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Savings and Loan Asset Composition and the Mortgage Market

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Over the past several years, savings and loan associations have diversified their asset portfolios by increasing the share of non-mortgage investments. New asset powers, along with poor earnings and deposit deregulation, have provided the impetus for this change with its important implications for the survival of savings and loans as effective competitors in financial markets. However, contrary to the concerns of some, savings and loans have not diversified their portfolios to the detriment of the mortgage market.

Savings and loan associations traditionally have been highly specialized financial institutions.¹ As they entered the 1980s, they held over 85 percent of their assets in mortgage loans and mortgage-backed securities. This concentration of assets in mortgages stemmed not only from regulations restricting investment activities but also from the tax benefits available to thrifts from holding mortgages. In such an environment, asset management for savings and loans primarily entailed using liquid assets as a buffer against fluctuations in flows to deposit accounts subject to interest rate ceilings.

In more recent years, expanded asset powers have opened new opportunities for thrifts to invest in nonmortgage assets, while the extremely poor performance of earnings among thrifts has diluted the appeal of the tax incentives attached to mortgage lending. In addition, factors affecting liabilities at savings and loans have led to changes in the composition of their assets. As a result, savings and loans have increased substantially the share of their funds allocated to nonmortgage assets.

The greater use of asset management and the diversification into nonmortgage activities by savings and loans is seen by many as necessary

for them to survive in today's interconnected financial system. However, the apparent reduced emphasis on mortgage lending also has raised some concerns. One of these is that more aggressive pursuit of nonmortgage activities by savings and loans will curtail the flow of funds to finance housing.² This concern is related to the longstanding belief that the volume of mortgage credit is tied to deposit flows at thrifts. Much of the public policy regarding savings and loans has been founded on this belief, including the differential on interest rate ceilings which for many years allowed thrifts to pay a higher explicit return on deposits than commercial banks.

This paper provides a perspective on the reasons for the increased asset portfolio diversification at savings and loans and the implications greater diversification may have for the mortgage market. The section, "Asset Diversification," examines how and why the mix of savings and loan assets has changed during the past several years. It argues that, while the easing of asset restrictions has had some bearing on changes in asset mix, tax effects and factors affecting liabilities management also have been instrumental in determining the asset composition at thrifts. The second section investigates whether the move to nonmortgage investments by savings and loans has affected mortgage interest rates and the allocation of funds to mort-

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gages. The findings in that section do not support the view that the change in asset mix at savings and loans has had a noticeable impact

on the mortgage market. General comments and conclusions are presented in the last section.

I. Asset Diversification

Historically, regulations have limited the options for savings and loans to invest directly in nonmortgage assets. The regulatory restrictions have been effectively reinforced by a tax code that provides strong incentives for thrifts to hold residential mortgages in the form of loans and mortgage-backed securities. By holding at least 60 percent of its assets in specified categories, a depository institution qualifies as a thrift and is eligible for special tax benefits.³ Among the "qualifying assets," mortgages are generally the highest yielding since most of the other qualifying assets are government obligations. Once meeting the test of a savings and loan, an institution can defer taxes on a portion of its income by placing retained earnings in special loan loss reserve accounts.⁴ The maximum proportion of income that can be sheltered in this way is 40 percent. To protect the maximum amount of income possible, a savings and loan has to hold at least 82 percent of its assets in qualifying assets.

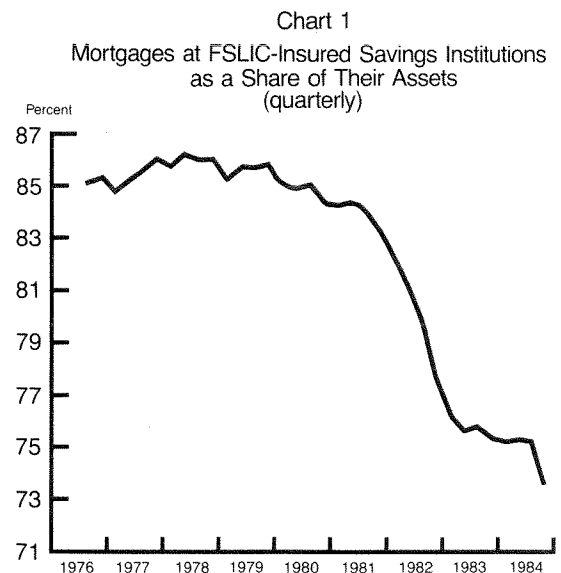
These regulatory "restrictions" and tax benefits clearly determined the choice of assets for savings and loans. Nevertheless, within these constraints, the asset composition for savings and loans also has been affected by limitations they faced in managing liabilities. Having relied heavily on small-denomination deposits subject to interest rate ceilings and limited access to "purchased" funds, savings and loans generally were not active liability managers. Consequently, asset management at these thrifts consisted mainly of a "passive" adjustment of short-term asset holdings to absorb swings in small-denomination deposits.

Through the late 1970s, the interplay of forces determining the asset composition of savings and loans resulted in an industry that held a more or less stable proportion of its assets in mortgages. Over the past several years, however, the asset mix at savings and loans has changed dramatically. Combined, mortgages

and mortgage-backed securities at FSLIC-insured savings institutions fell from 85½ percent of total assets at the end of 1979 to a little more than 73 percent in December 1984. As Chart 1 shows, the drop in the ratio of mortgages to assets at savings and loans was particularly pronounced between mid-1981 and mid-1983.

Asset Restrictions

A natural starting point for explaining this marked portfolio shift is the change in regulations governing the investment options for savings and loans. In 1980, the Depository Institutions Deregulation and Monetary Control Act (MCA) broadened asset powers for thrift institutions, widening their scope to invest in nonmortgage assets.⁵ Under the Act, federally chartered savings and loans were permitted to allocate up to 20 percent of assets to consumer loans, commercial paper, and other corporate securities. Federally chartered savings and loans were allowed to invest in shares of certain open-end investment companies, to issue credit



cards, to exercise trust and fiduciary powers similar to those of nationally chartered commercial banks, and to invest up to 5 percent of assets in education loans and community development and unsecured construction loans.⁶

For the most part, this set of new asset powers for savings and loans was adopted to complement the deposit interest rate deregulation called for in MCA. The decision to phase out rate ceilings on deposits, rather than to remove them immediately, was intended mainly to allow thrifts time to diversify and to shorten the effective maturity of their asset portfolios by using their new powers.

These regulatory changes were necessary conditions for meaningful asset diversification for many savings and loans. However, given the importance of the tax incentives associated with mortgage lending, the regulatory measures were probably not sufficient conditions. In the past, the ability to make deferred contributions to reserves provided a compelling incentive for savings and loans to hold mortgage-related assets irrespective of other regulations. For example, long before MCA, some state-chartered

savings and loans had considerably broader powers to engage in nonmortgage lending than their federally chartered counterparts. They did not exploit this apparent advantage to any real extent, however, mainly because the tax benefits associated with residential mortgage lending overwhelmed the gains associated with diversifying into nonmortgage assets.

Particularly weak earnings in recent years have diluted the appeal of the special tax treatment connected with mortgage lending. In the latter part of 1981 and the first part of 1982, over three-fourths of the federally insured savings institutions had negative net income. It was during this period that the most dramatic asset portfolio adjustments took place. In the last two years, lower market interest rates have allowed the savings and loan industry as a whole to post positive net earnings. Nevertheless, by mid-1984, the proportion of savings institutions insured by the Federal Savings and Loan Insurance Corporation posting losses still was about one out of four.

With both the regulatory and tax constraints to asset diversification relaxed, it is not sur-

TABLE 1
Portfolio Changes at FSLIC-Insured Savings Institutions

	Percent of assets as of December						Change in share of assets from 1979 to 1984 (percentage points)
	1979	1980	1981	1982	1983	1984	
<i>Assets</i>							
Mortgages and mortgage-backed securities	85.4	84.0	82.8	77.5	75.2	73.3	-12.1
Cash and securities	8.9	9.8	10.1	12.0	13.4	13.3	4.4
Consumer and commercial loans	2.8	3.0	2.8	2.9	3.4	4.5	1.7
Other assets	2.9	3.2	4.3	7.6	8.0	8.9	6.0
<i>Liabilities</i>							
Managed liabilities ¹	14.4	16.8	20.9	22.3	21.9	26.0	11.6

¹ Include large-denomination CDs, Federal Home Loan Bank advances and other borrowed funds.

prising that we saw a change in the asset composition of savings and loans. Indeed, from Chart 1, it might appear that the easing of “constraints” on assets was the dominant influence on the portfolio changes. However, further analysis suggests a somewhat more temperate assessment of the importance of the change in asset powers and the decline in earnings.

First, only a small portion of the drop in the ratio of mortgages to assets at savings and loans was related to an increase in nonmortgage loans. From 1979 to December 1984, consumer and commercial loans accounted for only 1.7 percentage points of the 12.1 percentage rise in the ratio of nonmortgage assets to total assets at FSLIC-insured institutions (Table 1).⁷ Moreover, the ratio of consumer and commercial loans to total assets was virtually unchanged from 1979 to 1982; it rose in 1983 and 1984 after most of the adjustment in the ratio of mortgages to assets had already taken place.

Special factors also account for much of the change in “other assets” shown in Table 1. For example, included in “other assets” is “goodwill and other tangible assets.” The value of this asset category was boosted considerably through the purchase accounting procedures used in savings and loan mergers. About 2.3 percentage points of the rise in “other assets” as a share of total assets from 1979 to 1984 can be attributed to the rise of goodwill alone. Of the remaining 3.7 percentage points rise in the ratio of “other assets,” about one-third can be explained by the increase in FSLIC-insured institutions’ equity investments in their service corporations, something they were allowed to do before MCA.⁸

Increased Liquidity

The growth in “cash and securities” over the past several years also indicates that the relaxation of asset restrictions was not the only influence on the asset mix at thrifts. The bulk of these assets are federal government or federally sponsored agency securities, bank CDs and federal funds, which savings and loans were empowered to hold even before MCA. And, as mentioned earlier, some of these securities can

be used by thrifts to qualify for special tax treatment.

The increase in the relative holdings of “cash and securities” could reflect factors affecting small-denomination deposits at thrift institutions. A possible connection is that the assets in cash and securities were accumulated in the face of deposit-rate deregulation which stimulated strong small-denomination deposit flows. Such a response by savings and loans would be in keeping with their traditional passive approach to managing liquid assets.

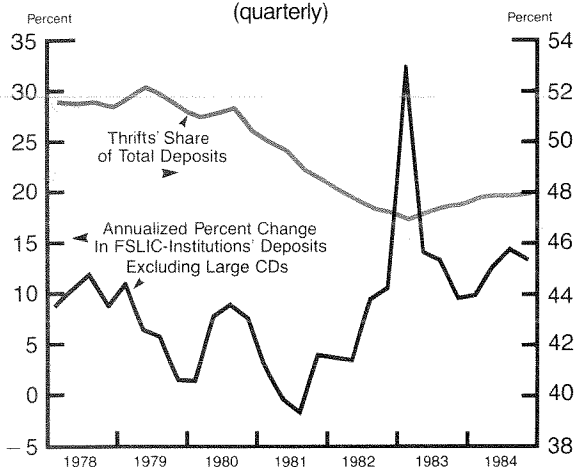
In this context, the quantity of these so-called “core deposits,” which represent the main source of funding for savings and loans, is difficult to control in the short-run. With limited use of managed liabilities (which include Federal Home Loan Bank advances, large-denomination CDs, RPs, and mortgage-backed bonds), most savings and loans have relied to a large extent on liquid assets, such as those included in cash and securities, as a buffer for variations in small-denomination deposit flows. Under this passive asset and liability management arrangement, there tends to be a positive correlation between changes in liquid asset holdings and core deposit flows at savings and loans.

This characterization of savings and loan management of liquid assets would seem to be particularly appropriate in the post-1982 period. Chart 2 shows that with the onset of full deposit deregulation—the introduction of the ceiling-free money market deposit account (MMDA) in late 1982—flows of deposit excluding large CDs surged in early 1983 and remained relatively strong through 1984.⁹

Savings and loans responded to a flood of core deposits in early 1983 by building up their holdings of cash and securities. In fact, virtually all of the rise in the ratio of cash and securities to total assets in 1983 (shown in Table 1) occurred in the first half of the year.¹⁰ After mid-1983, that ratio varied some from quarter to quarter, but on balance did not change much through the end of 1984.

The changes in managed liabilities at savings and loans in early 1983 mirrored that of liquid assets. Following the introduction of the

Chart 2
Thrift Deposits
(quarterly)



MMDA, savings and loans ran off a considerable volume of managed liabilities. This is reflected in Table 1 as a decline in the ratio of managed liabilities to total assets for 1983. However, the upward trend in savings and loan reliance on managed liabilities before 1983, which continued in 1984, suggests that thrifts may not have been reacting only to strong core deposit flows over the past several years. Indeed, Chart 2 indicates that, from 1979 through 1982, the growth of core deposits was relatively weak despite the introduction of market-rate deposit accounts.

One reason that core deposits did not perform "better" prior to 1983 is that, during the phase-out of deposit ceilings, deregulation represented a two-edged sword for savings and loans. The six-month money market certificate (MMC), for example, allowed thrifts to compete more effectively with issuers of nondeposit instruments and dampened for a while the impact of higher market interest rates on flows to thrifts. (This account was introduced in mid-1978 and had a variable-ceiling indexed to the six-month Treasury bill rate.) However, with the other edge of the sword, the effectiveness of the MMC as an instrument for thrifts to compete against commercial banks was reduced considerably in March 1979. At that time, the 25 basis point differential on the ceiling rate for

thrifts over that for commercial banks was removed whenever the six-month Treasury bill rate was 9 percent or higher. The impact of the loss of the differential on the popular MMC is illustrated in Chart 2. The purple line shows that, after the loss of the differential on the MMC, savings and loans and other thrifts lost ground to commercial banks during the phase-out of deposit ceilings. Thrifts' share of total deposits fell more or less steadily between mid-1979 and the end of 1982, and the drop was reflected in generally weak core deposit flows.

On balance then, the deregulation of deposit interest rate ceilings, with its impact on flows to core deposits, probably contributed to the rise in the holdings of cash and securities at savings and loans. However, the observation that reliance on both liquid assets and managed liabilities has increased, suggests that the increase in liquid assets at savings and loans probably reflected a higher demand of thrifts for liquidity rather than only strong flows of small-denomination deposits.

During the phase-out of deposit interest rate ceilings, which was marked by the loss of the bank/thrift differential on the popular MMC as well as high and variable market interest rates, the increased demand for liquid assets probably was due to a deterioration in the outlook for the stability and the overall availability of small-denomination deposit balances at savings and loans. The persistence of a relatively high ratio of cash and securities to total assets more recently may have two causes: a continued demand for liquidity in the face of the shortening overall maturity of core deposits that has accompanied deposit deregulation, and/or the greater amount of intermediation carried out through savings and loans in recent years.¹¹

Conclusion

The decline in the relative importance of mortgages at savings and loans in recent years has been the result of several factors in addition to the provisions of the MCA. These include the methods used by regulators to manage thrift crises, increased equity investments in thrifts' service corporations, and a dramatically changed financial environment.

In the future, some savings institutions probably will further diversify given the virtually unlimited scope of activities now open to them. They will be able to compete on a broader basis

in financial markets, and will probably tend to hold relatively more risky assets. Over time, however, earnings should improve and the improvement should reduce the impetus to move away from mortgage assets.

II. Implications for the Mortgage Market

This section examines the implications that the changes in savings and loan asset composition have for the mortgage market. The proposition that a link exists between the asset mix of savings and loans and the allocation of credit to housing is a variant of the one that ties the volume of mortgage credit to deposit growth at thrifts. Presumably, in the latter case, for a given volume of total credit, the larger the share of the funds channeled through thrifts, the higher the proportion of credit allocated to mortgages. If this were true, it follows that if thrifts reduce their propensity to invest in mortgage-related assets, then, all else equal, a smaller fraction of credit will go to mortgages and mortgage rates will rise relative to other market rates.

For deposit flows at thrifts and their mix of assets to have an impact on the allocation of credit to the mortgage market requires not only some separation of the mortgage market from the rest of the capital market, but also some segmentation within the mortgage market itself. That is, changes in mortgage lending by savings and loans, owing to developments specific to those institutions, must not be offset by other lenders.

Some degree of separation in financial markets might be expected in the short-run if institutional arrangements for channeling funds in the credit market are costly to adjust and the market disruptions are viewed as only temporary. However, it seems reasonable to expect that a permanent change in the propensity of thrifts to extend mortgage loans would induce adjustments by other lenders. This is particularly true given the increased importance of mortgaged-backed securities. In evaluating the impact of deposit interest rate ceilings, King (1979) suggests that regulation of thrifts is likely to affect the channels for mortgage credit rather

than the volume of such credit. This holds as well for regulations affecting the composition of assets at savings and loans.

The plausibility of the assumption that other participants in the capital market would adjust is only one reason that a changing asset mix at thrifts should not affect the allocation of credit. The idea that the asset mix at thrifts affects housing credit also is based on the questionable presumption that thrifts merely substitute non-mortgage assets for mortgages. This presumption ignores the fact that asset management should be related to liability management and the deregulation of deposits, which together affect the overall flow of funds to savings and loans.

In the previous section, it was pointed out that deposit deregulation contributed to the rebound of savings institutions as intermediaries. This has been particularly evident in the past couple of years, during which the strong performance of savings and loans was tied to the re-intermediation of small-denomination deposits following the lifting of deposit ceilings. The removal of deposit ceilings lowered the overall cost of deposits, making intermediation more efficient. To the extent that funds acquired by thrifts had been allocated to non-mortgage uses, such as in commercial paper held by money market mutual funds, the investment of those funds by thrifts in similar instruments would have no impact on the allocation of credit.

In addition, as discussed above, intermediation carried out by savings and loans in recent years has been boosted by their increasing reliance on large-denomination deposits and other nondeposit funds. This has been particularly true in the past couple of years. After the initial surge in small-denomination deposit growth following the introduction of MMDAs,

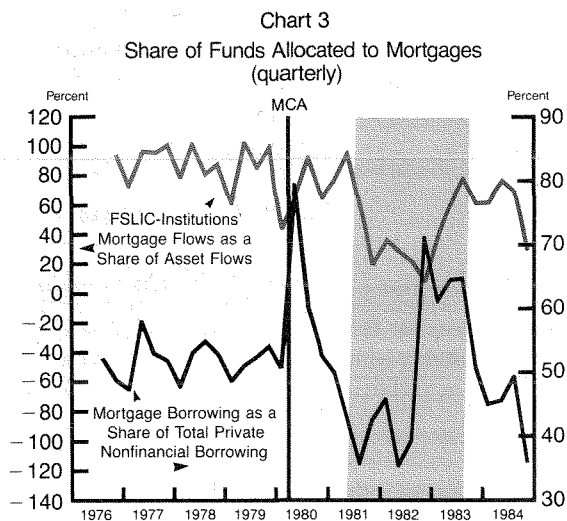
FSLIC-insured savings institutions once again picked up their issuance of managed liabilities. Some institutions have been particularly aggressive in issuing large CDs, apparently as part of a strategy to use liability management to increase asset growth.¹²

As a result of stronger managed liabilities, savings and loans have been able to extend a large volume of mortgage credit and simultaneously increase their relative holdings of non-mortgage assets. In 1984, for example, their mortgage holdings increased by about 15½ percent and total assets expanded by almost 20 percent. Thus, since the changing mix of assets was accompanied by rapid growth in assets, the nonmortgage activity at thrifts has complemented, rather than substituted for, mortgage lending.

Chart 3 provides evidence that is consistent with the view that changes in the mix of assets at FSLIC-insured savings institutions have not affected the allocation of funds to mortgages. The purple line in the chart represents the quarterly change in mortgages at FSLIC-insured institutions as a percent of the change in their assets, while the black line shows total mortgages flows—that is, net extensions of mortgages by all lenders, including households—as a share of private domestic nonfinancial borrowing.

The shaded region in the chart sets off the period in which the shift to nonmortgage assets at savings and loans was most pronounced. During that period, the ratios of mortgages to private domestic nonfinancial borrowing varied but, on balance, tended to rise, not fall. The movement of the ratio of total mortgage lending to private borrowing in the early 1980s appears to reflect changes in interest rates rather than portfolio adjustments at savings institutions. The peak in the 1980 credit control period aside, the ratio of mortgages to private borrowing fell in late 1980 and early 1981 as market interest rates rose. The ratio remained low, relative to the late 1970s, until the second half of 1982 when market rates began falling sharply.

As net mortgage flows at FSLIC-insured institutions (measured as a share of the change in



assets) stabilized between mid-1983 and the third quarter of 1984, the ratios of total mortgages to the volume of aggregate private borrowing fell. The two ratios did decline in the last quarter of 1984. However, on balance, it does not appear that there has been a consistent positive (or negative) relation between changes in the relative allocation of funds to mortgages by savings institutions and the share of aggregate borrowing accounted for by mortgages.

Another way of investigating the impact of the change in the asset mix at savings institutions on the mortgage market is to examine the behavior of mortgage interest rates. In keeping with several past studies on the determination of mortgage interest rates (see for example Jaffee and Rosen, 1979; Pyle, 1982; Anoako-Ada and Ben-Zion, 1983), it is assumed that mortgage rates can be modeled as a partial adjustment process such that,

$$R_t - R_{t-1} = \lambda(R_t^* - R_{t-1}). \quad (1)$$

In equation 1, R is the actual mortgage rate, R^* is the equilibrium mortgage rate, and λ measures the speed at which the mortgage rate adjusts to its equilibrium value. The equilibrium mortgage rate is assumed to be determined by the marginal cost of funds at savings institutions (C).¹³ For the purpose of this paper, the marginal cost is taken to be the rate on a 10-year Treasury bond.

To test whether changes in the composition of assets at savings and loans affect the rate on mortgages, the share of the flow of funds at FSLIC-insured savings institutions allocated to mortgages (M) is included as a determinant of the equilibrium mortgage rate. Also, to allow for the possibility that the flow of funds to savings and loans has repercussions on the mortgage rate, the equilibrium mortgage rate is expressed as a function of the percent change in small-denomination deposits at savings and loans (D).¹⁴

With these assumptions, the change in the mortgage rate can be expressed as a linear function:

$$R_t - R_{t-1} = \lambda[\alpha_0 + \alpha_1 C_t + \alpha_2 M_t + \alpha_3 D_t - R_{t-1}] \quad (2)$$

This can be restated in the standard regression form:

$$R_t = \beta_0 + \beta_1 C_t + \beta_2 M_t + \beta_3 D_t + \beta_4 R_{t-1} + \varepsilon_t \quad (3)$$

Based on portfolio theory, the use of simple regression analysis and equation 3 to investigate the relation between the mortgage rate and the asset mix at savings and loans may be unsatisfactory. Within a simple portfolio model, the fraction of funds allocated to mortgages by savings and loans would be expected to be pos-

itively related to the spread between the mortgage rate and the marginal cost of funds. This positive relation is just the opposite of what would be predicted under the "supply shock" hypothesis being tested in equation 3. Under that hypothesis, a greater allocation of funds to mortgages would tend to narrow the spread between the mortgage rate and the marginal cost of funds.

If both of these channels of influence come into play (the mortgage rate being affected by the flow of funds at savings and loans allocated to mortgages and vice versa), a single equation approach to estimating equation 3 would generate a biased estimate of β_2 . Accordingly, a two-stage estimation approach is used. In the first stage, an instrumental variable is derived for M.¹⁵ The second stage involves an ordinary least squares estimation of equation 3 in which the instrumental variable values for M are included.

The estimation results for equation 3 (with the instrumental variables included) are reported in Table 2.¹⁶ Equation I in the table is estimated using the commitment rate on mortgages from a survey conducted by the U.S. Department of Housing and Urban Development (HUD). In that equation, the estimated coefficient for M is not significantly different from zero. This result does not support the hypoth-

TABLE 2
Coefficients and Statistics for the Mortgage Rate Equation
(quarterly, 1978:2-1984:4)

Dependent Variable	Independent Variables					\bar{R}^2	SE	DW	ρ
	Constant	C_t	M_t	D_t	R_{t-1}				
I. HUD Commitment Rate	1.26	0.57 (3.90)*	-0.11 (-0.14)	-0.10 (-1.37)	0.45 (3.23)*	0.87	0.66	1.95	-0.32 (-1.60)
II. GNMA Rate	1.63	0.88 (15.05)*	-0.06 (-0.13)	-0.04 (-1.48)	0.08 (0.99)	0.99	0.23	1.92	0.79 (6.54)*

t-statistics in parentheses.

*Significantly different from zero at the one percent level.

esis that changes in the asset mix at FSLIC-insured institutions have had any significant contemporaneous impact on the primary mortgage market interest rate in recent years. The findings are confirmed when equation 3 is estimated using the actual values of M instead of the values of the instrumental variable.¹⁷

The results for equation I in Table 2 also show that the estimated coefficient for D is not statistically different from zero at the conventional levels of significance, although the t-statistic for the coefficient for D is larger than that for M.¹⁸ This finding suggests that, in the primary mortgage market, the growth rate of small-denomination deposits at savings institutions has not had an impact on mortgage rates in recent years. Jaffee and Rosen (1979), in contrast, showed that the ratio of the change in the level of savings and loan deposits to the value of new single-family homes had a negative and statistically significant relation to interest rates in the primary mortgage market prior to 1979. The evidence in Table 2 is consistent with the view that financial markets have become more integrated over time.¹⁹

Equation II in Table 2 tests for the impact of "supply shocks" at savings institutions on interest rates in the secondary mortgage market us-

ing the rate on GNMA securities as the dependent variable. The findings in equation II indicate that the secondary mortgage market rate is not influenced by changes in the asset mix or the flow of funds at savings institutions. One difference between the estimates for equations I and II is the more rapid adjustment of the secondary mortgage market rate. This, of course, is consistent with the secondary market being more fully integrated with the rest of the capital market.

From a theoretical perspective, in the long-run, adjustments within the capital market would be expected to eliminate any potential for an impact on the mortgage market stemming from a permanent change in the propensity of savings institutions to channel funds to mortgage borrowers. Even in the short-run, to the extent that asset restructuring by thrifts came about as a result of an increase in the level of intermediation at these institutions, the allocation of funds to the mortgage market would not be affected. Indeed, the empirical evidence is consistent with the view that the shift by savings institutions to holding a greater share of their assets in nonmortgage assets has not had an effect on mortgage rates or the allocation of funds to the mortgage market.

III. Conclusion

In recent years, savings and loans have been allowed to venture to a greater extent into non-mortgage activities. Since 1980, their new powers combined with poor earnings have encouraged greater diversification in their asset portfolios, thereby decreasing the relative role of mortgage-related assets in their portfolios. However, the relaxing of asset restrictions does not appear to be the only stimulus to thrifts seeking greater diversification. Changes affecting liabilities likely also have influenced the composition of savings and loan assets. In the future, as earnings improve, the tax incentives that traditionally have made mortgage lending particularly attractive to thrifts will reassert themselves.

The initiatives taken by savings and loans to balance their portfolios have important implications for their survival as effective competi-

tors in financial markets. They also will change the operation of the mortgage market. For example, there is an ever-growing tendency toward the use of mortgage-backed securities. Greater diversification does not, however, appear to have significantly altered the flow of funds to the mortgage market or the relation between mortgage rates and other market rates. In part, the greater interconnection of deposit and mortgage markets with money and capital markets probably has muted any potential impact stemming from asset changes at thrifts. Also, given the exceptionally rapid growth of savings and loan assets in the past two years, it is likely that the nonmortgage activity at savings and loans has been a complement to, rather than a substitute for, their traditional mortgage lending.

FOOTNOTES

1. Throughout the paper, the term "savings and loan associations" refers to all savings institutions insured by the Federal Savings and Loan Insurance Corporation (FSLIC), which includes both savings and loans and certain savings banks.
 2. At another level, there is the worry that increased non-mortgage investments would expose the Federal Savings and Loan Insurance Corporation to greater risk. There also is concern that, if savings and loans were to shed their traditional role as mortgage lenders, they would be subject to the same regulations that apply to banks and bank holding companies. Such regulations generally are more stringent than those for thrifts and their holding companies.
 3. See *Guide to Federal Income Taxes for Savings Institutions*.
 4. Depository institutions that do not meet the thrift test can make tax-sheltered contributions to loan loss reserves that are based on actual losses incurred in the past.
 5. The Garn-St Germain Act of 1982 also provides for some additional mortgage powers. For a description, see Federal Reserve Bank of Chicago, *Leveling the Playing Field, A Review of the DIDMCA of 1980 and the Garn-St Germain Act of 1982*.
 6. For a discussion of these powers and those given to federally chartered savings banks under MCA, see Federal Reserve Bank of Chicago, *Ibid*.
 7. The behavior of savings banks not insured by the FSLIC has been different from that of the FSLIC-insured savings institutions. The former markedly increased the proportion of assets held in nonmortgage loans (see Mahoney, Patrick I. and Alice P. White. "The Thrift Industry in Transition." *Federal Reserve Bulletin*, March 1985, pp. 137-156).
 8. Savings and loans also can engage in nonmortgage activities through service corporations. The activities of such subsidiaries are not reflected in the data shown in Table 1.
 9. In addition to the lifting of deposit ceilings, the sharp drop in interest rates in the second half of 1982 likely was a crucial factor in the revival of thrift deposit flows.
 10. For a discussion of the changes in assets and liabilities at thrift institutions and commercial banks brought on by the introduction of the money market deposit account, see Furlong (1983).
 11. The highly liquid MMDA, which by far is the most popular of the deregulated deposit accounts, allows up to six automatic transfers per month (up to three of these by check) and an unlimited number of withdrawals when they are made in person. The overall maturity of deposits at savings and loans also has been shortened as a result of the introduction of nationwide NOW accounts in 1981. NOW accounts are fully transactional.
 12. Keeley (1984) points out that deposit deregulation affected the liability structure of commercial banks by causing the substitution of smaller-denomination deposits for large certificates of deposits. For savings and loans, deregulation may have reduced their comparative advantage in attracting small-denomination deposits. This lost comparative advantage may account for some of their increased reliance on large CDs.
 13. A number of studies have examined the issue of whether mortgage interest rates are determined by marginal cost or average cost: Jaffee and Rosen, 1979; Pyle, 1982; Anoako-Adu and Ben-Zion, 1983; and Mayer and Nathan, 1983. There is little dispute over the fact that, on theoretical grounds, marginal cost pricing is the preferable approach for modeling the behavior of financial institutions. However, the empirical evidence is mixed. The average cost of funds (or deposits) at mortgage lending institutions has been found to be significant in explaining mortgage interest rates when some measures of the marginal cost of funds, but not others, are used in mortgage rate regressions. Nevertheless, on balance, the empirical evidence indicates that, of the two depictions of behavior, marginal cost pricing is more appropriate.
 14. Since the test is whether exogenous shocks to the flow of funds at savings and loans affect the mortgage rate, it is more appropriate to use the small-denomination deposits than some broader measure of liabilities over which these thrifts have greater control.
 15. The instrumental variable for M is derived from an equation with the marginal cost of funds, the lagged mortgage rate, the return on assets at FSLIC-insured institutions, the lagged ratio of the stock of mortgages to assets at FSLIC-insured institutions, and the percent change in total financial assets included as the right-hand-side variables. The adjusted R² for this estimated equation was 0.77.
 16. To control for the possible effects of the 1980 credit control period on the constant term, equation 3 also was estimated using a bivariate (0,1) dummy for the 1980:2 to 1980:3 period. The coefficient for this variable was not significantly different from zero, and the variable was not included in the estimations reported in Table 2.
 17. Based on the discussion in Section I, the composition of savings and loan assets would tend to be tied to core deposit flows. Given the potential for the interrelation between asset and liability management to affect the statistical findings regarding the relation of M to the mortgage rate, equation 3 was estimated with the variable D excluded. However, the estimated coefficient for M still was not significantly different from zero when either the actual or the instrumental values for M were used in the estimation.
 18. In keeping with the comment in the previous footnote, equation 3 was estimated with the variable M excluded. The findings regarding the impact of D on the mortgage rate were not materially changed.
- It is also possible that savings and loans do attempt to manage small-denomination deposits to some degree. Consequently, the growth rate of small-denomination deposits may be affected by the mortgage rate given the opportunity cost. For example, if mortgage rates for some reason were high relative to other market rates, savings and loans might attempt to attract a larger volume of small-denomination deposits. If this were the case, D would not be independent of the error term in equation 3. Accordingly, equation 3 was estimated using an instrumental variable approach similar to that used for M. In this case, the coefficient for D once again was not significantly different from zero.

19. The conclusions regarding the relation between mortgage rates and small-denomination deposit flows at savings and loans have to be tempered some, based on evidence not shown in Table 2. A series on commitment rates at savings and loans is available from the Federal Home Loan Bank Board (FHLBB). This series was not used in Table 2 because the FHLBB used interest rates on both fixed and variable-rate mortgages through September 1983. The HUD series is based on data for fixed-rate loans.

When equation 3 is estimated using the FHLBB series, the results concerning the relation between R and M are essentially the same as those reported using the HUD series. However, when either the actual or the instrumental variable values for M and D are used, the growth rate in small-denomination deposits has a small negative impact on the mortgage rate, and the effect is statistically significant. The problem is that it is unclear to what extent the mixing of variable- and fixed-rate yields accounts for these results.

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