

The Viability of the Thrift Industry

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Abstract

The defining characteristic of a thrift institution is the statutory requirement that it hold a specified percentage of its assets in certain residential mortgage-related instruments. Under new capital requirements and limitations on asset diversification, thrifts must earn a higher return on their mortgage assets, without taking on additional default risk or interest rate risk. The study uses a new empirical model to compute expected profitability, adjusted for risk, and concludes that expected returns from mortgage investment are inadequate to provide a market rate of return on required equity. Thrifts therefore should not be required to invest in home mortgage loans. If the existing requirement is preserved, the industry will experience impaired profitability, rising insolvencies, and continuing attrition.

The viability of the thrift industry

Thrift institutions, and especially those chartered as savings and loan associations (S&Ls), have historically played a large role in the provision of housing finance. In typical years, they originated and held roughly half of the residential mortgage loans in the United States. Thrifts did so because of laws and regulations that required them to invest in mortgages and prohibited them from engaging in certain other activities, because of tax and other incentives that encouraged them to invest in mortgages, and because mortgages provided an apparently low-risk asset in comparison with the alternatives available.

In recent years, the reasons for thrifts to participate in the mortgage market have become less compelling. Despite some new restrictions imposed in 1989, thrifts face fewer constraints on the reallocation of assets away from mortgages now than they did at the beginning of the 1980s. The tax incentives for mortgage investment have been reduced. And with increased competition, traditional mortgage products now offer less appealing rates of return. As a

result, thrifts have altered their portfolios to de-emphasize mortgage lending. The current policy debate concerns the viability of thrifts as mortgage lenders.

This paper reviews the performance of thrift institutions and the requirements for their participation in the mortgage market. We examine actual returns to mortgage investment, but because realized profitability is subject to many unpredictable factors, we also use a new empirical model to compute expected profitability. We conclude that expected returns from mortgage investment for thrifts have declined since the early 1980s and are inadequate to provide a market rate of return on required equity. Portfolio restrictions that require mortgage investment together with higher capital requirements may be expected to impair the viability of the thrift industry in the future. Regulation of thrifts therefore should be rationalized to permit, but not require, thrifts to invest in home mortgage loans.

Framing the issue

Thrift institutions engage in a variety of mortgage-related activities. They originate and service whole loans, and they trade and hold both whole loans and mortgage-related securities. Mortgage-related revenues come from origination and servicing fees, coupon interest, gains on sales, and miscellaneous sources such as prepayment penalties and escrow accounts. The legal definition of a thrift, however, is quite narrow: an institution that, once chartered as a savings institution, holds a specified percentage of total assets in mortgages and/or mortgage-backed securities (MBS). These are not unique instruments. Other types of institutions can and do hold similar assets. Nor is there any requirement for thrifts to originate new loans or to increase investment in mortgages over time.

The issue is whether thrifts should continue to be required to hold mortgage-related assets. Absent regulation, many, if not most, would choose to continue their specialization in mortgage-related activities, but it would be specialization by choice rather than by regulation. This paper considers the historical effect of statutory thrift specialization on the cost and availability of mortgage funds, and the implications for the thrifts of continuing this specialization.

Definition of a thrift

The current rules defining a thrift institution were enacted in the Competitive Equality Banking Act of 1987 (CEBA) and modified by the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA).¹ To be a qualified thrift lender (QTL), a savings institution must have 70 percent of its portfolio assets in “qualified thrift investments,” defined as residential real estate investments (defined below) and other qualified investments (e.g., consumer loans and mortgages for nonprofit organizations). At least 55 percent of portfolio assets must be in the residential real estate-related investment basket: home mortgages and home improvement loans, loans on manufactured housing (mobile homes), home equity loans, MBS, and certain obligations of the deposit insurance agencies. “Portfolio assets” means tangible assets less premises and required liquidity; portfolio assets equal approximately 90 percent of total assets for the typical thrift.

Until the early 1980s, there was little need for a minimum percentage of mortgages because there were so few permissible alternatives. The expansion of thrift asset powers in the Depository Institutions Deregulation and Monetary Control Act of 1980 led to the imposition of a “thriftiness” test in the Garn-St Germain Depository Institutions Act of 1982, a test based on long-standing provisions in § 7701(a)(19)(c) of the Internal Revenue Code. The qualifying percentage in the tax law was 82 percent, but many asset types in addition to those listed above (such as cash and U.S. Treasury obligations) were included. The CEBA requirements slightly narrowed the definition imposed by Garn-St Germain and set a 60-percent threshold. FIRREA made further adjustments and established the current 70-percent level.

A thrift that does not qualify for QTL status will have its scope of activities restricted, will be cut off from access to Federal Home Loan Bank (FHLB) advances, and may be restricted in the acquisition of thrift institutions across state lines. In failing the Internal Revenue Code test, it would raise its statutory tax rate by 2.7 percentage points or less (a maximum 8.7 percent increase in its tax liability).² The most stringent sanction would apply to the nonbanking activities currently permitted to thrifts. Thrifts failing the QTL test can engage only in the more limited range of activities permissible for national banks. In effect, putting 70 percent of the

assets of a thrift into a narrow range of banking activities (i.e., qualifying thrift investments) permits the thrift to put all its remaining assets into a wide range of nonbanking activities.

Changes in thrift balance sheets

Most thrifts meet the standards of the current QTL test; yet, at the margin, substantial diversification away from mortgages has taken place. Many activities can be conducted at the holding company level where the QTL test does not apply. Within the thrift itself, the test is generally not constraining because it applies to the stock of assets rather than to the flow. Qualifying asset levels were substantially above the current minimum percentage of assets for most thrifts when they began to diversify. Given the long lives of mortgage-related assets, even a major shift in the focus of new investment will change the overall portfolio composition only slowly.

Table 1 presents various measures of activity for savings institutions insured by the Federal Savings & Loan Insurance Corporation (FSLIC), some based on assets and others on income. The distinction is necessary because investment precedes income for some activities, such as leasing, while for others, such as mortgage banking, the value of the earning asset may not appear on the balance sheet. Although the categories and measures of activity are somewhat arbitrary, they are representative of broad trends under way in the thrift industry.

The table shows that traditional mortgage lending (portfolio investment) is the only activity to have a clear decline since the beginning of the 1980s. Mortgage banking activity has increased, as shown by the rising ratio of loans serviced to loans held, a ratio that has grown by a greater extent than is attributable to the decline in loans held. Some thrifts have shifted their asset mix away from mortgage loans toward investment securities (other than MBS). Such assets have contributed a greater share of income in recent years. The share of assets devoted to real estate development increased 68 percent between 1980 and 1988. Thrifts are also beginning to offer a full range of non-mortgage loans, paralleling the services provided by commercial banks. The share of non-mortgage loan assets has increased substantially.³

Table 1. Indicators of Thrift Industry Diversification, 1980 and 1988 (Percent)

Activity	December 1980	December 1988
Traditional thrift		
Mortgage assets share ^a	77.5	60.0
Mortgage income share	79.5	70.5
Mortgage banking		
Net loans serviced/held	3.4	30.1
Trading		
Investment assets share	0.5	5.3
Investment income share	9.9	12.6
Real estate development		
Real estate assets share ^b	7.6	12.8
Commercial banking		
Non-mortgage loan assets share ^c	0.6	5.8

Source: Authors' calculations for FSLIC-insured savings institutions as described in the text based on Federal Home Loan Bank Board unpublished data.

^a Includes all residential mortgage loans, home improvement loans, MBS, and loans secured by mobile homes.

^b Includes nonresidential mortgage loans; acquisition, development, and construction loans; real estate held for investment; and investments in subsidiaries.

^c Includes education, automobile, and other closed-end consumer loans; open-end consumer credit; consumer leases; and commercial non-mortgage loans.

Table 2 presents data on the number and assets of thrifts passing and failing the QTL test. As of September 1989, 22 percent of thrifts (569 thrifts) failed the current test, and nearly 80 percent of thrifts (74 percent of thrift assets) passed. A significant dropoff occurs, with more than 50 percent of thrifts and 60 percent of thrift assets failing the test, if the qualifying ratio rises to 80 percent, indicating that the QTL test is now a binding constraint for many thrifts. In reaction to the constraints imposed by FIRREA, earnings will not be reinvested, new capital will not be attracted, and new mortgage activities at the holding company level will be favored over portfolio lending at the thrift. An increasing number will soon be at the maximum limit of diversification. In considering the future of the industry, it is appropriate to evaluate the implications of continued statutory mortgage specialization.

Table 2. Effect of QTL Test on the Thrift Industry, September 1989

	Number of Thrifts	Percent of Thrifts	Assets (\$B)	Percent of Assets
Pass 70% (FIRREA) QTL test	2,040	78	876	74
Fail 70% (FIRREA) QTL test	569	22	315	26
Total	2,609	100	1,181	100

Source: James R. Barth and Philip R. Wiest, "Consolidation and Restructuring of the U.S. Thrift Industry under FIRREA," Office of Chief Economist, Office of Thrift Supervision, October 1989, data updated. Data exclude institutions placed in conservatorship through September 1989.

Thrift contributions to mortgage financing

The modern thrift industry was established to provide a source of housing funds that would be both deep and reliable.⁴ The success of this policy is evidenced by the current size of the industry: S&Ls continue to originate approximately 40 percent of all new residential loans and hold approximately 40 percent of residential mortgages (including MBS) outstanding. But the importance of the thrift industry to housing finance has been declining. Two simple measurements—originations and investment—indicate a downtrend in market share and a greater sensitivity to market shocks relative to market participants who have no particular advantages or incentives in holding mortgage loans.

Originations

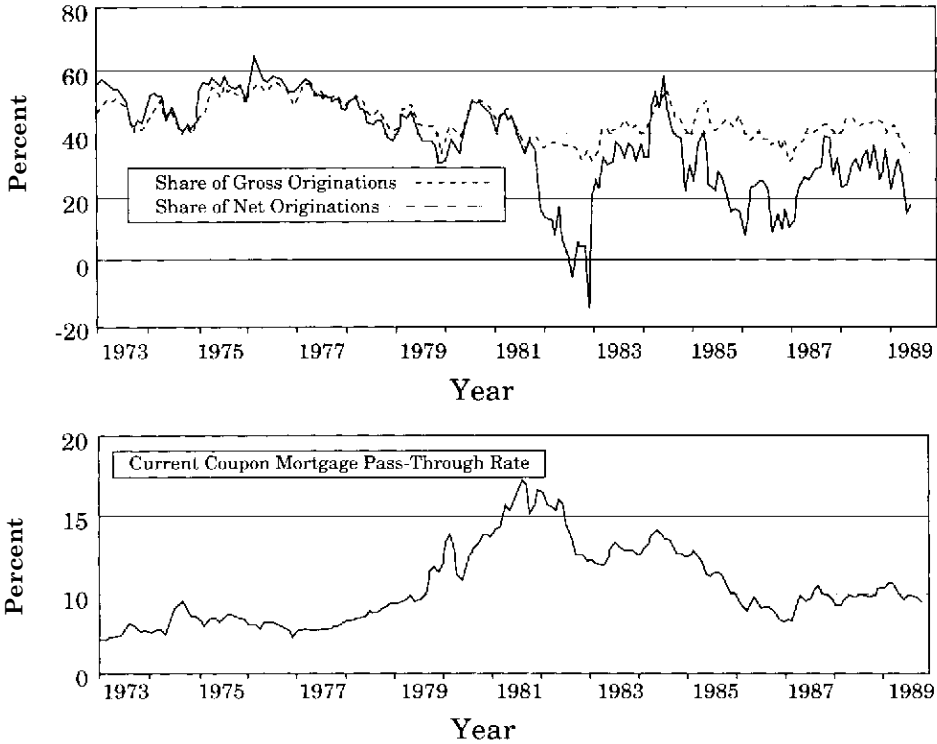
We first examined thrifts' share of mortgage originations over time. From January 1973 through September 1979 (immediately prior to the shift in Federal Reserve monetary policy), S&Ls accounted for 49.8 percent of the one- to four-family mortgage originations by dollar amount. S&Ls also purchased slightly more loans than they sold, raising their net share of acquisitions to 51.2 percent of the total. If mutual savings banks (MSBs) are included, the gross origination share rises to 55.5 percent and the net share to 58.4 percent. Inclusion of multifamily mortgages, however, does not materially affect the market shares. Market share was relatively stable over this period.

From October 1979 through June 1982, mortgage security yields rose to an average of 14.25 percent. Gross originations by S&Ls declined to 42.3 percent of the total, 46.3 percent if MSBs are in-

cluded. Furthermore, sales substantially exceeded purchases, lowering the net acquisition share to 35.4 percent for S&Ls and 38.4 percent for all thrifts combined. During a few months in 1982, net acquisitions were negative.

Since July 1982, mortgage rates have moved irregularly lower, averaging 12.99 percent for the July 1982 to June 1984 period and 10.46 percent from July 1984 to December 1988, and 10.04 percent in 1989. Thrifts' share of gross originations failed to recover, however, remaining between 40 percent and 42 percent for S&Ls and 46 percent to 48 percent if MSBs are included through the first quarter of 1989. Net sales drove net acquisition down to about 27 percent of the total for S&Ls and only 29 percent for all thrifts combined. Beginning in 1989, in anticipation of new capital requirements and other restrictions, thrift origination activities declined sharply. Because of substantial loan sales, the thrifts'

Figure 1. Mortgage Originations



Sources: U.S. Department of Housing and Urban Development *Survey of Mortgage Lending Activity* (various issues); The First Boston Corporation, unpublished data.

share of net originations fell below 20 percent by mid-1989. The relationship between market rates and S&Ls' share of gross and net mortgage originations is shown in figure 1.⁵

There are some limitations to this analysis; for example, many loan sales are in fact swaps for MBS. A different data set overcomes this limitation.

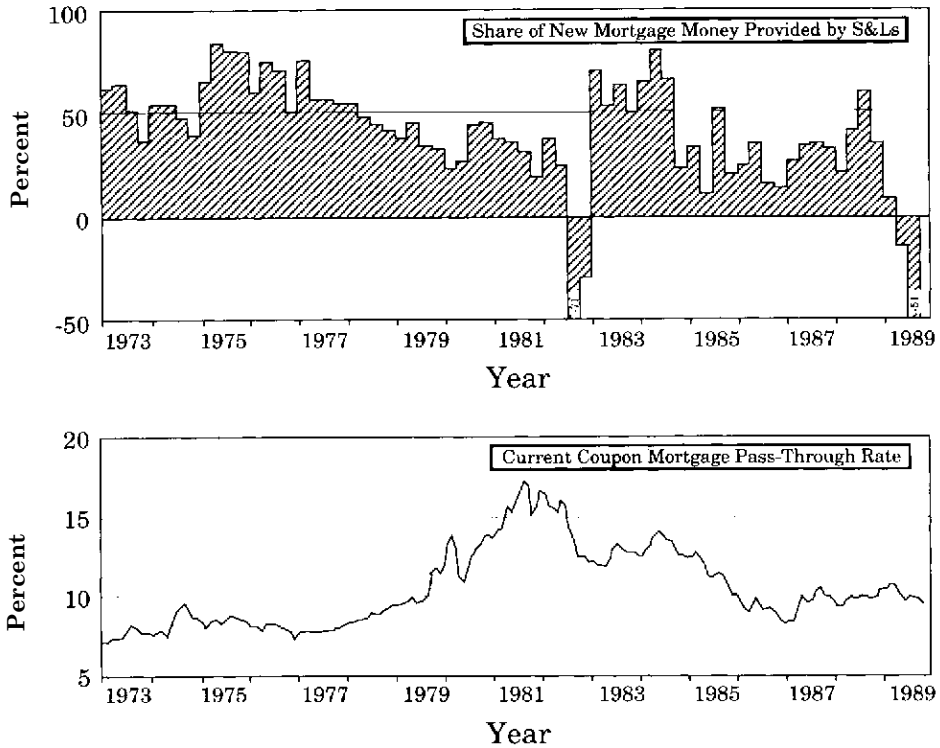
Investment

We next considered the net change in thrifts' holdings of mortgages and MBS as a share of the total volume of residential mortgages outstanding. From the second quarter of 1973 through the third quarter of 1979, S&Ls provided 56 percent of the net new funds for mortgages, with a slight downward trend after mid-decade. During the tight money period from the fourth quarter of 1979 to the second quarter of 1982, the S&Ls' share fell to 32 percent. After recovering to 35 percent in the following two years, the S&Ls' share declined to 30 percent through 1988 and was negative in the second and third quarters of 1989.⁶ The relationship between market rates and S&Ls' share of the increase in mortgage holdings is shown in figure 2. The similarity between figure 2, which includes mortgage securities, and figure 1, which does not, indicates that loan-for-securities swaps do not distort the analysis based on net originations.

Profitability of portfolio lending

In recent years, the profitability of portfolio lending for thrifts has depended on changes in market interest rates. Traditionally, thrifts funded higher yielding long-term mortgage assets with lower yielding short-term funds, paying expenses and a return on capital with the yield spread. Despite a recent narrowing of the maturity between assets and liabilities, the effective duration of thrift assets is still longer than that of thrift liabilities. Thrifts earn a positive spread from portfolio loans when interest rates decline, remain stable, or rise by a sufficiently small amount. When interest rates rise sharply, the typical thrift loses money. So thrift performance, even in recent years, depends largely on whether interest rates have risen or fallen. Historical performance measures are therefore not a good indication of the profitability of portfolio lending in general.

Figure 2. Mortgage Investment



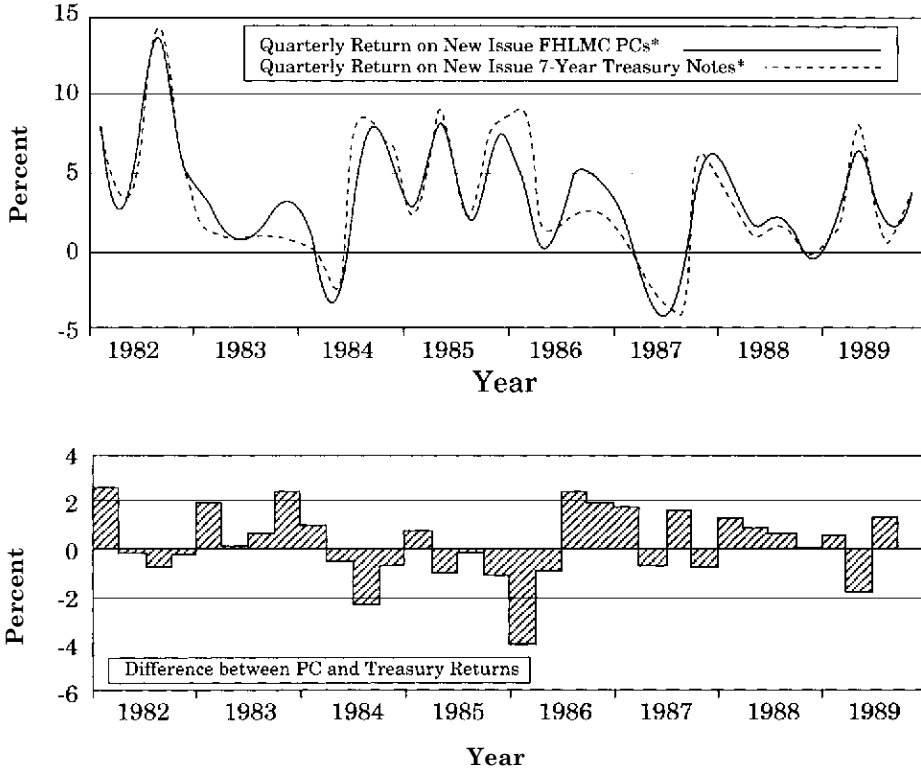
Sources: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts*, March 1989 Revision; The First Boston Corporation, unpublished data.

Realized profitability

To remove most of the effects of the portfolio mismatch, we compared quarterly total rates of return for newly issued mortgage securities with treasury securities of a comparable duration. In particular, we analyzed new current-coupon Freddie Mac participation certificates (PCs) and newly issued seven-year treasury notes. We use PCs rather than whole mortgage loans to eliminate default costs and origination and servicing expenses; these would otherwise have to be computed independently and subtracted from the rate of return. PCs are backed by the conventional (not government-guaranteed or -insured) loans that characterize most thrift portfo-

lios. An analysis using Fannie Mae MBS would have yielded similar results; we used data on Freddie Mac issues because the price information for the early years is more complete. The results are summarized in figure 3.

Figure 3. Mortgage and Treasury Rates of Return



Source: The First Boston Corporation, Fixed Income Research.

* Data are smoothed.

During the eight years from 1982 through 1989, the average quarterly rate of return on the PCs was 3.53 percent (14.62 percent at annual rates compounded semiannually), and the average rate of return on the treasury notes was 3.35 percent (13.95 percent annually). Thus, had thrifts match-funded their mortgage investments at treasury rates, they would have earned a net return of 66 basis points per year. The spread during the first half of the period, 1982-85, was 54 basis points and during the later part of the period, 1986-89, was 79 basis points.

From this spread must be deducted thrifts' incremental funding costs relative to treasuries, including direct administrative expenses. Any spread remaining would then represent the return on equity, which is the measure of profitability.

Thrifts' wholesale funding costs for intermediate term funds have averaged about 100 basis points over comparable treasuries. Shorter term funds are somewhat less expensive, but hedging costs to achieve the desired duration offset the advantage. Retail funds often carry substantially lower interest rates, but involve high administrative costs in the form of branch office operations, marketing, and processing. We have estimated the all-in marginal cost of funds for thrift institutions at 94 basis points over comparable maturity treasury rates during the 1983-89 period. (A complete discussion of this estimate is in the appendix.) A cost of funds 94 basis points over treasuries would have left a 15-basis-point negative margin for fully hedged mortgage lending over the 1986-89 period, and a substantial 40-basis-point negative margin over the 1982-85 period.

Required profitability

An appropriate way of evaluating the profitability of thrift mortgage lending is to calculate the rate of return on equity (ROE). For thrifts to attract and retain capital, they must earn a rate of return comparable with that of other market investments with similar risk characteristics.

Under FIRREA, thrifts are required to have minimum core capital equal to 3 percent of assets. Ultimately, they will also be required to meet requirements for risk-weighted capital no less stringent than those applied to banks. When fully implemented, current capital rules will require banks to have capital equal to 8 percent of risk-weighted assets. Mortgage loans carry a risk weight of 50 percent, and most MBS carry a risk weight of 20 percent. The core and risk-weighted requirements must be satisfied simultaneously. The core requirement is 3 percent for all assets, and the risk-weighted requirement translates to 4 percent for mortgage loans and 1.6 percent for MBS; which requirement is binding depends on the institution's mix of other assets. The following discussion computes ROE based on both a 3-percent (core) and a 1.6-percent (risk-based) requirement.

Using the results from the previous subsection and an assumed treasury yield of 8.5 percent, thrifts would have earned 4.44 percent on capital of 3 percent or 0.07 percent on capital of 1.6 percent over the 1986-89 period. Assuming a required market ROE of 15 percent with capital of 3 percent, the return on mortgages would have had to be 32 basis points greater; with capital of 1.6 percent the return would have had to be 24 basis points greater than it actually was. Results would have been even worse earlier in the decade. Mortgage investment was not profitable for thrifts during most of the 1980s.

Expected profitability

The evaluation of mortgage investment is complicated by complex cash flows. Because mortgages amortize and pay interest periodically, investors are exposed to substantial reinvestment risk. If market interest rates decline, mortgages may be refinanced, depriving lenders of anticipated interest income. As a result, the yield (internal rate of return) of a mortgage, computed at the time it is acquired, overstates its expected total rate of return. Ex post returns equal ex ante predictions (based on internal rate of return calculations) only for noncallable, default-free, zero coupon, bullet-maturity bonds.⁷ Yields on default-free mortgage securities exceeded treasury yields by as much as 250 basis points at various times between 1982 and 1989, but realized returns on mortgages have been much lower, as described previously.

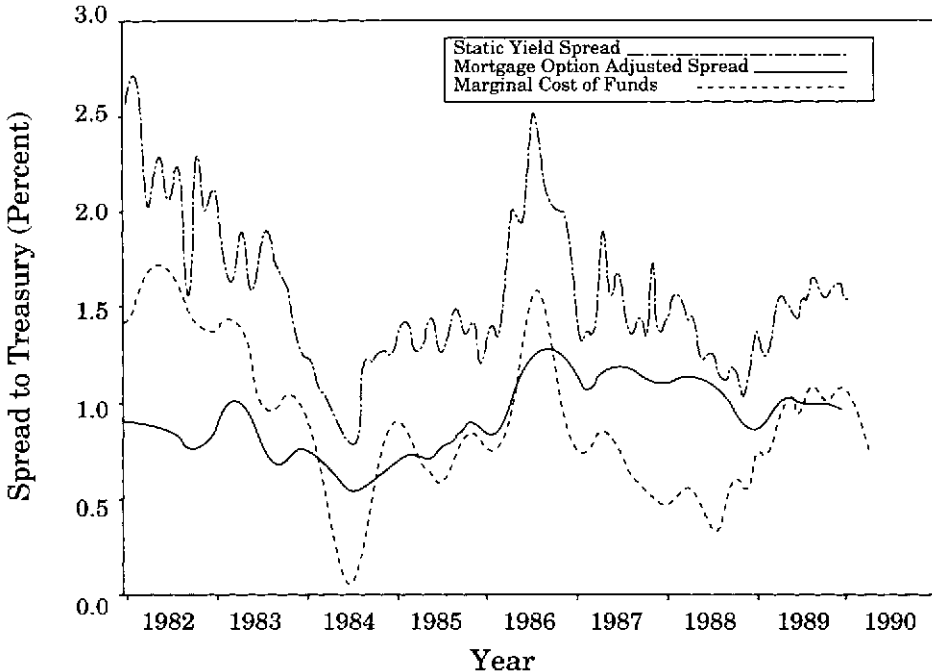
New techniques for the valuation of the complex options embedded in residential mortgages now make it possible to compute ex ante expectations of portfolio profitability. Through Monte Carlo simulation or other methods, the expected value of an instrument that can be called or put can be computed.⁸ In other words, one can apply probabilities to the cash flows expected from a mortgage investment under alternative interest rate scenarios and thereby compute an expected return or fair market value. Such a model was used to compute the expected return relative to treasury securities of newly originated conforming fixed-rate mortgages. Specifically, by using current-coupon Freddie Mac PCs, we abstracted from default risk and transactions costs.

The option-adjusted spread over treasuries for new current-coupon conventional mortgage securities exceeded 125 basis points until mid-1983. During most of the time since then, the spread has averaged between 50 basis points and 100 basis points. Spreads fell

nearly to zero in the summer of 1984 because of strong demand for mortgage securities and, possibly, market mispricing. Spreads widened to more than 150 basis points in the summer of 1986 as the market overestimated the call risk of mortgages.

Because thrifts cannot fund their mortgage portfolios at treasury borrowing rates, the expected net spread must be calculated relative to actual liability costs. Thrifts' funding costs have averaged 94 basis points over treasuries—somewhat lower prior to early 1986 and somewhat higher since then. Until early 1984, mortgage investment offered the expectation of a positive spread over funding costs for the average S&L. For most of the 1984-89 period, however, thrifts could not anticipate profitable investment in fixed-rate mortgages. Figure 4 summarizes trends, relative to treasury yield levels, of mortgage yields, option-adjusted spreads, and thrifts' marginal funding costs. Hendershott's (1988) results are consistent with ours.⁹

Figure 4. Mortgage Rate of Return and Thrifts' Cost of Funds



Sources: Author calculations based on unpublished data from The First Boston Corporation, unpublished data from the Federal Home Loan Bank of San Francisco; and various issues of *Functional Cost Analysis*, Federal Reserve Bank System.

Note: Data are smoothed.

Ex ante returns were sharply negative in mid-1984 and again from late 1986 through 1988. Mortgages would have offered a fair return on capital only for a brief period in mid-1986. From the announcement of the Bush administration's plan to resolve thrift insolvencies in February 1989 until the implementation of FIRREA in December of that year, market uncertainty and thrift asset sales drove up the expected returns from mortgage investment. The very act of mortgage sales by thrifts created conditions conducive to profitable mortgage investment by thrifts.

By early 1990, mortgage prices had reverted to levels that made it unprofitable for thrifts to invest in fixed-rate mortgages. During the first quarter of 1990 there was again a negative spread between option-adjusted mortgage returns and all-in thrift funding costs, exactly equal to the average realized return for 1986-89. Mortgage returns would have to have been 24 basis points to 32 basis points higher than they were in the first quarter of 1990 to provide a 15-percent ROE, based on capital requirements of 1.6 percent and 3 percent, respectively.

Large-scale investment in adjustable-rate mortgages (ARMs) has occurred too recently to perform a similar analysis for ARMs. Over the past few years ARM securities have offered spreads to treasuries, on an option-adjusted basis, about 10 basis points to 20 basis points greater than spreads offered by comparable fixed-rate mortgage securities. Even wider spreads are available on less liquid instruments, such as multifamily mortgage securities, mortgage strips, collateralized mortgage obligations (CMOs), and non-agency pass-through securities. These investments have been sources of profits in the past, but they cannot be expected to remain profitable as those markets become more liquid.

There are two main conclusions to be drawn from this analysis. First, investment in mortgages has been unprofitable for thrifts for most of the past six years. Second, there have been large swings in profitability over the period, including times when mortgages would have been attractive investments; but thrifts were constrained by law from periodically increasing and reducing their investment in mortgages to take advantage of these swings.

Despite the lack of profitability in portfolio lending, thrifts have been profitable overall as a result of other activities. To put the relative profitability of mortgage investment in perspective requires an overall view of the thrift business.

Sources of thrift profitability

In recent years, thrifts could barely expect to break even on their investment in mortgages. It is not a paradox, however, to say that the mortgage lending business, viewed in its entirety, may be profitable. Mortgage lending entails many steps, of which holding the pure loan in portfolio is only one. Thrifts may have profited from the noninvestment aspects of the mortgage business.

The development of a secondary mortgage market and a variety of mortgage-related securities has removed many of the obstacles faced by investors who wished to invest in mortgages.¹⁰ Thrifts no longer have a comparative advantage in holding “unfamiliar” and “illiquid” long-term amortizing mortgages, and they may even be at a disadvantage because of their portfolio restrictions.¹¹ But mortgage securities have not greatly affected the other attributes of mortgages, and it is in these areas that thrifts continue to excel.

Thrifts may profit from mortgages as the result of unexpectedly favorable interest rate moves, superior underwriting abilities, efficiencies in loan servicing, fees collected for loan origination, and intermediation between more and less liquid instruments. They may also benefit from below-market liability costs, marketing and cross-selling advantages, and imperfect consumer information. Of course, none of these profits requires the mortgage loan to be held in the thrift originator’s own portfolio. Finally, thrifts have made money on non-mortgage assets, such as consumer lending.

Policy implications and conclusions

Thrifts today compete for both assets and liabilities not only with other thrifts but also with other depository and nondepository institutions. Yields on both sides of the balance sheet are determined by conditions in the global capital market. The shrinkage of the thrift industry that is under way may be successful in reducing operating expenses, but it should not be expected to reduce deposit rates (beyond the reduction achieved by eliminating deposit growth by insolvent thrifts) or to increase mortgage rates. Provisions of FIRREA also suggest that FHLB advances may become a less attractive source of financing.

Under FIRREA’s restrictions emphasizing the holding of mortgages, the thrift industry will never attain consistent profitability, a fair return on invested capital, and a stable role in the provision of

housing finance. Because our analysis focuses on industry averages, it follows that above-average firms can (and do) earn positive income from holding mortgages. If nothing is done, however, currently average and below-average thrifts will fail, imposing further costs on the deposit insurance system.

These results are at the center of a fundamental paradox created by FIRREA. By restricting the assets of thrifts by means of the QTL test, the law made it impossible for the average thrift to meet the more stringent capital requirements also mandated by the law. There are essentially four ways a capital-deficient thrift can improve its capital-to-assets ratio: shrinkage through sale of assets, sale of additional equity, sale of qualifying subordinated debt, and retained earnings. Although shrinkage will make a significant contribution to capital positions, the other avenues will also be followed.

Each of the other sources relies on positive net income. Most obviously, retained earnings must be earned before they are retained. Less obviously, equity or subordinated debt infusions will reflect investors' or debtholders' expectations of positive present value cash flows from thrifts. Under current conditions, the required commitment to mortgage assets does not provide a basis for such expectations, on average, for the thrift industry. Reducing earnings by setting minimum mortgage investment shares through regulation implies greater inefficiency than would otherwise exist.

The QTL test is sometimes justified by reference to thrifts' reporting positive net income from mortgage lending. When evaluating such reports, it is important to make certain that the reported profitability emanates from mortgage investment and not from speculation on interest rate movements, mortgage origination, or servicing activities. With industry returns on mortgage assets so low, earnings for firms with positive returns from mortgage investment are doubtless lower than they would be without the current QTL requirements. The returns are so variable and meager in most cases that it appears unlikely that a market return on equity can be achieved. Where required returns are adequate, the firms are often large enough to take advantage of all economies of scale and scope, and they tend to be located in favorable locations (with strong regional economies and population growth, for example). Even in these cases, however, the increasing liquidity of the mortgage market will threaten returns over time and contribute to the industry's decline.

Three alternatives suggest themselves: make mortgage investment more profitable for thrifts, make mortgage investment less profitable for nonthrifts, or remove the requirement that thrifts invest in mortgages.

Increasing the profitability of thrift mortgage investment

Thrifts can continue to seek out the new and less liquid mortgage instruments that historically have provided an attractive rate of return. However, all such instruments ultimately lose their advantages. This strategy would require too high a rate of turnover to be consistent with large thrift holdings of mortgages. Other approaches would entail some form of direct or indirect (tax) subsidy to encourage thrifts to hold mortgages. The most likely source of improved profitability is a reduction in funding costs. The closure of hundreds of insolvent thrifts will probably reduce competition for deposits. Such thrifts have grown by bidding up deposit rates. Consolidation within the industry should reduce noninterest deposit costs. Fewer firms, which will tend to be larger, will achieve economies of scale and scope. Managerial emphasis on cost cutting and technological innovations will also help reduce costs. The analysis of realized returns and expected returns suggests that the average thrift must increase mortgage returns and/or reduce all-in funding costs by 24 basis points to 32 basis points (depending on the amount of leverage permitted).

Decreasing the profitability of nonthrift mortgage investment

The advent of mortgage securities has been the factor most responsible for the reduction of mortgage yields. Limiting the ability of the federally related agencies to issue and guarantee MBS would clearly raise mortgage yields. This cost would be paid directly by mortgagors and would decrease the availability of housing finance. If achieved through volume caps, the thrifts' market share and net spread would both increase. Alternative measures, such as user fees on the agencies, would induce a smaller shift in market share and would involve an income transfer from mortgagors to the government. Most estimates of the value of the federal agency guarantee are in the range of 20 basis points to 30 basis points.¹² If all of this value is attributable to the guarantee (and none to relative illiquidity, for example), the increase in yields from restricting

agency issuance might just barely provide a market rate of return to thrifts. Investments in unsecuritized mortgage loans will require incremental capital of at least 3 percent; thus, a 32-basis-point increase in net spread on mortgages would give a 15-percent return on capital.

There exists a bias in the setting of minimum capital standards for regulated financial intermediaries. Unsecuritized mortgage loans held by banks and thrifts require \$4 of capital for each \$100 of assets; mortgage securities guaranteed by Fannie Mae and Freddie Mac require \$1.60 in capital. Hemel calculated that Fannie Mae and Freddie Mac hold less than \$1.75 in capital for each \$100 in exposure, substantially less capital against their off-balance-sheet obligations than the \$2.40 differential between loans and securities implied by the bank and thrift rules. The inconsistency of the capital rules is apparent and the influence on markets may be important, but it is beyond the scope of this paper to determine which of the capital levels is out of line.¹³

Removing thrift portfolio restrictions

A viable solution is removing the requirement that thrifts hold most of their assets in housing-related instruments. Thrifts need the flexibility to adjust their portfolios in response to changing market conditions. They would likely continue to be active participants in the origination and servicing of loans. Even if the share of mortgages in their portfolios were to decline, the impetus for growth and investment in thrifts would likely increase the aggregate mortgage holdings of the industry. The QTL test should be eliminated or at least rationalized to give full weight to originations rather than holdings of mortgages. The powers that a thrift acquires by conforming to the QTL test should be evaluated on their own merits, rather than as a cross-subsidy for mortgage investments. Broadened powers may increase the need for regulatory oversight, but if thrifts are limited to powers essentially similar to banks', the additional burden should be manageable. Coordination or consolidation of bank and thrift regulation is a necessary component of this approach, as thrifts come to be identified more by the functions they perform than by the charter they hold.

Recommendations

Although the diversification away from holding mortgage assets in portfolio would be slow, diversification would occur. Whether thrift managers can capably diversify their assets is a legitimate concern. Allowing insolvent and weakly capitalized thrifts to diversify earlier in the 1980s produced a debacle. The approach today should be significantly different. Only those firms meeting their net worth requirements should be eligible to diversify, and other standards based on managerial abilities would need to be developed. Unlike the earlier diversification, eligible assets should include only those assets allowed commercial banks. Because regulatory oversight has shifted to bank regulators, examiners would be more familiar with the allowable assets than were thrift examiners in the last decade. Despite these precautions, diversification is difficult to manage and concern over the thrifts' ability to handle it should be taken seriously. The message of this paper, however, is that diversification is the best alternative.

It may be tempting for Congress to take no action, which would imply reliance on future events to improve the net spread of mortgages over thrifts' funding costs. We have stated several reasons why we conclude that the spread will narrow in the future because of increasing liquidity in the mortgage market. Thus the funding costs themselves will have to fall. Adequate profitability, however, would require that costs on average be lowered by 32 basis points in order to provide a return of 15 percent on 3-percent capital. Cost reductions of this magnitude may be unrealistic for most thrifts.

We conclude that a viable future for thrift institutions requires the removal of the requirement that thrifts hold most of their assets in housing-related investments. In a sense, removal of the requirement would mean the end of the thrift industry; the thrifts would evolve into commercial banks, completing the homogenization that is already well under way.¹⁴ If the requirement to hold mortgages is preserved, our analysis indicates that the industry will experience impaired profitability, rising insolvencies, and attrition of firms. Given the closure rule followed by the deposit insurance agencies, the attrition almost certainly will entail losses. In order to truncate these losses, the QTL requirement will ultimately have to be relaxed. The conclusion would remain the same: a thrift industry required to hold mortgage assets is not viable.

Appendix: Estimating thrifts' marginal cost of funds

The published data on thrifts' cost of funds have two grave limitations: the numbers are based on average costs, not marginal costs; and they include only the interest component, excluding administrative expenses. We have attempted to construct a data series representing a realistic measure of thrifts' marginal funding costs.

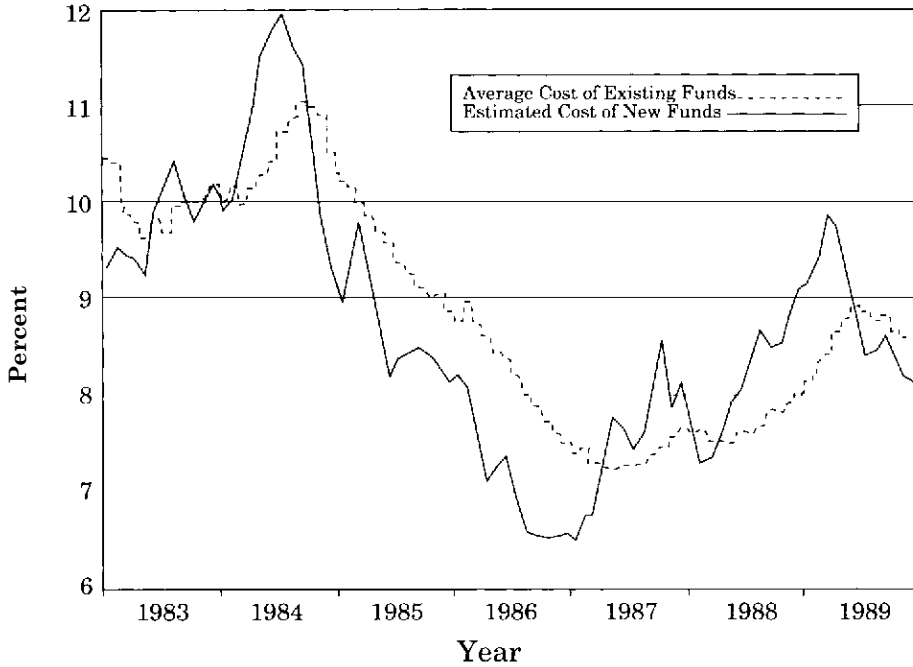
We began with the proprietary model described in Gerber to forecast the Cost of Funds Index of the 11th FHLB District based on current and lagged levels of short- and intermediate-term market interest rates.¹⁵ Using this model, we determined the long-run equilibrium cost of funds for each month based on monthly averages of market interest rates. The estimated marginal cost series is compared with the published average cost series in figure A-1. This marginal cost series represents only the interest component of the all-in cost of funds.

We next sought to estimate the average administrative expenses associated with funds acquisition. Expenses by liability category, as an annualized percentage of the average balance, came from the Federal Reserve Bank of New York.¹⁶ Each expense ratio was weighted by that component's share of the average thrift's liability mix. The weighted average expense was 73 basis points (see table A-1).

To obtain an all-in marginal cost of funds, we added 73 basis points to the annualized interest expense. We did not adjust for the implicit cost of maintaining working cash balances for deposit accounts. The all-in marginal cost of funds, computed as described here, averaged 111 basis points over comparable-maturity treasury securities from January 1983 through October 1989; since July 1984, the average has been 118 basis points.

Because thrifts may choose not to rely on retail deposits when their cost exceeds wholesale fund costs (and vice versa), we considered an alternative source of funds. FHLB advances are widely available to mortgage-lending thrifts. Figure A-2 compares costs of alternative sources of funds. We computed the spread over ten-year treasuries of FHLB advances (average of 4th and 11th district advances converted to semiannual bond-equivalent basis). We did not add any administrative expenses, nor did we allow for the implicit cost of holding FHLB stock. The cost of new advances averaged 103 basis points over treasuries from January 1983 through October 1989; this spread has been relatively constant across various subperiods.

Figure A- 1. Thrifts' Marginal Cost of Funds



Sources: Author calculations based on unpublished data from The First Boston Corporation, unpublished data from the Federal Home Loan Bank of San Francisco; and various issues of *Functional Cost Analysis*, Federal Reserve Bank of New York.

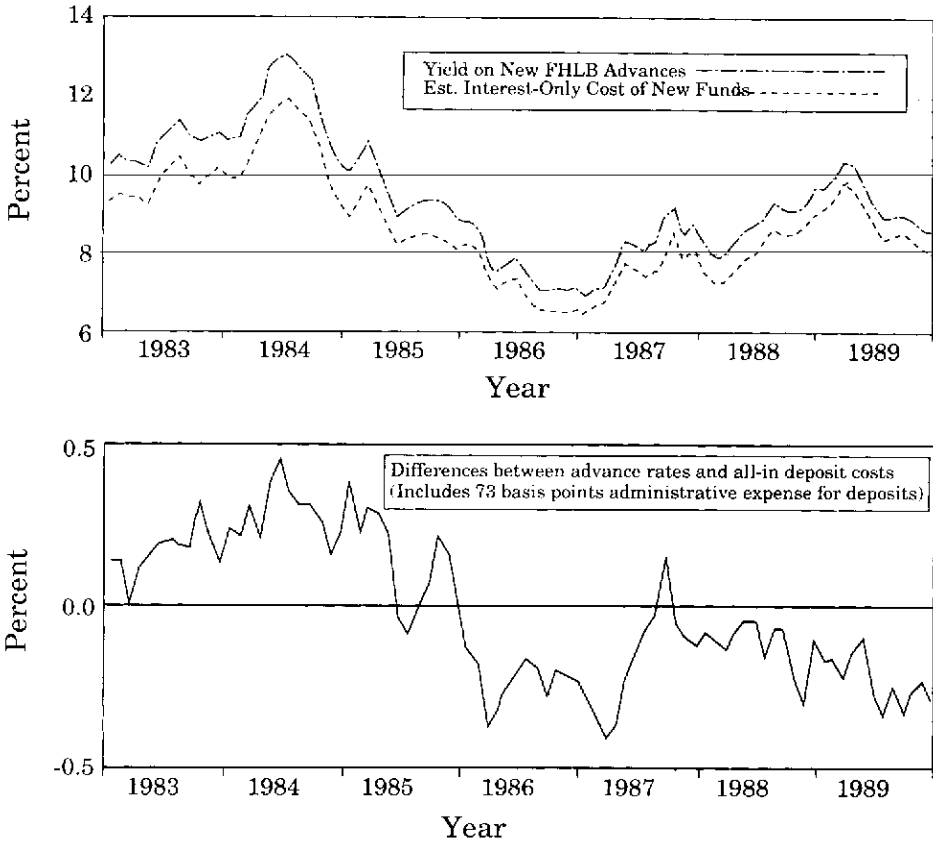
Table A-1. Estimating Thrift Institutions' Noninterest Cost of Funds

Liability	Noninterest Cost as Percent of Balance	Liability Mix (%)
Interest-bearing checking accounts	4.25	4.6
Regular savings accounts	2.20	7.1
Time open/other time deposits	0.74	9.6
Retirement accounts	1.23	7.3
Small certificates of deposit (CDs)	0.26	37.1
Other (borrowings, large CDs, other)	0.35	34.4
Average; Total	0.73	100.0

Source: Authors' calculations based on Federal Reserve Bank of New York, *Functional Cost Analysis, 1987 National Average Report, Thrift Institutions (1988)*; and FHLBB, unpublished data.

Note: Totals may not add because of rounding.

Figure A-2. Thrift Institutions' Cost of Funds



Sources: Author calculations based on unpublished data from The First Boston Corporation; unpublished data from the Federal Home Loan Bank of San Francisco; and various issues of *Functional Cost Analysis*, Federal Reserve Bank System.

Our marginal cost of funds series was computed as the minimum of the all-in (mostly retail) cost of funds and the cost of FHLB advances. In other words, we assumed that each month a thrift would choose the less costly of these two sources for the mortgages that it funded that month. Our cost of funds series averaged 94 basis points over treasuries from January 1983 through October 1989; since July 1984, the average has been 98 basis points.

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Endnotes

1. For a summary of other effects of FIRREA, see James R. Barth and Philip R. Wiest, "Consolidation and Restructuring of the U.S. Thrift Industry under the Financial Institutions Reform, Recovery and Enforcement Act," Research Paper no. 89-01 (Washington, DC: U.S. Department of Treasury, Office of Thrift Supervision, 1989).
2. Authors' calculations are based on Rae Jean B. Goodman, "The New Tax Law Gives Thrifts a Break," *Outlook of the Federal Home Loan Bank System* 3:1 (January/February 1987).
3. A more complete discussion of this issue may be found in R. Dan Brumbaugh, Jr. and Andrew S. Carron, "Thrift Industry Crisis: Causes and Solutions," *Brookings Papers on Economic Activity* 2 (1987).
4. For a discussion of the role of thrifts in housing finance and how their commitment to housing finance made them vulnerable to interest-rate variability at the beginning of the 1980s, see Andrew S. Carron, *The Plight of the Thrift Institutions* (Washington, DC: The Brookings Institution, 1982), and Andrew S. Carron, *The Rescue of the Thrift Industry* (Washington, DC: The Brookings Institution, 1983). These issues are also discussed in George J. Benston, Robert A. Eisenbeis, Paul M. Horvitz, Edward J. Kane, and George Kaufman, *Perspectives on Safe and Sound Banking: Overview, History, and Evaluation* (Cambridge: MIT Press, 1986), as well as in R. Dan Brumbaugh, Jr., *Thrifts under Siege: Restoring Order to American Banking* (New York: Ballinger, 1988), and in Robert E. Litan, *What Should Banks Do?* (Washington, DC: The Brookings Institution, 1987), in the context of thrift and commercial bank portfolio decisions. James R. Barth, Philip F. Bartholomew, and Carol J. Labich, "Moral Hazard and the Thrift Crisis: An Analysis of 1988 Resolutions," *Bank Structure and Competition* (Chicago: Federal Reserve Bank of Chicago, 1989) stresses moral hazard, while Lawrence J. White, "The Problems of the FSLIC: A Policy Maker's View," *Contemporary Policy Issues* 8, no. 2 (April 1990): 62-81, emphasizes the need for market-value accounting.
5. Origination data based on U.S. Department of Housing and Urban Development, *Survey of Mortgage Lending Activity*, various issues; mortgage yields from First Boston Corp., unpublished data.
6. Data from the Board of Governors of the Federal Reserve System, Flow of Funds Accounts, March 1989 revision.
7. The distinction between yield and expected return is equivalent to the "gross or promised" return and the "expected" return discussed by Patric H. Hendershott, "The Future of Thrifts as Home Mortgage Portfolio Lenders," *The Future of the Thrift Industry*, Proceedings of the Fourteenth Annual Conference (San Francisco: Federal Home Loan Bank of San Francisco, 1989).

8. A full explanation of the technique may be found in Andrew S. Carron and Marjorie Hogan, "The Option Valuation Approach to Mortgage Pricing," *Journal of Real Estate Finance and Economics* 1 (1988): 131-49. For another application of the technique, see Douglas T. Breeden, "Strategies for Profitable Mortgage Lending," *Strategies for the Nineties*, Proceedings of the Fifteenth Annual Conference (San Francisco: Federal Home Loan Bank of San Francisco, forthcoming).
9. See Patric H. Hendershott, "The Profitability of Mortgage Banking," mimeo, November 1988.
10. For a discussion of the "unbundling" provided by MBS, see Barry P. Bosworth, Andrew S. Carron, and Elisabeth H. Rhyne, *The Economics of Federal Credit Programs* (Washington, DC: The Brookings Institution, 1987).
11. For a discussion of the effect of mortgage securities on the thrift industry, see R. Dan Brumbaugh, Jr., *Thriffs under Siege*, 1988.
12. See Bosworth, Carron, and Rhyne, *The Economics of Federal Credit Programs*, 1987, and Patric H. Hendershott and James D. Shilling, "The Impact of the Agencies on Conventional Fixed-Rate Mortgage Yields," *Journal of Real Estate Finance and Economics* 2 (1989): 101-15. Mortgage security traders at First Boston indicate that collateralized mortgage obligations backed by non-agency securities require yields 25 basis points to 30 basis points higher than otherwise identical instruments backed by agency pass-through securities.
13. For additional evaluations of the effects of the agencies on mortgage markets, see Eric Hemel, *Fannie Mae and Freddie Mac: How Large Are the Risks of Higher Capital Requirements?* (New York: First Boston Corporation, 1990); Hendershott, "The Future of Thrifts," 1989; Hendershott and Shilling, "The Impact of the Agencies," 1989; and Susan E. Woodward, "Policy Issues in the Privatization of FNMA and FHLMC," *Expanded Competitive Markets and the Thrift Industry*, Proceedings of the Thirteenth Annual Conference (San Francisco: Federal Home Loan Bank of San Francisco, 1989).
14. The vulnerability of thrifts and the policy implications are also discussed in Edward J. Kane, *The Gathering Crisis in Federal Deposit Insurance* (Cambridge: MIT Press, 1985), and *The S&L Insurance Mess: How Did It Happen?* (Washington, DC: The Urban Institute, 1989).
15. See Robert I. Gerber, *Forecasting the 11th District Cost of Funds* (New York: First Boston Corporation, 1989) and Federal Reserve Bank of New York, *Functional Cost Analysis, 1987 National Average Report, Thrift Institutions* (New York: Federal Reserve Bank, 1988).
16. Ibid.