the statistical techniques employed by these researchers (most used regression analysis), there is variation in the estimates of the magnitude of capitalization ranging from almost zero to 100 percent.

Factors Affecting the Valuation of Below-Market Financing

A number of factors may affect the value of the financing premium. These factors include: (1) income and property tax rates, (2) the interest rate employed in the discounting process, (3) uncertainties surrounding future interest rates, (4) the anticipated holding period of the mortgage, (5) the size of down payments, (6) closing costs, (7) marketing considerations, and (8) the contracting skills of the buyer and seller.

The first of these factors, the marginal *income-tax rate* of the buyer, affects the value of the below-market-rate finance because the higher a buyer's income-tax rate, the less is the value of the financing for him or her. That is, buyers with higher tax rates perceive less difference between the present value and the book value of a below-market loan. They find the after-tax value of below-market financing is less because the lower mortgage payments reduce their mortgage tax deductions.

When a property-tax assessment is based on a sales price that reflects a financing subsidy, the home buyer's *property-tax* burden is inflated to the extent that the assessed value is not purged of the financing premium. Further, existing home owners may face additional tax burdens if house prices that reflect financing premiums are used as indicators of house price appreciation within tax district. If home buyers using below-market financing are well-informed, they will recognize this additional property-tax burden and accordingly attach a lower value to the financing premium.

The *discount rate* can affect the value of below-market financing. Typically, the CEA has been estimated using the average interest rate on conventional fixed-rate mortgages (assumed to be constant over the buyer's holding period) as the appropriate discount rate. Such interest rate is a good measure of the cost of below-market financing over the buyer's holding period. To the extent that the discount rate changes over the buyer's holding period, the value of the favorable financing would be affected. For example, an increase in the discount rate (or the buyer's time preference) will, ceteris paribus, decrease the value of the below-market loan. Moreover, future interest rates are uncertain, and Ferreira and Sirmans (1984, 1987) show that the more uncertain and volatile that rates become, the less the value a buyer attaches to the subsidy.

The buyer's *expected holding period* also affects the price paid for below-market rate financing. Mooney (1990) and Strathman, Delacy, and Dueker (1984) indicate that a truncated cash equivalence model may be a more appropriate way to measure the value of favorable financing. The truncated approach may be more accurate because most house buyers sell their homes before the mortgage is paid off. A 1985 survey of home sellers by the

National Association of Realtors shows that 58 percent of home buyers sell their residences in five years or less.

Another factor affecting the value of below-market financing is the amount of the *down payment* necessary to make the below-market financing feasible. The size of the down payment may influence the demand for, and hence, the value of such loans. Frequently, the amount of down payment for below-market financing is greater than that required for a new conventional loan. For example, a buyer may assume a below-market rate loan that has been partially amortized. If the assumed mortgage is for a house that has greatly appreciated in value since the seller purchased it, the combination of loan amortization and price appreciation may cause the house price to be much greater than the loan to be assumed. As a result, a buyer would have to make a very large down payment to receive the benefits of the below-market rate loan. Under this circumstance, fewer potential buyers (only those not facing the down payment constraint) would be able or willing to use the below-market financing, and its value would decline. Consequently, the greater the amount of down payment required, the less will be the value attached to the below-market financing.

Closing costs may be lower on below-market financed loans than on new conventional loans. These lower initial closing costs could affect the value of the financing premium. Furthermore, the use of below-market financing may allow the buyer to not be charged discount points that are typically owed on new loans. As a result of these lower closing costs, the value of such loans increases relative to conventional financing.

According to Clauretie (1984), *timeliness* of a house sale is an additional factor affecting the value of below-market rate financing. A seller recognizes that a lower selling price may result in a shorter marketing time. If she desires to sell quickly, she may be willing to make concessions on the financing premium (in other words, capitalize less of the premium into the house price). Conversely, a seller less concerned about a fast sale will be more likely to hold the property longer to secure a price that captures more of the value of the below-market rate financing. This line of reasoning predicts a direct relationship between "time on the market" and the amount of the subsidy capitalized into house prices. In addition, differences in contracting skills of the buyer and seller can affect the value of the financing premium. A buyer or seller who is experienced in negotiating concessions from the opposing party may be able to influence the amount of the financing premium that is included in the negotiated sales price.

Capitalization and Mortgage Revenue Bonds

Several researchers have suggested that capitalization occurs when house purchases are financed with funds from tax-exempt MRBs.[3] Durning and Quigley (1985, 515) provide three hypotheses as to how this capitalization might occur:

> First, since housing supply is relatively inelastic, at least in the short run, an injection of mortgage revenue bond financing in a local housing market, if sufficiently "large," could drive house prices above their short-run equilibrium levels. . . . Second, mortgage revenue financing provides an open-ended rebate in the unit price of housing services. . .(and) thus the form of the subsidy may result in less efficient search or shopping behavior by housing demanders who are thus observed to pay higher prices for otherwise comparable dwellings. . . . Third, the institutional arrangements for dispensing revenue bond financing (in particular, through suppliers or builders) may permit sellers to obtain the benefits of the tax financial subsidy simply by rationing access.

Even though Durning and Quigley found significant capitalization of bond financing into house prices, their empirical tests could not distinguish among these three hypotheses.

A study by Clauretie, Sirmans, and Merkle (1986) provided evidence supporting Durning and Quigley's first hypothesis. They showed that a "large" tax-exempt MRB issue can have an impact on market-wide prices of owner-occupied housing. (See chapter 11 in this volume for a complete description of this study.)

In the next section of this paper, we provide empirical support for Durning and Quigley's hypothesis that "rationed access" leads to the capitalization of MRB subsidies. We examine a bond program in which MRB loans made in targeted areas were dispensed through builders. We find that this generally accepted institutional arrangement for dispensing MRB loans al-lowed the benefits to be capitalized into selling prices. This result raises a question of fairness: is it in the public's interest to allow sellers to capture the benefits of tax-exempt MRBs?

ECONOMETRIC MODELS OF CAPITALIZATION

All econometric models of capitalization have one simple objective: to estimate the magnitude of the financing subsidy that is capitalized into house prices. However, this simple objective is complicated by the fact that the sell-

ing price of the house and the financing subsidy are usually interdependent. This interdependency creates a simultaneity problem that biases the estimated capitalization coefficient of below-market financing. In particular, capitalization studies involving seller-finance mortgages, buydowns, MRBs, and property taxes are plagued by this problem. Various econometric techniques have been proposed for eliminating the simultaneity problem and the resulting bias in the estimated coefficient. Unfortunately, the suggested transformations have created another problem in that the estimated coefficient no longer can be interpreted as the magnitude of the financing subsidy that is capitalized.

In this section, we present a methodology that provides a resolution to these problems. We then test the methodology using data on sales financed with MRB loans, where access to the loans were controlled by the seller (in this case, the builder). The results support the hypothesis that where access to MRB loan is controlled by the seller, the entire subsidy is capitalized into house prices.

The Standard Model

As discussed in the previous section, the standard methodology used to test the extent to which a financing subsidy is capitalized in house prices is a hedonic pricing model of the form:

$$(4) \quad SP = \alpha(H) + \beta(CE) ,$$

where SP is the selling price of the house, H is the attributes of the house, CE is the cash equivalent savings of below-market financing, and α and β are parameters to be estimated.

The cash equivalent, CE, can be written as the difference between the selling price (SP) of the house, the down payment (D), and the present value of the annuity from the below-market financing (PDV_m) discounted at the prevailing market rate:

$$(5) \quad CE = SP - D - PDV_m .$$

Combining equations (4) and (5) clearly illustrates the interdependency, or simultaneity, discussed earlier, which biases the estimated capitalization coefficient (β).[4]

The Durning and Quigley Model

To eliminate the simultaneity problem, Durning and Quigley (1985) and Durning (chapter 9) have suggested this transformation of equation (4):[5]

(6) $SP = \gamma H + \delta[-PDV_m - D]$,

where $\gamma_i = \alpha_i/1\text{-}\beta$, and $\delta = \beta/1\text{-}\beta$ is an estimate of the percentage of the subsidy that is capitalized.

Clearly, the suggested transformation is econometrically superior to equation (4) because it eliminates the potential bias in the estimated coefficient. Note, however, that δ cannot strictly be interpreted as the capitalization coefficient. One alternative is for the analyst to solve for β, which can then be applied to some base figure to arrive at a dollar estimate of the amount of the financing subsidy that is capitalized. Unfortunately, it is not clear what that base should be. Whereas it is pragmatic to say that this base should be the cash equivalent savings, the argument in the brackets of equation (5) does not satisfy the structural definition of cash equivalent savings, given by equation (5). Consequently, while the Durning and Quigley model is econometrically superior to the standard model, it is not clear how the coefficient should be interpreted.

The Desired Selling Price Model

To solve these problems, we propose the "desired selling price" (DSP) model. The DSP model assumes that when access to the below-market financing is controlled by the seller, the stage is set whereby the entire financing subsidy would be impounded in the selling price of the property, i.e., 100-percent capitalization will occur. However, to ensure 100 percent capitalization of the subsidy, the following necessary and sufficient conditions must hold: (1) the market values of comparable properties sold without the benefit of the below-market financing are observable by the seller; (2) the seller allocates the below-market financing; and (3) the buyer must accept the house and financing as a bundle, i.e., unbundling is not allowed. It is worth noting that the preceding conditions accurately describe the circumstances under which most below-market financing instruments are utilized.

In an environment where these three conditions hold, the seller captures all of the subsidy by depicting the desired selling price (DSP) as follows:

$$(7) \quad DSP = MV[1 - \lambda(1 - \eta\phi)]^{-1} ,$$

where λ is the loan-to-value ratio, η is the present value factor of an annuity at the prevailing market rate, ϕ is the mortgage constant at the below-market financing rate, and MV is the market value of the property without below-market financing. The intuition behind equation (7) is that the desired selling price is equal to the true market value of the house, plus 100 percent of the financing subsidy. The term in the parentheses, the conversion factor that adjusts for complete capitalization of the financing subsidy, is derived using the standard capital structure argument where market value is equal to the sum of debt and equity: $MV = DSP[1-\lambda(1-\eta\phi)]$. If the contract rate on the instrument is equal to the market rate, then $MV = DSP$.

Moreover, the model is general enough to subsume other types of below-market financing, e.g., in the case of assumption financing where the simultaneity problem is absent, $\lambda = FV/DSP$. In this case, the DSP model, equation (7), collapses to the following:

$$(8) \quad DSP = MV + FV(1 - \eta\phi) .$$

Here, FV is simply the face value of the loan to be assumed by the buyer. Note that this equation is identical to the standard hedonic model used in the valuation of houses with assumption financing.

In calculating the desired selling price with equation (7), the seller uses the observed market value of the comparables to form an expectation about MV. Likewise, both η and ϕ are easily determined by the seller because *ex ante* the seller observes the maturity of the below-market loan, its contract interest rate, and the market interest rate.

Using the DSP model, a determination of the extent of the financing subsidy that is capitalized is analogous to regressing the actual selling price (SP_i) of the below-market financed properties on DSP_i.

$$(9) \quad SP_i = a_0 + a_1(DSP_i) .$$

A statistical test for the significance of the constant term and the slope coefficients will then confirm whether the alternative hypothesis of entire subsidy capitalization is rejected. More specifically, if a_0 is not significantly different from zero and a_1 is not significantly different from one, these results imply that the entire financing subsidy is capitalized into the actual selling price.

The two-step (T-S) estimation procedure implied here yields consistent estimates of second-step parameters. However, Murphy and Topel (1985) show that the standard errors are biased downward. This bias results from the

fact the imputed regressor, DSP, used in the second step is measured with sampling error because DSP is a value predicted from the first step. As a correction for the standard errors, estimates from the naive T-S procedure are inflated by a positive factor (see Murphy and Topel 1985, equation 15', 375). Because the precise t-statistic on the DSP coefficient is critical to the test of the underlying hypothesis, we correct the standard error estimates using the Topel-Murphy correction technique.

APPLICATION OF PROPOSED METHODOLOGY

In this section, we demonstrate how our new methodology is used to estimate the extent to which the subsidy inherent in MRBs is capitalized into price of houses financed with loans from this tax-exempt bond. In recent years, the rise in the volume of MRB originations has been accompanied by increasing criticisms of the program. Two basic, interrelated allegations have been leveled against the program: (1) the benefit of MRBs accrue largely to the sellers rather the home buyers who are the intended beneficiaries; and (2) hence, MRBs do not reduce housing affordability problems. By estimating our model, we seek directly to confirm or refute the first allegation. And to the extent that the first allegation is confirmed, the second allegation would also seem warranted.

The Institutional Background

The setting for the application of the model is Louisiana where a $100 million of MRBs were issued by the state on August 15, 1983. Proceeds from this bond issue were used to provide mortgage loans at below-market rate for new housing in specific targeted areas.[6] The loans were available on a first-come first-served basis, and the maximum number of the newly constructed projects that could be financed with the bond money was set at 50 percent. Prospective borrowers could use the loans only to finance properties in specific projects, i.e., the loans were tied to specific properties or builders. To facilitate this "tieing", builders paid commitment fees to lenders; this in effect gave the builders direct control of access to the subsidized financing.

This setting provides a unique opportunity to test for the capitalization of the benefits of the financing subsidy in circumstances where institutional arrangements permit sellers to ration access. If builders (or their selling agents) can control access to subsidized mortgages and assign them to specific properties, then they can hold firmly to asking prices that capitalize some or all of the subsidy.

The Data

The data consists of 126 condominium units in seven newly constructed complexes in Baton Rouge, Louisiana, that were sold between December 1983 and June 1985. The condominiums are located near Louisiana State University (LSU), and are comparable in size, occupancy, and amenities. Buyers of the condominium units had similar income levels and socio-economic backgrounds. Indeed, a random survey of 31 purchasers showed that over 90 percent of them were white-collar professionals in high-income tax brackets who purchased the condominium units for use by their children who were attending LSU.

One of the seven condominium projects was located in a so-called targeted area in which MRB loans could be made with few restrictions. Because the builder paid a commitment fee to reserve MRB financing, eligible buyers of some units in this condominium project were able to obtain below-market MRB loans. Of the 126 units in the condominium, the sale of 24 units was financed with MRB loans. Consequently, for these 24 units, the builder directly controlled access to the subsidized financing.

On average, the MRB-financed condominiums sold for $61,900. The average mortgage amount on the MRB-financed units was $56,000, with a contract interest rate of 10.65 percent and a 30-year term. Nationally, during this time, the interest rate on comparable 30-year fixed-rate mortgages ranged from 12.5 to 14 percent. In addition, there was another important difference between conventional mortgages and MRB loans: the borrower with an MRB loan had to pay a two-percent penalty if he or she prepaid the mortgage within the first two years. The characteristics of the condominium units in the sample are summarized in table 1.

Empirical Results

The first step in the application of our model is to estimate the "true market value" of the houses sold with MRB financing. We estimated a hedonic equation for the sample of comparable properties that were conventionally financed and used the results to predict the market value for the houses financed with MRB loans.

Based on previous empirical research on house prices (see King 1973 and Miller 1982), we estimate a hedonic model of the following form:

$$(10) \quad MV_i = f(LA_i, FLRS_i, EXTQUAL_i, BRICK_i, STUDY_i, BKYARD_i,$$
$$FRONT_i, BEDS_i, DISLSU_i, TIME_i, DSBYCL_i) ,$$

where MV_i is the selling price of the ith condominium unit, $TIME_i$ is a monthly time trend with December 1983 equal to 1, and other variables are described in table 1.

The results from the estimation of equation (10) for the sample of 102 conventionally financed properties are shown in Table 2.[7] The dependent variable is the selling price of these units. The hedonic model performs quite well; the high adjusted R^2 (.95) indicates that almost all of the variation in condominium price is explained by the model. All the 11 variables have the expected signs and the parameters of 8 of the 11 variables are significant.

The results in table 2 were used to estimate the true market value (MV) of each condominium financed with MRBs. Next, the estimated MV was used to solve equation (7) for the desired selling price (DSP) under the hypothesis that 100 percent of the financing benefit was capitalized.

Equation (7) was solved for the desired selling price under two scenarios: the first is called the *ex-ante* model. Under this scenario, we assume that the builder or his selling agent, before putting the units on the market, forecasts the overall market interest rate and the loan-to-value ratio for borrowers receiving MRB loans, to be 13 percent and 95 percent, respectively. These figures were the averages for the market at the time the condominiums were originally put on the market. The contract interest rate on the MRB loans was 10.65 percent, and all had a maturity of 360 months.

For the second scenario, the *ex-post* model, we assume that the builder priced the condominium units using the actual loan-to-value ratio for each transaction and the market interest rate prevailing at the time of each sale.[8] Under normal course of events, the seller's desired selling price will be based on the ex-ante model.

We estimated equation (9) using as regressors the desired selling prices obtained from solving equation (7) under the two scenarios. In table 3, we report the parameter estimates and the corrected and uncorrected standard errors. The dependent variable is the selling price of twenty-four mortgage bond-financed condominium units. For the most part, the variation in the observed selling price of the condominium units is explained by the regressor.

Table 1. Description of Variables and Summary of Various Characteristics of the Condominium Data

Variable	Description of Variable	Mortgage Bond Financed Transactions (n=24)	Conventionally Financed Transactions (n=102)
Selling Price (SELPRICE)	Sales price of the condominium unit	$61,904.50 (8,732.26)	$64,248.10 (11,954.10)
Living Area (LA)	Living area of the unit in square feet	922.92 (186.44)	1,097.28 (234.12)
Number of Floors (FLRS)	Dummy variable equal to 1 if unit has two floors	.38 (.50)	.25 (.43)
Exterior Quality (EXTQUAL)	Dummy variable equal to 1 if exterior quality is rated by independent appraisers as excellent	0	.37 (.49)
Brick Construction (BRICK)	Dummy variable equal to 1 if building has brick construction	0	.60 (.49)
Study (STUDY2)	Dummy variable equal to 1 if unit has a study	.08 (.28)	.01 (.10)
Backyard (BKYARD)	Dummy variable equal to 1 if unit has a backyard	.58 (.50)	.44 (.50)
Front Location (FRONT)	Dummy variable equal to 1 if unit is located in the front of a condominium complex	.42 (.50)	.34 (.48)
Number of Bedrooms (BEDS)	Number of bedrooms in unit	1.88 (.34)	1.95 (.59)
Distance to LSU (DISLSU)	Distance in tenths of miles to LSU's campus	1.00 (0)	13.99 (7.20)
Closing Costs (DSBYCL)	Present value of closing costs, mortgage interest buydown, and private mortgage insurance paid by the seller for the buyer	$2,063.79 (958.31)	$3,706.88 (2,433.19)

Standard deviations are in parentheses.
Source: Sa-Aadu, Sirmans, and Benjamin (1989). Reproduced with permission.

Table 2. Hedonic Estimates for Conventionally Financed Transactions

Variable	Estimate (t-Statistic)	
Living Area (LA)	21.89*	(6.57)
Number of Floors (FLRS)	5177.50*	(3.39)
Exterior Quality (EXTQUA)	11639.08*	(7.40)
Brick Construction (BRICK)	4377.90*	(2.64)
Study (STUDY)	-920.62	(-.32)
Backyard (BKYARD)	-1328.53*	(-2.07)
Front Location (FRONT)	1839.83*	(2.44)
Number of Bedrooms (BEDS)	4025.33*	(3.27)
Distance to LSU (DISLSU)	38.94	(.74)
Time Trend (TIME)	136.31	(1.06)
Closing Costs (DSBYCL)	0.51*	(1.72)
Constant	19449.64*	(5.17)
$\bar{R}^2$		.95

*Significant at the .05 level.
SOURCE: Sa-Aadu, Sirmans, and Benjamin (1989). Reproduced with permission.

Table 3. Two-Step Estimates of the Capitalization of Mortgage Revenue Bond Financing into Condominium Prices

Variable	Coefficient	Uncorrected Standard Error	Corrected Standard Error	$\bar{R}^2$
EX-ANTE MODEL				
Constant	7065	5194	6553	
DSP	0.921	0.086	0.104	.83
EX-POST MODEL				
Constant	7417	5611	7042	
DSP	0.936	0.095	0.114	.81

Note: DSP is calculated using equation (7) and the results in table 1 to predict the market value of the MRB-financed units. See the text for a discussion of the *ex-ante* and the *ex-post* models.
SOURCE: Sa-Aadu, Sirmans, and Benjamin (1989). Reproduced with permission.

Our specific concern centers on the estimated standard errors. Note that while the corrected standard errors are in all cases larger than their uncorrected counterparts (as expected), the correction factors are rather small. For the *ex-post* model the naive T-S procedure overestimates the t-statistic on the desired selling price coefficient (DSP) by 25 percent. The corresponding figure for the *ex-ante* model is 20 percent. Moreover, the results are identical for the *ex-ante* and *ex-post* assumptions of seller behavior.

Accordingly, at the 95-percent confidence level, we could not reject the hypothesis that the entire MRB financing subsidy is capitalized into the selling price of the condominiums. Further, it is comforting to note that the constant term, as predicted, is insignificant. It is also worth noting in this context that the necessary T-S adjustment to the standard errors does not change the statistical inference; rather the correct adjustment confirms the robustness of our results.

POLICY IMPLICATIONS OF CAPITALIZATION

Policy debates on housing affordability problems are still very much dominated by the topic of how effective MRB bonds are in reducing the affordability problems of first-time home buyers. The primary goal of MRB programs is to enable first-time home buyers to finance their home purchases with proceeds from the tax-exempt bonds. Proponents of MRBs contend that without this cheap source of mortgage financing, a significant proportion of first-time home buyers will have to postpone entry into the housing market. Implicit in this argument is the assumption that the target population actually benefits from the taxpayer subsidy innate in MRBs. But opponents of MRBs counter that a majority of the households who receive MRB loans to finance their home purchases could probably have purchased similar homes using conventional fixed-rate or adjustable-rate mortgages.

While the policy debate continues, one important issue remains largely unresolved: who actually benefits from MRB subsidy? We have shown earlier in this chapter that under the institutional arrangement where builders (or their sales agents) controlled access to loans made with funds from tax-exempt bonds, the entire value of the MRB subsidy was capitalized into the selling price of the units financed with MRB loans. From this finding we conclude that the intended beneficiaries, first-time home buyers, on average received no benefit from MRBs.

If the intended beneficiaries on average do not benefit from MRBs, who does? First, it is clear that the institutional arrangements for disbursing the MRB subsidies lead to a wealth transfer from taxpayers to individual developers in the form of capitalization of the subsidy into house prices. Second, this

capitalization or wealth transfer means that the target population would have consumed the same amount of housing even in the absence of the MRB program. In other words, the MRB program simply buys the base. Consequently, MRB loans may not actually help alleviate the affordability problems of first-time home-buyers, the intended beneficiaries.

The apparent diversion of MRB benefits raises other important questions concerning resource allocation, market efficiency, and distributional equity. If abnormal profits are to be made in housing markets where properties are financed with MRBs, investors may be encouraged to move resources away from other housing market segments, or other segments of the economy, into this market segment. This shift may eventually lead to "over investment" in this market segment, resulting in inefficiency in resource allocation. In fact several studies, for example Mills (1987), suggest that there is already over investment in housing.

In the same vein, it is blatantly inequitable that taxpayers should finance the abnormal returns that accrue to builders or sellers of MRB-financed dwellings in the form of capitalization of the financing subsidy. For every $1 billion of these tax-exempt bonds that are issued, the costs to the taxpayer, in the form of lost revenue to the federal government, is estimated to be about $150 million. Additionally, the capitalization of the MRB subsidies has another important tax consequence: an MRB-financed house that is subsequently sold with conventional financing will produce lower capital gains to the extent that the original basis of the house has not been purged of the capitalized financing subsidy. As a result, the seller will pay a lower capital gains tax and federal tax collections will be reduced. Consequently, the cost of MRBs to taxpayers is increased.

Another consequence of this inflated-adjusted basis of the property is that the seller may have a strong incentive to buy another residence of greater or equal value to the one he is selling in order to avoid payment of a capital gains tax. This creates the so-called locked-in effect, and it results in both inefficient resource allocation as well as additional loss in federal tax revenue.

Finally, unless prices are adjusted for the capitalization effect, selling prices that reflect financing premiums can cause inequities in real estate tax assessment. Sirmans, Sirmans, and Smith (1987) find that both horizontal and vertical inequities may result when house prices reflect financing premiums. The results reported in this chapter confirm that possible horizontal inequities exist across properties.

SUMMARY

Previous research measuring the effects of below-market financing on house prices has been plagued by two key problems: solving the simultaneity problem usually encountered in the estimation of the price of the financing subsidy and at the same time retaining an easily interpretable model. In this chapter, we have presented a simple model that avoids the simultaneity problem and is also easily interpreted. In particular the model allows the analyst to test, in a straightforward manner, how much of the financing subsidy is capitalized into house prices. The model is general enough to permit the analysis of other types of below-market financing. We test the model using data on properties financed with MRB. Our results lead to the acceptance of the hypothesis that, under the described circumstance, the entire financing subsidy innate in an MRB loan is impounded in the selling price of the property.

Appendix 1. Selected Studies that Examine the Capitalization Of Below-Market Financing into House Prices (Arranged in reverse chronological order of publication)

Citation	Types of Below-Market Financing Examined	Time Period/ Location of Study	Empirical Results
Sunderman, Cannaday, and Colwell (1990)	Assumption	January 1979- August 1984; Champaign, IL	Study indicates that both the cash equivalent and the financed-fee valuation adjustment techniques may overvalue the premium associated with assumption financing. Findings: • loan-to-price ratio affects the proportion of the financing premium capitalized into the sales price. As the loan-to-price ratio decreases, the percentage of financing premium paid increases. • 18.1 percent capitalization of before-tax cash equivalent premium. • 14.5 percent capitalization of financed-fee valuation adjustment.
Mooney (1990)	Assumption	January - October 1985; Minneapolis and Duluth, MN	Shows that the value of below-market financing is greater for lower-priced housing than higher priced housing and is greater in an active (seller's) market. Regression results indicate: • 90 percent capitalization of before-tax cash equivalent premium for lower-priced housing sub-sample from Minneapolis. • 309 percent capitalization of before-tax cash equivalent premium for lower-priced housing sample from Duluth.

Author	Topic	Date/Location	Findings
Sa-Aadu, Sirmans, and Benjamin (1989)	Mortgage Revenue Bond	December 1983–June 1985/Baton Rouge, LA	• 128 percent capitalization of before-tax cash equivalent premium for full housing sample from Duluth. • insignificant capitalization of before-tax cash equivalent premium for full housing sample from Minneapolis and higher priced subsamples from Minneapolis and Duluth. Develops a new methodology to correct for simultaneity bias associated with traditional cash equivalence approaches while retaining an easily interpretable model. The methodology is tested using data on mortgage revenue bonds. The results suggest that all the financing subsidy is capitalized into house prices.
G. Sirmans, C. Sirmans, and Smith (1987)	Assumptions and Seller-Provided Seconds	July–December 1980; Atlanta, GA	Examines the horizontal and vertical inequities in property tax assessments arising from below market financing premiums. Develops a theoretical model to measure the financing premium that incorporates the premium for below-market financing and the discount required for the expected property tax inequity. Regression results indicate: • 34 percent capitalization of financing premium when taxes are incorporated. • vertical inequities with 29 percent capitalization for upper price range (above the median price). • no significant capitalization for properties in lower price range (below the median price).

Ferreira and Sirmans (1987)	Assumption	Simulation	Explains why analyses employing cash equivalence adjustment techniques have found less than 100 percent capitalization: • unexpected changes in market interest rates may decrease the cash equivalent premium for assumable loans. • under certain circumstances, homebuyers may prefer new conventional mortgages.
Benjamin and Sirmans (1987)	Mortgage Revenue Bond	December 1983–June 1985/Baton Rouge, LA	Employs Durning and Quigley's (1985) methodology to correct for simultaneity bias associated with traditional cash equivalence approaches. Under the Durning and Quigley model the study finds that only 26 percent of the financing subsidy is capitalized, while the traditional approach suggests that all the subsidy is capitalized.
Agarwal and Phillips (1985)	Assumption	July 1981–March 1982; 1982/Virginia Beach, VA	Findings: • capitalization of before-tax cash equivalent premium decreases with higher home prices (i.e., below-market financing is much more valuable to a buyer of lower-priced housing) and longer expected holding periods. • seller assisted secondary financing does not affect house prices when holding primary financing constant.

Durning and Quigley (1985)	Tax-Exempt Bonds Assumptions, Seller Financing and Mortgage Blends	December 1981-February 1982; Little Rock, AR	Uses cash equivalence and the hedonic pricing model adjusted to reduce estimation bias. Finding: • 34-35 percent of seller-to-buyer financing and 18-27 percent of MRB financing is capitalized into the house price.
Ferreira and Sirmans (1984)	Assumption Financing	January 1976-April 1977 and January-December 1980; Greenville, SC	Demonstrates that interest rate volatility should affect the value of assumable loans and the premium should be lower than the cash equivalent value. Finding: • no significant premium paid for either time period when employing cash equivalence methodology.
Hubert and Mann (1984)	Seller-Paid Discount Points, Seller-Paid Closing Costs, and Seller Financing	1978-1981; King County, WA	Findings: • 41 percent capitalization of before-tax cash equivalent premium. • 54 percent capitalization premiums in individual years 1979-1981.
Clauretie (1984)	Assumption, Seller and FHA/VA Financing	1978-1982; Shreveport, LA	Findings: • 117 percent capitalization of before-tax cash equivalent premium for assumptions financing. • 160 percent capitalization of seller financing for homes on the market longer than 100 days. • no capitalization of seller financing for homes on market less than 100 days.

Author (Year)	Type of Financing	Period; Location	Findings
Smith, G. Sirmans, and C. Sirmans (1984)	Assumption and Secondary Seller Financing	July–December 1980; Atlanta, GA	Findings: • employing a truncated cash equivalent model, authors reveal 100 percent capitalization before-tax for a three-year holding period. Authors show 100 percent capitalization after-tax for a four-year holding period.
Strathman, Delacy, and Dueker (1984)	Assumption Seller, and FHA/VA Financing	July 1981–June 1982; Portland, OR	Finding: • using regression analysis, 90 percent capitalization of before-tax cash equivalent premium when assuming a five-year holding period.
Rosen (1984)	Assumption and Secondary Seller Financing	1978–1982; California	Finding: • 100 percent of the before-tax cash equivalent premium is shifted to the buyer.
Agarwal and Phillips (1983)	Assumption Financing	July 1981– March 1982; Virginia Beach, VA	Findings: • 36 percent capitalization of before-tax cash equivalent premium for homes under $60,000. • premium decreases as holding period expands.
Bible and Crunkleton (1983)	Assumptions and Seller Financing	August 1979– September 1981; Norfolk, Chesapeake, Portsmouth, and Virginia Beach, VA	Findings: • regression results show that the average home-buyer paid a premium of 1.77 times the average discounted loan savings arising from below-market interest rates.
Goolsby, Graaskamp, and Warner (1983)	Seller Financing	October 1977– March 1981; Madison, WI	Findings: • regresses price per unit of condominiums and total building price on the CEA and other variables. • 146 percent capitalization for price per unit and 201 percent capitalization for total price.

Author	Type	Date/Location	Findings
G. Sirmans, Smith, and C. Sirmans (1983)	Assumption Financing	July–December 1980; Atlanta, GA	Findings: • Cash equivalent premium explains the effect of assumption financing better than the financed-fee valuation methodology. • 32.2 percent capitalization of before-tax cash equivalent premium into the sales price of a house purchased within an assumption. • 20 percent capitalization of the financed-fee valuation adjustment.
Corgel and Goebel (1983)	Assumption Financing	January 1981– June 1981; Gainesville, FL and March 1978–June 1981; Lubbock, TX	Findings: • 41 percent capitalization of before-tax cash equivalent premium for Gainesville, Florida, and 40 percent for Lubbock, Texas. • full capitalization over a three-year holding period.
G. Sirmans, C. Sirmans, and Smith (1983)	Assumption and Secondary Seller Financing	July–December 1980; Atlanta, GA	Finding: • 35 percent capitalization of after-tax cash equivalent premium for assumptions and seller second mortgages when combined.

ENDNOTES

1. Sirmans, Smith, and Sirmans (1983) discuss a second technique to find the CEA financing premium. The CEA can be calculated as the difference between the balance owed on the mortgage and the present value of the payments on the mortgage discounted at the current market rate of interest.

2. The financed-free valuation adjustment is an alternative approach to the CEA methodology (see Sunderman, Cannaday, and Colwell 1990) and may have greater limitations (see Sirmans, Smith, and Sirmans 1983).

3. Kraft (1981) discusses MRB programs and their history. Also, see chapter 1 in this volume. For a discussion of various aspects of tax-exempt financing, see the articles in Kaufman (1981).

4. In situations where the outstanding loan to be assumed at below market rate is known, as is the case with assumption financing, the simultaneity problem does not exist.

5. An alternative methodology, with rather exacting data requirements, is provided by Clauretie (1983).

6. The Federal Register (1981) and the Louisiana Housing Finance Agency define the term "targeted area" to mean (i) a census tract in which 70 percent or more of the families have an income that is 80 percent or less of the state-wide median income, or (ii) an area of chronic economic distress. Between 1984 and 1985, the Louisiana Housing Finance Agency allocated approximately 15 percent of the MRB proceeds to single-family property financing in targeted areas.

7. We experimented with other functional forms, for example the semi-log form, and the results were qualitatively similar to those reported in table 2.

8. We define market interest rate as that rate that will prevail on comparable fixed-rate mortgages based on Federal Home Loan Bank Board data.

9

BEHAVIORAL RESPONSES TO
MORTGAGE REVENUE BOND SUBSIDIES:
EFFECTS ON EFFICIENCY AND DISTRIBUTION

Danny W. Durning

INTRODUCTION

The policy debate about mortgage revenue bond (MRB) programs has addressed both the efficiency and distribution of the loan subsidies. Strong theoretical arguments and some empirical evidence have supported the conclusion that MRB programs are inefficient, yielding less in benefits than they cost (Congressional Budget Office 1979; Tuccillo and Weicher 1979; Peterson and Cooper 1979; Lurie 1982; General Accounting Office 1983, 1988; and the California Office of Legislative Analyst 1985). Also, a small amount of empirical research has shown that a majority of the subsidies has been distributed to households with above-median incomes (General Accounting Office 1983, 1988; chapter 4 in this book).

These studies of MRB subsidies are incomplete and may evaluate MRB programs inaccurately because they do not adequately factor in how the subsidies affect the decisions of house buyers and sellers. For example, according to microeconomic theory, if MRB loans provide a subsidy that reduces the price of housing, buyers will respond to the lower price through both income and substitution effects. The actual changes in buyer behavior in response to MRB subsidies depend on the nature of the subsidy and how it is distributed. In the Experimental Housing Assistance Program (EHAP), different forms of rental subsidies caused different responses by renters (Friedman and Weinberg 1982), and home buyers and sellers will respond to the incentives provided by MRB subsidies.

The research I report in this chapter suggests that MRB subsidies induce changes in the behavior of house buyers or sellers that reduce the efficiency of the subsidies and cause them to be distributed less equitably than they would be without the behavioral responses. I find that buyers respond to MRB subsidies like renters in the EHAP program responded to the percent-of-rent vouchers: they shop less efficiently and purchase more housing services than they otherwise would. As a result, MRB programs may produce fewer social benefits than research has so far indicated.

REDUCING THE BENEFITS OF MRBS

As discussed in chapter 4 of this book, proponents of MRB programs argue that the programs are justified largely because this policy instrument produces three favorable outcomes. First, MRBs increase home ownership by helping low- and moderate-income households purchase houses they otherwise could not afford. Second, they have positive effects on the housing stock and neighborhoods as a result of positive externalities created by an increase in home ownership. Third, they provide an economic stimulus that generates taxes and jobs.

These favorable outcomes will be reduced if the subsidies cause changes in behavior that result in either (1) the capitalization of any portion of the value of MRB subsidies into house prices or (2) an increased consumption of housing services. Capitalization would divert subsidies from buyers to sellers, enabling fewer households to purchase rather than rent houses. Also, it would have negative distributional effects: capitalization would transfer money from taxpayers to sellers. There are no good policy justifications for providing public subsidies to a subset of sellers simply because society wants to help "deserving" buyers.

Further, I would argue than any MRB subsidy provided simply to increase housing consumption would diminish the pool of subsidies available to increase home ownership. To the extent that they stimulate an increase in housing consumption, MRB loan subsidies create horizontal inequities unless all households eligible for the subsidies receive one. Otherwise, the subsidies enable one set of households to purchase more housing services than similar households without the subsidies.

THE CAPITALIZATION OF MRB SUBSIDIES

At first glance, the capitalization of MRB subsidies seems unlikely. These subsidies typically are administered by individual lenders who are third parties to the transactions between buyers and sellers. The terms of third-party financing should not affect the sales prices of houses; a seller should not be concerned with the interest rate paid by a buyer. Whatever the interest rate, the seller will be cashed out of the property by the loan (that is, he or she will be paid the sales price in one lump sum).

A closer examination of MRB loan programs shows a more complex situation than the usual third-party financing. Unlike normal loans, MRB loans do provide subsidies that may affect the behavior of buyers or sellers. In some research on the topic, John Quigley and I (1985) found that in early 1982, between 18 and 25 percent of the present value of MRB loan subsidies

provided in the Greater Little Rock, Arkansas area was capitalized. Another study (Strathman, DeLacy, and Dueker 1984) observed that in 1982, house purchases financed by the Oregon veteran's loan program (which sold general obligation bonds to obtain below-market capital) cost more than similar houses financed with conventional mortgages.

These two studies used samples of house purchase transactions in 1982, a year in which housing sales fell to about half of the 1978 levels. The question I investigate here is whether capitalization of MRB subsidies takes place in more "normal" markets than existed in 1982. In other words, are the results of these two studies duplicated in markets in which sales approximate the decade averages and in which lending institutions–rather than sellers– provide most mortgage financing?

A Model of MRB Financing

The model I use to estimate capitalization of below-market MRB loans is a straightforward extension of the standard hedonic price model employed in studies of creative finance capitalization (Rosen 1984). The standard model is as follows:

$$(1) \quad S = \sum \alpha_i x_i + \beta F_a ,$$

where S is the sales price of a house, x_i is the ith characteristic of the house, F_a represents the after-tax value of the financial terms, and α and β are parameters to be estimated.

The value of F_a for each house is calculated as follows:

$$(2) \quad Fa = (1 - t)(PDV_c - PDV_m) ,$$

where t is the household's marginal tax rate, PDV_c is the present value of the payments at the contractual rate, and PDV_m is the present value of the flow of payments discounted by the market interest rate. I assume a household's marginal tax rate will be constant for the term of the loan.[1]

Model (1) can be estimated directly. Both PDV_c and PDV_m can be calculated using data from individual mortgages, market interest rates, and each household's marginal tax rate. However, this estimation creates a statistical complication that may cause biased estimates of β (Clauretie 1984). By definition, the sales price of each house equals the down payment (d) plus the present value of the payment stream at the contractual rate:

$$(3) \quad S = d + PDV_c .$$

The substitution of (3) and (2) into (1) yields:

$$(4) \ S \ = \ \sum \alpha_i x_i \ + \ \beta(1 - t) \ (S - d - PDV_m) \ .$$

The spurious correlation introduced by including S on the right-hand side of (4) means that ordinary least squares (OLS) regression will yield biased and inconsistent estimates of capitalization effects. This problem can be corrected by subtracting S from both sides of (4) and solving for S. Such a correction of simultaneity bias follows the suggestions of Johnston (1972), who shows that parameters will be biased upwards if estimated using equation (1).

The reduced form model is:

$$(5) \ S \ = \ \sum \theta_i x_i \ + \ \delta[z(1 - t)(-d - PDV_m)] \ + \ R \ ,$$

$$(5a) \ S \ = \ \sum \theta_i x_i \ - \ \delta[-z(1 - t)(-d - PDV_m)] \ + \ R \ , \ \text{where}$$

$$(6) \ \delta \ = \ \beta/(1 - \beta + \beta t) \ ,$$

z is an indicator variable equal to 1 if the loan is an MRB loan and equal to 0 if it is a market rate loan.[2] R is the residual value of the estimate.

The reduced form model, equation (5), will produce consistent estimates of the parameters of (4) by ordinary least squares (OLS) estimation of (5) and solving for α_i and β. A consistent estimate of the capitalization effect is:

$$(7) \ \beta \ = \ \delta/(1 + \delta - t\delta) \ .$$

A large sample t-ratio can be estimated for β using a Taylor expansion series (Kmenta 1971).

Application to the Arkansas MRB Program

Greater Little Rock, Arkansas is a metropolitan area of about 200,000 people; it includes the cities of Little Rock and North Little Rock. This area proves a good site for the analysis of capitalization because it typifies the cities in which MRB loans are especially popular. Greater Little Rock has been growing moderately, and it has house prices about 85 to 90 percent of national averages. For example, the 1980 census showed the median owner-specified house value in Greater Little Rock as $40,100 compared to the national median of $47,100. In 1983 the average MRB loan in Greater Little Rock was about $49,110; nationally, the average was $51,931 (National Council of State Housing Agencies 1984). The results of this study of the Greater Little Rock

area should be generalizable to other MRB programs, except those in the largest metropolitan areas where house prices are much higher.

I base my empirical analysis of capitalization upon observations of 148 sales of single-family dwellings in the Greater Little Rock area during 1983. Each observation includes information about house characteristics, the financial terms of the loan, and the socio-economic characteristics of the borrower.

Of the 148 observations, 76 are MRB loans made by the Arkansas Housing Development Agency (AHDA) in 1983 between March and October. The AHDA provided information about the financial terms of the loans and the borrower characteristics. I obtained the description of house characteristics from either Multiple Listing Service (MLS) records or from house descriptions on file in the county assessor's office.

The remaining 72 houses were purchased with market-rate loans, including conventional loans, Federal Housing Administration-insured loans, and Veteran's Administration-guaranteed loans. The sample includes only houses priced below the maximum amount that could be paid for houses purchased with MRB loans ($71,640 for new and $65,670 for existing houses). The information about the loan terms came from mortgages on file in the Pulaski County courthouse, the house characteristics were gathered from MLS or county assessor records, and borrower socio-economic characteristics were supplied by five mortgage lenders.

The MRB loans in this sample were available from two bond issues by the AHDA, the only agency in Arkansas authorized to issue bonds for financing single-family house purchases. The first bond issue, completed in April, raised $26.4 million. The agency sold the bonds as market rates fell to their bottom for the year. As a result, during the summer of 1983 the AHDA offered fixed-rate mortgage loans with an interest rate of 9.625 percent, about four percentage points below market rates. The second bond issue (raising $50 million) was completed in June. The mortgage loans financed by this issue had an interest rate of 10.2 percent.

These mortgage loans required a minimum down payment of five percent of the sales price. In addition, a payment of 5.5 points (5.5 percent of the mortgage amount) had to be made to the lender when the loan was approved.

The AHDA imposed several important restrictions on the MRB loans aside from the maximum purchase price mentioned above. For instance, households receiving the loans could have an annual income of no more than $40,000, plus $2,000 for each dependent. In addition, 90 percent of the loans had to be made to first-time buyers (households that had not owned a house in the previous three years).

Estimates of Capitalization

Table 1 presents parameter estimates for the financial variable (δ) and its transformation, β, the estimated capitalization rate. In addition, the parameter estimates are shown for one of the control variables, an indicator variable for FHA loans. The table provides parameter estimates under two scenarios. First, the loans will be held by all borrowers for their full terms (30 years); second, all loans will be kept by borrowers for seven years and then will be paid off.[3]

The control variables include important house characteristics, location (by zip-code area), and a proxy for neighborhood quality (median house price in the census district). All coefficients of the control variables have the expected signs except for lot size and the FHA indicator, which are sometimes negative. However, neither coefficient differs statistically from zero in any of the estimated models. Definitions of the independent variables are in appendix 1.

Table 1: Estimated MRB Capitalization Rates
Greater Little Rock, 1983[a]

Independent Variable	Scenario 1: 30-Year Holding Period	Scenario 2: 7-Year Holding Period
FHA Indicator	-416.60	-397.07
(1 = yes)	(-0.18)	(-0.18)
MRB Finance	.126	.114
Variable (δ)[b]	(2.16)	(2.17)
Corrected R^2	.732	.732
Capitalization	.115	.105
Rate (β)	(2.00)	(2.02)
Observations	148	148

[a]The dependent variable is the contract sales price plus points. t-ratios are in parentheses. Complete regression results are available from the author.
[b]MRB finance variable is $[-z(1-t)(-d-PDV_m)]$; see equation (5a).

The regression model explains about three-fourths of the variations in house prices. The estimated capitalization rate is 11.5 percent if the loans are held their full terms. If loans are kept for only seven years, the estimated capitalization rate is reduced by roughly one percentage point. These results indicate that for every dollar of MRB subsidy, a buyer pays a house price that is 10 to 12 cents higher than with a market-rate loan.[4] The capitalization estimates are statistically significant at the five-percent level.

One potential difficulty with these estimates is that about three-fourths of the market loans were FHA-insured loans, and the sales prices of houses financed with an FHA loan likely included financing premiums. During 1983, lenders charged four to six points for FHA financing, but borrowers could pay no more than one point. Thus sellers had to pay several points when buyers financed their purchases with FHA loans. According to accumulated research evidence (Zerbst and Brueggeman 1977; Colwell, Guntermann, and Sirmans 1979), a major portion of these points was capitalized into house prices.

Although I included a control variable for FHA financing in the model, this variable may not be adequate to account fully for the effect of FHA-point capitalization on estimates of MRB-subsidy capitalization. So, I tested the influence of FHA financing on the MRB-subsidy capitalization estimate by repeating the regression with a sample that included only MRB and conventional loans (n=95). Table 2 presents the estimates of the MRB financial variable coefficients. The estimated capitalization rates run about two percentage points higher than the estimates for the original sample. The safest interpretation of tables 1 and 2 is that the after-tax capitalization ranges from 10 percent to 14 percent of the sales price.

Such results indicate that capitalization reduces the average after-tax subsidy by approximately $1,240 if loans are held their full term. For loans kept only seven years, the capitalization reduces the average after-tax subsidy value by about $700.[5]

WHY DOES CAPITALIZATION OCCUR?

I hypothesize that the capitalization of MRB subsidies results from the effects of the subsidies on the behavior of either the house buyers or sellers. I test two hypotheses: (1) MRB subsidies cause house buyers to shop less efficiently than if they had to purchase a house with a market-rate loan, and (2) MRB subsidies are controlled by house sellers who charge buyers for the favorable financing.

Table 2: Estimated MRB Capitalization Rates
Conventional and MRB Loans Only[a]

Independent Variable	Scenario 1: 30-Year Holding Period	Scenario 2: 7-Year Holding Period
MRB Finance Variable $(\delta)^{b}$	151 (2.79)	.138 (2.81)
Corrected R^2	.722	.722
Capitalization Rate	.136 (2.56)	.125 (2.58)
Observations	95	95

[a]The dependent variable is the contract sales price plus points. t-ratios are in parentheses. The complete regression results are available from the author.
[b]The MRB variable is $[-z(1-t)(-d-PDV_m)]$; see equation (5a).

Capitalization Through Inefficient Shopping

A home buyer with an unrestricted voucher to pay a portion of her mortgage payment–like a renter with a voucher to pay a percent of her rent–may exert less effort in a search for housing. The home buyer's voucher reduces the private rewards (the dollars going into her wallet) of a more intensive search. Whereas a buyer with a market-rate loan would save a dollar for each dollar reduction in house price produced by locating a better bargain, the buyer with a voucher will not receive the full savings (Courant 1987). For a subsidized buyer, the private return is less. She gets 1-r of every dollar of savings (where r is the percentage reduction in the present discounted value of the house price resulting from the MRB subsidy).

Were the MRB subsidies provided by the Arkansas Housing Development Agency equivalent to percent-of-rent vouchers? The answer to this question is not clear. Lenders in Little Rock distributed MRB loans (and the accompanying subsidies) to households based on their lending criteria and MRB program guidelines. These lenders did not dispense vouchers—they made mort-

gage loans. In other words, a household went to a lender for an MRB loan to purchase a specific house, not for a pledge of MRB financing for any house. Thus, MRB subsidies were received after the buyer had selected a house; an unrestricted voucher would have been given before the search.

However, buyers might have perceived the MRB subsidies as an unrestricted voucher because of the role played by real estate brokers in the housing search process. Though a potential buyer may not have had a lender's pledge to provide an MRB subsidy, a real estate broker may have advised the buyer that he was eligible for such a subsidy and was likely to get one should he act promptly. The search process may have proceeded as if the buyer had a voucher because he presumed—based on the broker's advice—that he would get a below-market MRB loan.[6]

Because inefficient shopping is an unobserved variable, I tested for its existence with a model that uses the sales price-asking price ratio (S/AP) as the dependent variable. The expectation is that, other things being equal (including the characteristics of the supply side of the market), S/AP will increase as shopping efficiency decreases.

This expected relationship between S/AP and shopping effort is quite reasonable under the assumption that sellers set their asking prices without knowing in advance the source of financing used by the buyer. We can think of the asking price (AP) as the function of the characteristics being purchased (vector x_i in equation 1), a bargaining buffer (b), and errors made by the seller in estimating the value of the house (e):

$$(8)\ AP = (1+b+e) \sum \alpha_i x_i .$$

In an efficient market, the sales price will be equal to the sum of the values of the characteristics:

$$S = \sum \alpha_i x_i .$$

I hypothesize that households with MRB subsidies will shop inefficiently. This inefficient shopping implies that the households will pay some percentage increment (v) over the value of the characteristics, so the sales prices for houses financed with MRB loans (Sb) will be greater than the market value:

$$(9)\ S_b = (1 + v) \sum \alpha_i x_i , \ v > 0 .$$

For efficient shoppers the S/AP ratio is:

$$(10)\ S/AP = \sum \alpha_i x_i /(1 + b + e) \sum \alpha_i x_i = 1/(1 + b + e) .$$

For buyers with MRB loans, the S_b/AP ratio is:

(11) $S_b/AP = (1+v)/(1+b+e)$.

Thus, $(S_b/AP) > (S/AP)$ if $v > 0$. In this case, v is the price paid for inefficient shopping.

Factors contributing to inefficient shopping may include characteristics of the buyer as well as the existence of a subsidy. A younger household may lack experience in assessing the market value of houses, or it may not be skilled in bargaining. A more affluent household might place a higher value on the marginal time spent searching for a house, therefore conducting a less intensive (that is, time consuming) search than a poorer household that places less value on leisure time. Also, house buyers may have personal characteristics that affect their ability or willingness to bargain; for example, they may be impatient, impulsive, or unintelligent.

Of course, sellers may also have personal characteristics that contribute to their failure to obtain the full market value of their houses. Buyers, in these cases, may obtain bargains.

An examination of the average sales price/asking price ratios for house buyers in Greater Little Rock during 1983 shows that buyers with MRB loans paid a sales price nearer the asking price than did buyers with market rate loans.[7] The average S/AP ratio for all houses with three or fewer bedrooms sold in 1983 through MLS listings was .952. The average S/AP ratio for a sample of houses financed with MRB loans was .978.

These ratios support the hypothesis that MRB subsidies cause households to shop less intensively; however, the ratios are not conclusive evidence of shopping inefficiency because we do not know if other factors cause the differences. For example, the ratios do not account for the effect of buyer personal characteristics such as age and income on the S/AP ratios.[8]

To test more completely the hypothesis that the S/AP ratio is higher for buyers with subsidies (holding other factors constant), I estimate the following models:

(12a) $S/AP = \Psi + \gamma_1 Y + \gamma_2 Age + \gamma_3 FHA + \gamma_4 Bond + U$,

(12b) $S/AP = \Psi + \gamma_1 Y + \gamma_2 Age + \gamma_3 FHA + \gamma_4 F_a + U$,

(12c) $S/AP = \Psi + \gamma_1 Y + \gamma_2 Age + \gamma_3 FHA + \gamma_4 Bond + \gamma_5 R + U$,

(12d) $S/AP = \Psi + \gamma_1 R + U$,

where Y is household income, Age is the age of the householder, FHA is an indicator variable with a value of one for households receiving FHA-insured loans, Bond is an indicator variable with a value of one for households receiving MRB loans, and F_a is the after-tax MRB subsidy. The γ_i and Ψ are parameters to be estimated.

R in equations (12c) and (12d) is a proxy variable for inefficient shopping. It is the residual (R) of equation (5a). Thus, R is the difference between the predicted house value (the estimated market value) and the actual sales prices for each observation. If the hedonic regression were perfectly specified and all relevant variables included, R would be the effects of inefficient shopping, the portion of the house price that exceeds the market value. However, because equation (5a) omits some variables, R consists of the effect of inefficient shopping and other elements.[9]

Table 3 presents the parameter estimates of these models.[10] The results indicate that bond financing is associated with a higher S/AP ratio, holding income and age constant.[11] Also, increases in the S/AP ratio are positively related to increases in the subsidy amounts.

The parameter estimate of R (the proxy variable for inefficient shopping) in (12c) was positive and statistically significant. Including R in equation (12c) almost doubled the explanatory power of the model while having no effect on the bond loan coefficient. The results of estimating model 4 indicate that R (the inefficient shopping proxy) has an independent effect on the S/AP ratio.

Sellers Extract Payment for Below-Market Mortgage Financing

The hypothesis that the capitalization of MRB subsidies results from inefficient shopping will be true only if a buyer receiving an MRB subsidy can finance the purchase of the house of his choice with an MRB loan. However, MRB loans may be controlled by sellers rather than buyers. If so, sellers will likely attempt to charge for the subsidies by increasing the price of houses financed with the MRB loans. The situation is analogous to loan buydowns or assumptions.[12]

These results provide additional support for the hypothesis that shopping inefficiency resulting from MRB subsidies contributes to their capitalization. Given the cross-sectional nature of this analysis and the large random component of S/AP, it is not surprising that the coefficient of determination is small.

If a few sellers control the below-market financing, they will permit a buyer to obtain an MRB loan only if she purchases certain houses owned by the sellers. A buyer will be willing to pay a higher price for a house with an MRB subsidy than for an identical house that must be financed with a

conventional loan as long as she would end up with a lower monthly payment.

Table 3: Parameter Estimates of Models Testing for Inefficient Shopping

Dependent Variable: Sales Price/Asking Price

Variable	Model 1	Model 2	Model 3	Model 4
Income	.00001	.00001	.08-E4	
	(2.00)	(1.67)	(1.19)	
Age	.002	.0017	.0018	
	(1.98)	(1.74)	(1.74)	
FHA Loan	.049	.033	.049	
(1=yes)	(2.07)	(1.67)	(2.41)	
Bond Loan	.059		.059	
(1=yes)	(2.55)		(2.55)	
Bond Savings		.05-E4		
		(2.38)		
Residuals[a]			.024-E4	.027-E4
			(2.68)	(3.04)
Intercept	.82	.85	.84	.97
	(18.1)	(21.9)	(19.3)	(191.3)
Adjusted R^2	.09	.08	.15	.08
F-value	2.93[b]	3.15[c]	4.40[c]	9.27[c]

(t-ratios are in parentheses)
[a]Residual values from regression results reported in table 1.
[b]F-value is statistically significant at the .05 level.
[c]F-value is statistically significant at the .01 level.

For example, suppose a household could buy a $100,000 house with a $90,000 loan at the market rate of 10 percent for 30 years. The household would pay $790 per month for principal and interest. If this household were provided an MRB loan at 8 percent, the monthly payment would be $660 per

month for a $90,000 loan. However, if the seller raised the price of the house because the household had an MRB loan, the household would continue to prefer the below-market MRB loan (and higher house price) until the house price increased to the point that the monthly payments exceeded $790 per month. The household could pay a sales price of up to $119,000 (a loan of $107,600) and still have lower monthly payments with an MRB loan than with a market rate loan.

Did sellers control MRB subsidies provided by the AHDA in the Greater Little Rock area? Some did. The AHDA allowed builders to reserve up to one-fourth of the MRB funds by paying a specified number of points.[13] These reserved funds were then available only to borrowers who purchased the houses offered for sale by the builders paying the points. Thus, some builders clearly had control over who received a portion of the subsidies.

Yet, it is uncertain if builders perceived that these subsidies were under their control (like buydowns) or if the remainder of the MRB loans were controlled by real estate brokers or builders. While formal rules of the MRB program did not permit real-estate brokers to reserve MRB loans for their customers, these brokers could informally have had favorable access to the loans through their standing relationships with lenders. For example, they might have known that they had first claim on available subsidies, or they might have had inside information about how to obtain the subsidies. As the advisers to sellers, real-estate brokers could have used informal control of subsidies to help the sellers capture some of the value of the loan subsidies. Because real estate brokers typically receive a percentage of a house's sales price as their commissions, they increase their fees if the subsidy values are capitalized.

An indirect method must be employed to investigate whether MRB subsidy capitalization results from seller control of subsidies. In my approach, I exploit the knowledge that builders could directly reserve MRB funds to finance the sale of particular newly-built houses, but real estate brokers could not reserve funds to finance the sale of existing houses. I expect that because builders had to pay a fee to reserve funds and because they had explicit control over the loans, they may well have treated the loans as buydowns. Because real estate brokers do not have similar formal control, they should be less able to capitalize the value.

The same sample used in the first part of the paper to test for capitalization can be used to determine whether loans for new houses were capitalized at a greater rate than loans for resale houses. Because the prices paid (α_i) for the housing characteristics (x_i) should be the same for both new and existing houses (a Chow test indicates that we cannot reject the hypothesis that the differences in the coefficients equal zero), the financing variables can be

included in the regression model as separate variables. Thus the model is as follows:

$$(13) \ S = \sum \theta_i x_i + \delta_1 F_n + \delta_2 F_e,$$

where F_n is the after-tax MRB finance variable for new houses (equal to zero if not a new house) and F_e is the after-tax MRB finance variable for existing houses (equal to zero if a new house). The parameters to be estimated are θ_i and δ_i.

See table 4 for the regression estimates of the financial variable parameters in equation (13). The estimated capitalization rate for resale houses is larger than the capitalization rate for new houses. However, a test of the null hypothesis that $F_e = F_n$ cannot be rejected (t = .75).[14] The results therefore indicate that no statistically significant difference exists between capitalization rates for new and resale houses.[15]

This result does not support acceptance or rejection of the hypothesis that a buydown effect contributes to capitalization. The capitalization rates may be the same because the sellers of both new and existing houses have control over the subsidies and extract a price for them, or because neither of them control the subsidies. While the regression results indicate that the subsidies for purchases of both new and existing houses are capitalized at the same rates, we have too little data to determine if a buydown effect results in capitalization of subsidies for these houses, or if no buydown effect exists.

In order to conclude that a buydown effect did contribute to the capitalization of MRB subsidies, the regression results would have to show that subsidies clearly under the control of sellers (like MRB loans formally reserved by builders) were capitalized at a greater rate than subsidies not controlled by them. The hypothesis could be rejected if the opposite were found, that is if subsidies controlled by sellers were capitalized at a lower rate than subsidies they did not control.

DO RECIPIENTS OF MRB SUBSIDIES PURCHASE MORE HOUSING SERVICES?

Do MRB subsidies stimulate additional housing consumption? If so, the part of the subsidies spent on additional housing consumption does not go toward increasing the rate of home ownership. As a result, the social benefits of the subsidies, except in a few cases, are reduced.[16] In addition, the few households receiving MRB subsidies consume more housing than households with the same socio-economic characteristics who do not get the subsidies.

**Table 4: Estimated MRB Capitalization Rates
Separate Estimates for New and Existing Houses[a]**

Financial Variable	30-Year Holding Period	7-Year Holding Period
FHA Indicator	-513.6	-499.8
(1 = yes)	(-0.22)	(-0.22)
MRB Loan Variable	.100	.090
(New Houses Only)[b]	(1.47)	(1.47)
MRB Loan Variable	.148	.135
Resale Houses Only)[b]	(2.26)	(2.27)
Adjusted R^2	.73	.73
Capitalization Rates	.093	.084
(New Houses Only)[c]	(1.37)	(1.37)
Capitalization Rates	.134	.123
(Resale Houses Only)[c]	(2.08)	(2.08)

[a]The dependent variable is the contract sales price plus points.
The t-ratios are in parentheses. Complete regression results
are available from the author.
[b]The finance variable is $[-z(1-t)(-d-PDV_m)]$; see equation (5a).
[c]The t-ratio is calculated using a Taylor expansion series.

I use two methods to estimate the consumption effects, if any, of MRB subsidies. The first method determines the difference in sales prices paid by buyers with MRB loans and buyers with market rate loans, holding incomes constant. I calculate a difference in means that consists of two parts. The first part is the average amount of the subsidies that is capitalized into house prices. The second part is the additional housing services consumed by households with MRB loans. Increases in the consumption of housing services is proportional to increases in house sales prices. A house sales price (S) equals the amount of housing services (H) purchased by a household multiplied by the unit price of housing (P_h). In any particular market, the unit

price of housing is constant, therefore when a buyer pays a higher sales price (after accounting for capitalization), she is purchasing a proportional increase in housing services.

Table 5 shows the difference in means of prices paid for houses financed with market rate loans compared with houses financed with mortgage revenue bond loans. The difference in means is calculated using a paired sample matched by incomes. These results indicate that, holding incomes constant, households with MRB subsidies paid $2,896 more for houses (including the payment of points) than did households with market-rate loans. The difference is statistically different from zero at a 10 percent level.[17]

If households with MRB loans pay, as indicated by the matched pairs, about $2,896 more for houses, capitalization of MRB subsidies accounts for a maximum of $1,240 of this amount. Thus, these matched pairs indicated that buyers with MRB loans purchase housing services worth at least $1,600 more than housing services purchased by buyers (with comparable incomes) who obtain market-rate loans.

Table 5: Difference in Means of Matched Pairs
Incomes and House Prices

Variable	Market Loans	MRB Loans	Mean Difference	t-Ratio
Monthly Average Household Income	$ 2,539 (684)	$2,540 (679)	$1.14 (42.8)	.26
Avg. House Price With Points	$53,796 (14,727)	$56,692 (11,236)	$2,896 (1,616)	1.79

In my second approach to identifying consumption effects of MRB subsidies, I estimate the income elasticity of demand in the Greater Little Rock housing market for buyers with market-rate loans. Then I use the estimated elasticity parameter to predict the sales prices that households with MRB loans would have paid without the subsidies. The income elasticity, according to Stephen Mayo, may be estimated by regressing the log of income on the log of sales prices:[18]

$(14)\ lnP_hH = lnS = \xi + \phi\, lnY,$

where P_h is the unit price of houses, H is the amount of housing services, Y is income, and ϕ is income elasticity.

If the predicted sales prices—after accounting for capitalization—are greater than the actual sales prices, it may be concluded that households with MRB loans consume more housing services than households with the same incomes who do not have loan subsidies.

Income and price elasticities are further investigated using the methodology of the EHAP research by Joseph Friedman and David Weinberg (1982). They exploited the fact that households in the percent-of-rent voucher program were provided different percentage subsidies, including zero to create a control group. Thus, the percent of rent paid by the program—the subsidy (λ)—varied from household to household. Borrowing from Friedman and Weinberg, I used the following model to estimate income and price elasticity for all households in the sample:

(15) $\ln P_h H = \ln S = \xi + \phi_1 \ln Y + (1 + \phi_2) \ln P_h + \phi_2 (1 - \lambda)$.

Since P_h is unknown, but Y and λ are known, this model can be estimated by:

(16) $\ln S = \xi_1 + \phi_1 \ln Y + \phi_2 \ln(1 - \lambda)$,

where

(17) $\xi_1 = \xi + (1 + \phi_2) \ln P_h$, and

(18) $\lambda = 1 - (1 - t)PDV_c / (1 - t)PDV_m >= 0$.

If the unit price of housing (P_h) is constant and Y and 1-λ are independent of P_h, equation (16) may be estimated by OLS (Friedman and Weinburg 1983, 130; Hanushek and Quigley 1981). These assumptions appear reasonable for the sample used in this study. The loans were made during a limited period of time (within 1983), so P_h should not be changing due to shifts in market supply and demand that would be expected over a longer time. The value of (1-λ) varies with the monthly changes in discount rate used to estimate the present discounted value of the subsidy. Therefore, the subsidy value should be independent of the P_h unless P_h varies systematically with the market interest rate.

Estimating equation (14) with a sample consisting only of buyers with market-rate loans (N=72) yields the following coefficient estimates, t-ratios, and R-square:

$$\ln S = 5.964 + .6249 \ln Y$$
$$\qquad (11.6) \quad (9.42)$$

$$R^2 = .56$$

The estimate of the sale price ($P_h H$) that would have been paid by households with an MRB loan in the absence of the subsidy is obtained by using the above coefficient estimates. Given the coefficient estimates and the income of MRB buyers, the predicted sale prices can be calculated.

The predicted average sales price for MRB borrowers is $51,572, while the actual average sales price is $53,678—a difference of $2,106 (both predicted and actual include the payment of points). With a maximum of $1,240 paid to sellers for the loan subsidies (through capitalization), MRB buyers purchase over $800 more in housing services than other households.

Thus both the matched pairs and regression analysis support the conclusion that households with MRB loans respond to the subsidy by purchasing at least $800 to $1600 in additional housing services. Including the previously estimated capitalization of the subsidy, households with an MRB loan pay an average of between $2,100 and $2,800 more for a house than they would have paid with a market rate loan.

The result of estimating equation (16) is as follows (t-ratios are in parentheses underneath the appropriate variable):

$$\ln S = 6.56 + .547 \ln Y - .279 \ln (1\text{-}\lambda)$$
$$\qquad (15.50) \; (\; 10.01) \quad (-2.25)$$

$$R^2 = .424$$

These coefficients show a price elasticity of -.28 and an income elasticity of .55. This price elasticity is remarkably similar to the price elasticity in the EHAP percent-of-rent voucher research.[19] Both the similarity of price elasticities and the previous indication that capitalization is caused by inefficient shopping support the conclusion that MRB subsidies are analogous to percent-of-rent vouchers. The effects of MRB subsidies on the behavior of their recipients appear similar to the reported effects of the percent-of-rent vouchers on the behavior of households receiving those subsidies.

CONCLUSION

This chapter has addressed the question of whether behavioral responses to MRB subsidies lead to a decreased efficiency and a less equitable distribution of the subsidies. Specifically, the investigation examined whether

a portion of the MRB subsidies is capitalized and whether the subsidy induces households to purchase a greater amount of housing services.

The first finding was that between 10 percent and 14 percent of the value of MRB subsidies was capitalized during 1983 in one urban market. Further analysis showed evidence that the capitalization resulted at least partly from inefficient shopping by MRB loan recipients. The research is inconclusive about whether a portion of the capitalization of subsidies can be attributed to the treatment of some MRB subsidies as buydowns.

My research also shows that households receiving MRB subsidies purchase more housing services than households with the same income who receive no subsidies. This increased consumption, combined with the evidence of inefficient shopping, support the conclusion that the MRB subsidies resemble percent-of-rent vouchers in their effects on consumer behavior.

One policy implication that can be drawn from these findings is that MRB subsidies provide fewer home ownership benefits and have worse distributional inequities than previous research indicated. The behavioral responses to these subsidies tend to work against the stated purpose of increasing home ownership. Given the capitalization and consumption effects, fewer households than expected are assisted to become home owners, and less of the money goes to "deserving" households (i.e, those marginal households actually needing assistance).

The results of this study show that from 20 to 50 percent of the value of the MRB subsidies goes either to sellers or to buyers for purchase of housing services in excess of what they would have acquired with a market rate loan. Future evaluations of MRB programs should factor in the effects of capitalization and increased consumption when estimating benefits. The horizontal inequities resulting from the subsidies should also be considered.

Another policy implication of the findings is that it will be difficult to devise an MRB subsidy distribution system that does not have unwanted behavioral effects. If builders and real estate brokers control them, at least a portion of the value will be capitalized. If the subsidies are distributed through a neutral mechanism, they become like percent-of-rent vouchers, causing inefficient shopping and undesirable increases in consumption.

Perhaps the only way to reduce these effects is through some complicated and explicit targeting of subsidies to marginal buyers for purchase of no more than a certain amount of housing services. Such regulation is contrary to the arrangements that have given private firms broad discretion to implement MRB programs, and might require much larger transaction costs.

Appendix 1

Below are definitions of variables used in the hedonic regression analyses:
Living area: square feet of enclosed space (excluding garage).
Lot size: size of the lot in square feet.
Age: age of the house in years.
Fireplace*: one or more fireplaces.
Extra garage*: two-car garage.
No garage*: no garage or carport.
Air conditioning*: central air conditioning.
Condominium*: dwelling unit is part of a condominium.
Baths: number of bathrooms.
Zip code*: indicator variables for location by zip code.
   72205: Little Rock suburbs near city center
   72207: Little Rock suburbs further from city center
   72218: North Little Rock central residential areas
   72209: Older Little Rock neighborhoods near central city
   72076: City of Jacksonville, northern Pulaski County
   72203: Mabelvale area; moderate income housing near major Little Rock
       shopping centers
   72216: City of Sherwood
   72211: Rapidly growing Little Rock fringe area
   72204: Central Little Rock residential areas
Value: median house value in the census district in which the house is
      located. This variable accounts for the effect of the neighborhood on
      the house price.
Cedar*: house has a cedar exterior.
Brick veneer*: house has a brick exterior.
Siding*: house is covered by siding.
May-June*: house sale was completed during May or June, 1983.
July-Aug.*: house sale was completed during these months.
Sept-Dec.*: house sale was completed after September.
FHA*: house sale was financed with an FHA-insured loan.
MRB finance variable: $[-(z)(1-t)(-d-PDVm)]$

---

*Indicator variables

ENDNOTES

1. Each household's net taxable household income was calculated using gross household income, minus adjustments for the number of dependents and estimated nonhousing deductions. Given the estimate of net taxable household income, the marginal tax rate was obtained from the 1983 IRS schedule of tax rates for single and married households.

2. The indicator variable z sets the value of the after-tax MRB financing variable to zero for all market-rate loans. The financial terms of market rate loans (except for the payment of FHA points by sellers) are not expected to affect the sales price. An FHA indicator variable controls for the effects of seller payment of FHA points.

3. The discount rate used in this study is the three-month moving average of the interest rate on fixed-rate conventional mortgages for new houses as reported in the FHA opinion survey. The three-month moving average was chosen because house purchase transactions are started well before the closing dates of the loans. By including the two months prior to the loan closing, it is possible to capture more precisely the market interest rates perceived by buyers.

   In the early stages of this research, an alternative discount rate (Bank of America's mortgage interest rate for 30-year fixed-rate loans) was used. The regression results were consistently close to the results with the FHA survey discount rate.

4. The capitalization rates estimated using the standard model (equation 1) are much higher than the capitalization rates estimated by the reduced form model. The standard model capitalization coefficients are as follows:

   Cap. Rate (30-year holding period):   44 percent
   (t-ratio: 2.133; adjusted R^2: .73)

   Cap. Rate (7-year holding period):   70 percent
   (t-ratio: 2.12; adjusted R^2: .73)

5. The average after-tax present discounted value of an MRB subsidy was $9,090 for loans held the full 30-year term and $5,624 for loans held for 7-years.

6. Offers to buy a house may have been made contingent on receiving MRB loans. Thus, buyers may have offered higher prices for houses with MRB loans without committing themselves to pay the higher price if the purchase were financed with a market-rate loan.

7.   The results are affected by the capitalization of FHA points. The mean differences are understated because the capitalization of FHA points inflates the sales prices of housing financed by market-rate loans.

8.   The S/AP ratios for MRB loans may be higher because sellers with houses to be financed with MRB loans set asking prices closer to the values of housing characteristics than did other sellers. However, such behavior would make little sense: there are no incentives for such pricing decisions, and it is unlikely, with a few exceptions, that persons with a house for sale knew how the future buyer would finance the purchase. A regression of house characteristics and indicator variables for type of financing on asking price showed that the bond indicator is not statistically different from zero (a t-ratio of less than 1). Thus there is no evidence that the higher S/AP ratio is a result of sellers systematically setting lower asking prices for houses financed with MRB loans.

9.   Friedman and Weinberg (1982) and Merrill (1983, 151-154) use the residuals from a hedonic price equation to investigate whether inefficient shopping exists. If the hedonic price equation is correctly specified and has all relevant variables, the residual is the portion of the price paid for the house that is more or less than the market value. A positive residual in this case is the payment in excess of the market value. A negative residual is an indication of a bargain--payment less than the market value.

      Because it is quite likely that some variables are omitted from the hedonic price model, the residual consists of two elements: inefficient shopping and the marginal value of the omitted variables. Weinberg and Friedman attempt to separate the two effects.

10.   The data used for the estimates in this section are a subsample of the data described in the first part of the chapter. Only loans for which the asking price is known (n = 95) were included in the sample.

11.   For example, the S/AP ratio, according to model 1, increases as income and age rise. Households with higher incomes paid a sales price nearer the asking price than households with lower incomes. Also, as the age of the household increased, there was an increase in the percentage amount of the asking price that was paid by the buyer.

      The relation of increasing income to an increasing S/AP ratio was expected. Higher-income households may place a higher value on their spare time and may therefore shop less intensively. The relation of age to S/AP, however, is counter to the idea that households will become better shoppers with experience.

      The positive values for FHA and Bond indicator variables provide evidence that the households receiving those loans paid more for the houses they purchased than they would have paid without these type of loans.

12.   A loan buydown is a type of creative house finance that has been used frequently in the 1980s. Typically, a builder makes a lump sum payment that prepays (buys down) the interest charges on a loan to purchase a house constructed by the builder. Most often, the lump-sum payment reduces the interest rate paid by the buyer for a period of three years.

      Research has shown that builders try to recover the value of the buydown by charging a higher sales prices. See Agarwal, Phillips (1984, 191-197).

10

CAPITALIZATION OF THE BENEFITS OF MORTGAGE REVENUE BOND FINANCING: LESSONS FROM EMPIRICAL RESEARCH

Kirk McClure

INTRODUCTION

In recent years, a series of studies have investigated the extent to which sellers of homes raise the selling prices if the buyers have financing from mortgage revenue bond (MRB) funds. By raising the price, an individual seller captures the benefits of MRB financing that are intended for the buyer.[1] These studies have concluded that some or all of these benefits are misallocated, at the expense of the intended population of moderate-income home buyers, to the financial gain of the sellers.

The process through which sellers capitalize the benefits of MRB financing depends upon the interests of both the buyer and the seller. Among comparable homes, the buyer seeks the one that is associated with the lowest monthly payments. The seller seeks the highest selling price, even if that price is above the fair market value of the home. The MRB-qualified buyer would not pay more than the fair market value of the home plus the present value of the lower monthly payments with MRB financing; a conventionally financed, comparable home could be purchased at a lower price. The seller would not accept less than the fair market value of the home as an unsubsidized buyer would be willing to pay the fair market price. However, a buyer with MRB financing and a seller may agree on a price that generates lower monthly payments than would result if the purchase were conventionally financed, but this price may still be above the fair market value of the home if sold to an unsubsidized buyer. This defines a range of possible levels of capitalization from none (the home is sold at fair market value) to full capitalization (the home is sold at fair market value plus the present value of the MRB benefits) or anywhere in between.

Durning and Quigley (1985) suggest that the capitalization process can result from any combination of three conditions:

> •*Inelastic supply in the short run.* The injection of MRB funds into a market area can create too much demand for the units available in that area pushing up the prices of these homes.

•*Seller control of MRB funds.*   If the sellers are able to reserve
MRB funds exclusively for their units, then they are in a position to
capture all of the benefits of MRB financing as they control access to the
funds.

•*Inefficient search.*   Because a unit of housing service has a lower price
when purchased with MRB financing, the buyer receives less reward for
additional effort spent searching for the best alternative in the market.
The reduced return on additional searching may result in less searching or
less aggressive negotiation of the selling price, either of which may lead to
paying too high a price for the home purchased.

In the research reported in chapter 8, Sa-Aadu, Benjamin, and Sirmans
concluded that MRB subsidies were fully capitalized in a situation in which a
developer controlled access to MRB loans. In chapter 9, Durning found only
about 11 percent of the after-tax MRB-subsidy value was capitalized. Other
studies (Durning and Quigley 1985; Benjamin and Sirmans, 1987) have
concluded that part of the MRB subsidy was capitalized.

This paper tests for the capitalization process using a data set drawn from
the Kansas City, Missouri area. These data describe single-family homes sold
during late 1987. Some of these home purchases were financed with MRB
loans funded through the proceeds of bonds issued by the Missouri Housing
Development Commission (MHDC). Some buyers receiving MRB loans were
eligible because they were purchasing houses located in an area targeted for
receipt of MRB financing, and others received MRB loans to purchase houses
located outside of the target area. All MRB loans were dispensed on a first-
come, first-served basis with no reservation of the loans by brokers or
builders. These data permit testing of the possible causes of capitalization and
suggest some qualifications on the conclusions drawn from the previous
research.

Analysis of the Kansas City data indicates that the method through which
the MRB funds are dispensed influences the extent of capitalization. The
results provide evidence that no MRB benefits are capitalized when the loans
are not reserved by builders or brokers and when the funds are targeted to
areas that are large enough to absorb the funds without disturbing the market
for existing single-family homes.

EMPIRICAL EVIDENCE

The Models

Two different approaches have been taken to determine the extent of capitalization. In the first, standard hedonic price equations are estimated with the specification including a variable that measures the present value of the benefits of MRB financing. In the second, the actual selling price of each MRB-financed home is regressed on the desired selling price that reflects the home's market value, if conventionally financed, plus an additional amount that is the present value of the savings from MRB financing.

The first method was used by Durning and Quigley (1985) and Benjamin and Sirmans (1987), and it is described in chapter 9. It uses a model that can be estimated by ordinary least square regression:

(1) $S = \sum \theta_i X_i + \delta z (-PDV_m - D)$

where

$\theta_i = \alpha_i /(1-\beta), \quad \delta = \beta/(1-\beta),$

and z is a dummy variable that has a value of 1 if the sale is financed with MRB funds or has a value of 0 if the sale is conventionally financed.[2] By manipulation of the formula for the parameter δ, it can be seen that

$\beta = \delta/(1+\delta).$

This provides a consistent estimate of the extent of the capitalization of MRB-financing benefits.[3]

The second method was used by Sa-Aadu, Sirmans, and Benjamin (1988 and chapter 8), and is described in chapter 8. This approach uses the model:

(2) $SP = a_0 + a_1 DSP,$

where DSP is the seller's desired selling price which includes the market value of the home in a normally functioning, unsubsidized market plus the full amount of the benefits from MRB financing.[4] (See chapter 8 for a complete description of the methodology.)

Results from Prior Research

For their data, Durning and Quigley (1985) used 118 single-family home sales advertised through the Multiple Listing Service (MLS) in the Little Rock area in 1982. The characteristics of the homes sold were obtained from the MLS. Employing the hedonic price methodology on this data, they estimated that between 18 and 28 percent of the benefits of MRB financing were capitalized by sellers, depending upon the type of lender.

Durning (chapter 9) repeated these tests using similar data from 1983 sales in order to reduce the possibility that the capitalization effects resulted from the unusually tight market conditions that existed in 1982. With this data set, the estimated capitalization effects were lower, ranging from 10 to 14 percent.

In the Little Rock area at the time of the study, the MRB funds used to finance the purchase of existing units were dispensed through an informal system of allocating blocks of funds to specific brokers for periods of time. If the broker could match a seller with a buyer who qualified for the MRB financing, then the funds would be committed by a lender. As these same brokers advise the sellers as well as the buyers, the brokers are closely involved in the selection of an asking price, the submission of a bid price, and the negotiation of a final selling price. Brokers earn their fee as a percentage of the selling price. As a result of this system of payment, they have an incentive to arrange for a selling price at the highest possible level, which may include the capitalization of the benefits of MRB financing.

The Little Rock MRB funds could also be reserved by builders. If the home was newly constructed, the builder could obtain a set-aside of MRB funds in advance of completing the unit by paying a fee to the housing finance agency. With the reserved funds, the builder could directly control access to the MRB subsidy as the sale of the unit and the use of the MRB financing were offered as a package. In either case, with set-aside funds on new construction units or reserved funds on existing units, the seller was in a position to capture some, if not all, of the benefits of MRB financing.

Benjamin and Sirmans (1987) used a similar methodology with a data set comprised of condominiums sold in the Baton Rouge area during 1984 and 1985. These units were located in seven different developments, one of which was in a target area making it eligible for the use of MRB financing. In this case, as found with some of the Little Rock data, the builder was able to reserve MRB financing for the buyers in advance of completion of the units thus controlling access to the MRB funds. Benjamin and Sirmans applied the hedonic price model to this data and found that about 20 percent of the benefits of the MRB benefits was capitalized by the builder/seller.[5]

Sa-Aadu, Sirmans and Benjamin (chapter 8) repeated the analysis of the Baton Rouge data using the two step methodology regressing selling price on

desired selling price. With this second approach, they found that fully 100 percent of the MRB benefits was capitalized by the builder/seller. They used two variations on this model. The first employed the actual loan-to-value ratio in the calculations; they referred to this as the *ex post* model. With the second, the loan-to-value ratio prevailing in the market at the time was used in the calculations; they referred to this as the *ex ante* model. The results were the same independent of the approach.[6]

Data Reflecting a Large Target Area and No Reservation of Funds

Using new data from the Kansas City area for sales in late 1987, it can be seen that the extent of capitalization is very much a function of the method through which the funds are dispensed. The Missouri Housing Development Commission (MHDC) issued MRB funds for the purchase of single-family homes during 1987. These funds were available throughout the state of Missouri. However, a target area within Kansas City, Missouri was given a special allocation of funds which were held for use in the target area for a period of time. Any funds which were unused at the end of the period were released for use outside the target area.

This target area is very large as it encompasses 88 census tracts in the central part of the city and comprises a large proportion of the city as a whole. This is in contrast to the small target area found in the Baton Rouge data where a single development realized a windfall gain from being included in the area while the other developments did not. The Kansas City target area is sufficiently large relative to the number of sales that could have been financed from the bond issue such that no identifiable subset of units enjoyed a competitive advantage.

The MRB funds were made available for new or existing units, but the builders of new units were not able to obtain a commitment of funds in advance. There was no system through which brokers could reserve the funds for their own use. These administrative decisions concerning the dispersal of the funds reduce the opportunities for sellers to capture the MRB benefits through higher prices.

This data set includes 285 sales of single-family homes in the cities of Kansas City, Missouri and Independence, Missouri, a suburb adjacent to Kansas City. Of these sales, 126 were financed with MRB funds, and the remaining 159 were conventionally financed. As the MHDC requires FHA insurance on the loans that it underwrites, all of the sales in the data set were insured through FHA to eliminate differences in prices due to the effects of the insurance requirements. Descriptive data on these sales were obtained through the Multiple Listing Service.

Analysis of the MHDC Data

These data were analyzed using both methodologies described above. For the first method, the models were run assuming the present value of the MRB benefits are discounted over the 30-year life of the mortgage loan and again discounting over a seven-year period, which is a typical period for a buyer to carry this type of loan. Both approaches to the present-value calculations were applied to the full data set and to a subset which excluded the MRB sales not in the target area to determine if the target area sales experienced a capitalization effect different from that found in the nontarget area sales.

This analysis found that there was effectively no capitalization of the MRB benefits by sellers. The coefficients for the MRB benefits were insignificantly different from zero for the full data set. The models worked relatively well, with R-squared statistics of .66 and with most coefficients for the descriptive variables being significant and of the expected sign. The models fitted using the MRB sales from the target area had similar results despite small sample size. The coefficients for the MRB variables did not prove to be significantly different from zero at the 0.05 level. These results are detailed in table 1.

The coefficients do, however, have t-scores with probabilities that range from 0.08 to 0.13. Accepting these lower thresholds for significance testing, the estimated levels of capitalization are low at 3 percent and 5 percent for the models using all MRB sales and 8 percent to 15 percent for the models using only those MRB sales located within the target area.

The analysis was repeated using the second methodology that regresses actual sales price on desired sales price. With this approach, the desired selling price has been calculated under alternative assumptions, first, with the actual loan-to-value ratio for the sale as financed (the *ex post* model) and, again, using the 97-percent loan-to-value ratio that was typical for FHA insured sales at that time (the *ex ante* model).

The model used to estimate the market value of homes in the absence of the MRB financing had an acceptable fit with an R-squared value of 0.69 and with most coefficients being significant and of the expected sign. These results are listed in table 2. This model was used to generate market values for the MRB-financed homes. These estimated market values were adjusted to the desired selling prices by adding the subsidy values, and then the resulting values were entered into the second-step model to explain actual selling price. Table 3 lists the results.

Using all MRB-financed sales and both approaches to the estimation of the desired selling price, the models generated R-squared statistics of 0.59. To determine whether the coefficients indicate full capitalization of the MRB benefits, the coefficient (a_1) in each model must be examined with its confidence interval to see if it contains the value of one. For both models, the

Table 1. Estimates of the Effects of MRB Financing on Single-Family Home Selling Prices: Hedonic Price Models

Dependent Variable: Selling Price

Variable	MRB Sales In and Out of Target Area		MRB Sales Inside of the Target Area	
	7-Year Discount	30-Year Discount	7-Year Discount	30-Year Discount
Bedrooms	1,423.91 (1.7)	1,440.87 (1.7)	2,146.64 (1.7)	2,161.05 (1.8)
Bathrooms	5,673.38 (4.8)	5,651.87 (4.8)	6,684.83 (4.1)	6,656.30 (4.1)
Livable Area	10.22 (4.9)	10.22 (4.9)	8.78 (3.1)	8.80 (3.1)
Garage	6,574.98 (8.2)	6,583.22 (8.2)	7,333.50 (6.4)	7,370.53 (6.4)
Basement	4,063.41 (3.4)	4,072.15 (3.5)	2,875.26 (1.6)	2,858.25 (1.6)
Age of Home	-154.04 (3.2)	-154.47 (3.2)	-180.88 (2.7)	-178.48 (2.7)
Suburban School	3,064.45 (2.5)	3,060.44 (2.5)	3,095.18 (1.7)	3,038.91 (1.6)
MRB Benefits	-0.06 (1.6)	-0.03 (1.5)	-0.18 (1.8)	-0.09 (1.6)
Constant	16,322.60 (5.3)	16,343.52 (5.3)	15,154.24 (3.7)	15,113.61 (3.7)
R-Squared	.66	.66	.67	.67
Total Observ.	285	285	178	178
MRB Observ.	126	126	19	19

(t-ratios in parentheses.)
SOURCE: McClure (1989). Reproduced with permission.

**Table 2. Estimates of the Market Value of Single-Family Home
Selling Prices of Conventionally Financed Homes:
Hedonic Price Model**

Dependent Variable: Selling Price

Variable	Estimated Parameter	T-Ratio
Bedrooms	1,751.06	(4.2)
Bathrooms	7,647.36	(4.6)
Livable Area	7.41	(2.6)
Garage	7,024.62	(5.8)
Basement	3,113.70	(1.7)
Age of Home	-230.08	(3.3)
Suburban School	2,432.06	(1.3)
Constant	18,351.61	(4.2)
R-Squared	.69	
Observations	159	

Source: McClure (1989). Reproduced with permission.

coefficient plus a 95-percent confidence interval do not include one. In both cases, the coefficient plus the confidence interval only just include 0.9 which is the average ratio of estimated market value to desired price.

This result indicates that there was little or no capitalization. However, with both models, the intercepts are positive and significant rather than zero as would be expected. These positive values suggest that the estimated desired selling prices are biased downward, which reduces the reliability of the results.

Using only those MRB-financed sales located within the target area, the results are even less reliable as the models fit poorly. The R-squared statistics are low, and the standard errors are relatively large. The coefficients plus a 95 percent confidence interval cover the entire range from 0.9 to 1. Thus, no conclusions can be drawn from these tests.

Table 3. Estimates of the Effects of MRB Financing on Single-Family Home Selling Prices Two-Step Models

Dependent Variable: Selling Price

Model	Variable	Estimated Parameter	Standard Error	T-Score	R-Squared	N of Cases
Ex Post: All MRB Sales	Constant	9,763.60	2,765.148	(3.50)	.59	
	Desired Selling Price	0.71	0.05	(13.30)		126
Ex Ante: All MRB Sales	Constant	9,747.27	2,738.52	(3.60)	.59	
	Desired Selling Price	0.71	0.05	(13.40)		126
Ex Post: Target Area	Constant	10,708.35	10,796.03	(0.99)	.30	
	Desired Selling Price	0.68	0.24	(2.74)		19
Ex Ante: Target Area	Constant	10,161.35	10,760.28	(0.94)	.32	
	Desired Selling Price	0.67	0.24	(2.80)		19

Note: See Equation 2. The parameters estimated above are a_0 (constant) and a_1 (desired selling price).
Source: McClure (1989). Reproduced with permission.

SUMMARY AND POLICY IMPLICATIONS

Previous research has found that the benefits of MRB financing have been misallocated. This misallocation may have been due to the injection of funds into a market area where the supply is inelastic in the short run, due to the ability of sellers to control access to these funds, or due to inefficient searching for a home by a buyer qualified for MRB financing. The research indicates that the procedures for dispensing the MRB funds foster some of the capitalization process.

Concerning the first possible cause of capitalization, an inelastic supply of homes, MRB funds are often dispensed only to buyers of homes within a designated target area. The designation of a target area can result in unintended capitalization if the MRB funds will finance a large percentage of the homes available for sale within the area.

If MRB funds are available only on homes within a target area and the alternative homes for sale are all located outside of the target neighborhood, then the sellers within the target area may increase the price so as to capture all of the benefits of the MRB. This process was found with the Baton Rouge data. However, the MHDC data indicate that nothing inherent in the process of delineating a target neighborhood makes capitalization an automatic result. Capitalization will not be facilitated by creating a target area that contains many units for sale relative to the number of homes that can be financed with MRB funds.

The second cause of capitalization is seller control of access to funds, which may result when builders, brokers and sellers are allowed to reserve funds for MRB loans prior to the identification of buyers. However, the situation can be avoided when MRB loans are dispensed to eligible buyers on a first-come, first-served basis, and capitalization can be reduced to a negligible amount.

A system that permits brokers to reserve funds, as found with the Little Rock data, results in partial capitalization. Such a system was not used by the MHDC, which allocated bond funds to many lenders throughout the metropolitan area without the reservation of the funds, whether formally or informally, by brokers. It appears that the MHDC approach to dispensing MRB funds results in an effective delivery of the benefits to the intended population.

The third possible cause of capitalization, inefficient search, is an unavoidable by-product of subsidizing the home purchase process, but it appears to be of negligible significance. The Kansas City data indicate that, if target areas are large and there is no seller control of access to funds, capitalization can be effectively eliminated. Because the issuer of the MRB financing cannot control the buyers' behavior in searching and bidding for a

home, seller capitalization of benefits due to an inefficient search is somewhat immune to administrative remedy. As no capitalization is found with the Kansas City data, it appears that this third possible cause leads to little or no price increases on MRB financed homes.

The new results here amend the results reported earlier. It is clear from the prior research that capitalization can be a problem lessening the effectiveness of the MRB-subsidy approach. Where the system used to dispense the funds is poorly designed with very small target areas or with the seller or broker able to control access to the funds, capitalization can be carried to the extreme. If either of these two conditions is present, the buyer may enjoy little or none of the benefits of MRB financing.

The agencies that issue tax exempt bonds for single-family home purchases are confronted with a choice in terms of how they might respond to this problem. They may either implement a cost-containment system in an effort to eliminate seller capitalization of the benefits through a regulatory mechanism, or they can avoid the problem through a first-come, first-served allocation of the funds to any qualified buyer. Where the MRB funds are used to finance the purchase of existing homes, either approach is available. Where the MRB funds are committed to newly constructed dwellings, the administrator has little choice but to adopt a cost-containment system.

State housing finance agencies are among the principal administrators of MRB financing and already have gained a great deal of experience in administering cost-containment programs. These agencies have administered other federally funded programs in the past that obligated them to review development costs so as keep these costs as low as possible. Such programs include the Section 8 New Construction and Substantial Rehabilitation programs. These programs were largely oriented toward multi-family rental housing development. As a result, the agencies' cost-containment systems reflect that type of housing development rather than the single-family housing commonly financed through MRBs. But the administrative mechanisms would be similar if applied to single-family development.

Experience drawn from these efforts to contain costs on the multi-family housing programs suggests that it likely would not be possible to develop administrative review procedures that could prohibit the capitalization of the benefits of MRB financing. Such procedures may be impossible because the ability to determine the market value of a piece of real estate is an imperfect science requiring a great deal of data and very accurate models. The available procedures may not provide the level of accuracy required to identify price markups due to favorable financing.

Any model used to estimate the house values is subject to some error. The models used to predict sales prices in this research have standard errors equal to about $7,600 or about 16 percent of the mean sales price of $47,000.

The present value of MRB benefits amount to about $5,000 or about 10 percent of mean sales price. Assuming that the cost-containment systems would employ similar models, the greater scale of the error in their ability to predict final sales prices would make it difficult, if not impossible, to isolate a price markup in any individual case. When determining market prices, the administrative agency would probably prefer to err on the side of increased production. It would likely accept sales prices as high as the predicted costs, plus some "cushion" added to the predicted costs to cover the prediction error. The addition of this cushion would, very likely, permit the capitalization of the MRB benefits.   This suggests that developing a regulatory mechanism to control capitalization would not be effective.

However, the first-come, first-served approach to the dispensing of the MRB funds appears to be an effective response to these problems. The reservation of the funds by sellers and brokers should be eliminated and any target area for receipt of the funds should be drawn sufficiently large such that there would be little or no capitalization of the MRB benefits by the sellers. Under this approach, the full amount of the benefits are being applied to reduce the monthly payments of the low- and moderate-income households eligible for MRB subsidies. This approach is, of course, limited to existing housing. Where the MRB financed housing is newly constructed, a cost-containment system is necessary but is unlikely to prevent capitalization of the benefits.

ENDNOTES

1.   The studies by Durning and Quigley (1985) and Benjamin and Sirmans (1987), plus chapters 8 and 9, focus on the inefficiencies resulting from poor administration of MRB funds. Other related research can be found in the U.S. General Accounting Office (1983), National Association of Home Builders et al. 1988 (1988), and Kaufman (1981).

2.   The dummy variable that needs to be introduced as the new test variable, $(- \text{PDV}_m -D)$, has no meaning for the sales financed with market rate loans. This model is designed to estimate the change in selling price associated with a change in the value of an MRB subsidy, holding other factors constant. The financial terms of market rate loans are not expected to affect the selling price. Because of this, the test variable needs to be set to zero for the non-MRB financed sales.

3.   The expected sign of δ is actually negative as the variable with which it is associated, $(- \text{PDV}_m - D)$, is negative and becomes smaller as the value of the home increases. However, the calculation of the parameter β from the value of δ involves use of the absolute value of δ to correct for the negative sign. Thus, the estimate of β is given by:

$$\beta = |\delta|/(1+|\delta|).$$

11
MORTGAGE REVENUE BONDS AND
LOCAL HOUSING MARKETS

Terrence M. Clauretie
and
C. F. Sirmans

INTRODUCTION

Because of the low interest cost of mortgage revenue bonds (MRBs), state and local housing programs based on MRB issuance have been particularly popular during periods when nominal market interest rates have been at their cyclical peak. During these times of high interest rates, mortgage and housing activity have historically slowed due, in part, to the problems facing savings institutions (the traditional source of mortgage funds) and due to the nature of the demand function for mortgage credit. Before the secondary mortgage market expanded, when interest rates rose, traditional mortgage lenders faced constraints on the amount of funds available for lending in the residential market. Additionally, the demand for mortgage funds has been interest elastic as potential house buyers have postponed their purchases during periods of high interest rates.

It is not surprising, then, that during periods of relatively high interest rates and slow housing-market activity, MRBs would find great appeal among home buyers, lenders, and real estate agents. In fact, the central purpose of MRBs is to increase market activity during such periods by making housing affordable to that segment of the market that may have been rationed out. MRBs are generally directed at and restricted to the households most likely to be rationed out of the housing market: first-time home buyers and households with constrained income levels.

In this chapter, we offer an empirical test of the effect of an MRB issue on a local housing market. The focus of the test is on asset prices. For the test, we chose a bond issue that, while not large in absolute terms, was significant relative to the size of the local housing market. Also, the bond issue was timed to coincide with the highest nominal interest rates of the post-war economy. As a result, the spread between the mortgage-market rate and the rate on MRB loans was large.

DESCRIPTION OF THE BOND ISSUE

The bond issue that is the focus of this research was a $55.2 million issue announced in May 1979. Mortgage loans financed by this issue were available from September 1979 through, with few exceptions, June 1980 in Shreveport, Louisiana, a city of approximately 250,000 people.

From January 1978 through April 1979 (a month prior to the announcement of the bond issue), the average number of houses sold each month through the local multiple listing service (MLS) was 278. Historically, this was a relatively low volume of sales that reflected the high interest rates. The bond issue made available 1,291 loans, nearly five months of sales at pre-issue levels. Thus, the issue was sizable relative to the market and undoubtedly caused an increase in the demand for housing over that of the previous year or so.

The interest rate on the MRB loans was 7.5 percent. During the month that the MRB loans were first dispersed, October 1979, the nationwide interest rate for conventional mortgages was 12.1 percent. As a result of the difference in interest rates, the monthly payment on a 30-year MRB loan was approximately 67 percent of the payment on a conventionally financed mortgage loan. Because of the large payment savings, demand for the MRB loans was very strong.

The strength of the demand was evident in the effort made by potential buyers to get one of the MRB loans. Six days before applications for the MRB loans were to be accepted, would-be borrowers lined up outside the offices of the 17 authorized lenders. Because of this large interest in the loans, potential borrowers were directed by the Shreveport Mortgage Authority to a central loan processing location at a local stadium. Four days before the first day of applications, over 2,500 applicants, many with camping equipment, arrived at the stadium. As the number of applicants swelled, the assembly was termed "Camp Wannamortgage (*Shreveport Times* September 11, 1979)."

According to the newspaper stories, some people at Camp Wannamortgage were concerned that they would have few properties to select from as a result of the large increase in housing demand created by the program (*Shreveport Times* September 11, 1979). Their concern was increased by a story printed in the local paper on the day that loan applications were accepted. In that story, some lenders were quoted as stating that they expected buyers to run out of houses before the lenders ran out of the low-rate funds (*Shreveport Times* September 13, 1979).

Under the provisions of the loan program, a household receiving an MRB loan could have a family income of up to $25,000 annually. An MRB loan

could be used to purchase a house costing up to $70,000, and the loan amount could not exceed $60,000.

Table 1 shows the total available funds and the monthly MRB-loan originations through October 1980. From October 1979 through June 1980, the bond issue financed the purchase of 1,269 properties, approximately 50 percent of all MLS sales in the city during this time.

Table 1. Monthly Loan Originations Under the Housing Bond Issue

Month	Number of MRB Loans	Amount	Average Loan	Cumulative Percentage
1979				
September	0	0	0	0
October	71	$2,885,700	$40,644	5.22
November	438	18,944,025	43,251	39.52
December	236	9,569,350	40,548	56.84
1980				
January	179	7,323,750	40,915	70.10
February	132	5,785,350	43,828	80.58
March	74	3,360,850	45,417	86.66
April	46	2,003,450	43,553	90.29
May	52	2,419,150	46,522	94.67
June	41	2,029,850	49,509	98.34
July	5	187,600	37,520	98.68
August	10	423,150	42,315	99.45
September	3	122,500	40,833	99.67
October	4	181,700	45,425	100.00
Total	1,291	$55,236,425	$42,786	
Amount available		55,258,545		

SOURCE: Clauretie, Sirmans, and Merkle (1986). Reproduced with permission.

EFFECT ON THE LOCAL HOUSING MARKET

Many previous studies have explored the relationship between the terms of financing and property prices. The bulk of the research has concerned itself with the effect of property-specific financing. That is, it has analyzed the extent to which financing attached to a specific property affects the value of that property. The evidence suggests that FHA-VA discount points (Colwell, Guntermann, and Sirmans 1979; Guntermann 1979; Smith and Sirmans 1984; Zerbst and Brueggeman 1977, 1979,), assumable low-rate loans (Sirmans, Smith, and Sirmans 1983), owner financing (Rosen 1984) and interest rate buydowns by builders (Agarwal and Phillips 1984) all have a positive effect on the transaction price of the property to which they are attached.

However, the case of MRB financing is somewhat different. Armed with a commitment for a low-rate loan, the eligible house buyer is free to select any property for sale within the prescribed geographic and price range. Thus, the price effects of a large MRB issue are expected to be widespread in nature and result from a shift of the demand curve (and possibly the supply curve) for residential properties in general.

The effect of the bond issue can extend to the properties with values above the eligible price bracket. As property prices for the lower-priced eligible houses are bid up, the effect may spill over to higher-priced properties as the price differential for a given quality differential narrows. Additionally, sellers of the lower-priced properties will be able to move up to higher-quality residences, a move that would have been precluded by an inability to sell their former residences.

Two Period Analysis

Two distinct time periods associated with an MRB issue should be recognized. The first is the announcement period, that time during which the availability of the below-market MRB loans is made known, but the loans are not actually being dispersed. In this case, that period of time was between May 1979 and August-September 1979. The second time period is the origination period, the time that the loans are made available to eligible borrowers.

The effect of the MRB issue on the local housing market may differ during these two periods. During the announcement period, it is expected that the supply of properties on the market will be reduced because house owners will anticipate that they will receive a higher price when the MRB loans are being made and the number of sales increases. During this period, owners have no incentive to increase the supply of properties.

Also, during the announcement period, the demand for properties may also decline. Some potential buyers will postpone their house purchases until they can apply for the low-rate loans from the bond program.[1]

Figure 1 shows the possible results of the shifts in the supply and demand curves during the announcement period. Here the curve D_i represents the demand curve for properties in the absence of any bond issue (announced or otherwise) as a function of the existing market rate, i. S_i represents the relatively inelastic supply curve under the same situation. D_a represents the shift of the demand curve to the left in anticipation of future low-rate funds availability.

Figure 1.

Possible Changes in the Demand and Supply Curves

During the MRB Loan Announcement Period
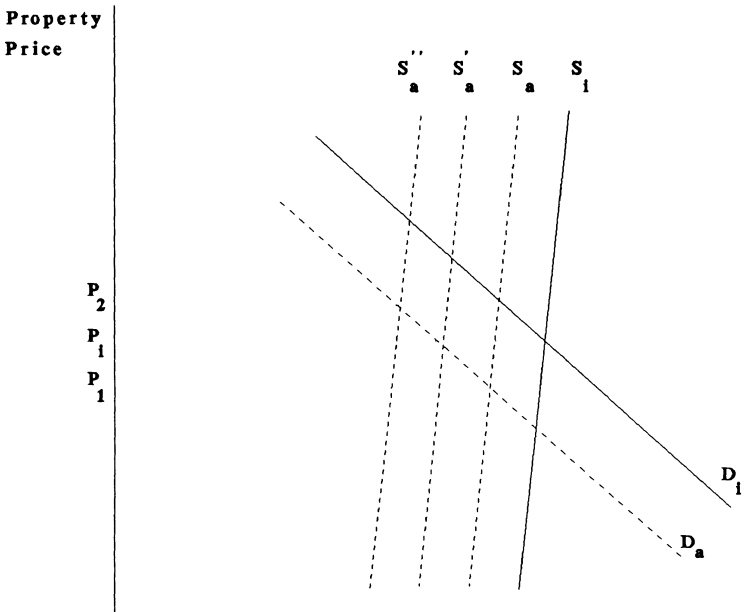
The change in property prices during this time period will depend on the shift of the supply curve *relative* to that of the demand curve. The curves S_a,

S_a', and S_a'' represent shifts that are less than, equal to, and greater than those of the demand curve. They result in prices that are lower than (P_1), equal to (P_i), or greater than (P_2), the average price in the absence of the announcement of a bond issue. Since there is no *a priori* theoretical reason to hypothesize that the shift in the supply curve relative to the demand curve will be of any particular magnitude, the question of the effect of the MRB loans on property prices becomes an empirical one.

This uncertainty is not true of the origination period. During this period, the availability of MRB loans will result in a shift of the demand curve relative to the supply curve, resulting in higher property prices. This shift is demonstrated in figure 2. Here, there is an unambiguous increase in property prices. In the next portion of this chapter, we test for the price effects of the Shreveport MRB issue during the announcement period and the origination period.

Figure 2.
Expected Change in the Demand Curve
During the MRB Loan Origination Period
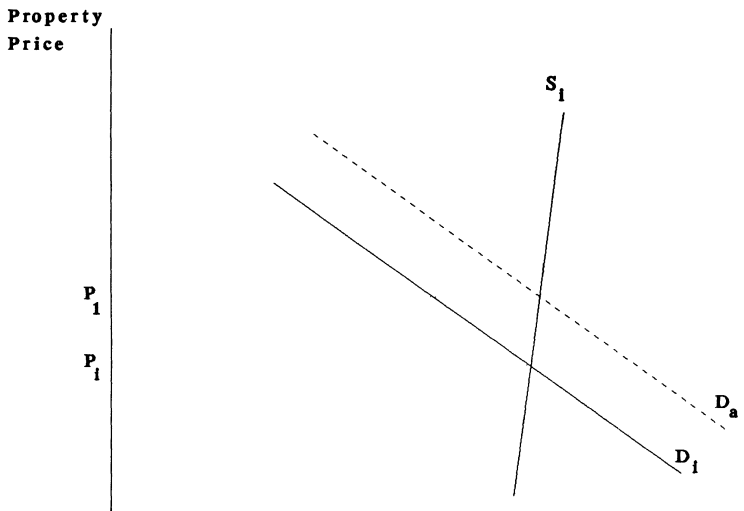
Methodology

The methodology that we propose is straightforward. We selected a sample of properties exchanged in the Shreveport market over a number of years that include the months during which the two periods of the bond-loan program occurred. For this sample, we collected a variety of data on the transactions, including the sales prices, characteristics of the houses sold, and the financing arrangements. The transaction prices are assumed to be a function of the characteristics of the property and the time of sale, the latter being within or without the period of focus. In other words, to a standard hedonic equation we add a variable representative of the two periods (announcement and origination) of the bond-loan program.

To form the hedonic equation, we selected a large number (658) of properties that were financed with non-MRB loans over a six-year period, 1977 through 1982. The bond loans under study were made in the middle of this six-year period.

A standard hedonic equation is of the form:

$$(1) \quad P = \alpha + \sum_{i=1}^{n} \beta_i \, X_i + \lambda D_i + \epsilon_i$$

where,

$P =$ property price;

$X_i =$ physical and financial characteristics that are reasonably expected to affect transaction prices;

$D_i =$ a dummy variable equal to one if the transaction occurred during the period of the bond issue (either the announcement period or the origination period, or both), otherwise it is equal to zero; and

$\epsilon_i =$ an error term.

The sample of properties was selected without regard to the type of financing, except that properties financed with MRB loans were excluded. During this time, many transactions involved nontraditional (creative)

financing. The use of creative financing, such as assumption financing, owner financing, or a combination of the two, was made popular by the high interest rates. The data on this type of financing and the year of exchange are presented in table 2.

The use of nontraditional financing requires that we control for this variable in addition to the physical characteristics of the properties. The use of below-market rate financing is expected to inflate the transaction price of the property above that based on its physical characteristics alone. That is, a test of a model such as equation (1), which includes only the physical characteristics and not the financial characteristics of the property, would yield predicted prices consistently below the actual prices for properties that were financed with low-rate loans of some type. There would be no recognition that the savings in the payments resulting from the special financing are routinely capitalized into the price of the property.

Table 2. Basic Data on Type of Financing

Year	Conventional	FHA-VA	Assumption	Owner	Assume-Owner	Cash	Total
1977	5	22	8	0	0	0	35
1978	42	53	52	3	0	8	158
1979	24	45	44	2	3	5	123
1980	16	32	46	2	8	9	113
1981	12	32	51	16	16	4	131
1982	4	7	33	24	24	6	98
TOTAL	103	191	234	47	51	32	658

SOURCE: Clauretie, Sirmans, and Merkle (1986). Reproduced with permission.

Several previous studies of the capitalization process (Rosen 1984; Sirmans, Smith, and Sirmans 1983) include as an explanatory variable the present value of the payment savings over the life of the low-rate loan. The present value is computed with respect to the current market rate of interest. Although we do not intend to present evidence on the extent of capitalization

in this chapter, we nonetheless recognize the importance of controlling for the terms of financing by modifying equation (1):

$$(2) \quad P_{j,\,t} = \alpha + \sum_{i=1}^{n} \beta_{i,\,t}\, X_{i,\,t} + \sum_{i=1}^{3} \beta_{i,\,t}\, V_{i,\,t} + \lambda D_t + \epsilon_t$$

where:

$P_{j,t}$ = price of house j in period t;

$X_{i,t}$ = the following standard physical characteristics: lot size, age, square feet of living space, number of bedrooms, number of bathrooms, garage (dummy), fireplace (dummy), central air conditioning (dummy), days on the market, neighborhood (four dummies for five neighborhoods), CPI (CPI less the cost of shelter to measure the impact of general inflation), and loan-to-value ratio;

$V_{i,t}$ = the present value of future payment savings on each of three types of loans: government underwritten, assumption, and owner financing; (some properties may have two present values if they were sold with both assumption and owner financing); and

D_t = is a dummy variable for the period of the bond financing.

The term $V_{i,t}$ is often referred to as the cash equivalency value of the special financing (see chapter 8). Its coefficient in hedonic equations has been taken to represent the proportion of the loan's "value" that is capitalized into the price of the property. The capitalization question is not of concern in this chapter; we include a measure of the value of low-rate loans only to control for its presence.[2]

Empirical Results

The empirical test of the effect of the MRB loans on market prices consists of an ordinary least squares (OLS) test of equation (2). We propose several estimates of the equation. First, we consider the announcement period and the origination period as one period during which the price effects can be

measured. That is, we make no distinction between the two periods. If a transaction occurred at any time during the announcement period (May 1979 to September 1979) or the origination period (October 1979 to June 1980) the value of D_i is one, otherwise it is zero. Alternatively, we view the announcement period and the origination period to be distinct. For a given transaction, the value of D_i is one only if it takes place within one or the other of the periods. This allows us to focus on the empirical question of the relative shifts of the supply and demand curves within the two time periods.

Second, we recognize that the inclusion of creatively financed properties may contaminate the sample even though we have included a variable to control for its presence. If the variable chosen (the cash equivalent value of the creative financing) fails to be an unbiased measure of the financing, the results could bias the estimate of the market effect of the bond issue. This bias may occur because a relatively greater proportion of properties may have been creatively financed during the time the MRB loans were being made than before or after. To control for this possibility, we test equation (2) in two different ways: first, with all properties included in the sample, and second with only conventionally financed properties as part of the sample data. The results of the two tests can be compared to determine if the term for creative financing adequately controls for its presence.

In all, we made four tests of equation (2): a combined period test with all houses in the same sample, the same test with only conventionally financed houses, and a two-period test with the two different samples. The complete regression results are presented in appendix 1.

The results suggest the following: when the announcement and origination periods are combined (first two models in appendix 1), estimates of the market effect of the MRB issue range from $2,000 to $3,000 per transaction. This test does not distinguish between the two subperiods of the bond issue and offers no evidence on the direction and relative shifts of the supply and demand curves within each subperiod.

When the two subperiods are considered separately, the effect of the bond issue on market prices appears to be restricted to the origination period. The coefficient on the announcement dummy variable is not significantly different from zero in either of the last two equations. The coefficient on the origination-period dummy variable is significant and of the order of magnitude of $3,000 to $4,000 per transaction.

The equations that differentiate between the properties financed with traditional financing (conventional, FHA, VA, cash) and those without are comparable. The basic relationship appears to be stable. That is, capitalization of creative financing does not appear to be picked up in the coefficients of the dummy variables representing the time period of the bond issue. The essential results of our empirical tests are summarized in table 3.

Table 3. General Price Effect of the Bond Issue

Model	Coefficient	t-Value	Adjusted R-Square	F-Value
One Dummy Variable Model[a]				
All Houses	$2,145	1.982*	.875	268.63
Noncreatively Financed Houses	3,059	2,831**	.882	265.96
Two Dummy Variable Model				
All Houses				
Announcement Period	1,084	.686	.880	239.42
Origination Period	2,907	2.133*		
Noncreatively Financed Houses				
Announcement Period	1,225	.780		
Origination Period	4,380	3.299**	.883	252.01

[a]Announcement and origination periods combined.

One and two asterisks indicate significance at the 0.05 and 0.01 levels, respectively.
SOURCE: Clauretie, Sirmans, and Merkle (1986). Reproduced with permission.

WEALTH DISTRIBUTION IMPLICATIONS OF MORTGAGE REVENUE BONDS

The above results have some implications for the distribution of wealth. The wealth of those households who receive MRB loans clearly is increased by the low-rate financing. In this case, the households received assumable loans, so when they were ready to sell their houses, they could sell the favorable financing along with their houses. Because market interest rates remained at relatively high rates after 1980, MRB loan recipients that sold their houses then likely received a premium for the houses, which reflected the value of the financing.

In other words, because the bond financing was attached to the property subsequent to the initial transaction, future transactions would capture its value in the price of the property. Thus, participants in the bond program were able to capture the value of the low-rate financing even in the event of a resale of the property shortly after the initial purchase.[3]

On the other hand, the general house-buying public (nonparticipants) were faced with property prices that were $3,000 to $4,000 per property greater than they would otherwise have been for a several-month period. Data provided by the Shreveport MLS indicated that 2,897 properties were sold during the ten months of the origination period of the bond issue. If the MLS sales represent nearly all of the area's property transactions, then house buyers paid between $8 and $11.5 million in additional housing prices, by our estimates, over the origination period. There is a good case for concluding that the MRB loan program resulted in a wealth redistribution from the general house-buying population to those eligible for bond financing.

Table 4 shows a calculation of the present value of the payment savings accruing to the participants in the bond program. The value of the payments savings is based on the interest-rate differential that existed in each month of the origination period and was assumed to last for ten years. As was indicated above, the program participants who may have sold their residence within few years of purchase would have captured the remaining value of the payment savings via an increase in the value of the property. Approaching the estimation of payment savings in this manner yields a value to the participants of approximately $11 million.

From this analysis, we conclude that MRB programs redistribute some wealth between nonparticipating home buyers and participants of the program within the local market. This redistribution is quite apart from any redistribution that may occur at the national level because of the special tax status afforded to the bond issue.

Table 4. Estimates of Payment Savings

Month	HUD Series Conventional Mortgage Rates	PVm	Savings Factor[a]	Amount Originated Each Month	PV of Savings on Mortgages Originated Each Month[b]
1979					
October	12.51%	69.30	.177	$ 2,885,700	$ 510,768
November	12.50	68.31	.189	18,944,015	3,580,421
December	12.50	68.31	.189	9,569,350	1,808,607
1980					
January	12.80	67.50	.199	7,323,750	1,457,426
February	14.10	64.16	.239	5,785,350	1,376,913
March	16.05	59.60	.292	3,360,850	981,368
April	15.55	60.71	.279	2,003,450	558,962
May	13.20	66.49	.210	2,419,150	570,441
June	12.45	68.45	.187	2,029,850	379,582
July	12.45	68.45	.187	187,600	35,081
August	13.25	66.32	.213	423,150	90,131
September	13.70	65.15	.227	122,500	27,807
October	14.10	64.16	.238	181,700	43,245
Total	-	-	-		$11,420,752

[a]The savings factor (SF) is used to calculate the present value of mortgage savings. It is determined by this formula:

$$SF = \left[\frac{PV_1 - PV_m}{PV_1} \right]$$

where PV_1 = $84.24 = the present value of $1 to be received for
  120 months discounted at the low rates of interest,
PV_m = the present value of $1 to be received for 120 months
  discounted at the higher market rate of interest, and

[b]The present value of the difference in monthly payments between
a low and high rate loan for a ten-year tenure can be found by:
  PV of Savings = (SF) (Loan Amount).

Appendix 1
Estimation of Equation (2)

One Dummy Models

Variable	All Houses (Coefficient)	(t-value)	Noncreatively Financed Houses (Coefficient)	(t-value)
Constant	-27,449.60	(5.21)**	-31,662.40	(6.13)**
Age	-456.60	(11.05)**	-464.60	(10.91)**
Air Condition	3,156.13	(2.69)**	3,594.80	(3.04)**
Fireplace	1,809.18	(1.69)	2,084.00	(1.90)*
House Area (sq. ft.)	35.92	(26.09)**	36.73	(25.78)**
No. Bathrooms	1,779.40	(1.91)**	588.60	(0.61)
Lot Size	.234	(3.61)**	.194	(3.03)**
Garage	939.20	(1.13)	933.57	(1.11)
No. Bedrooms	-2,750.70	(3.32)**	-2,172.70	(2.56)**
Neighborhood				
1	-19,432.80	(12.67)**	-17,691.90	(11.33)**
2	-15,265.90	(11.69)**	-13,944.30	(10.49)**
3	13,056.40	(6.41)**	-10,738.90	(4.93)**
4	-17,478.70	(9.63)**	-16,870.60	(9.06)**
Days on Mkt.	-9.04	(1.39)	13.01	(1.90)
Value				
FHA/VA	.065	(0.59)	.047	(0.46)
Assumption	.383	(4.58)**		
Owner Fin.	-.289	(1.57)		
CPI (Less Shelter Cost)	214.81	(12.68)**	241.34	(16.50)**
L-T-V Ratio	-1,339.50	(0.57)	-3,832.50	(1.66)*
Period				
Announce.				
Origination				
Combined	2,145.10	(1.98)*	3,059.00	(2.83)**
Adjusted R^2	.880		.882	
F-Value	252.03**		265.96**	

One and two asterisks indicate the variable is significant at the .05 and .01 level, respectively.

Appendix 1 (continued)
Estimation of Equation (2)

Two Dummy Models

Variable	All Houses (Coefficient)	(t-value)	Noncreatively Financed Houses (Coefficient)	(t-value)
Constant	-27,637.40	(5.23)**	-31,491.40	(6.10)**
Age	-458.60	(11.08)**	-467.50	(10.98)**
Air Condition	3,194.40	(2.72)**	3,663.10	(3.10)**
Fireplace	1,787.50	(1.67)	2,029.20	(1.85)
House Area				
(sq. ft.)	35.92	(26.09)**	36.72	(25.81)**
No. Bathrooms	1,802.20	(1.93)**	644.10	(0.67)
Lot Size	.235	(3.63)**	.196	(3.06)**
Garage	971.70	(1.17)	980.90	(1.16)
No. Bedrooms	-2,757.00	(3.33)**	-2,216.70	(2.62)
Neighborhood				
1	-19,507.20	(12.70)**	-17,872.40	(11.43)**
2	-15,231.70	(11.66)**	-13,892.90	(10.46)**
3	-13,179.10	(6.45)**	-10,974.40	(5.04)**
4	-17,483.10	(9.64)**	-16,869.80	(9.07)**
Days on Mkt.	-9.11	(1.40)	-12.91	(1.89)*
Value				
FHA/VA	.035	(0.31)	-.093	(0.86)
Assumption	.371	(4.38)**		
Owner Fin.	-.297	(1.61)		
CPI (Less				
Shelter Cost)	215.40	(12.71)**	240.40	(16.44)*
L-T-V Ratio	-1,281.30	(0.54)	-3,588.90	(1.55)
Period				
Announce.	1,084.20	(0.69)	1,224.70	(0.78)
Origination	2,906.70	(2.13)*	4,380.30	(3.23)**
Combined				
Adjusted R^2	.880		.883	
F-Value	239.41**		252.01**	

One and two asterisks indicate the variable is significant at the .05 and .01 level, respectively.

ENDNOTES

1. Suppliers and demanders were prohibited from contracting for properties during the announcement period. Because of this prohibition, there could be no increase in either the demand or supply functions as a result of the bond issue during the announcement period.

2. Another issue that concerns the type of test employed here is that of statistical problems associated with the use of OLS tests of hedonic equations. One problem is the presence of multicollinearity among the physical characteristics of the properties. Gau and Kohlhepp (1978) present a sound discussion of this issue. Basically, the presence of multicollinearity will lead to biased estimates of the coefficients of the physical variable and, in many cases, to counterintuitive signs. Additionally, studies (Mark 1983 and Moore, Reichert and Cho 1984) have shown that the coefficients of the physical variables may be unstable over time. Fortunately, none of these statistical problems concerns our tests since we are focusing exclusively on the coefficient of the time variable.

3. There was some informal speculation and discussion by real estate brokers that many bond issue participants sold their properties shortly after their purchase for substantially more than they had paid for them.

12
THE ECONOMICS OF
MORTGAGE REVENUE BONDS:
A STILL SMALL VOICE

Richard L. Cooperstein

The MRB tax expenditure has shown remarkable resilience over time. MRBs survived even during the years of Gramm-Rudman-Hollings and the fight for deficit reduction. This despite the solid evidence of the high cost of this tax-code distortion in relation to the minimal benefits accruing to home buyers (see chapter 3). The reason for their continued survival has little to do with objective benefit-cost analysis. MRBs survive in the way that many other narrowly defined but poorly targeted preferences do: special interest groups like them, so the legislators they influence like them as well.

The perils of MRBs are a good example of the process of making policy. Even on issues that appear to be solely economic, economic analysis is only one input to the policymaking process. Despite the subjective nature of wealth redistribution that goes beyond objective analysis, economic analysis can provide useful information about the nature and extent of the redistribution. For MRBs, this question is whether we want to devote a few more tax dollars to the housing industry—shared in fairly equal parts by suppliers, financiers, and consumers. However, the political arena is where the rubber really meets the road. Understanding the incentives and influence of those affected by policy helps clarify why each party lines up on a particular side of an issue, and who wins and who loses.

The housing lobby—builders, realtors, and mortgage originators—likes MRBs because these bonds represent more federal tax preferences in which to share. These groups might not fight so hard to keep MRBs alive if they captured none of the rents and needy home buyers garnered all the benefits. Another group with strong preferences for MRBs are state and local governments. Part of the bond proceeds are typically used to fund some of their administrative costs, and any increase in resources devoted to their locality is a free good paid for by federal taxpayers.

Home ownership is one of the most encouraged activities in the tax code. The deductibility of mortgage interest and property taxes, and nontaxation of imputed rental income and capital gains, make home ownership an irresistibly attractive way to consume housing services and accumulate wealth. Of course, these preferences are costly. The President's 1992 Budget estimates the cost of deducting mortgage interest and property taxes at $50 billion annually.

Tax-free imputed rental income and capital gains make the total bill even higher. The cost of MRBs is estimated at $1.7 billion annually, and as described in chapter 3, perhaps two-thirds of this tax loss accrues to individuals other than the home buyers.

The policy question that should be asked is whether we need yet another poorly targeted encouragement for home ownership when taxpayers already spend so much on this activity. However, unless economic evidence, like that provided in many chapters of this book, changes some very strong opinions, it seems unlikely to change the political will. The next best step is to target the $1.7 billion that taxpayers annually spend on MRBs, so that needy home buyers actually receive the subsidy.

Chapter 7 by Stegman and Stebbins evaluates a promising alternative, mortgage credit certificates (MCCs). Home buyers receive about one-third of the benefits of MRBs; by contrast, virtually all of the tax credit accrues to the home buyers. There are no bond buyers, bond counsels, developers, or state and local employees to pay out of the bond proceeds. There is no uncertainty about the size of the subsidy, which for MRBs depends on the interest-rate spreads between taxable and tax-exempt instruments.

While MCCs are more efficient than MRBs (the subsidy goes where it is directed), they are now ineffective because the tax credits are not refundable. Thus, if the certificate value of an MCC exceeds the recipient's tax liability, the MCC value becomes the tax liability, and the recipient does not get a tax refund for the certificate value in excess of the taxes owed.

Because MCCs are not refundable, the precise value of an MCC for a household is not known until the household pays its taxes. As a result, MCCs have little impact on the household's decision and ability to become a home owner. Also, because MCCs are not refundable, low-income households— which have little taxable income—usually cannot use the full value of the credit because it exceeds their tax liability. As a result, the usable credit—the size of the subsidy—is small and will not have a sizable impact on home ownership affordability.

The MCC must be refundable to be effective. Only if the credits are refundable are home buyers guaranteed they will receive the full value of the credit regardless of actual tax liability. If the value of the credit is certain (as it would be if it were refundable), mortgage originators could treat the credit as an increase in home buyer income, increasing the household's ability to qualify for a mortgage loan. Making MCCs refundable also would allow the credit to be more effective for precisely those who need it most: families with little taxable income.

MCCs have been around for several years and the importance of refundability is well established, but MCCs have not caught on and Congress has not made them refundable. It is hard to see a reason why MCCs are less

13
MRBS SHOULD BE CONTINUED BECAUSE THEY WORK, WORK WELL AND WORK EFFICIENTLY

John T. McEvoy[1]

No one is contesting the restrictions Congress has placed on MRBs. The energies of MRB advocates are directed toward making MRBs, which Congress overwhelmingly supports, a permanent program.

Making the MRB program and Low Income Housing Tax Credit program (for which we are also the principal advocate) permanent remains the unfulfilled major objective of the National Council of State Housing Agencies, which represents the states on housing in Washington. We want to add permanent extensions of these important federal programs to our success in helping secure enactment and implementation of such legislation as the 1990 National Affordable Housing Act, more effective implementation of the Resolution Trust Corporation Affordable Housing program, and adequate funding for other federal housing programs.

The mortgage revenue bond (MRB) program has been an unqualified success in providing lower-income Americans a unique and otherwise unavailable chance to own a decent and affordable home.

In 1990, MRB loans helped more than 100,000 lower-income buyers get into their first homes. Their average income was less than 80 percent of the national median income. Nationwide, average first-time conventional purchasers had incomes 60 percent greater than MRB borrowers.[2] On average, MRB borrowers purchased homes that cost 46 percent less than conventional first-time purchases.[3] MRB interest rates were as much as 2.5 percent below conventional market rates, meaning savings of as much as $100 per month on an MRB loan of typical size.

Since 1980, the use of MRBs has been targeted by progressively tighter tax-law restrictions enacted by Congress to make sure the program serves only those who need it. These restrictions have included limits on incomes of eligible borrowers, on the price of the homes that can purchased under the program, and on MRB volume. The total overall volume of private activity bonds including MRBs was severely limited in the Tax Act of 1986.

The 1986 Act restricted MRB loans to first-time buyers of homes that cost 90 percent or less of average purchase prices in the area. To be eligible for an MRB loan, a borrower's income must be 100 percent or less of the greater of the area or state median income in the case of households of one

or two persons, and 115 percent or less of the higher of area or state median income in the case of larger households.

In 1988, Congress went further and established a recapture penalty to make an MRB loan uneconomical for anyone who could afford conventional financing in the foreseeable future. This penalty requires post-1990 MRB loan recipients whose incomes rise more than five percent a year above the MRB income limits to pay the federal government up to 50 percent of the gain from the sale of their house if they resell it within nine years.

Finally, Congress has specified that no more than two percent of the face amount of an MRB issue may be spent on costs associated with the issuance and sale of MRBs.

MRBs ARE THE ONLY FEDERAL INCENTIVE TARGETED TO FIRST-TIME HOME BUYERS

The MRB program is the only available federal program to reduce home mortgage costs for lower-income first-time home buyers whose incomes are insufficient to support a home purchase. Though down payment assistance is also an important factor in home ownership, a buyer must be able to make the monthly mortgage payment if he or she is going to own a home.

During 1990 alone, state housing finance agencies (HFAs) provided MRB loans to 131,464 households, and local HFAs made another 48,719 MRB loans. With the assistance provided by the MRB program, state HFAs have cumulatively helped more than 1.3 million American households become home owners.

Under the MRB program, HFAs raise money by selling tax-exempt bonds and lending the proceeds of the sale to first-time home buyers. Because buyers of these bonds accept a lower rate of return on their investment than if the bonds were taxable, HFAs can lend bond proceeds to home buyers at interest rates as much as 2.5 percent below conventional mortgage rates, meaning savings of as much as $100 per month on a typical MRB mortgage—20 percent of an average monthly mortgage payment.

Without the lower monthly payments made possible by the MRB program, millions of American working families—teachers, firemen, police officers, industrial, service, and agricultural workers—whose income is too low to buy a home and rises more slowly than house prices, may never realize their dream of home ownership.

The MRB program works in all economic cycles. When conventional interest rates are high, MRBs keep the window of opportunity for home ownership wedged open for lower-income Americans. When conventional in-

terest rates dip, MRBs can reach potential first-time home buyers with even lower incomes.

Critiques of the MRB program that assert MRBs benefit higher-income buyers are based nearly entirely on econometric theory which is based upon data—itself disputed (see Wrightson 1988)—that was compiled four years before Congress placed new limits on the income of MRB borrowers and enacted the "recapture" formula.

Well-informed debate of the merits of any government program sustains the fabric of democracy itself. But informed debate requires good data. Criticism of today's MRB program on the basis of data upon which Congress has already acted to reform the MRB program simply cannot be taken seriously.

Though the data itself is meaningless in its obsolescence, these critiques also remind us that South Carolina Senator Fritz Hollings once defined an economist as "someone who looks at something which works in practice and asks 'Hmmm, I wonder if that would work in theory?'"

Does the MRB program work? Listen to Jim Rouse, Chairman and founder of The Enterprise Foundation, the nation's leading nonprofit housing developer:

> Developing low-priced housing in high risk neighborhoods requires in-novative thinking. In inner-city Baltimore, an Enterprise affiliate com-bined MRBs with other approaches to build new homes affordable to families with incomes as low as $10,000 per year. MRBs helped get pay-ments down as low as $259 a month for families who never before believed that owning their own home was possible.

And Nicholas Brady, Secretary of the Treasury and Chairman of the Resolution Trust Corporation (RTC) Oversight Board:

> Using state and local housing agency bond financing will help us achieve our goal of preserving the affordability of single family homes for buyers of RTC's affordable housing properties.

And Governor Ray Mabus of Mississippi, who also chairs the committee of the National Governors' Association responsible for housing policy:

> The Mortgage Revenue Bond Program is a key component of state affordable housing strategies. It provides needed capital to promote home ownership among low- and moderate-income families. Extension of this program is a high priority of the nation's governors.

And Carl Riedy, Vice President for Affordable Housing Initiatives at the
Federal Home Loan Mortgage Corporation:

> The MRB program has the unique ability to increase the universe of
> first-time home buyers by providing below-market interest rate
> mortgages. The loss of the MRB program would seriously impede
> Freddie Mac's ability to design affordable home ownership initiatives.

In reality, the MRB program works so effectively to provide low-
income buyers a chance for home ownership that more than 85 percent of
both houses of Congress (88 of 100 Senators and 369 of 435 House members)
joined as cosponsors of a bill in the last Congress to extend the program, far
more than supported any other single piece of tax legislation in memory. In
the first five months of the new Congress, comparable numbers of members
of Congress have joined in cosponsoring bills in both the House and the
Senate to extend the program, once and for all, permanently.

These members of Congress, like the low-income housing professionals
who urge permanency for the MRB program, believe the value of the MRB
program outweighs the cost attributable to it.[4] The many real and productive
lower-income home ownership uses to which state and local governments have
put MRBs have produced this massive support.

ASSISTANCE FOR FIRST-TIME HOME BUYERS IS ESSENTIAL

Since the early 1970's, home prices have increased dramatically relative
to average incomes, making it extremely difficult for many lower-income
families to buy a home, and nearly impossible for many others. Between 1975
and 1989, the median American household income increased by only 6.2
percent after inflation. Meanwhile, median home sales prices rose by 19
percent for existing houses and by 38 percent for new houses.

Lower mortgage interest rates and stagnant home prices in recent
months have not significantly brightened the picture. The U.S. Bureau of the
Census has reported that the national home-ownership rate fell between 1980
and 1989 from 65.6 percent to 63.9 percent, the first decade-long decline since
the 1930's. For households headed by individuals under 35—the typical first-
time home buyer and the primary market served by MRBs—home ownership
fell from 41.2 percent in 1982 to 39.1 percent in 1989, a five percent decline
(Callis 1990).

The Joint Center for Housing Studies of Harvard University has docu-
mented an even steeper downturn in the young household home-ownership
rate. According to the Joint Center (1990), the home-ownership rate between

1973 and 1989 fell by 11 percent for households headed by individuals 30 to 34 years old (from 60.2 percent to 53.6 percent), by 19 percent for households headed by individuals 25 to 29 years old (from 43.6 percent to 35.4 percent), and by 25 percent for households headed by individuals under 25 years of age (from 23.4 percent to 17.6 percent).

According to the Joint Center, the average after-tax home-ownership cost for potential first-time buyers purchasing a typical starter home was 33.1 percent of household income in 1989—36 percent greater than in 1973. The total annual cost of home ownership during the same period rose to $7,208—97 percent higher than in 1973 (Joint Center for Housing Studies of Harvard 1990).

MRBs help eligible borrowers who simply otherwise could not do so to "bridge the gap" to home affordability.

Table 1
Home-ownership Rates by Age of Head (Percent)

Age	1973	1976	1980	1983	1987	1989
Under 25	23.4	21.0	21.3	19.3	16.1	17.6
25 to 29	43.6	43.2	43.3	38.2	35.9	35.4
30 to 34	60.2	62.4	61.1	55.7	53.2	53.6
35 to 39	68.5	69.0	70.8	65.8	63.8	63.9
40 to 44	72.9	73.9	74.2	74.2	70.6	70.8
45 to 54	76.1	77.4	77.7	77.1	75.8	75.3
55 to 64	75.7	77.2	79.3	80.5	80.8	80.2
65 to 74	71.3	72.7	75.2	76.9	78.1	78.2
75 and Over	67.1	67.2	67.8	71.6	70.7	70.3
Total	64.4	64.8	65.6	64.9	64.0	64.0

SOURCE: Joint Center for Housing Studies of Harvard (1990).
Reproduced with Permission.

MRBS ARE USED IN CREATIVE WAYS TO PRODUCE
VARIOUS PUBLIC BENEFITS

In addition to empowering lower-income home buyers, MRBs produce far-reaching benefits to the nation year after year by creating jobs in the construction industry, helping the government sell its foreclosed housing inventory, and bringing mortgage funds into capital-short areas.

HFAs have developed imaginative ways to make MRBs work harder to accomplish a variety of public purposes. These activities include using specially structured MRB issues, agency and appropriated funds, and special set-asides of MRB funds for single parents, minorities, veterans, rural areas, inner cities, disaster areas, very low-income and handicapped individuals, and other special needs.

MRB funds have been set aside in numerous states for buyers of many of the foreclosed homes owned by the Resolution Trust Corporation (RTC), Federal Housing Administration (FHA), Farmers Home Administration (FmHA), and the Veterans Administration (VA). HFAs in ten states have reserved $188 million in MRB financing for RTC home sales alone, including $140 million in Texas.

HFAs are strengthening the capacity of nonprofit groups and supporting their initiatives by providing MRB loans to lower-income buyers of homes built by profits. In Maryland, for example, a nonprofit organization combined MRBs with other funding to build new homes for families with incomes as low as $10,000 per year, with payments as low as $259 per month. Similar programs are operating in California, Connecticut, Georgia, Illinois, Indiana, Minnesota, Montana, Nebraska, Ohio, Oregon, Vermont, and Wisconsin.

MRBs are revitalizing distressed neighborhoods, funding the repair and purchase of homes in older, urban communities. The State of New York Mortgage Agency (SONYMA) Project Set-Aside Program allocates blocks of funds for 30-year mortgage loans to housing projects under construction in targeted urban areas. Funds are made available to developers, builders, and local community development organizations without commitment or reservation fees. Other similar targeted initiatives are operating in California, Illinois, Kentucky, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, Washington, and Wisconsin.

MRBs are being used to help very low-income renters move out of public and assisted housing into homes of their own. Connecticut, for example, has implemented a pilot program to provide 250 families living in public housing with the opportunity for home ownership. Other states with similar programs to help public and assisted housing tenants become home owners include Delaware, Michigan, New York, Virginia, and Wyoming.

More than 20 HFAs also combine MRB proceeds with their own funds to reduce down payments and closing costs for home buyers with limited cash resources, through such means as grants, second mortgages, and sweat equity.

MRBs also represent a major source of mortgage funds for capital-poor rural states and areas. Georgia, Wisconsin, and other states have set aside funds for targeted rural areas, utilizing the capacity of larger urban lenders to assist rural lenders, and combining MRBs with other resources.

MRBS ARE TARGETED FOR MAXIMUM EFFICIENCY

Congress has given states the option of issuing MRBs or Mortgage Credit Certificates (MCCs). However, only 16 states currently operate MCC programs. The 14,696 certificates issued nationally in 1990 represent slightly over ten percent of the total number of mortgages financed by HFAs that year, down from 18 percent in 1989.

Most states have discontinued or decided not to start MCC programs because MCCs tend to skew benefits toward higher-income borrowers who have more significant income tax payments for MCCs to offset. In addition, the benefits of MCCs to borrowers can vary from year to year depending on the borrower's present tax situation. While some assert that MCCs would be more efficient if they were refundable, Congress is unlikely to approve this change in the tighter current budget environment.

The growing support the MRB program commands in both Congress and the low-income housing community speaks volumes for a proposition often advanced by the most conservative American president of modern times: "If it ain't broke, don't fix it!"

ENDNOTES

1. Executive Director, National Council of State Housing Agencies. The NCSHA is a national, nonprofit organization that represents 58 state-chartered housing finance agencies (HFAs) in promoting affordable housing opportunities. These HFAs are public agencies created in every state (except Kansas and Arizona), and in the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. They address a broad spectrum of housing needs through the financing, development, and preservation of affordable ownership and rental housing for lower-income Americans. HFAs collectively operate 500 different affordable housing programs.

2. The average income of an MRB borrower nationally was $27,800. The national median income was $35,700. The average first-time conventional purchaser income was $44,500.

3. The average purchase price of an MRB home nationally was $59,822. The average first-time conventional buyer bought a home worth $111,100.

4. On September 7, 1990, the Congressional Joint Committee on Taxation, the federal government's official estimator of the "costs" of tax programs, estimated that continuing the MRB program on the present basis for five years would reduce revenues by $770 million during that period. This cost represents .0001 percent of the total federal budget cost projected for the same period and 1.5 percent of the revenue loss attributable to the home owner mortgage interest deduction for all taxpayers of all incomes in 1992 alone. Budget of the Federal Government, Fiscal Year 1991.

14

THE FUTURE OF MORTGAGE REVENUE BONDS
WHERE DO WE GO FROM HERE?

Danny W. Durning

Perhaps the time has come for mortgage revenue bond (MRB) supporters and opponents to negotiate a truce in their running battle over the future of MRBs. The truce agreement might look like this: MRB proponents would pledge they will not try to undo the key targeting provisions of the laws regulating MRBs if opponents would agree to a permanent extension of MRBs. Such a truce agreement would force supporters to accept some program restrictions they do not like, but would end their annual congressional battles for survival. The agreement would require MRB critics to accept the long-term existence of MRB programs, but would reassure them that the net costs of MRBs will not substantially increase. As a bonus, the truce would offer Congress a way to break the cycle of annual debates over the future of MRBs without adding greatly to coming budget deficits.

If such a truce is not acceptable to MRB program leaders or were later broken, MRB opponents could propose additional regulations to target MRBs better than they are now. However, those targeting proposals should be put aside if a truce is made and held.

THE CRITICS' PERSPECTIVE

From the perspective of MRB critics, the truce agreement might be acceptable for several reasons.

•*It might help avoid going back to the "bad old days" of MRBs.* The worst nightmare of many MRB opponents is a return to the era of unregulated MRBs when many local—and a few state—governments loaned their public powers to investment bankers, bond lawyers, and the real estate industry to set up and operate MRB programs. These private interests, cloaked in the rhetoric of public service, extracted billions of dollars in profits as they replaced private mortgage loans with MRB loans.

Most MRB opponents believe such a haywire public-private partnership is impermissible: the partnership should involve more than governments handing Wall Street and its retinue the mantle of government and pre-

tending that the public is being served. Instead, they think the partnership should consist of governments engaging the talents of the bond industry for the public good. Such a partnership has been developed in many states because the legislative restrictions placed on MRB programs during the 1980s have encouraged housing finance agencies to manage their programs, not just to turn them over to the bond industry.

A return to the bad old days may be possible as zeal for tax reform declines and the federal budget deficits fade as a top concern. The MRB industry, with its seasoned lobbying skills, may be able, even in the absence of a truce, to use its considerable clout on Capitol Hill to get MRBs permanently extended. If so, its next step might be to persuade Congress to strip away the regulations that have targeted MRB loans and have limited the size of MRB programs. Maybe such developments can be headed off by a truce agreement.

• *The restrictions on MRBs may have targeted MRB loans well enough to make MRB programs tolerable.* When critics compare state and local MRB programs of 1991 with those of the early 1980s, they can see that the abuses have been reduced or eliminated. Although many may doubt that the income and house price restrictions adequately target most loans to lower-income households, they must acknowledge that the restrictions help insure that few MRB loans—except those made in targeted areas— are made to affluent households. Also they find that the cost of MRBs to the federal treasury is small compared to the cost a decade ago.

Evidence of the improved targeting can be seen by comparing the average price of houses bought with MRB loans with the average price of all housing (see table 1). Although this evidence is not definitive, it shows that in 1984 the average price of a house bought with an MRB loan was 71.4 percent of the average price paid for all existing single-family houses purchased that year, and 64.7 percent of the average price paid for new houses. In 1990, those percentages had declined to 62.5 percent and 50.4 percent, respectively. Those lower percentages indicate that in 1990 MRB loans were better targeted to the purchase of modest homes.[1]

In coming years, the average price of houses financed with MRBs may fall below those prices shown in table 1, or at least increase very slowly, due to the latest—and best—targeting regulation that went into effect at the beginning of 1991. This regulation, the recapture requirement, has decreased the attractiveness of MRBs by reducing the value of the subsidies they provide.[2] As a result, more households that qualify for

MRBs may opt for market-rate financing if they qualify for it (and evidence shows that a large portion will). So, the demand for MRB loans will decline, and a larger portion of the loans will be made to the households that truly need them to buy houses.

Table 1. Average Price Paid for Single-Family Houses
Selected Years

Year	A MRB Average[a]	B Avg. Exist. Houses[b]	C Avg. New Houses	A/C	B/C
1984	$51,659	$72,400	$ 79,900	71.4%	64.7%
1985	53,494	75,500	84,300	70.9	63.5
1986	56,360	80,300	92,000	70.2	61.3
1987	59,832	85,600	104,500	70.0	57.3
1990	59,721	95,500	118,600	62.5	50.4

[a]This column consists of the average price of all single-family houses purchased by households receiving MRB loans. The data are collected and reported by the National Council of State Housing Agencies.

[b]This column consists of the average price paid for all resale houses purchased in the United States. The next column contains information on the average price of all new houses purchased in the United States. The source of the data is the National Association of Realtors.

Another complaint about MRBs—that too many are issued because HFAs do not have to pay their full costs—has been addressed by legislation limiting the volume of MRBs that may be issued. And, by imposing a volume cap on private-purpose bonds, including MRBs, Congress has forced states to allocate the available bond volume among MRBs, sewage and solid waste disposal, air and water pollution control facilities, water facilities, and other such uses. As a result, states now face an opportunity cost when they issue MRBs, and thus have to consider more carefully the benefits of MRBs compared to other types of investments.

In short, although MRB critics may think that MRBs are inherently inefficient, they should be pleased with the regulations, especially the recapture requirement, that have better targeted MRBs and that have limited both the amount of MRBs that can be sold and the profits that can be earned from them. These regulations have significantly increased the portion of MRB proceeds that yield public benefits.

•*MRBs may stimulate enough beneficial spinoffs to earn their keep.* MRBs helped motivate the creation of 48 state and dozens of local HFAs, many of which now have the experience and expertise to be housing policy innovators. Clearly, MRBs have stimulated an expansion of the housing policy community, bringing new blood, fresh ideas, and energy to this policy area. And, they have stirred many state and local governments to devote additional resources to solving housing problems. Also, they have provided an improved administrative infrastructure capable of implementing new federal programs, giving the federal government more flexibility in designing housing initiatives.

Perhaps these benefits are worth the net costs of the present MRBs program, especially after the recapture provision has improved the targeting of MRB loans to needy households. If HFAs issue $12 billion per year in MRBs, the annual cost of the bonds is between $250 and $300 million. And, if as the GAO suggests, only about a quarter to half of that tax expenditure produces public benefits, the remaining $125 to $225 million per year might be viewed as a subsidy for the operation of HFAs. Critics might ask themselves if that cost is unreasonable compared to the money spent each year on the administration of a demoralized U. S. Department of Housing and Urban Development.

THE VALUE OF A TRUCE FOR MRB PROPONENTS

From the perspective of MRB supporters, the truce agreement may or may not appear to be a good idea, depending on their interests. It might appeal to the innovative HFAs, many of whom have diversified into administering various housing programs and financing different types of economic development activities. However, it might not be welcomed by HFAs dominated by the bond and real estate industries, who want the largest possible programs because their benefits increase as the sale of MRBs increases.

The agreement would provide a stable political environment in return for acceptance of a targeted program with a limited volume of MRBs or MCCs. With a stable environment, the HFAs and their industry groups, NCSHA and

ALHFA, might make more productive use of the resources they must spend on lobbying to keep MRBs alive. These resources might be rechannelled into the tasks of improving the operation of existing HFA programs and gaining approval of new federal, state, and local housing initiatives.

IF MRB ADVOCATES DO NOT WANT A TRUCE

The proposed truce agreement may be rejected by MRB program leaders who believe that the present restrictions on MRB programs should be removed and the use of MRBs substantially expanded. If pro-MRBers want more legislative battles, MRB critics should consider countering with these proposals to target MRB loans even more carefully to lower-income households:

●*Reduce the size of the "targeted areas" by allowing no more than, say, ten percent of a state to be designated as such.* Target areas are now the biggest loopholes for MRB programs. In them, most of the targeting restrictions are liberalized or lifted. As a result, loans may be made—and subsidies provided—to affluent households that already own houses.

If target areas really were discrete sites in which an investment of MRB subsidies could have significant externality benefits, then they might be justified. But, in many states, a quarter or more of all people live in target areas consisting of half or more of the states. Given the size of these target areas, it is difficult to understand how any spillover benefits are produced by subsidizing the home purchases of affluent households living in them.

●*Require households that receive MRBs to show that they could not qualify for a market-rate loan.* Another improved targeting mechanism would be to require that households receiving MRB loans prove they could not qualify for market-rate loans. Such a requirement would increase the likelihood that households that receive MRB subsidies actually need them to purchase a modest house.

●*Make sure that builders and real estate brokers do not control who receives MRB loans.* To reduce the amount of the MRB subsidies that is capitalized into house prices, HFAs could be prohibited from allowing developers or real estate brokers to reserve MRB loans for their customers. Instead, HFAs could be required to set up methods of dispensing MRB loans that insure all eligible house buyers have equal access to them.

CONCLUSION

In recent years, MRB supporters have devoted a substantial amount of time and resources to the task of keeping MRB programs alive. Opponents have labored to kill them. It seems likely that in the future the resources devoted to fights over MRBs could be better spent on improving existing housing policy and developing new policies that address the needs of low-income households. To that end, a truce in the on-going MRB battles may be in order.

Endnotes

1. Because of the nature of the data, table 1 may be viewed as indicative of a trend rather than definitive proof of one. The data are not directly comparable. The data on the average price of houses financed with MRB loans include both new and existing houses. The other estimated sales prices do not mix new and existing houses. Nevertheless, the data in table 1 seem adequate to show a rough trend.

2. The recapture requirement is based on the idea that households that receive MRB subsidies to purchase houses should have to repay part of the subsidies if they resell their houses for a profit within a few years and their incomes have risen substantially. With this requirement, an owner who sells his or her house within ten years after receiving an MRB loan may have to return a portion of the subsidy he or she received. The recapture amount is reduced if the borrower's income is less than the inflation-adjusted income ceiling for the MRB program, plus $5,000. Also, the recaptured amount cannot exceed 50 percent of the gain realized on the sale of the house or 6.25 percent of the highest principal amount of the loan, whichever is less.

REFERENCES

Aaron, Henry. 1970. Income Taxes and Housing. American Economic Review 60(2):789-806.

_____. 1972. Shelter and Subsidies. Washington: The Brookings Institution.

Agarwal, Vinod, and Richard A. Phillips. 1983. The Effects of Mortgage Rate Buydowns on Housing Prices. AREUEA Journal 11(4):491-503.

_____. 1984. Mortgage Rate Buydowns: Further Evidence. Housing Finance Review 3(2):191-198.

_____. 1985. The Effects of Assumption Financing Across Housing Price Categories. AREUEA Journal 13(1):48-57.

Allan, John. 1988. New Assault on Munis Likely As Revenues Are Sought in 1989. Credit Markets March 21:20.

Apgar, William, Jr. 1988. The Nation's Housing: A Review of Past Trends and Future Prospects for Housing in America, Housing Policy Project, HP1. Cambridge-MIT Center for Real Estate Development. March.

Arndt, Randy. 1979. Furor Surrounds Mortgage Bond Ban. Nation's Cities Weekly May 21:1,4.

Ayanian, Robert. 1983. Expectations, Taxes, and Interest: The Search for the Darby Effect. American Economic Review 73(4):762-765.

Benjamin, John, and C.F. Sirmans. 1987. Who Benefits from Mortgage Revenue Bonds? National Tax Journal 40(1):115-120.

Betnum, Nathan. 1976. Housing Finance Agencies: A Comparison Between States and HUD. New York: Praeger Publishers.

Bible, Douglas, and Jon Crunkleton. 1983. The Effects of Financing on the Sale of Multi-Family Properties. The Real Estate Appraiser and Analyst 49(2):33-37.

Bill Curtailing Tax-Exempt Mortgage Bonds Jolts Housing Industry. 1979. National Journal April 30:1090-1091.

Brueggeman, William, and Robert Zerbst. 1979. Discount Points and Housing Prices: A Reply. The Journal of Finance 34(4):1055-1060.

California Legislative Analyst. 1985. The Use of Mortgage Revenue Bonds in California. Sacramento: reproduced.

Calkins, Susannah, and Leanne Aronson. 1980. The Home Mortgage Bond Controversy. Publius 10(1):111-118.

Callis, Robert. 1990. Homeownership Trends in the 1980s, Current Housing Reports, Series H121. Washington, DC: U.S. Department of Commerce, Bureau of the Census.

Carter Backing Bill to Halt Tax-Free Mortgage Bonds. 1979. Arkansas Gazette May 13:10a.

Chambers, Daniel, and Douglas Diamond, Jr. 1988. Who Never Becomes a Homeowner? Housing Finance Review 7(2):149-167.

Chicago's Bond Plan to Entice Homebuyers. 1978. Business Week July 17:27.

Christofferson, Clyde. 1983. Tax Exempt Bond Battle Begins. State Government News 26(11):11-12.

Clark, Timothy. 1985. Tax Reform Lobbying Begins, But Real Battle Awaits Reagan's Decisions. National Journal March 30:684-689.

_____. 1986. Tax Reform Debate Stems the Rising Tide of Municipal Revenue Bonds. National Journal January 25:216-220.

_____, and Richard Cohen. 1986. Resolving the Differences. National Journal July 5:1658-1665.

Clauretie, Terrence. 1983. A Note on the Bias in House Price Capitalization Models. AREUEA Journal 11(4):521-524.

_____. 1984. Capitalization of Seller-Supplied Financing: Implications for Assessments. Property Tax Journal 3(4):229-238.

_____, C. F. Sirmans, and Paul Merkle. 1986. The Effect of Bond Issues on Housing Markets. Housing Finance Review 5(3):207-215.

Coalition Backing Bond Mortgages. 1983. San Francisco Sunday Examiner & Chronicle April 10, real estate section.

Colwell, Peter, Karl Guntermann, and C. F. Sirmans. 1979. Discount Points and Housing Prices: Comment. The Journal of Finance 34(4):1049-1054.

Congressional Budget Office. 1979. Tax-Exempt Bonds for Single-Family Housing. Washington, DC: GPO.

_____. 1982. The Mortgage Subsidy Bond Tax Act of 1980: Experience Under the Permanent Rules, staff working paper. Washington, DC: GPO.

Cooper, Terence. 1979. Tax-Exempt Bonds Aid Local Housing Development Strategies. Journal of Housing 36(11):573-575.

Cooperstein, Richard L. 1985. Quantifying the Decision to Become a First-Time Home Buyer. Ph.D. Dissertation, University of Maryland, College Park.

_____. 1989. Quantifying the Decision to Become a First-Time Home Buyer. Urban Studies April 26(2):223-233.

Corgel, John, and Paul Goebel. 1983. Financing Adjustments Via Cash Equivalency: Evidence on Accuracy. The Real Estate Appraiser and Analyst 49(2):55-61.

Courant, Paul. 1978. Racial Prejudice In a Search Model of the Urban Housing Market. Journal of Urban Economics 5(3):329-345.

Cuomo Responds to Dole on Mortgage Subsidy Bond Program. 1984. Tax Notes August 20:813.

Daniels, Belden, and Catherine Crockett. 1988. Do You Know Where Your Capital Markets Are? Journal of State Government 61(4):129-136.

Data Resources, Inc. and Coopers & Lybrand. 1983. An Analysis of Tax-Exempt Pollution Control Financing: Final Report. Prepared for the Council of Pollution Control Financing Agencies. June.

Davie, Bruce. 1981. A Congressional View of Tax-Exempt Bonds. In George Kaufman, ed., Efficiency in the Municipal Bond Market: The Use of Tax Exempt Financing for "Private" Purposes. Greenwich, CN: JAI Press.

Davie, Bruce, and Dennis Zimmerman. 1988. Tax-Exempt Bonds After the South Carolina Decision. Tax Notes June 27:1573-1580.

Dowling, Bob. 1979. Bond Battle Spreads into Congress. Housing June:12.

Downs, Anthony. 1985. The Revolution in Real Estate Finance. Washington, DC: The Brookings Institution.

Durning, Dan, and John Quigley. 1985. On the Distributional Implications of Mortgage Revenue Bonds and Creative Finance. National Tax Journal 38(4):513-523.

Durning, Danny. 1986. Essays on Home Ownership Policies. Ph.D. Dissertation. Graduate School of Public Policy, University of California, Berkeley.

_____. 1987. The Efficiency and Distribution of Mortgage Revenue Bond Subsidies: The Distributional Effects of Behavioral Responses. Journal of Policy Analysis and Management 7(1):74-93.

E.F. Hutton Talks About Forgotten American Families (advertisement). 1979. Wall Street Journal April 20:8-9.

Elser, George. 1989. After South Carolina. Municipal Finance Journal 10(1): 7-21.

Epes, Wooten. 1988. Financing Growth: Arkansas Assists Small Industries. The Journal of State Government 61(4):157-160.

Falcioni, John. 1988. Support Grows for Federal Mortgage Bonds. City and State March 28:1,21.

Ferreira, Eurico, and G. Stacy Sirmans. 1984. Assumable Loan Value in Creative Financing. Housing Finance Review 3(2):139-148.

_____. 1987. Interest-Rate Change, Transaction Cost, and Assumable Loan Value. Journal of Real Estate Research 2(2):29-40.

Follain, James, Jane Katz, and Raymond Struyk. 1978. Programmatic Options to Encourage Homeownership. Occasional Papers in Housing and Community Affairs vol. 2. Washington, DC: U.S. DHUD.

Forbes, Ronald, Philip Fischer, and Alan Frankle. 1979. An Analysis of Tax-Exempt Mortgage Revenue Bonds. Albany: State University of New York.

Ford, Wallace, 2d. 1983. Don't Disrupt a Mechanism That Works. New York Times Nov. 6:III,2.

Friedman, Joseph, and Daniel Weinberg. 1982. The Economics of Housing Vouchers. New York: Academic Press.

_____. 1983. The Great Housing Experiment, Urban Affairs Annual Reviews, vol. 24. Beverly Hills: Sage Publications.

Furor Over Tax-Free Bonds to Buy Homes. 1979. U.S. News and World Report April 16:87-88.

Galper, Harvey, and Eric Toder. 1981. Modeling Revenue and Allocation Effects of the Use of Tax-Exempt Bonds for Private Purposes. In George Kaufman, ed., Efficiency in the Municipal Bond Market: The Use of Tax Exempt Financing for "Private" Purposes. Greenwich, CN: JAI Press.

Galper, Harvey, Robert Lucke, and Eric Toder. 1986. The Economic Effects of Tax Reform: A General Equilibrium Analysis. Prepared for the Conference on Tax Policy, Brooking Institution.

Garment, Suzanne. 1985. The Tax Plan: Now for the New Politics as Usual. Wall Street Journal May 31:7.

Gau, George, and D. B. Kohlhepp. 1978. Multicollinearity and Reduced-Form Price Equations for Residential Markets: An Evaluation of Alternative Estimation Methods. AREUEA Journal 6(1):50-69.

General Accounting Office. 1983. The Costs and Benefits of Single-Family Mortgage Revenue Bonds: Preliminary Report. GAO/RCED-83-145. April.

_____. 1988a. Homeownership: Mortgage Bonds Are Costly and Provide Little Assistance to Those in Need. GAO/RCED-88-111. March.

_____. 1988b. Homeownership: Targeting Assistance to Buyers Through Qualified Mortgage Bonds. GAO/RCED-88-190BR. June.

Gensheimer, Cynthia. 1982. The Mortgage Subsidy Bond Tax Act of 1980: Experience Under the Permanent Rules. Congressional Budget Office, staff working paper. Washington, DC: GPO.

Georgia Residential Finance Authority. 1977-1984. Annual Reports.

Gillette, Clayton. 1983. Fiscal Federalism and the Use of Municipal Bond Proceeds. New York University Law Review 58:1030-1083.

Glen, Maxwell. 1979. Tax-Free Bonds for Housing—Too Good to be True? National Journal April 28:696-699.

Goldberg, Arthur. 1981. A Call to Action: State Sovereignty, Deregulation and the World of Municipal Bonds. The Urban Lawyer 13(3):253-283.

Goolsby, William, James Grasskamp, and Timothy Warner. 1983. Cash Equivalent Value of Real Property. The Real Estate Appraiser and Analyst 49(3):43-48.

Grier, Peter. 1984. Lobbying Washington. Christian Science Monitor December 6:32-33.

Guntermann, Karl. 1979. FHA Mortgage Discount Points, House Prices and Consumer Behavior. AREUEA Journal 7(2):163-176.

Hanushek, Eric, and John Quigley. 1981. Consumption Aspects. In Katharine Bradbury and Anthony Downs, eds., Do Housing Allowances Work? Washington, DC: The Brookings Institution.

Harney, Kenneth. 1983a. Revenue Bond Struggle. San Francisco Sunday Examiner & Chronicle March 13, real estate section.

_____. 1983b. Tax Exempt Bonds on Spot. San Francisco Sunday Examiner & Chronicle March 20:real estate section.

Hartwell, Carol. 1986. Housing and Community Development. In Book of the States, 1984-85. Lexington, KY: Council of State Governments.

Hendershott, Patric. 1981. Mortgage Revenue Bonds: Tax Exemptions With A Vengeance. In George Kaufman, ed., Efficiency in the Municipal Bond Market: The Use of Tax Exempt Financing for "Private" Purposes. Greenwich, CN: JAI Press.

Henry, Margaret. 1990. The 101st Congress and Tax-Exempt Bonds: A Retrospective View From the Front Lines. Muni Week December 31:22,23.

_____. 1991. The 102nd Congress and Tax-Exempt Bonds: A Professional's Look Into the Crystal Ball. Muni Week January 7:26,27.

Hoffman, Garry. 1978. Mayor Casts Swing Vote for Mortgage Plan. Arkansas Democrat November 8:19a.

How Exempt are Tax-Exempt Bonds? 1985. State Tax Review 43(38):17:1.

How Tax-exempt Revenue Bonds Out-Compete Other Loans. 1983. San Francisco Sunday Examiner and Chronicle August 28:13.

Hubert, James, and Bruce Mann. 1984. The Effect of Creative Financing on the Value of Single-Family Homes. The Real Estate Appraiser and Analyst 50(1):5-10.

Iwarere, L. Jide. 1987. Benefits from Subsidized Home Ownership Loan Programs of State Housing Finance Agencies: The Case of the Georgia Residential Finance Authority. Ph.D. Dissertation, University of Georgia.

Janis, Irving. 1965. The Problem of Validating Content Analysis. In Harold Lasswell and Nathan Leites and Associates, Language of Politics. Cambridge, MA: The MIT Press.

Johnston, J. 1972. Econometric Methods, 2nd ed. New York: McGraw-Hill.

Joint Center for Housing Studies of Harvard University. 1990. The State of the Nation's Housing. Cambridge: reproduced.

Joint Committee on Taxation. 1985a. Tax Reform Proposals: Tax Treatment of State and Local Government Bonds, JCS-23-85. Washington DC: GPO.

_____. 1985b. Estimates of Federal Tax Expenditures for Fiscal Years 1986-1990, JCS-8-85. Washington, DC: GPO.

_____. 1988. Estimates of Federal Tax Expenditures for Fiscal Years 1989-1991, 100-2, May. Washington, DC: GPO.

Kain, John, and John Quigley. 1975. Housing Markets and Racial Discrimination. New York: National Bureau of Economic Research.

Kaufman, George (ed). 1981. Efficiency in the Municipal Bond Market: The Use of Tax-Exempt Financing for "Private" Purposes. Greenwich, CN:JAI Press.

Kaup, James. 1982. Mortgage Revenue Bonds: Understanding the Basics. Kansas Government Journal October:288-290.

Kendall, Leon. 1979. The Pros and Cons of Home Mortgage Revenue Bonds. Government Financial Management Resources in Review, (newsletter issued by the U.S. Department of Housing and Urban Development).

King, Thomas. 1973. Property Taxes, Amenities, and Residential Land Values. Cambridge, MA: Ballinger.

Kmenta, Jan. 1971. Elements of Econometrics. New York: Macmillan.

Koebel, C. Theodore. 1985. Mortgage Credit Certificates: Are They An Effective Alternative to Mortgage Revenue Bonds? Prepared for the Kentucky Housing Corporation. March.

Kormendi, Roger, and Thomas Nagle. 1981. The Interest Rate and Tax Revenue Effect of Mortgage Revenue Bonds. In George Kaufman, ed., Efficiency in the Municipal Bond Market: The Use of Tax Exempt Financing for "Private" Purposes. Greenwich, CN: JAI Press.

Kraft, John. 1981. Control of Tax-Exempt Financing: Is Local Policy Initiative Preempted? National Civic Review 70(9):449-459.

Lesser, Joseph. 1986. Federal Taxation of State cnd Municipal Bonds? The Constitutional Showdown Might Be at Hand. Urban, State, and Local Law Newsletter 10(1):7-10.

Let's Hear It for E.F. Hutton. 1978. Forbes November 13:196.

Levatino, Adrienne. 1978. Low Cost Loans Spur Middle-Class Homeownership in Older Neighborhoods in Chicago. Journal of Housing 35(11): 587-589.

Levatino-Donoghue, Adrienne. 1979. Local Bonds for Housing Present New Opportunities But Pose Financial Threats. Journal of Housing 36(6): 306-309.

Linneman, Peter. 1985. An Economic Analysis of the Homeownership Decision. Journal of Urban Economics 17(2):230-246.

Lurie, Irene. 1982. A Note on the Inefficiencies of Interest Subsidies. National Tax Journal 35(4):491-495.

Makin, John. 1985. Special Interests Ambush Tax Reform. Wall Street Journal August 10:30.

Mark, Jonathan. 1983. An Empirical Examination of the Stability of Housing Price Equations Over Time. AREUEA Journal 11(3):397-415.

Matlack, Carol. 1979. Tax-Exempt Housing Bonds Spur Battle Among Investment Firms. Arkansas Gazette August 10:1a,5a.

Mayo, Stephen. 1981. Theory and Estimation in the Economics of Housing Demand. Journal of Urban Economics 10(1):95-116.

McClure, Kirk. 1989. A Research Note on the Capitalization of Mortgage Revenue Bond Benefits. National Tax Journal 42(1):85-88.

Merrill, Sally. 1983. The Use of Hedonic Indices. In Joseph Friedman and David Weinberg, eds., The Great Housing Experiment, Urban Affairs Annual Reviews, vol. 24. Beverly Hills: Sage Publications.

Miller, Norman. 1982. Residential Property Hedonic Pricing Models: A Review. In C. F. Sirmans, eds., Research in Real Estate, vol. 2. Greenwich, CN: JAI Press.

Mills, Edwin. 1987. Has the United States Overinvested in Housing? AREUEA Journal 15(1):601-616.

Milward, H. Brinton. 1978. Innovation in State Housing Policy. Paper delivered at the 1978 Annual Meeting of the American Political Science Assn.

Mooney, Steven. 1990. Cash Equivalency in Dichotomous Residential Markets. Journal of Real Estate Research 5(1):89-106.

Moore, James, Alan Reichert, and Chien-Ching Cho. 1984. Analyzing the Temporal Stability of Appraisal Model Coefficients. AREUEA Journal 12(1):50-71.

Mortgage Bond, Credit Certificate Programs Extended by Tax Bill. 1988. Housing & Development Reporter October 31:536.

Mortgage Money From City Bonds: Bonanza or Booby Trap? 1978. Savings and Loan News 99(10):70-73.

Murphy, Kevin, and Robert Topel. 1985. Estimation and Inference in Two-Step Econometric Models. Journal of Business and Economic Statistics 3(3):370-379.

Murray, Michael. 1978. Methodologies for Estimating Housing Subsidy Benefits. Public Finance Quarterly 6(2):161-192.

Nagel, Trevor, and Walter J. St. Onge III. 1988. Housing Bonds and Tax Reform: The Perils of a Partial Analysis of Low-Income Housing Programs. Yale Law and Policy Review 6:287-308.

National Association of Home Builders, National Association of Realtors, National Council of State Housing Agencies, and Association of Local Housing Finance Agencies. 1988. A Referendum on the American Dream. Washington, DC: reproduced.

National Council of State Housing Agencies. 1983. Council of State Housing Agencies Response to the General Accounting Office "The Costs and Benefits of Mortgage Revenue Bonds: Preliminary Report". Washington, DC.

_____. 1984. Survey of State Housing Finance Agencies. Washington, DC.

_____. 1987a. Production Activities of State Housing Finance Agencies 1985 and Cumulative. Washington, DC.

_____. 1987b. Government Relations Handbook. Washington, DC.

_____. 1987c. Membership Survey on Impact of Tax Reform. Washington, DC.

_____. 1990. Housing Resource Book. Washington, DC.

Nenno, Mary. 1989. Housing and Community Development: Maturing Functions of State and Local Government. Washington, DC: NAHRO.

Oleszak, Walter. 1983. The Policymaking Process in Housing. In Congressional Research Service. Housing-A Reader, prepared for the House Committee on Banking, Finance and Urban Affairs. Washington: GPO.

Paine, Webber, Jackson and Curtis. 1974. The Creating of a State Housing Agency. New York: mimeograph.

Peek, Joe, and James A. Wilcox. 1986. Tax Rates and Interest Rates on Tax-Exempt Securities. New England Economic Review Jan-Feb:29-41.

Peterson, George, and Brian Cooper. 1979. Tax Exempt Financing of Housing Investment. Washington: The Urban Institute.

Petersen, John. 1987a. Examining the Impacts of the 1986 Tax Reform Act on the Municipal Securities Market. National Tax Journal 40(3):393-402.

_____. 1987b. Tax Exempts and Tax Reform: Assessing the Consequences of the Tax Reform Act of 1986 for the Municipal Securities Markets. Washington, DC: Academy of State and Local Government.

Pope, Claude. 1979. Tax-Exempt Housing Bonds: The MBA Stance. Mortgage Banker 39(10):22-29.

Pryde, Joan. 1988. Final Go-Round Ahead For Mortgage Bonds. Credit Markets March 7:1,17.

_____, and Dave Ahearn. 1988. Congress Passes Favorable Bill: Mortgage Bonds Granted Extension for One Year. Credit Markets October 31:1,10.

_____. 1989a. The "Prince of Darkness" Speaks Out. Muni Week April 24:1,8.

_____. 1989b. Congress Approves Tax Legislation Extending Mortgage Revenue Bonds, IDBs. Muni Week March 25:35.

_____. 1989c. Look Behind the Scenes Finds Mortgage Bonds Just Missed Permanent Exemption This Year. Muni Week December 11:1,12.

_____. 1991a. Bond Hungary: Volume Cap Devoured by Environmental and Energy Projects. Muni Week May 28:34.

Rasey, Keith. 1985. HFAs: The First Twenty Five Years. CSHA Supplement October 7:8,28.

Ritchie, John. 1983. The Sunset Controversy. Journal of Housing 40(6): 174-176.

Robinson, Donald. 1982. Minimum Tax on Income that Includes Interest on State and Municipal Obligations Would Be Unconstitutional. Municipal Finance Journal 3(2):83-95.

Rosen, Harvey, and Kenneth T. Rosen. 1980. Federal Taxes and Homeownership: Evidence from Time Series. Journal of Political Economy 88(1):59-75.

Rosen, Kenneth. 1984. Creative Financing and House Prices: A Study of Capitalization Effects. Housing Finance Review 3(2):119-127.

Sa-Aadu, J., C. F. Sirmans, and John Benjamin. 1989. Financing and House Prices. Journal of Financial Research 12(1):83-91.

Seib, Gerald. 1979. New Municipal Bonds Provide Home Buyers With Cut Rate Loans. Wall Street Journal February 26:1,12.

Shafroth, Frank. 1983. Mortgage Revenue Bonds Keep Tax Conferees at Odds. Nation's Cities Weekly July 25:2.

Shelton, John. 1968. The Cost of Renting Versus Owning a Home. Land Economics XLIV(1):59-72.

Sidor, John. 1988. State Housing Initiatives: The 1988 Compendium. Washington, DC: Council of State Community Affairs Agencies.

Sirmans, G. Stacy, C. F. Sirmans, and Stanley Smith. 1983. The Effect of Assumption Financing on Residential Property Values. Federal Home Loan Bank Board Journal 16(7):22-25.

_____. 1984. Assumption Financing, Cash Equivalency and Comparable Sales Analysis. Real Estate Appraiser and Analyst 50(3):55-60.

_____. 1987. Property Tax Inequities, Creative Financing, and House Prices. Urban Studies 24(3):409-415.

Sirmans, G. Stacy, Stanley Smith, and C. F. Sirmans. 1983. Assumption Financing and Selling Prices of Single Families Homes. Journal of Financial and Quantitative Analysis 18(3):307-317.

Smith, Lee. 1979. Tax-Free Housing Bonds Cost More Than They Are Worth. Fortune, July 2:86-91.

Smith, Stanley, and G. Stacy Sirmans. 1984. The Shifting of FHA Discount Points: Actual vs. Expectations. AREUEA Journal 12(2):153-161.

Smith, Stanley, G. Stacy Sirmans, and C. F. Sirmans. 1984. Creative Financing "Concessions" in Residential Sales: Effects and Implications. Housing Finance Review 3(2):129-138.

Solem, James. 1987. Housing Provisions of the 1986 Tax Reform Act: Can the States Make Them Work? National Tax Journal 40(3):419-429.

Stegman, Michael, and J. David Holden. 1987. Nonfederal Housing Programs. Washington, DC: Urban Land Institute.

Stevens, Lynn. 1988. State, Local Officials Need Political Clout to Fight for Tax-Exempts. Credit Markets April 18:24.

Stover, Bob. 1978. Financiers Vocal, Buyers Are Silent on LR Bond Plan. Arkansas Gazette December 5:1a.

Strathman, James C., P. Barton DeLacy, and Kenneth Dueker. 1984. Creative Financing 'Concessions' in Residential Sales: Effects and Implications. Housing Finance Review 3(2):149-163.

Struyk, Raymond. 1976. Urban Homeownership: The Economic Determinants. Lexington, MA: Lexington Books.

Sunderman, Mark, Roger Cannaday, and Peter Colwell. 1990. The Value of Mortgage Assumptions: An Empirical Test. Journal of Real Estate Research 5(2):247-257.

Sunley, Emil, and Mary Walz. 1985. The Mortgage Credit Certificate Program: The Effectiveness of Using a Federal Income Tax Credit to Assist Home Purchase, and Some Implications for Program Implementation. Prepared for the Council of State Housing Agencies and the National Association of Realtors. April.

Surrey, Stanley, and Paul McDaniel. 1985. Tax Expenditures. Cambridge, MA: Harvard University Press.

Tax-Exempt Financing Program in Jeopardy. 1983. San Francisco Sunday Examiner & Chronicle February 6, real estate section.

Tax Exempt Housing Bonds: Rapid Growth Fires Debate. 1979. Urban Institute Policy and Research Report Fall, 9:6-8.

The Research Group. 1974. Arkansas Housing Study: Inventory of Selected Housing Finance and Development Legislation and Programs. Little Rock: reproduced.

Thygerson, Kenneth, and Thomas Parliment. 1979a. Mortgage Bond Plans Fail to Achieve Urban Goals. Savings and Loan News 100(4):40-41.

_____. 1979b. Mortgage Bond Plans Inflate Home Prices, Property Taxes. Savings and Loan News 100(5):38-39.

_____. 1979c. Mortgage Bond Plans Threaten to Displace the Private Market. Savings and Loan News 100(6):30-31.

Toder, Eric, and Thomas Neubig. 1985. Revenue Cost Estimates of Tax Expenditures: The Case of Tax-Exempt Bonds. National Tax Journal 38(3):395-414.

Tuccillo, John, and John Weicher. 1979. Local Mortgage Revenue Bonds: Economic and Financial Impacts. Washington, DC: The Urban Institute.

U.S. Congress, House. Committee on Ways and Means. 1979. Tax Treatment of Mortgage Subsidy Bonds, hearings on H.R. 3712, May, 96th Cong., 1st sess.

_____, Senate. 1981. Congressional Record, 97th Cong., 1st sess., December 7:S14597.

_____, House. Committee on Ways and Means. 1983a. Trends in Municipal Financing and the Use of Tax-Exempt Bonds to Finance Private Activities, hearings on June 15 and 16, 98th Cong., 1st sess.

_____, Senate. Committee on Finance, Subcommittee on Taxation and Debt Management. 1983b. Housing Finance Opportunity Act and Denial of Tax Exemption to Certain Bonds Guaranteed by Federal Agencies, hearing on May 13, 98th Cong., 1st sess.

_____, Senate. Committee on Finance. 1983c. Administration's Fiscal Year Budget Proposal, hearings on June 15, 16, 22, 23, 28, and 29, pr II, 98th Cong., 1st sess.

_____, Senate. Committee on Finance. 1985. Debate on Industrial Revenue Bonds, hearing on June 25, section 99-246, pr. VIII., 99th Cong., 1st sess.

_____, House. Committee on Ways and Means, Subcommittee on Select Revenue Measures. 1988a. Low-Income Housing Tax Credits and the Role of Tax Policy in Preserving the Stock of Low-Income Housing, hearings on March 2 and 3, serial 100-50, 100th Cong., 2nd sess.

_____, Senate. Committee on Finance, Subcommittee on Taxation and Debt Management. 1988b. Expiring Tax Provisions, hearing on March 28, 100th Congress, 2nd sess.

U.S. Department of Commerce, Bureau of the Census. 1983. 1980 Census of Population, part 5, Arkansas.

_____. 1983. Census Tracts, Little Rock-North Little Rock SMSA, 1980 Census of Population and Housing.

U.S. Department of Housing and Urban Development, Little Rock Office. 1984. <u>Affordable Housing, The American Dream</u>. Little Rock: reproduced.

Voinovich on Mortgage Revenue Bonds. 1983. <u>Tax Notes</u> April 11:155.

Weiss, Carole. 1983. Ideology, Interests and Information. In Daniel Callahan and Bruce Jennings (eds.), <u>Ethics, the Social Sciences and Policy Analysis</u>. New York: Plenum Press.

White, Michelle, and Lawrence White. 1977. The Tax Subsidy to Owner Occupied Housing: Who Benefits? <u>Journal of Public Economics</u> 7(1): 111-126.

White, Sharon. 1987. Tax-Exempt Financing Under the Tax Reform Act of 1986. <u>Public Management</u> 69(3):6-9.

_____. 1989. Overview of the Technical and Miscellaneous Revenue Act of 1988 as It Relates to Tax-Exempt Obligations. <u>Municipal Finance Journal</u> 10(1):23-53.

White, Thomas. 1982. HFAs: A State Resource. <u>Journal of Housing</u> 39(2): 38-39.

Wolman, Harold. 1971. <u>Politics of Federal Housing</u>. New York: Dodd, Meade and Co.

Woodruff, John. 1978. NLR Council Establishes Board Empowered to Issue Tax-exempt Bonds to Finance Mortgages. <u>Arkansas Gazette</u> Nov. 17:13a.

Wrightson, Margaret. 1988. <u>Who Benefits From Single-Family Housing Bonds?: History, Development and Current Experience of State-Administered Mortgage Revenue Bond Program</u>. Georgetown University Working Paper.

_____. 1989. The Road to South Carolina: Intergovernmental Tax Immunity and the Constitutional Status of Federalism. <u>Publius</u> 19(3):39-55.

Zerbst, Robert and William Brueggeman. 1977. FHA and VA Mortgage Discount Points and Housing Prices. <u>The Journal of Finance</u> 32(5):1766-1773.

_____. 1979. Adjusting Comparable Sales for FHA and VA Financing. <u>The Appraisal Journal</u> 47(3):374-380.

Zimmerman, Dennis. 1986. Separating Public- and Private-Purpose TaxExempt Bonds. <u>Tax Notes</u> May 5:509-513.

_____. 1988. The Intergovernmental Struggle Over Tax-Exempt Bond Reform. In Michael Bell (ed.), <u>State and Local Finance in an Era of New Federalism</u>. Research in Urban Economics, vol. 7. Greenwich, CN: JAI Press.

_____. 1991. <u>The Private Use of Tax-Exempt Bonds</u>. Washington, DC: The Urban Institute Press.