

Price Distortions Induced by the Revenue Structure of Federally-Sponsored Mortgage Loan Programs

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THE BUNDLE OF GOODS represented by a residential mortgage loan may be separated into two components: (1) financing, provided by a mortgage lender; and (2) loan origination and administration, provided by a mortgage originator/service. In a competitive, non-regulated market each of these goods should be priced to cover its marginal cost of production.

The marginal dollar cost of the first of these two goods, financing, is proportional to the total dollar amount of the loan, while the marginal dollar cost of the second, loan origination and administration, varies little by loan size. However, under federally-sponsored residential mortgage loan programs, the revenues (prices) received by both the mortgage lender (i.e., interest payments) and the mortgage originator/ servicer (i.e., origination and servicing fees) are proportional to the total dollar amount of the loan.¹ This paper examines the implications of this pricing structure for mortgagors and loan originator/ servicers and suggests an alternative structure that should alleviate some of the problems engendered by the current system.

1. THE REVENUE STRUCTURE OF FEDERALLY-SPONSORED MORTGAGE LOAN PROGRAMS

Under the FHA mutual mortgage insurance plan and the VA mortgage guarantee program, the maximum fee that a mortgage originator may assess against a mortgagor for arranging and processing a loan is one-percent of the face amount. This fee ceiling means that the costs of producing small loans often exceed the revenues received for performing this service.

When a mortgage originator sells a loan to FNMA or GNMA, or issues a GNMA mortgage-backed security, the seller receives a monthly "servicing fee" that is determined as a fixed percentage of the declining balance of the loan.² On loans sold to FNMA the fee is equivalent to an annual rate of three-eighths of one-percent of the unpaid principal; while on loans sold to GNMA, or used to support a mortgage-backed security, the annual rate is forty-four hundredths of one-

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¹ * Penner and Silber [10] contains an excellent review of the various federally-sponsored mortgage loan programs.

² For a discussion of the technicalities of mortgage loan administration, see DeHuszar [2].

percent.³ Thus, *ceteris paribus*, large loans are clearly more profitable to originate and service than similar small loans.

The differential profitability among loan sizes may produce one of three outcomes: First, the borrowers of small loans may be unable to obtain funds because their loans are not profitable to originate and service. This might be called the credit-rationing effect.⁴

Second, if loans of all sizes are granted on the same terms, a wealth-transfer from the borrowers of large loans to the borrowers of small loans may occur because the prices paid by the former group more than cover the marginal costs of their loans. The excess payments on these loans offset the deficits on smaller loans. This might be called the indirect-subsidy effect.

Third, loan producers may require additional side-payments on small loans to compensate for the underpricing of their origination and servicing. One way in which the originator might accomplish this is by levying larger "front-end" discounts on small loans, thereby earning a marketing profit (capital gain) when the loans are resold in the secondary market. Although the discount points on FHA/VA loans technically are paid by the property seller, in practice, property prices are adjusted upward to cover the discount. Thus, the cost actually is borne by the mortgagor. This might be called the full-cost effect.

To determine which of these three effects predominates in practice, a group of eight mortgage banking companies (MBC's) were asked to describe their mortgage pricing policies.⁵ At the time of the survey, one firm granted loans to all borrowers on the same terms, while one firm refused to grant loans of less than \$18,500, but provided the same terms on all loans above that amount. For these two firms the indirect-subsidy effect predominated, although for the second firm, the credit-rationing effect predominated for loans below \$18,500.

The remaining six firms all practiced differential pricing on the basis of loan size. A representative pricing schedule provided by one company is presented in Table 1. For these six companies it would appear that the full-cost effect predominated.⁶

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However, unless the discount points were set at a level sufficient to fully offset the differences in origination and servicing revenues on different loan sizes, there may have been an indirect-subsidy effect even for these firms.

³ The servicing fee is subtracted from the monthly mortgage payment before it is transmitted to the permanent investor. The investor receives a "net" interest rate equal to the gross interest rate less the servicing fee. Other institutional mortgage investors are consistent with FNMA/GNMA in setting their servicing fee as a fixed percentage of the declining loan balance. This practice is motivated by FHA/VA regulations which permit only a one percent "original" servicing fee on all loans. Since investors are interested in obtaining a constant net interest rate regardless of loan size, a proportional servicing fee has evolved as a compromise between FHA/VA requirements and investor demands.

⁴ At the risk of overstatement, the credit-rationing effect may be related to the problem of "redlining." That is, the refusal by institutions to service lower income borrowers may be induced by a revenue structure that makes small loans unprofitable to originate and service, even though they are insured by FHA or guaranteed by VA.

⁵ The motivation for using MBC's in this sample was twofold: First, MBC's are the primary producers and services of FHA/VA loans [6]. Second, unlike other financial intermediaries, MBC's do not hold loans for investment purposes. Therefore, using MBC's provides a convenient and explicit separation of the financing of the loans from their origination and administration.

⁶ Additional evidence of the larger discounts required on smaller loans is provided by the statistical studies that have found an inverse relationship between mortgage yields and loan size [12] or mortgage yield and property value [9]. These studies amortized the discount points on the loans to compute their "yields-to-maturity."

TABLE I
MORTGAGE COMPANY PRICING SCHEDULE
FOR FHA/VA LOANS

Loan Amount	Discount Points
\$30,000 and up	5.0 points
\$20,000 to \$29,999	5.5 points
\$15,000 to \$19,999	6.0 points
\$ 10,000 to \$14,999	7.0 points

To give some indication of whether or not these price adjustments were adequate, a stochastic discounted cash-flow model was used to compute the discount points required in the primary market for an MBC to break-even (i.e., earn a zero expected net present value) on loans of different sizes.⁷ Financial data provided by the eight MBC's were used to estimate the various cash-flow parameters incorporated in the model.⁸ The computations assumed that the secondary market price for which the loans could be resold was four discount points.⁹ The results are presented in Table 2.

TABLE 2
NVP "BREAK-EVEN" PRICING SCHEDULE

Loan Amount	Computed "Break-even" Discount Points
\$30,000	3.25 points
\$19,999	4.35 points
\$14,999	5.45 points
\$10,000	7.10 points

Although the absolute levels of the discount points in Tables I and 2 are not directly comparable (since they depend upon the secondary market price, which may or may not be comparable), it is possible to compare the differential in discount points among loans of different sizes. Table 2 shows that the computed break-even discount point differential between a \$14,999 loan and a \$30,000 loan was 2.2 points; while the difference between the discount on a \$19,999 loan and a \$30,000 loan was 1.1 points. Table I shows that the actual spreads between the required discount points on these loan sizes were slightly less than the computed differences, being 2.0 points and 1.0 points respectively. These results indicate that, in general, the full-cost effect did prevail for the firms that adjusted their

⁷ The model is based on the premise that it is profitable to originate and service a loan only if the present value of the cash benefits that the MBC expects to receive for performing these functions exceeds the present value of the expected cash expenditures. A detailed discussion is available in [7] or [8].

⁸ The parameter values used in the computations were best estimates. However, sensitivity analysis indicated that the same general relationship among loan sizes held over a wide range of parameter values.

⁹ Since the net interest rate received by the institutional investor is the same on all loans, there is no reason for the secondary market price to differ by loan size. The 4.01% discount used in these computations is representative of the discount which prevailed at the time these data were collected, but because the secondary market price was fluctuating, it was not possible to tie the data to an exact secondary market discount.

prices, although some wealth-transfer may have existed at the extremes and within price categories.¹⁰

II. AN ALTERNATIVE PRICING STRUCTURE

The foregoing analysis indicates that borrowers generally pay the full cost of mortgage financing, including the cost of originating and servicing their loans. These results are consistent with the results that would be expected in a competitive, non-regulated market. However, since regulated prices are likely to be a continuing feature of federally-sponsored mortgage loan programs, an alternative pricing structure merits consideration.

A revenue structure that would seem to more closely approximate the cost structure of producing and servicing loans is a fixed-dollar ceiling on the origination fee and a fixed-dollar per annum (or per month) servicing fee.¹¹ A fixed-dollar servicing fee could be instituted by setting the net interest rate received by the institutional investor at a competitive level and adding a clearly identified servicing fee. The primary effect of this fee structure would be to alter the timing rather than the (present value) amount of the total payments. The proposed revenue structure should yield several benefits.

First, to the extent that mortgage prices across firms and within price categories are not fully adjusted to offset the difference in revenues among loan sizes, the present system does induce a wealth-transfer from the borrowers of large loans to the borrowers of small loans. The fixed-dollar structure should eliminate the indirect-subsidy since marginal revenue should equal marginal cost on each loan.

Second, the proposed fixed-dollar fee structure may be advantageous to liquidity constrained borrowers. Under the present system, the dollar amount of the servicing fee is larger in the early years of the loan's life and declines as the loan matures. Under a fixed-dollar system, the dollar amount of the servicing fee would be constant (or increasing if it is inflation-adjusted) throughout the loan's life. In comparison with the present proportional fee arrangement, under a fixed-dollar system, the dollar amount of the servicing fee would be smaller in the early years of the loan's life and larger in later years. For example, under the present system, the dollar amount of the fee in the first year on a \$20,000 loan is $(.00375 \times \$20,000 =)$ \$75.00; while it is \$150.00 on a \$40,000 loan. However, the cost data used in this study indicate that a servicing fee of approximately \$25.00 per annum should cover variable servicing costs. Thus, the proposed fee structure translates into a smaller monthly mortgage payment (relative to the present structure) in the early years of the loan's life and a larger payment as the loan matures. If house buyers are liquidity-constrained¹² and anticipate increasing incomes over time, the fixed-dollar (inflation-adjusted) servicing fee should conform better with their ability to pay.¹³ Third,

¹⁰ It is interesting, in light of these results, to consider the likely outcome of proposals by various legislators to disallow discount points on federally-sponsored loans. Even if the interest rate were set so that the average size loan would sell at par value in the secondary market, the disallowance of discount points would probably exacerbate the credit-rationing effect for smaller loans.

¹¹ In examining this problem from a different perspective, Guttentag [4] has suggested that the credit-rationing effect could be alleviated by varying interest rate ceilings according to loan size. Such a policy would be consistent with various state laws that establish interest rate ceilings on loans extended by consumer finance companies.

¹² The fact that most mortgagors are attracted to the FHA and VA loan programs because of their reduced down payment requirements suggest that these borrowers are liquidity-constrained. Further-more, since the preponderance of mortgage defaults occur within several years after loan inception [1] [3] [5] [13] a system that reduces costs early in the loan's life should reduce foreclosures.

¹³ The fixed-dollar fee structure may yield an additional benefit to the liquidity-constrained borrower. Typically, discount points on FHA/VA loans are reflected in a higher property price. Since the increased price cannot be fully mortgaged, the required down payment is increased. To the extent that a fixed-dollar fee structure reduces discount points and, therefore, the required down payment, it should further benefit liquidity-constrained borrowers.

a fixed-dollar fee structure should make all loans equally profitable to originate and service, thereby eliminating any credit-rationing that does result from the present fee structure.

Finally, to the extent that the need to establish differential discount points according to loan size represents an inefficient pricing mechanism, a fixed-dollar structure should reduce this inefficiency and, therefore, the cost of producing and obtaining mortgage loans.

Although institution of the proposed fee structure would require coordination of FHA, VA, FNMA and GNMA, the benefits should be worth the effort.

REFERENCES

1. Steven E. Bolten. "Residential Mortgage Risk Characteristics," *Decision Sciences* (January 1974), pp. 73-85.
2. William I. DeHuszar. *Mortgage Loan Administration* (New York: McGraw-Hill Book Company, 1972).
3. *FHA Experience With Mortgage Foreclosures and Property Acquisitions* (Washington, D.C.: Housing and Home Finance Agency, 1963).
4. Jack M. Guttentag. "Changes in the Structure of the Residential Mortgage Market: Analysis and Proposals" in *Study of the Savings and Loan Industry*, Irwin Friend, ed. (July 1969), pp. 1479-1559.
5. John P. Herzog and James S. Earley. *Home Mortgage Delinquency and Foreclosure* (New York: Columbia University Press, 1970).
6. *Loans Closed and Servicing Volume* (Washington, D.C.: Mortgage Bankers Association, 1974).
7. John J. McConnell. *Mortgage Companies - A Financial Model and Evaluation of their Residential Real Estate Lending Activities*, unpublished Ph.D. thesis, Purdue University, (1974).
8. _____. "Valuation of a Mortgage Company's Servicing Portfolio," *Journal of Financial and Quantitative Analysis* (September 1976) pp. 433-453.
9. Alfred N. Page. "The Variation of Mortgage Interest Rates," *The Journal of Business* (July 1964), pp. 280-294.
10. Rudolph G. Penner and William I. Silber. "The Interaction between Federal Credit Programs and the Impact on the Allocation of Credit," *American Economic Review* (December 1973), pp. 838-852.
11. *Report of the Commission on Mortgage Interest Rates* (Washington, D.C.: U.S. Government Printing Office, 1969).
12. Richard L. Sandor and Howard B. Sosin. "The Determinants of Mortgage Risk Premiums: A Case Study of the Portfolio of a Savings and Loan Association," *The Journal of Business* (January 1975), pp. 27-38.
13. George M. Von Furstenberg. "Default Risk on FHA-Insured Home Mortgages as a Function of the Terms of Financing: A Quantitative Analysis," *Journal of Finance* (June 1969), pp. 455-465.

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Along this line of argument, at least one federally-sponsored study [11] has concluded that discount points present a more difficult barrier for potential borrowers to scale than increases in the contract interest rate.