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WORKING PAPER 83-65

ON THE DISTRIBUTIONAL IMPLICATIONS
OF MORTGAGE REVENUE BONDS
AND CREATIVE FINANCE

BY

DAN DURNING

JOHN M. QUIGLEY

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ON THE DISTRIBUTIONAL IMPLICATIONS OF
MORTGAGE REVENUE BONDS AND CREATIVE FINANCE*

by

Dan Durning

and

John M. Quigley

University of California
Berkeley

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Working Paper 83-65

I. INTRODUCTION

- A. Alternative House Finance
- B. The Capitalization Issue

II. CREATIVE FINANCE AND MORTGAGE REVENUE BONDS

III. FINANCIAL TERMS AND HOUSING PRICES: THEORY

- A. Seller-to-Buyer Finance
- B. "Blended" Concessionary Financing
- C. Mortgage Revenue Bonds

IV. EMPIRICAL EVIDENCE

- A. The Model
- B. The Pulaski County Data
- C. The Regression Results

V. CONCLUSIONS

REFERENCES

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ABSTRACT

Knowledge of the distribution of the benefits of below market mortgage financing is crucial to the evaluation of a number of government policies, including the proposed federal override of "due-on-sale" clauses in mortgage contracts and the effects of local government mortgage revenue bond financing on housing "affordability."

This paper indicates that the widely accepted rule of thumb used by appraisers and real estate professionals to evaluate below-market financing (and which was used to support federal intervention to permit the enforcement of due-on-sale clauses) is simply incorrect.

The paper then analyzes the extent to which the benefits of below-market mortgage financing are capitalized into higher housing prices. The analysis considers direct seller-to-buyer financing, mortgage "blends," and local government mortgage revenue bond financing.

The empirical results, based upon an extensive analysis of transactions in a single housing market, indicate that only about 28-34 percent of seller-to-buyer financing is capitalized into housing prices. This suggests that, at least in the particular market analyzed, buyers gained a great deal through loan assumptions and seller financing. The results also indicate, somewhat surprisingly, that about 18-26 percent of mortgage revenue bond financing was capitalized, suggesting that the value of this program to targeted first-time home buyers is even lower than previously expected.

ON THE DISTRIBUTIONAL IMPLICATIONS OF
MORTGAGE REVENUE BONDS AND SELLER FINANCE

by

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I. INTRODUCTION

A. Alternative House Finance

Mortgage lenders did not anticipate the sustained inflation of the 1970's, and during the latter half of the decade their assets, long-term, fixed-rate mortgages, yielded negative rates of return. During this same period, many of the lenders' traditional customers shifted their savings from low cost, regulated passbook accounts to unregulated money market accounts. This disintermediation forced lenders to borrow heavily at prevailing market rates. As a result, many lenders found that the cost of funds had risen above the return on assets.

Lenders responded to these phenomena by raising mortgage interest rates, first to increase yields, later to ration credit. They also rationed credit by imposing more restrictive rules of thumb -- income-payment formulas and the like -- to persons applying for mortgage loans.

High interest rates and credit rationing came at a time when a

large portion of the baby boom generation was reaching the age at which they would normally be expected to enter the homeownership market. Many of these potential buyers found that credit conditions made owner-occupied housing simply too expensive to afford.

The response to these market forces, beginning in 1978, was a substantial revision of mortgage lending patterns; alternative means of housing finance were developed to supply "affordable" mortgage credit. The two most important forms of alternative finance were below-market mortgage loans, financed by commercial paper issued by state and local governments, and direct seller-to-buyer financing, better known as "creative finance."

Mortgage revenue bonds issued by state and local governments exploit the tax-exempt status of government obligations to provide mortgages to eligible households at interest rates several percentage points below the prevailing market rate. The conspicuous success of Chicago's mortgage revenue bond program in July 1978 stimulated similar issues by other local governments and state agencies.[1]

By 1979, "creative" housing finance, the second and more pervasive response to high interest rates, was an increasingly common component of real estate transactions. The most prevalent of these unconven-

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1. Congressional action halted the use of mortgage revenue bonds for several months beginning in April 1979, but such programs have been permitted in a more restricted form since passage of the Mortgage Subsidy Bond Tax Act of 1980.

tional techniques -- seller financing, contract sales, mortgage assumptions and builder buydowns -- are not really new.[2] However, the widespread adoption of these techniques during the last few years is unprecedented. An estimated 60 percent of all existing houses purchased in 1981 -- and up to 70% during the first half of 1982 -- were financed by these unconventional means.[3]

B. The Capitalization Issue

When below-market mortgage financing is made available to borrowers, the financial terms may have value apart from the bundle of housing goods purchased. The positive consequences of a number of public policies and any evaluation of the policies themselves depend quite specifically upon the way in which these financial terms are valued in the marketplace.

Consider, for example, local government revenue bond programs. The explicit purpose of these programs is to subsidize housing demand, i.e., to address the "affordability" problem by reducing the monthly payment that a household would have to make to purchase a home.[4] Clearly, however, if the value of the below-market financing were cap-

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2. For an early examination of the use of seller financing, see Fred G. Case, "The Use of Junior Mortgages in Real Estate Financing," Journal of Finance, X(1), March, 1955, pp. 41-54.

3. "Quarterly Membership Survey: The Impact of Creative Finance," Real Estate Today, January, 1982, pp. 18-19, and G. Christian Hill, Wall Street Journal, July 17, 1982, p. 1.

italized into sales prices--and merely increased seller profits--these programs would have very different equity consequences.

Some opponents of local government revenue bond programs argue that, in fact, the value of the below-market loan is capitalized: "Shallow interest rates subsidies, such as those produced by municipal tax-exempt mortgage revenue bonds, are likely to be capitalized into higher home purchase prices, thereby creating unnecessary inflationary pressure in local housing markets and eliminating any cost savings provided by the subsidy." [5]

Though the capitalization of the interest rate subsidy is a crucial consideration in the formulation of public policy concerning the use of mortgage revenue bonds, the issue was not addressed in the 1980 and 1983 congressional debates about limiting the scope of these bonds, nor was it noted in the more dispassionate analyses by government and

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4. When mortgage revenue bonds were under scrutiny by Congressional critics, E.F. Hutton bought two full pages of the Wall Street Journal (April 20, 1979, pp. 8-9) to "explain" the purpose of the mortgage revenue bonds. The main theme of this advertisement is generally considered a primary justification for such programs: "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 only at very high interest rates and down payments.... The focus of national debate ought not to be the locally issued, single family mortgage revenue bond, but, rather, what can be done to make housing more affordable for millions of Americans. E.F. Hutton proposes that the single family mortgage revenue bonds issued by local units of government is one way to accomplish that goal."

5. "Mortgage Bond Plans Inflate Home Prices, Property Taxes," Savings and Loan News, May, 1979, p. 38.

non-profit agencies (Congressional Budget Office, 1979; Tuccillo and Weicher, 1979; General Accounting Office, 1983). Apparently, no analysis of mortgage revenue bond loan capitalization has been attempted.

Capitalization is also an important consideration in an evaluation of creative finance. The most frequently used type of creative finance has been the assumption of an existing mortgage combined with seller financing. In large part, however, loan assumptions are only possible because legislative or judicial actions in many states made it virtually impossible for lenders to enforce the due-on-sale clauses typically written into mortgage contracts.

In the policy debate about the enforcement of due-on-sale clauses, it has often been asserted that the value of assumed mortgage loans is capitalized. For example, the study of due-on-sale clauses by the Department of Housing and Urban Development (HUD) states:

"Economic theory suggests that sellers should be able to appropriate most of this gain by selling their houses at a higher price than sellers of houses without assumable mortgages.... If, at current market interest rates, buyers are willing to pay the market price for a house, they should be willing to pay a higher price in order to assume a below-market rate loan. Competition among buyers should assure that selling prices rise by just enough to eliminate any advantages for borrowers.... We conclude that it is original borrower who receives most of the benefits of low rate mortgages....[6]

This line of argument has been used to support the conclusion that

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6. Office of Policy Development, U.S. Department of Housing and Urban Development, An Economic Analysis of Due-on-Sale,

federal action to permit enforcement of due-on-sale clauses would be desirable.[7]

Surprisingly, given the extent of alternative mortgage finance and the importance of capitalization to an evaluation of alternative finance, there is practically no evidence on the subject. This paper provides such evidence on the extent to which different types of below-market financing are capitalized in the market for owner-occupied housing. The plan of the paper is straightforward. Section II describes these alternative forms of mortgage finance more precisely and indicates the extent of their use in recent years. Section III discusses the potential effects of alternative finance upon housing prices and indicates why existing "theory" and appraisal practice is misleading. Section IV presents a simple empirical model to measure these effects and indicates the extent of capitalization which occurred in one market during the early part of 1982. Conclusions are presented in Section V.

II. SELLER FINANCE AND MORTGAGE REVENUE BONDS

So-called creative finance includes those home purchase financing

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Washington, DC: Government Printing Office, 1981, p. 5. A similar, though less explicit, assertion about the capitalization of below-market assumable loans is found in: Federal Home Loan Bank Board Task Force on Due-On-Sale, Final Report, February 1982, p. 5

7. The Garn-St. Germain Depository Institution Act of 1982 will permit all lenders to enforce due-on-sale clauses after October, 1985. In the interim, federally chartered Savings and Loan Institutions (S & L's) can enforce due-on-sale clauses, but banks and state-chartered S & L's have more limited powers to enforce these provisions.

instruments which institutional lenders do not directly originate. Typically, the terms of creative financing appear to be concessionary. The most common form of creative finance has been the assumption of an existing mortgage, [8] often combined with the seller financing of a second mortgage. In the 33 states where "due-on-sale" clauses are enforceable, contract purchase agreements have become widespread. [9] Under these agreements, the seller retains title to the house until the last monthly payment is made by the purchaser. In this way, the sale date of the property can be made to coincide with the term of an existing mortgage. [10]

For new dwellings, where the seller is the builder or developer, "buy downs" may be offered to induce sales. In a typical buy down, a builder will pay a lending institution to reduce the interest rate (and hence the monthly payments) charged to a buyer for some specified

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8. In 1981, about 50% of all purchases of existing houses were financed, at least in part, by mortgage assumptions. This number includes "blends", described in more detail below. Real Estate Today, January, 1982, p. 18.

9. In June, 1982, the de la Cuesta decision gave all federally chartered savings and loan associations the right to enforce due-on-sale clauses despite any contrary state laws or court decisions.

10. Somewhat less common forms of creative finance include wrap-around and shared-equity mortgages. "Wraps" are sometimes used by sellers when property is encumbered by a large first mortgage. Instead of negotiating the assumption of this mortgage, the seller may retain it and negotiate a new first mortgage with the buyer. The seller uses monthly payments from the new first mortgage to make payments on the old mortgage to a lending institution. Shared appreciation mortgages permit an investor (who may not be the seller) to make regular payments in return for a share of the appreciation in house value realized at some future date.

period. Depending upon the specific rules-of-thumb used by the lending institution, such an arrangement can often be structured to make more potential buyers "qualified" for institutional finance.

Table 1 provides some evidence on the extent of creative finance in the market for existing (used) single family houses. Between 1970 and 1981, non-institutional sources of mortgage finance increased tenfold, from \$6.7 billion to \$76.7 billion. Between 1978 and 1980, the relative importance of non-institutional finance more than doubled, from 21% to 45% of all finance for purchasing existing dwellings. In 1981, a larger fraction of the financing of purchases of existing dwellings was provided by individuals than by financial institutions; \$1.26 of financing was provided by sellers (or other individuals) for every \$1.00 originated by banks and other lending institutions. In 1982, alternative finance was heavily relied upon until late Summer. Since then, the use of seller finance has been steadily declining with interest rates. The interest rate comparison is suggestive.

Local government mortgage revenue bonds were pioneered in July 1978 by the City of Chicago, which first used its ability to issue tax-exempt bonds to finance below-market mortgage loans for city residents. Since the subsidy is provided by general tax payers to local residents, it is hardly surprising that these mortgage revenue bonds quickly became quite popular.

TABLE 1

Mortgage Financing and Interest Rates for Sales
of Existing Single Family Houses 1970-1982

Year	Financing					Interest Rate	
	Total (\$B) (a)	Institu- tional (\$B) (b)	Other (\$B)	Other (%)	Annual Change (%)	Percent (%) (c)	Annual Change (%)
1970	29.70	22.99	6.72	22.6		8.20	
1971	41.98	37.33	4.65	11.1	- 50.9	7.54	- 8.0
1972	52.06	50.03	2.03	3.9	- 64.9	7.38	- 2.1
1973	59.36	51.16	8.20	13.8	+253.9	7.86	+ 6.5
1974	61.65	43.38	18.28	29.6	+ 53.4	8.84	+12.5
1975	72.77	53.33	19.45	26.9	- 10.0	9.01	+ 1.9
1976	96.03	80.63	15.40	16.0	- 40.5	8.92	- 0.1
1977	129.64	115.55	14.09	10.9	- 31.9	8.83	- 0.1
1978	161.44	127.02	34.42	21.3	+ 95.4	9.37	+ 6.1
1979	175.59	126.08	49.51	28.2	+ 32.4	10.66	+13.8
1980	153.53	84.62	68.90	44.9	+ 59.2	12.53	+17.5
1981	137.64	60.94	76.70	55.7	+ 24.1	14.51	+15.8
1982	100.64	64.73	35.91	35.7	- 35.9	14.78	+ 1.8

Notes: a. Calculated as: sales of existing houses times median sales price of existing housing times average loan-to-value ratio. Data supplied by Regional Data Associates and National Association of Realtors.

b. Data supplied by Regional Data Associates.

c. Defined as: the national average contract interest rate for conventional mortgage loans made by all major types of lenders for purchase of existing houses. Compiled from the Federal Home Loan Bank Board Journal, various issues.

By April, 1979, over 50 cities in 12 states had issued mortgage revenue bonds, and over a hundred bond issues were in some stage of preparation.

As local government bond activity accelerated, federal tax losses threatened to be substantial. In response, the Mortgage Subsidy Bond Tax Act of 1980 was enacted, placing limitations on the use of mort-

gage revenue bonds!!!, and stipulating that mortgage bonds could not be issued after the end of 1983.

As table 2 shows, the importance of these below-market mortgage revenue bond programs has been growing. The total amount of these funds jumped in 1978, then continued to rise in 1979 and 1980. In 1982, almost 12 percent of the net increase in home mortgages held was financed by state and local government bond issues.

III. FINANCIAL TERMS AND HOUSING PRICES: THEORY

A. Direct Seller-to-Buyer Financing

There has been a surprising consensus among many appraisers, financial analysts and real estate professionals about the ways in which favorable financial terms negotiated between buyers and sellers are reflected in the selling prices of residential properties (and hence agreement about the appropriate adjustment to be made in the posted prices of otherwise comparable properties sold subject to differing financial terms). In particular, the cash value of "creative" finan-

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11. These limitations include: a ceiling on the total amount which can be issued within each state each year; a requirement that ninety percent of lendable proceeds must be made available to first-time home buyers; a limitation on the purchase price of bond-financed housing; and a ceiling on the rate of interest which can be charged by the issuer.

TABLE 2

Increase in Home Mortgage Loans Held
(In Billions)

Year	Net Increase In Mortgages (a)	State/Local Government Increase	Percent of Total
1970	\$ 15.0	\$0.1	0.7%
1971	29.9	0.1	0.3
1972	43.7	0.1	0.2
1973	44.9	0.6	1.3
1974	33.3	0.7	2.1
1975	41.1	0.8	1.9
1976	65.7	0.8	1.2
1977	99.4	0.2	0.2
1978	109.3	1.9	1.7
1979	112.5	4.7	4.2
1980	81.0	7.5	9.3
1981	68.4	6.9	10.1
1982	54.7	6.5	11.9

Notes: a. Net increase in mortgage loans is defined as: total amount of new home mortgages minus loan repayments.

Source: Data for 1970-1981 are from Table 4 in Daniel Larkins, "Recent Developments in Mortgage Markets," Survey of Current Business, February, 1982, p. 22.

Data for 1982 are constructed from Federal Reserve Board "Flow of Funds" data and an estimate by the Council of State Housing Agencies of the amount of funds raised by mortgage revenue bonds in 1982.

cial terms (the difference in present values between market terms and the actual financial terms of the transaction) is to be subtracted from the contractual selling price of a dwelling to reflect the effects of concessionary financial terms (Friedman and Lindeman 1979A, 1979B; Libscomb 1981; Mals 1982; D'Ardenne 1980). The result, the cash equivalent sales price, is, according to the theory, the amount paid for the housing bundle alone.

There remain some controversial details -- whether the cash equivalence calculation should be gross or net of federal taxes (Clauret 1982) and the ways in which the calculation should be adjusted to reflect differences in the market rates for junior mortgages (Findlay and Fischer 1983). Nevertheless, there is reasonable agreement on the underlying theory (which formed the basis for the conclusion of the HUD evaluation of the due-on-sale clauses noted above).

This reasoning is certainly incorrect as a matter of theory and logic, and it is almost surely inaccurate in any empirical application.

The specific financial terms associated with the sale of a residential property are a bundle of valuable services, as is the bundle of public services and taxes which are associated with that property. The proposition that the selling prices of dwellings should be adjusted by the cash value of concessionary financial terms is no more plausible than the proposition that property tax differentials are capitalized dollar for dollar into housing values. Both conclusions depend upon the behavior of suppliers and demanders in a market for highly differentiated commodities, not upon principles of accounting or appraisal.

Sellers are willing to offer differing packages of financing in return for other benefits. In particular, sellers may be quite willing to offer concessionary financial terms, and to incur liquidity losses and some risk of default when compared to a cash sale. In

return for these concessions, the seller may garner certain tax advantages[12] and may expect to reduce the time required to sell a property. A seller may even be willing to provide concessionary financing in order to avoid a psychologically painful decision to lower the sales price of a house. Anecdotal evidence indicates sellers resist lowering sales prices below those at which similar houses have been sold in the neighborhood.[13]

Similarly, buyers are willing to bid for differing packages of financial terms, obtaining the advantages of lower interest rates, lower down payments, avoiding the payment of loan origination points, and gaining more flexible contractual provisions (including the avoidance of institutional rules for mortgage qualification). In return for these advantages, whose value to a buyer is similarly affected by tax considerations and expected tenure in the house, a buyer may be quite willing to bid higher prices.

Equilibrium in the market for differentiated financial terms can be defined as the locus of points where the bid prices of demanders coincide with the offer prices of suppliers.[13] Presumably consumers of

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12. These potential advantages may include the benefits of installment sale reporting and the sheltering of capital gains from the 15% minimum additional tax (which may arise when capital gains and liabilities are spread over several years) and the benefits of converting ordinary income into capital gains.

13. For example, see "Financing Concessions Conceal a Real Slump in the Prices of Houses," Wall Street Journal, August 7, 1981, pp. 1 and 19.

differing incomes and tax brackets will have differing bid prices, and suppliers of differing circumstances and liquidity constraints will make differing offer prices. The distribution of suppliers and demanders of various characteristics will determine the equilibrium market price for alternative financial terms, that is, the capitalization of concessionary finance. There is no reason at all why this market capitalization function need be the same as the function which computes the cash value of differing financial terms; with differentiated buyers and sellers no arbitrage process insures that the market capitalization and cash equivalence functions will be identical.

B. "Blended" Concessionary Financing

In many states, mortgage lenders have been permitted to enforce due-on-sale clauses, but have chosen to compromise with borrowers. The result is a "blend", essentially a three party financing transaction.

A blended mortgage typically requires the buyer to meet the underwriting standards of the lender and to pay a loan origination fee. The mortgage rate to be paid by the buyer is set somewhere between the rate on the existing mortgage and the market rate. In many cases, the "blend" is changed from a fixed-rate to an adjustable-rate mortgage.

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14. This is a straightforward application of the modern analysis of the "hedonic prices" of differentiated products. See Rosen 1974.

The blended mortgage provides to the buyer some of the interest rate advantages of a loan assumption, but the transaction is stripped of many of the important features of direct buyer-to-seller financing. The loss of these features--if they, in fact, are valuable--should affect the capitalization of concessionary terms.

C. Mortgage Revenue Bonds

In contrast to direct seller-to-buyer finance and blends, the concessionary financial terms provided by mortgage revenue bonds are supplied by a third party external to the transaction itself. The effect of the concessionary financing on the sales price of a house should be minimal as long as there are large numbers of potential sellers relative to bond financed buyers.

There are, however, three ways in which revenue bond financing could lead to an increase in the price of housing:

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.

If the market were sufficiently thin or if, as a result of the subsidy, demanders "shopped" less efficiently for housing, then part of the subsidy could be captured by sellers who were encouraged to hold to their asking prices more firmly. We see no compelling theoretical reason why a demand subsidy should lead to less efficient search or shopping behavior; nevertheless evidence on the behavior of low-income households in the Experimental Housing Allowance Program strongly suggests this behavioral response (Friedman and Weinberg, 1982, pp. 115-124).

Sellers could be thoroughly informed about mortgage revenue bond programs and the value of the below-market financing. This knowledge could lead them, if they had houses which qualified for a bond financed loan (and if the number of such qualifying houses were small) to set and hold to prices which would enable them to share the value of the financing. Again, with a "large" number of potential sellers, it is unlikely that higher prices could be maintained.

In any case, the capitalization of revenue bond financing terms is an empirical matter which can be settled by evidence about the operation of the housing market.

In summary, contrary to the assertions repeated in the appraisal and financial literature, and in contrast to the arguments of the HUD task force studying due-on-sale clauses, this discussion leads to the following conclusions.

1. The capitalization of "creative" financial terms negotiated between buyer and seller depends upon the distribution of potential buyers with varying incomes, tax consequences and liquidity characteristics and potential sellers with differing liquidity constraints and evaluations of risk. There is no theoretical reason to presume that the market capitalization of financial terms coincides with the cash equivalent method of comparing terms.
2. The capitalization of below market financial terms offered to buyers by third parties, such as state or local housing finance agencies, depends upon the extent of such subsidies in the market, the effect of the subsidies on the "shopping" behavior of buyers, and the distribution of information about subsidy program to sellers.
3. The evaluation of the importance of the capitalization of financial terms in the market is an empirical matter which can only be resolved by analyzing evidence on the operation of the housing market.

IV. EMPIRICAL EVIDENCE

A. The Model

The relationship between housing prices and concessionary financial terms is estimated by the familiar hedonic regression equation:

$$(1) \quad S = \sum_i \alpha_i x_i + \beta T$$

where S is the selling price of a home, x_i is the i th housing characteristic, T represents financial terms, and the α_i and β are parameters. Specifically, the hypothesis that housing values reflect the cash equivalence of concessionary financial terms implies:

$$(2) \quad T = (PDV_C - PDV_m)$$

where PDV_m and PDV_C are the present values of the agreed upon payment stream (initial payments, "points", monthly payments, and "balloons") at the market rate and the contractual rate of interest respectively, and:

$$(3) \quad \beta = 1$$

By examining the sales agreements on file in the County Courthouse, both PDV_m and PDV_C can be computed; hence equation (1) could be estimated directly. This procedure however, overlooks one major statistical complication. By definition the selling price of each house is

equal to the down payment (d) plus the present value of contractual terms,

$$(4) \quad S = d + PDV_c$$

and substitution of (4) and (2) into (1) yields:

$$(5) \quad S = \sum_i \alpha_i x_i + \beta[S - d - PDV_m]$$

The spurious correlation introduced by including S on the right hand side of (5) means that straightforward ordinary least squares regression relating selling prices to the present discounted value of the savings arising from concessionary financing will yield biased and inconsistent estimates of capitalization effects.[15]

Subtracting βS from both sides of (5) and solving for S removes the spurious correlation in (5), i.e.,

$$(6) \quad S = \sum_i \gamma_i x_i + \delta [-PDV_m - d]$$

where

$$(7) \quad \gamma_i = \alpha_i / (1 - \beta) ; \delta = \beta / (1 - \beta)$$

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15. The only other paper we have seen which analyzes the capitalization of financial terms makes this error (Rosen 1982).

Thus, unbiased estimates of the parameters of (5) are obtained by ordinary least squares estimation of (6) and solving for the α 's and β . In particular, an unbiased estimate of the capitalization effect is:

$$(8) \beta = \delta / (1 + \delta)$$

B. The Pulaski County Data

Our empirical analysis of the effect of mortgage revenue bonds and "creative" financial terms on house prices is based upon observations on sales of 118 single-detached dwellings advertised in the multiple listing service (MLS) in a single housing market (greater Little Rock, Arkansas) during the three month period, December 1981-February 1982. Information on the characteristics of the dwellings was obtained from the MLS records, and information on the financial terms associated with each transaction was obtained from county records maintained by Pulaski County, Arkansas.

The Little Rock data offer a rich sample of the major forms of alternative finance. During this period, the proceeds of two Pulaski County Residential Facilities Board bond issues were available for households with incomes below \$37,500 to purchase houses with mortgages less than \$75,000.[16] At this time, many lenders insisted that loan assumptions be "blended", but there were still a substantial number of direct assumptions of loans.[17] Seller financing was used with

both direct assumptions and blends, and some seller first mortgage loans were recorded.

The sample of Little Rock housing market transactions for the empirical analysis includes observations on: (1) loan assumptions and seller financing which took place without the involvement of a lending institution[18]; (2) mortgage loan assumptions (some with seller financing) with a "blend" mortgage, which required payment of new loan origination points, insured that the borrowers met the lender's underwriting standards, and adjusted the interest rates upward; (3) below-market rate mortgage revenue bond issue loans, for which the buyers were required to meet the lending institution's "qualifications" and the bond program requirements, and were required to pay loan origination points; and (4) new market-rate loans, including conventional, VA and FHA first mortgages from lending institutions.

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16. Pulaski County was an early and frequent issuer of local government mortgage revenue bonds. The funds available in late 1981 and early 1982 were left over from December, 1980 bond issues, probably the last in the nation before the restrictions of the Mortgage Subsidy Board Tax Act of 1980 came into effect. A Fortune magazine article referred to Pulaski County as the "nation's housing bond capital". Lee Smith, "Tax Free Housing Bonds Cost More Than They are Worth," Fortune, July 2, 1979, p. 90.

17. David Palmer, "Local Lenders Insist on Renegotiation, Offer Compromises," Arkansas Gazette, January 17, 1982, p. 1F.

18. We include mortgage "buydowns" in this category. These buy downs involve a direct seller-to-buyer interest rate subsidy, but also go through an institutional lender.

Table 2 provides a summary of the 118 dwellings included in the sample. Part A of the table indicates the living area, lot size and age of the dwellings. Also presented are the average number of bathrooms and garages, and the fraction of houses with fireplaces, and those located in the cities of Little Rock and North Little Rock.

Column 2 presents this information separately for those transactions which included some form of financing negotiated between buyer and seller. Included in this category are 30 assumed or seller initiated first mortgages, some with seller financed second mortgages, and 5 buydowns initiated by builders or developers.

Column 3 presents the same information for those transactions in which buyers were financed through lending institutions. Included in this category are 15 market-rate first mortgages (including Conventional, VA and FHA), 19 institutionally approved "blends", and 49 transactions that were financed from the proceeds of mortgage revenue bonds.

The table indicates that the average property had 1,750 square feet of living space and a lot size of about 12,000 square feet. Dwellings were, on average, about 11 years old, with two baths and 1-1/2 garages. The properties sold for \$69,000. On average, the housing characteristics are quite similar for dwellings financed by sellers and by lending institutions.

TABLE 2

Means and Standard Deviations
of Characteristics of Properties
(Standard Deviations in Parentheses)

A. Housing Characteristics	All Transactions N = 118	Seller Financed N = 35	Institutionally Financed N = 83
Selling Price	\$ 69398.00 (27506.00)	\$ 68493.00 (33154.00)	\$ 69768.00 (24731.00)
Living Area (Sq. Feet)	1756.30 (568.20)	1705.70 (643.20)	1777.70 (532.00)
Lot Size (Sq. Feet)	11773.00 (6513.70)	9923.50 (3061.40)	12557.00 (7368.40)
Age (Years)	11.03 (13.31)	10.51 (10.47)	11.25 (14.33)
Fireplace (1 = Yes)	0.73 (0.45)	0.57 (0.49)	0.80 (0.40)
Number of Baths	2.04 (0.51)	1.97 (0.46)	2.07 (0.53)
Number of Garages	1.57 (0.64)	1.54 (0.65)	1.59 (0.64)
Little Rock (1 = Yes)	0.65 (0.48)	0.71 (0.45)	0.63 (0.48)
N. Little Rock (1 = Yes)	0.14 (0.34)	0.06 (0.23)	0.17 (0.37)

TABLE 2
(Continued)

Means and Standard Deviations
of Characteristics of Properties
(Standard Deviations in Parentheses)

B. Cash Value of Concessionary Finance	All Transactions N = 118	Seller Financed N = 35	Institutionally Financed N = 83
All Mortgages (N = 118)	\$ 11441.00 (82058.00)	\$ 14826.00 (10815.00)	\$ 10013.00 (6288.00)
Institutionally Financed			
Market Rate (N = 15)	-0-	---	---
Bonds (N = 49)	4829.70 (6056.00)	---	11631.00 (3036.40)
Blends (N = 19)	2213.40 (5782.20)	---	13746.00 (7007.80)
Seller Financed			
Assumptions (N = 26)	3421.60 (7875.20)	15529.00 (9667.21)	---
Seller First Mortgages (N = 4)	653.78 (4770.50)	19287.00 (17664.00)	---
Buydowns (N = 5)	332.20 (1695.80)	7604.60 (3534.00)	---

Note: Means reported by Column 1 are for all 118 transactions.
Means reported in Columns 2 and 3 are for those dwellings sold
with a given type of financing.

Part B of the table summarizes the concessionary financing associated with these transactions. Compared to market interest rates[19], the average concession was about \$11,000 in present value terms. The average concession for institutionally financed transactions was \$10,000, including market rate financing (at no concession), mortgage revenue bond financing (at a \$12,000 average concession), and blends (at almost \$14,000, on average). The present value of the savings associated with seller financed transactions was almost \$15,000, including \$7,600 in buydowns, \$15,500 in mortgage assumptions, and over \$19,000, on average, in seller financed first mortgages.

C. The Regression Results

Table 3 presents estimates of equation (6), the hedonic relation between the selling price of houses and their characteristics. Column (1) includes four physical characteristics of dwellings. The coefficients of the living area and lot size variables are highly significant, and indicate that larger dwellings on larger parcels command a premium. The age coefficient, also highly significant, suggests that, ceteris paribus, a dwelling ten years older would sell for a discount of about \$3,200; the results also indicate a substantial premium for

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19. The market rate of interest was calculated as the average of the December, 1981 and January and February, 1982 contract interest rates for loans made for purchase of existing houses: The Federal Home Loan Bank Board Journal, May 1982, Table S5.1. The analysis was also conducted using an alternative discount rate, the market value of a treasury note or bond with a term equivalent to that recorded for each house sale. The results are indistinguishable from those reported below.

dwellings with fireplaces (generally a proxy for higher quality luxury homes).

TABLE 3
Estimates of Capitalization
of Financial Terms
(t ratios in parentheses)

Variable	A. Regression Estimates					
	1	2	3	4	5	6
Living Area	26.71	26.24	16.23	14.96	16.53	15.18
(Sq. feet)	(8.68)	(8.86)	(5.45)	(4.95)	(5.36)	(4.86)
Lot Size	0.99	1.13	1.44	1.52	1.46	1.53
(Sq. feet)	(3.74)	(4.21)	(6.32)	(6.69)	(6.27)	(6.63)
Age	-315.34	-412.50	-221.10	-281.30	-218.80	-279.20
(Years)	(2.40)	(3.04)	(2.02)	(2.49)	(1.99)	(2.46)
Fireplace	10395.10	9429.30	6124.40	6303.10	5966.30	6192.80
(1 = Yes)	(2.41)	(2.19)	(1.64)	(1.71)	(1.58)	(1.67)
Little Rock		10028.40		6666.80		6613.00
(1 = Yes)		(2.41)		(1.92)		(1.90)
N. Little Rock		7172.00		11837.60		11786.20
(1 = Yes)		(1.28)		(2.54)		(2.51)
Seller Finance			0.507	0.520	0.510	0.520
(Cash Equiv.)			(7.38)	(7.43)	(7.36)	(7.39)
Inst. Finance			0.350	0.360		
(Cash Equiv.)			(5.38)	(5.44)		
Blends					0.340	0.350
					(4.67)	(4.82)
Bonds					0.360	0.370
					(5.00)	(5.02)
Constant	6703.12	214.12	1868.50	2729.00	1069.40	3262.10
	(1.14)	(0.03)	(0.38)	(0.52)	(0.20)	(0.58)
R2	0.61	0.62	0.73	0.74	0.73	0.74
B. Estimated Capitalization Rates (%)						
Seller Finance			33.64%	34.21%	33.77%	34.21%
Inst. Finance			25.93	26.47		
Blends					25.37	25.93
Bonds					26.47	27.00

In column (2), the model is expanded to include dummy variables for more centrally located properties in the cities of Little Rock and North Little Rock. The results are consistent with a sizeable accessibility premium in the metropolitan housing market. These simple regressions explain about 60 percent of the variation in housing prices.

The results reported in columns (1) and (2) are broadly consistent with expectations and with previous results on price determination in the market for owner-occupied housing.

The next two columns report the results when the cash equivalent concessionary financial terms is added to the model. The coefficients of both variables are highly significant; with the addition of these variables, the simple regressions explain about three quarters of the variation in selling prices. These results suggest substantial capitalization of concessionary seller financing into housing prices. Specifically, from equation 8 the regression results indicate that 33-34 percent of the cash equivalent of these negotiated terms is reflected in higher selling prices. Stated another way, in contrast to the assumption that concessionary financial terms are reflected dollar-for-dollar in increased housing prices, these empirical results suggest that roughly three quarters of the face value of the concession represents a true price reduction, and about one quarter of the concession is reflected in higher prices.

The coefficients in columns (3) and (4) also suggest that institu-

tionally financed concessionary terms (here defined to include blends as well as bonds) are capitalized into significantly higher sales prices. Interpreted at face value, the coefficients suggest that one quarter of the face value of the concessionary terms is capitalized into higher prices. In part, this result may be attributable to the importance of blends; it suggests that sellers are able to sell the right to apply to the lending institution for a blend for about one fifth of the prospective savings.

In columns (5) and (6), the cash value of institutional finance is disaggregated into separate bond and blend categories. Somewhat surprisingly, the results indicate that blends and bonds are capitalized at the same rate.

It is understandable that blends are capitalized at a lower rate than those creative financing arrangements negotiated wholly outside of institutional lenders. This difference reflects the value of the origination points, and the avoidance of scrutiny and verification of institutional lenders' underwriting standards. The difference may also reflect the differential value of fixed-rate mortgages compared to variable rate mortgages. Most loans assumed were fixed rate mortgages, but lenders required almost all of the blends to be changed to variable rate mortgages.

Capitalization of the subsidy provided by mortgage revenue bonds is genuinely surprising. To test the robustness of this result (and to satisfy our own skepticism), we conducted one further statistical analysis -- a stratification of the sample by type of finance. Table 4 presents the results of this investigation. Columns (1) and (2) compare seller-financed transactions (N=35) with arms-length market rate transactions (N=15); columns (3) through (6) compare all forms of institutional finance, bonds, blends, and market rate finance. The estimated capitalization rates are quite similar for these stratified models to those reported in Table 3. Concessionary seller finance is capitalized at 29-30 cents on the dollar and institutional finance at 18-19 cents. The capitalization rates for blends and bonds are the same.

Conversations with participants in the local housing market during this period clearly establish that sellers and builders were well aware of the existence of below-market bond financing and, frequently, of the identities of prospective purchasers who qualified for subsidized financing. For example, a major portion of one of the bond issues was set aside for new house financing. Builders used the bond funds as "take out" loans, paying commitment fees to lenders to reserve the money.

In the market for existing housing, realtors had a more informal arrangement with lenders. Realtors could reserve a certain amount of bond money for a limited period of time, though they did not pay com-

TABLE 4

Estimates of Capitalization of
Financial Terms Stratified by Source
(t ratios in parentheses)

	Seller Finance		Institutional Finance			
A. Regression Estimates						
Variable	1	2	3	4	5	6
Living Area (Sq. feet)	17.33 (3.38)	14.56 (2.81)	19.83 (5.54)	19.73 (5.67)	19.92 (5.67)	19.78 (5.33)
Lot Size (Sq. feet)	1.72 (4.51)	1.76 (4.58)	1.36 (5.88)	1.47 (6.49)	1.36 (5.78)	1.47 (6.38)
Age (Years)	-423.55 (1.71)	-532.17 (1.98)	-275.02 (2.34)	-358.29 (3.02)	-274.32 (-2.31)	-357.82 (-2.98)
Fireplace (1 = Yes)	9945.72 (1.49)	9809.92 (1.51)	3270.25 (0.70)	2663.87 (0.65)	3239.81 (.68)	2950.17 (.64)
Little Rock (1 = Yes)		11205.50 (1.47)		10356.80 (2.63)		10347.80 (2.61)
N. Little Rock (1 = Yes)		2250.20 (2.31)		11713.90 (2.36)		11724.5 (2.35)
Seller Finance (Cash Equiv.)	0.41 (4.40)	0.43 (4.56)				
Inst. Finance (Cash Equiv.)			0.23 (3.28)	0.22 (3.17)		
Blends					.22 (2.93)	.22 (2.90)
Bonds					.23 (2.99)	.22 (2.86)
Constant	2284.81 (0.25)	-3223.36 (0.32)	7109.77 (1.18)	-1128.78 (0.17)	6872.3 (1.01)	1253.71 (.174)
R2	0.68	0.70	0.70	0.72	.69	.72
Number of Observations		50			83	
B. Capitalization Rates (%)						
Seller Finance	29.08%	30.07%				
Inst. Finance			18.70%	18.03%		
Blends					18.03%	18.03%
Bonds					18.70%	18.03%

mitment fees for the funds. When they matched a buyer qualified for a

bond loan with a seller whose house also qualified, they could direct the buyer to the lender who had "their" bond money. Since realtors are often counsellors to sellers, and are often involved in setting asking prices and providing advice about the prevailing market situation, they are in a position to help sellers capitalize the bond money.

As noted earlier, however, widespread knowledge of the identities of those prospective purchasers who qualify for bond financing and the counsel of brokers are not sufficient by themselves to insure capitalization of the bond subsidy -- at least not as long as sellers are reasonably competitive.

It is possible, however, that the form of the subsidy acts to make buyers less competitive in the market by searching available dwellings less aggressively. For qualified dwellings, the revenue bond subsidy acts as an open-ended housing price reduction for any households eligible for the program. Consider, for example, that a household has tentatively chosen a dwelling. This household will decide to search an additional dwelling if the expected benefit in terms of lower prices exceeds the cost of search. However, a dollar's saving in gross housing prices yields less than a dollar in net savings to any household that qualifies for revenue bond financing. Since the expected benefit to additional search is thereby reduced, it is rational to expect search to be less intensive.

Again, the empirical evidence suggests that almost one fifth of the

bond subsidy is reflected in higher prices -- due to less aggressive search by purchasers, due to thin or weakly competitive markets, or for some other reason.

V. CONCLUSION

In recent years, a number of policy choices have been advocated based, at least in part, upon judgments about the magnitude and distribution of benefits of below-market mortgage financing. For example, the theoretical "deduction" that the cash value of assumed mortgages would be capitalized into higher housing prices was used as an argument by the federal executive branch to encourage legislative action to permit the enforcement of due-on-sale clauses. Similarly, the conclusion that federally financed mortgage revenue bonds would make housing more "affordable" to first-time buyers is based upon the theoretical presumption that such subsidies would not be capitalized into higher prices.

At the local level, the appropriate appraisal practices for adjusting sales prices of comparable properties and local assessment policies for computing tax liability based on real property valuation similarly depend upon some "judgment" about capitalization or some empirical evidence.

This paper indicates why the resolution of this issue requires empirical evidence as well as theory and presents a statistical analysis of the capitalization of financial terms in one market. The

results, obtained during a period of high interest rates in early 1982, suggest that 28-34% of the cash value of seller financing (assumptions and direct seller loans completed without the involvement of an institutional lender) was capitalized into house prices. Stated another way, these results suggest that more than 70% of the cash value of the concessionary terms offered by sellers during this period of high interest rates was, in fact, concessionary. When concessionary loan assumptions involved an institutional lender, creating "blends", the rate of capitalization was somewhat less, about 18-26%. The lower rate of capitalization indicates that non-financial features of direct buyer-to-seller financing has considerable value itself. The results also indicate, somewhat surprisingly, that subsidized revenue bond mortgages, below-market loans procured by buyers from mortgage lenders are capitalized at about 18-19%, at least in this metropolitan housing market.

Taken together, these results weaken the principal argument which was used to justify a federal override of those state laws and court decisions which limited the enforcement of due-on-sale clauses. Since sellers were able to capitalize only a small fraction of the transfer from lenders, the nullification of due-on-sale clauses actually would have made housing more "affordable" for some buyers.

Also, the results may make even stronger those arguments against the use of local government mortgage bonds. Since sellers capture about twenty percent of the value of bonds, the benefits of the bond program in terms of "affordable housing" are even lower than had been

claimed.

These conclusions do not suggest that the quantitative findings about the capitalization of alternative financing in Pulaski County during early 1982 are generalizable to all housing markets at other times. However, the analysis does provide the first piece of empirical evidence about the distribution of the benefits of below-market financing among housing market participants and suggests that simplistic assumptions about about the full or partial capitalization of benefits are unwarranted.

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