NBER WORKING PAPERS SERIES

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Working Paper No. 3548

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 1990

Prepared for the 1990 Economic Policy Conference of the Federal Reserve Bank of St. Louis, I thank Jack Goodman, Robert Van Order, and Kevin Villani for comments on an earlier draft. This paper is part of NBER's research program in Financial Markets and Monetary Economics. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

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ABSTRACT

Three major changes occurred during the 1980s in the market for home mortgage credit; the securitization of fixed-rate mortgages, the development of a national primary market for adjustable-rate mortgages, and the decimation of the saving and loan industry. These changes and their impacts on various financial industries and homebuyers are the subjects of this paper. I also briefly speculate about likely future changes in this market.

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Three major changes occurred during the 1980s in the market for home mortgage credit: the securitization of fixed-rate mortgages, the development of a national primary market for adjustable-rate mortgages, and the decimation of the saving and loan industry. These changes and their impacts on various financial industries and homebuyers are the subjects of this paper. I briefly summarize the three major changes before presenting a detailed analysis.

The FHA/VA fixed-rate mortgage (FRM) market was integrated with the capital market gradually throughout the 1970s via increased usage of the Ginnie Mae pass-through program, and the conventional FRM market was integrated in the first half of the 1980s with the development of active markets for the mortgage pass-through securities of Freddie Mac and Fannie Mae. Integration was stimulated in the 1980s by the deregulation of deposit rate ceilings and the erosion of thrift tax subsidies, two developments that switched thrifts from low cost funders of mortgages to high cost funders. As a result, coupons on new-issue FRMs now swiftly adjust to changes in other capital market rates, and mortgage funds are readily available at all times and places at going market rates.

Nationwide authority to originate adjustable-rate mortgages (ARMs) was not given to federally-chartered thrifts until 1979, and ARMs with loose per adjustment period and life-of-loan rate caps were not permitted until 1981. In response to this authorization, ARMs accounted for two-fifths of the total conventional loan volume originated by all lenders over the 1984-89 period, and by 1989, half of the thrift home loan portfolio was in ARMs. The widespread

existence of ARMs reduced the previous cross-subsidy from more mobile to less mobile households and increased the ability of many households to qualify for larger loans.

The large losses of the savings and loan (S&L) industry in the 1980s stemmed first from badly mismatched asset and liability portfolios in the late 1970s and early 1980s, when interest rates skyrocketed, and then from rapid S&L growth and accelerated investment in nontraditional, and expost nonprofitable, real estate loans in 1983 and 1984. In the 1985-88 period, the industry grew at a relatively slow rate, and since passage of FIRREA, the industry has been in freefall. Between the end of 1984 and the end of 1990, the S&L share of home mortgages outstanding has declined from 43 percent (also the average share in the second half of the 1970s) to 25 percent. As I will discuss, the S&L problems in the early 1980s substantially raised conventional FRM rates, but the recent decline in the S&L home mortgage share has not raised FRM rates, at least for the 90 percent of FRMs that can be sold to Fannie Mae and Freddie Mac.

The remainder of this paper is divided into six sections. The first two describe the development of mortgage securitization and its impact on mortgage rates. The next two document the growth in the ARM market and the decline in the S&L industry. Section V speculates about future prospects for the market for home mortgage credit, and Section VI summarizes the paper.

I. The Development of Mortgage Pass-Through Securities

In 1968, the Government National Mortgage Association (Ginnie Mae) was formed within the U.S. Department of Housing and Urban Development to administer government mortgage support programs. Two years later Ginnie Mae began guaranteeing mortgage-backed pass-through securities, GNMAs, representing shares in pools of FHA/VA loans. Investors in pass-throughs receive a pro rata share of the payments, both scheduled and early (in the event of prepayment or

default), on the underlying mortgages. While investors in whole FHA/VA loans are insured by FHA or VA against loss of principal and interest, investors in GNMAs are guaranteed the full timely payment of principal and interest.

In 1970, the Federal Home Loan Mortgage Corporation (Freddie Mac) was chartered to spur the development of a secondary market for conventional mortgages. Freddie Mac introduced the first conventional mortgage pass-through in 1971, the Mortgage Participation Certificate (PC). Because the underlying conventional mortgage is not itself fully insured, in contrast to FHA/VA loans, the Freddie Mac guarantee adds more value to the underlying mortgage than does the Ginnie Mae guarantee even though Freddie Mac doesn't have a full faith and credit Federal guarantee. In 1981, the Federal National Mortgage Association (Fannie Mae) initiated a conventional mortgage-backed security (MBS) program similar to Freddie Mac's PC program. Fannie has intermediated in the more traditional sense, buying mortgages and issuing its own debt, since 1938, and it has an implied guarantee comparable to Freddie Mac's.

The size of the FHA/VA and conventional loan volume that can be securitized by Ginnie Mae and the sponsored agencies (Fannie and Freddie) is restricted by limits on the dollar value of loans that can be pooled into the various pass-through securities. The dollar limit on GNMAs follows from the limit on the underlying FHA and VA loans. The 1990 limit varies regionally from $67,500 to $124,750. The lower limit was not changed in the 1980s, but the upper limit, which was $90,000 between 1980 and 1987, was increased in both 1988 and 1989. Moreover, limits were raised in numerous regions multiple times during the 1980s. The dollar limit on conventional loans that Fannie Mae and Freddie Mac can purchase, the "conforming" limit, changes annually with a house price index but does not vary regionally. The 1989 limit was $187,600, up 63

percent since 1985 (the limit was virtually unchanged in 1990). In 1987, over 90 percent of home mortgages loans (80 percent of dollar volume) was eligible for pooling by the agencies, and this percentage has been fairly constant.

The markets for fixed rate FHA/VA and conforming conventional loan pass-throughs developed at different rates. Table 1 presents data on the growth in the securitization of fixed-rate FHA/VA loans. The importance of securitization to the new origination market is measured as the ratio of GNMA issues backed by single-family loans to total originations of these loans (Ginnie Mae is prohibited from securitizing FHA/VAs over 18 months old). By the second half of the 1970s, two-thirds of FHA/VA originations went into GNMA pools; by the early 1980s four-fifths did; and since 1982 all FHA/VAs have gone into GNMAs.[1]

As the data in Table 2 indicate, the pass-through market for conforming conventional loans developed less rapidly. The best measure of the agencies' presence in this market is the share of new fixed-rate conventional FRMs (generally defined as less than one year since origination) eligible for agency securitization (under the conforming limit) that is, in fact, securitized by Freddie Mac and Fannie Mae. The upper part of Table 2 lists total agency pass-through issues, those backed by seasoned FRMs, new ARMs and multifamily loans, and, by subtraction, new FRMs. The lower part puts the agency issues backed by new FRMs into a market perspective. Total single-family conventional originations are multiplied by an estimate of the fraction that had a fixed rate, and the result is divided by agency issues backed by new FRMs to obtain the agency share of the total FRM market. Of course, the agencies can only participate in the conforming end of the market. Assuming this end to be 75 percent of total FRM volume, the last column is an estimate of the percentage of new FRM conforming loan volume that is sold directly to Fannie and Freddie.

As can be seen, this estimate rose from 4 percent in the 1977-81 period to almost 25 percent in the 1982-85 period and to over 50 percent since 1986, including 69 percent in 1989.

The difference in the development of FHA/VA and conventional pass-throughs in the 1970s and early 1980s stems largely from the historical differences in the origination of FHA/VA and conventional mortgages. Mortgage bankers have tended to dominate the FHA/VA market, accounting for 70 to 80 percent of originations (Table 1) versus only 7 percent of conventional originations prior to 1982 and 15 percent since, and they sell virtually all their originations to other investors. Thus when an improved method for selling mortgages became available, mortgage bankers quickly took advantage of the opportunity. By the early 1980s, virtually all of mortgage banker originations were sold into Ginnie Mae securities or to Fannie Mae and Freddie Mac (some conventionals were sold to Fannie Mae for its portfolio). In contrast, depository institutions have dominated conventional originations (80 to 90 percent), and they have tended to keep their originations as portfolio investments. Thus an improved selling method alone was not sufficient to stimulate the conventional pass-through market.

Portfolio restrictions on savings and loans (no corporate loans, bonds, or equity issues) encouraged investment in residential mortgages prior to the 1980s. Moreover, these investments were especially profitable to thrifts, owing to special tax advantages. The tax preference was the ability of thrifts to compute loan loss reserves that far exceeded a reasonable provision for normal losses, as long as thrifts invested a large fraction of their assets in housing-related loans or liquid assets (Hendershott and Villani, 1980, appendix). In effect, thrifts were allowed to transfer large portions of their before tax income to reserves, thereby avoiding taxes. Between 1962 and 1969,

the transfer was limited to 60 percent of taxable income; between 1969 and 1979, the fraction was gradually reduced to 40 percent; the Tax Reform Act of 1986 lowered the fraction to 8 percent.

The incentive provided by the extraordinary loan loss provisions for investment in residential mortgages depends on the expected level of thrift taxable profits over the expected life of the investment (with no profits now or in the future, the incentive is zero), the income tax rate, and the statutory fraction of income that can be transferred to reserves. Assuming a one percent net pretax return on assets, the incentive was substantial in the 1960s and 1970s (Hendershott and Villani, 1980). In the 1960s when the transfer fraction was 60 percent, savings and loans would have accepted a three-quarters percentage point lower pretax return on tax preferred housing-related assets than on comparable nonpreferred assets. By 1979, when the transfer fraction was down to 40 percent, they would have accepted a half percentage point less.

Two major factors have driven the increase in conventional loan securitization in the 1980s. First, thrifts maintained their share of mortgage originations but reduced their relative investment in home mortgages (have sold some of the originated mortgages). Most strikingly, the share of saving and loan total assets in home mortgages and agency securities (largely Fannie and Freddie pass-throughs) fell from 72 to 59 percent during the 1982-84 period. This portfolio shift reflected the reduced profitability of savings and loans, first due to high interest rates and a maturity mismatch and then due to disinflation and credit losses, and the expansion of savings and loan asset powers. The reduced profitability eroded the tax incentives for residential mortgage investment, while the expansion of powers encouraged thrifts to invest more widely. Second, a Freddie Mac PC or Fannie Mae MBS is excellent collateral for borrowing through FHLB advances and security repurchase

agreements, and in the 1980s these became cheaper marginal sources of funds than deposits for many savings and loans. During the 1984-88 period, savings and loans increased such debt by over $150 billion. That is, some loans were simply swapped for pass-throughs, and the pass-throughs were retained in portfolio and "repoed" or used to increase advances.

Recent years have also marked a surge in the resecuritization of fixed-rate mortgage-backed securities, the slicing up of these securities into different maturity tranches (CMOs or REMICs) or into interest or principal strips (IOs and POs). The first resecuritization (issuance of a multiclass mortgage security) was a Freddie Mac CMO issue in 1983. Issues have risen from $16 billion in 1986 to $100 billion in 1989. Initially issues were dominated by private sector participants; Fannie Mae and Freddie Mac accounted for only two percent of issues in 1986-87. By 1989, though, these agencies accounted for 83 percent of issues. Throughout the 1986-89 period, pass-through securities, rather than whole mortgage loans, have been the collateral for 96 percent of multiclass issues.

The securitization of conventional conforming ARMs by Fannie Mae and Freddie Mac is less prevalent. It appears that only 2 to 3 percent were securitized in 1984-85 and that the percentage is still only 10 to 12 percent. The greater securitization of fixed-rate than adjustable-rate mortgages likely reflects both the greater standardization of FRMs than ARMs and the greater desire of originators to hold ARMs than FRMs in their portfolio.

Finally, some investment banks and large thrifts also securitize home mortgages, but these institutions largely (possibly exclusively) limit themselves to nonconforming or jumbo loans and they likely securitize only 10 to 20 percent of the market (Woodward, 1988). Fully private mortgage securitizers cannot compete with Fannie Mae and Freddie Mac for two reasons: the agencies do not have to maintain as much capital as fully private

institutions, and the agencies' costs of securitizing are lower. The latter stems from lower explicit costs (exemption from SEC requirements, state and local taxation, etc.) and from the economies of scale achieved as a result of being the low cost securitizer in a large part of the market.

II. The Impact of Securitization on Mortgage Coupons

A clear implication of mortgage securitization is that mortgage yields should be more closely connected to capital market rates with securitization than without. The expected impact of securitization on the general level of mortgage rates is more complicated. Empirical evidence relating to each of these impacts is discussed below.

Timing of Conventional Mortgage Rate Adjustment to Capital Market Rates

The perfect mortgage market model says that the coupon rate for a near-par mortgage depends on a small number of general capital market variables, such as the six-month and seven-year Treasury rates and the volatility of these rates (Hendershott and Van Order, 1989). Moreover, the response to changes in those variables is predictable and fast. In contrast, twenty years ago mortgage lending was tied to the thrifts, which were heavily regulated and also tax-advantaged to invest in mortgages, and connections of mortgage and capital markets were tenuous and gradual. Hence most researchers focused on things peculiar to the thrift industry, such as deposit rates and deposit flows, rather than general capital market conditions, as determinants of mortgage rates. If one regressed actual mortgage rates during such a period on fictional mortgage rates predicted by the perfect market model, one would expect to obtain a poor fit. Moreover, to the extent that the predicted rate had any effect, it would be a lagged one.

Roth (1988) analyzed the integration of mortgage and capital markets by looking at trends in the month to month correlation of changes in coupon rates on conventional mortgage commitments and 10-year Treasuries annually from 1972 to 1987. His results are reproduced and extended to include 1988 and 1989 in Table 3. Prior to 1982, the correlation of the changes ranged from -0.5 to +0.5 and was never statistically different from zero. After 1981, through, the correlation was never less than 0.58 and was always statistically positive. Moreover, in the last three years the correlation has averaged 0.90.

A potential problem with Roth's analysis is that the mortgage rate incorporates a call premium while the Treasury rate does not, and in some periods the value of the call premium may have changed markedly, possibly disguising a close relationship between the noncall component of the mortgage coupon and the Treasury coupon. Hendershott and Van Order (1989) attempted to correct for this potential problem by constructing a perfect mortgage-like capital market rate and estimating the adjustment of conventional commitment mortgage rates to this perfect rate (rather than to a Treasury rate). The analysis consisted of two parts. First, they estimated a price equation for GNMAs, set the price equal to the new-issue price, and solved the equation for the perfect-market retail coupon rate. Second, they regressed conventional commitment mortgage coupon rates on current and past values of the estimated perfect-market coupon rate taken from the GNMA equation.

The price equation was estimated on weekly GNMA price and coupon data from the January 1981-July 1988 period. In this equation, the GNMA price was regressed on the coupon (adjusted to a bond-equivalent basis), the seven-year Treasury rate, and two determinants of the value of the borrower's call option -- the term structure slope (seven-year rate less six-month rate) and an

estimate of the volatility of the seven-year rate. Various interactions of these variables were included to allow for nonlinear price responses.

To obtain the perfect-market rate, the estimated price equation was solved for the coupon rate after the mortgage price was set equal to 100 less the actual points charged in the conventional market (less one point presumed to equal origination costs). This coupon was then converted to a mortgage (rather than bond-equivalent) basis, and 50 basis points were added for servicing and other costs. As the degree of integration increased, changes in the perfect-market coupon rate should have been reflected more quickly in the conventional commitment rate.[2]

Retail conventional commitment rates were regressed on the current and lagged one to eight week values of the perfect-market rates for various parts of the 1971-88 period. Table 4 reports the cummulative adjustment of the commitment rate concurrently and over two, four, six, and eight week lags. The shift toward integrated markets is striking. The percentage of the change in the perfect-market rate that is reflected instantaneously in the retail conventional rate rose monotonically from effectively zero in the 1970s to 8 in the 1980-82 period, 16 in the 1983-85 period, and 59 in the 1986-88 period. The fraction of the change in the perfect-market rate reflected in the conventional rate within two weeks rose monotonically from a sixth in the first half of the 1970s, to almost half in the early 1980s, to over half in the 1983-85 period, and to nearly one in recent years.

Securitization and the Level of Mortgage Rates

Probably the best starting point is a comparison of the actual conventional commitment rate and the Hendershott-Van Order fictional perfect-market rate. Table 5 lists annual values of these rates and the difference

between them for the 1971-88 period.[3] The precise differences are, of course, subject to some error: the actual rate is a survey rate and the perfect rate is computed from an empirical equation estimated with error. Nonetheless, the overall pattern of the differences seems both systematic and plausible. The actual rate was three-quarters of a percentage point below the perfect-market rate in the 1971-75 period; a third of a point below in the 1976-80 period; and roughly half a point above the perfect rate in the 1982-86 period.

As explained above, the low mortgage rates in the 1970s can be attributed to tax advantages for thrift mortgage investments and portfolio restrictions against nonmortgage investments, and the switch in the 1980s reflects a sharp relative shift of thrifts out of home mortgage investments owing to the reduced (non) profitability of savings and loans and the expansion of savings and loan asset powers. The half percentage point premium in the early 1980s provided the incentive for the securitization of conforming conventional FRMs. The premium covered the start-up costs of the securitizers and the liquidity premium demanded by investors.

Beginning in the middle of 1987, the actual rate is very close to the perfect market rate, the conventional conforming mortgage market seemingly being fully integrated into capital markets. That is, as the volume of mortgage pools grew, bid/ask spreads were bid down (and thus the liquidity premium fell), and the per dollar costs of the securitizers declined. This suggests that the rates on conforming loans, which are eligible for purchase by the agencies, should have declined relative to rates on nonconforming or jumbo loans.

The raw data displayed in Table 6 suggest that beginning in 1986 yields on conforming loans were lowered relative to those on nonconforming loans. Average effective rates are listed for loans of increasing size (percent of the conforming loan limit) with similar loan-to-value ratios (75 to 80 percent)

originated in California in the May-June periods of 1978, 1985, 1986 and 1987. Holding the loan-to-value ratio and state of origination constant controls for default risk. California was chosen because it accounts for roughly a quarter of the dollar value of all conventional FRMs closed in the United States and more than half of all jumbo loans (those over the conforming limit). The number of loans in the samples and the percent of the eligible dollar volume securitized by FNMA and the FHLMC are reported at the bottom of the table (see Hendershott and Shilling, 1989, for more detail on the loan samples).

In general, one would expect the loan rate to decline with loan size because the costs of originating and servicing loans decreases per dollar of loan as the loan size increases. This is clearly the case for loans below the conforming limit in all years except 1985, where the limited number of observations results in much noise in the averages. Of most interest, though, is what happens to the loan rate when the loan size increases above the conforming limit. Prior to 1986, the loan rate is either flat (1978) or still decreasing (1985). But in 1986, the loan rate jumps at, and in 1987 just above, the loan limit. That is, rates on loans below the loan limit are noticeably lower than those above the limit. The most likely cause is, of course, the expanded activities of Fannie Mae and Freddie Mac. These expanded activities probably also influence rates on loans just above the limit because such loans are likely to be conforming within a year (Woodward, 1988). Thus, the low rate for loans that are 100 to 115 percent of the limit in 1987 may not be as anomalous as it first appears.

Hendershott and Shilling (1989) estimated, separately on data for 1978 and 1986, the relationship between rates on loans closed and the following factors: loan-to-value ratio, loan size, precise month the loan was closed, dummy variables for geographic regions in the state, and whether the loan was on a new property, was under the conforming limit, or was just above the limit.

The loan-to-value ratio had the expected positive impact; the loan size and the new property dummies had the expected negative impacts; and the responses in the two years were remarkably similar. For those two years, however, the effects of the conforming limit differed markedly. In 1986, conforming loans had a 30 basis point lower rate than well-above-the-limit loans, and soon-to-be-conforming loans had a 15 basis point lower rate (standard errors were only 5 basis points). In 1978, however, the point estimate for the conforming loan coefficient was only 3 basis points.

It should be emphasized that the perfect market rate listed in Table 5 is computed from a GNMA price equation, not an equation explaining prices on seven- or ten-year Treasury bonds. The working assumption of Hendershott and Van Order was that the GNMA market has been integrated with capital markets since 1981. This assumption seems plausible because GNMAs have full faith and credit guarantees and have traded like Treasuries, with comparably low transactions costs and high volume, at least since 1981. However, some would argue that the resecuritization phenomenon, particularly the surge in CMOs and REMICs, has lowered GNMA yields, and thus conventional mortgage rates, relative to Treasury yields. This might suggest an additional quarter point relative decline in the cost of FRMs since the first half of the 1980s (O'Keefe and Van Order, 1990).

The agency securitization explosion and the resultant reduction in FRM yields has affected a number of financial firms importantly. Most obviously, the shareholders of Fannie Mae and Freddie Mac have benefitted. One guide is the movement in Fannie Mae's stock price, which quadrupled from 8 in early 1983 to 32 in the summer of 1990.[4] Also benefitting were those investors who were holding FRMs when the agencies were lowering FRM rates and thus mortgage prices were rising. On the other hand, the 30 basis point reduction in FRM yields hurts ongoing portfolio lenders, both those investing in FRMs and those wishing

to originate more ARMs for their portfolios. The latter group includes both S&Ls and commercial banks. Finally, securitization has led to greater specialization in separate phases of the mortgage process; different firms are concentrating on origination, servicing, investing and insuring (Fannie and Freddie).

III. The Growth in Adjustable Rate Mortgages

Prior to the 1980s, there was one mortgage type, the standard fixed-payment mortgage (FRM). Periodically in the 1960s and 1970s, increases in interest rates reminded thrifts of the problems of borrowing short and lending long. At these points (1971 and 1974 specifically), federally-chartered thrifts lobbied for permission to offer borrowers an alternative choice, adjustable rate mortgages (ARMs), that would reprice more in line with thrift deposits. Congress made clear to the regulatory body (then the Federal Home Loan Bank Board) that it did not want borrowers to have that choice (Cassidy, 1984). In December 1978, an exception was made for federally-chartered S&Ls in California, allowing them to compete with state-chartered S&Ls, and in July 1979, nationwide authority to invest in ARMs was first granted. However, annual and life-of-loan rate increases were restricted to one-half and two-and-a-half percent, respectively, and the choice of rate index was greatly restricted.

Ironically, about the same time that interest rates were peaking in the early 1980s, Congress gave thrifts the opportunity to invest in ARMs that might be attractive to both lenders and borrowers. In April 1981, fairly liberal regulations were implemented for federally chartered S&Ls and savings banks, and in August 1982, these were loosened further and extended via the Deposit Institutions Act to all state-chartered institutions (although individual states could override the regulations during a three year period). Thrifts,

indeed, took advantage of this opportunity. In the middle of 1982, ARMs were only 10 percent of the single-family mortgage portfolio of FSLIC-insured S&Ls. By March 1989, 48 percent of the thrift single-family loan portfolio (including mortgage-backed securities) was in ARMs (Hendershott and Shilling, 1990). Moreover, over the 1984-89 period, ARMs accounted for 43 percent of the conventional single-family loan volume originated by all lenders (computable from Table 2).

The coupon on a FRM reflects the pure cost of "intermediate" term (say 7 year) money plus the cost of a call or prepayment option.[5] Alternatively, the FRM coupon can be thought of as the pure cost of short-term money (say one year) plus the cost of an intermediate term (say 7-year) rate cap that will pay the borrower the difference between the actual short-term rate and the initial one should interest rates rise.[6] The sole existence of the FRM caused cross subsidization among borrowers because all borrowers pay virtually identical costs for the call option or rate cap even though the option/cap is certainly more valuable to less mobile households than to more mobile households because longer lived options/caps have greater value than shorter lived options/caps. That is, with the FRM, more mobile households, who pay more for the call option/rate cap than it is worth to them, subsidize less mobile households, who pay less than it is worth to them. The existence of adjustable-rate mortgages (ARMs) would give mobile households an alternative to overpaying for the FRM and would reduce the subsidy to less mobile households who choose the FRM.

A second potential advantage of ARMs for at least some borrowers stems from the facts that initial coupon rates on ARMs are less than those on FRMs and lenders qualify borrowers based on the lower rates. Thus borrowers financing with ARMs can obtain larger loans and purchase larger houses. The latter suggests that the ARM share of conventional single-family mortgage originations will vary cyclically as the FRM-ARM rate spread varies, and Figure

1 shows that this variation has occurred. Large rate spreads (two and a half percentage points) in 1984-85 and mid1987-end1988 were associated with 40 to 60 percent ARM shares, while small spreads (one and a half points) in 1986-mid 1987 and late 1989 were associated with 20 to 25 percent shares.[7]

Another important determinant of the ARM/FRM choice is the level of the FRM rate (Brueckner and Follain, 1989); the higher the FRM rate, the more desperately do households need to obtain a lower initial rate on which they can qualify for a reasonably sized loan. The sharply reduced ARM share in 1986 relative to earlier years reflected, in part, the marked decline in FRM yields in 1985 and 1986.

The successful securitization of the FRM market, but not the ARM market, has likely reduced the FRM rate relative to the ARM rate. This can significantly alter the ARM/FRM mix. For example, using an FRM rate of 10.50, an ARM rate of 8.50 and the mean values of the other demographic variables relevant to the ARM/FRM choice, Brueckner and Follain's (1989) estimation equation implies a 23 percent probability of this household choosing an ARM. However, a 30 basis point higher FRM rate raises the ARM probability to 32 percent.

IV. The Saving and Loan Industry

The institutions that have been most affected by, or causally linked to, changes in the home mortgage market in the 1980s have been savings and loans (and Fannie Mae and Freddie Mac). A shrinkage in the savings and loan industry in the very early 1980s and a relative shift of savings and loans (S&Ls) out of home mortgages in the 1982-84 period raised conventional FRM rates from one-half percentage point below perfect-market levels in the 1970s to one-half

point above perfect-market levels in the early 1980s. This induced securitization, which successfully lowered conforming FRM rates back to perfect market levels.

Figure 2 provides data on both savings and loan behavior and the relative role of S&Ls as home mortgage investors over the past quarter century. The behavior of S&Ls is reflected in the proportion of S&L assets invested in home mortgages either directly or indirectly through holdings of agency securities. As can be seen, this proportion varied within a fairly narrow 72 to 74 percent range until 1981, before plummeting to 59 percent at the end of 1984. The ratio slipped further to 57 percent at the end of 1987, but has since risen to 61 percent. The sharp decline in 1983 and 1984 reflected accelerated growth in the S&L industry (18 percent annual growth rate), not an actual shift out of mortgages.

The S&Ls presence in the home mortgage market is measured as the ratio of S&L total (direct and indirect) home mortgage holdings to total home mortgage debt outstanding. This presence is the product of the other two series in the figure, the fraction of S&L assets invested in home mortgages and the ratio of S&L total assets to the book value of all outstanding home mortgages. Beginning at 0.43 in 1965, the S&L presence rose gradually throughout most of the 1970s, reaching a peak of 0.51 in 1977. Since then the S&L presence has been halved. The increase between 1969 and 1977 and subsequent decline through 1981 reflected swings in the size of the S&L industry relative to the size of the home mortgage market (recall that the S&L mortgage portfolio share was constant over this period). The ratio of S&L total financial assets to total home mortgage debt outstanding rose from 0.56 in 1969 to 0.70 in 1977, before declining to 0.63 in 1981.

While S&L total financial assets grew between 1984 and 1988, they grew at a slower rate than the home mortgage market; with a constant S&L mortgage portfolio share, the S&L share of the home mortgage market fell from 73 to 63 percent. Since early 1989, S&L assets have been shrinking rapidly; in just a year and a half the ratio of S&L total assets to home mortgage debt has fallen from 0.36 to 0.25. In this year and a half, S&Ls have liquidated nearly $90 billion in agency securities and over $50 billion in direct home mortgage holdings. The recent decline is, of course, related to the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA), although that Act was itself largely a belated recognition of economic realities.

FIRREA has two offsetting effects on home mortgage investment by S&Ls. First, the Act strongly encourages such investment in two ways. A strengthened qualified-thrift-lender (QTL) test directly mandates more investment. S&Ls must now keep 70% of assets in qualified loans rather than 60%, and fewer nonhousing related loans are now classified as qualified than was previously the case. In addition, restrictions on nonhousing related loans are substantially increased. For example, limitations are tightened on commercial real estate loans, tangible personal property holdings, commercial and corporate debt, and wholly-owned service corporations, and existing junk bond holdings must be liquidated entirely. While some of these provisions are not yet fully in force (the new QTL test does not go into effect until June 10, 1991 and junk bonds do not need to be fully liquidated until July 1, 1994, although regulators are forcing undercapitalized thrifts to liquidate sooner), the decline in the home mortgage portfolio share of S&Ls has already been arrested.

The negative effect of FIRREA on S&L home mortgage investment comes from the increased capital requirements that are already leading to a downsizing of the S&L industry. S&Ls are shrinking and being sold off wholesale to nonS&Ls.

To date, this second effect, the downsizing, has dominated, and the S&L role in home mortgage financing has plummeted. It is noteworthy, though, that interest rates on conforming home mortgages do not appear to have risen relative to Treasury rates, which is what one would expect given the full integration of the market. Figure 3 contains monthly average values for the Freddie Mac commitment rate and the seven-year Treasury rate. The commitment rate has continuously tracked the seven-year rate, and the difference in 1990 is about the same as in 1988 and is less than in 1989. While simply comparing these rates is generally inappropriate because the call premium built into mortgage coupon rates can change, sharp changes in the slope of the term structure and the volatility of interest rates do not appear to have occurred in the 1988-90 period. Whether ARM rates or jumbo FRM rates have been affected is unknown.

A quick look at the policy mistakes that caused the crippling of the S&L industry is probably worthwhile. The FSLIC debacle is generally viewed as occurring in two stages (Kane, 1989). First, sharply rising interest rates easily eliminated the net worth of most S&Ls owing to their asset-liability mismatch (borrowing short and lending long). This mismatch was, of course, aided and abetted by Congress, which prevented the widespread introduction of ARMs by a decade. Second, S&Ls then took substantial risks (doubled their bets) in the 1980s, as one might expect. The latter was made easier by the increase in deposit insurance coverage from $40,000 to $100,000 per account, the use of brokered deposits, and the enactment of new asset powers (including additional flexibility in writing mortgage contracts). Regulatory forbearance and loose oversight, this time aided and abetted by both Congress and the Administration, encouraged this risk taking and led, in conjunction with the generous tax provisions of the 1981 Tax Law, to substantial overbuilding in throughout the U.S. As a result, "good" real estate investments have turned

bad, and commercial banks and other real estate investors are starting to take large real estate losses.[8] The cost to taxpayers and investors of forebearance is truly going to be enormous.

Complicating matters is the erosion in the basic profitability of S&L mortgage portfolio lending. Owing to increases in the costs of deposits and advances relative to Treasury rates, S&Ls haven't been the low cost supplier of home mortgage credit for some time (Hendershott, 1990b). With a low profit stream, untoward events (credit problems, rising interest rates) quickly reduce capital, rather than just lowering dividends, and, with little capital, shortly increase taxpayer liabilities.

We are now supposedly solving the S&L problem by recapitalizing or shrinking (forbearance is out), reregulating (new assets powers are out) and reintroducing strict oversight. It is noteworthy, however, that the original source of the problem, the vulnerability of S&Ls to periods of sustained increases in interest rates, has not been removed. In early 1989, S&Ls were still using roughly 40 percent of their short-term deposits to fund long-term fixed-rate mortgage investments; the $400 billion so funded is slightly more than was so funded in 1978. Moreover, many of their adjustable-rate mortgages have rate caps that will bind in a period of sustained interest rate increases. If interest rates should repeat their 1977-86 pattern, taxpayers would certainly lose another $50 billion or more in present value dollars (Hendershott and Shilling, 1990).

V. Future Prospects

Three questions follow from our earlier analysis. First, will the advantages of Fannie and Freddie be reduced, possibly leading to an increase in FRM rates and to greater fully-private securitizing? Second, will there be an

increase in ARM securitization, leading to lower ARM yields and expanded use of ARMs? Third, what will happen to the S&L industry and what impact will this have on mortgage rates? These questions are addressed in turn.

As noted above, the agencies have not had to hold as much capital as fully private institutions, and the agencies have lower explicit costs. User fees have been proposed to compensate the government/taxpayer (the insurers of the agencies) for the greater risk associated with lower capital requirements and to recapture for the taxpayers some of the advantages extended. Alternatively, increases in required capital have been advocated to reduce the insurer's risk. Each of these proposals would tend to raise the coupon rate on new-issue conforming FRMs and thus reduce the tilt of new originations from ARMs to FRMs.

To the extent that the agencies can fully pass through their costs to borrowers, the 15 basis point annual user fee on agency mortgage-backed securities (MBSs) proposed by the Bush Administration would raise FRM rates by 15 basis points. Because not all of the cost is necessarily shiftable, maybe rates would only rise by 10 basis points. A doubling of capital from roughly 0.75 percent of assets to 1.5 percent, which would seem to be the minimum required if the Treasury's proposal were adopted, would have about the same effect. Maybe half of the 30 basis point fee required by the agencies (the difference between the mortgage rate, net of servicing, the borrowers pay and the yield investors in MBSs receive) is return on equity, with the rest covering explicit costs and a fair charge for the default guarantee the agencies provide MBS investors. The doubling in capital would then necessitate a 15 basis point increase in the agency fee, and thus in FRM rates, if the required return on capital investment in the agencies did not change. However, the required return will be less because the agencies would be only half as levered. Thus, again, about a 10 basis point rise in FRM rates would occur.

Securitization of ARMs would be stimulated by a more attractive FHA ARM. Currently, FHA ARMs constitute only about one percent of the total ARM market because the FHA's 1/5 program (maximum one percentage point rate adjustment per period and five percentage points over the life-of-the loan) is unattractive to both borrowers and lenders. Borrowers dislike the 1/5 loan because lenders charge a higher initial coupon to compensate for the tight rate caps and the primary advantage of an ARM to a borrower is a low coupon that increases affordability. If FHA were given a 2/6 ARM program, the FHA share of the ARM market would rise significantly.

Successful securitization of an FHA-ARM would likely lead to securitization of a similar conventional ARM. However, never should we expect as great ARM as FRM securitization. Possibly the most popular one or two ARMs will become widely (above 50 percent) securitized, but other less popular products will always exist and these will not have sufficient volume and thus liquidity to be widely securitized. Nonetheless, the secondary market would provide a ceiling for yields on the popular ARMs and this, in turn, would provide some discipline for yields on other ARMs.

The decline in the S&L industry owing to FIRREA has just begun. A further 30 to 50 percent decline over the next five years should be expected. While some of the S&Ls will be sold to commercial banks, many banks, too, face increased capital requirements and all face higher deposit insurance premiums. The depository institution sector generally is likely to shrink over the next five years. On the other hand, there is no evidence that the relative decline in the S&L industry since 1984 or the absolute decline since early 1989 has raised home mortgage rates relative to capital market rates.

VI. Conclusions

The market for fixed-rate mortgages is now fully integrated with capital markets. Since 1986 the share of newly-originated conventional conforming

fixed-rate mortgages securitized by the Fannie Mae and Freddie Mac has ranged from 50 to 70 percent, and virtually all FHA/VA mortgages go directly into GNMA mortgage pools. Moreover, empirical estimation implies that conventional yields adjust fully to changes in capital market rates within two weeks.

Mortgage rates are currently about what one would expect given capital market rates. In contrast, conventional rates were a half percentage point "too low" in the 1970s, owing to thrift tax advantages and portfolio restrictions, and a half point "too high" in the 1982-86 period because thrift profits and portfolio restrictions had effectively disappeared. This half point "excess" return on mortgages stimulated development and use of the Freddie Mac and Fannie Mae pass-through programs. Since the middle of 1987, rates on the conforming FRMs these agencies can buy have been "about right," while rates on nonconforming or jumbo FRMs are about 30 basis points higher. Enactment of user fees on agency mortgage-backed securities or higher capital requirements for the agencies would likely raise coupons on conforming FRMs.

ARMs have become a major factor in the conventional mortgage market, with the ARM share of total originations periodically swinging between a quarter and a half, depending largely on the level and term structure of interest rates. Borrowers are more likely to choose ARMs the less affordable is housing (the higher are interest rates) and the more ARMs allow borrowers to solve the affordability problem (the lower is the ARM rate relative to the FRM rate). ARM securitization, however, has lagged behind FRM securitization owing to the lack of both an attractive FHA-ARM and standardization of conventional ARMs. Introduction of a more attractive FHA-ARM would likely lead to greater securitization of the comparable conventional ARM product, as well as the FHA-ARM.

The S&L industry has been shrinking relatively since 1984 and absolutely since passage of FIRREA. Another 25 to 50 percent decline is likely. The past shrinkage does not appear to have raised conforming FRM rates; whether jumbo FRM rates or ARM rates are being affected is unknown.

Footnotes

[1] The agencies also securitize multifamily mortgages. Between 1975 and 1982, 8 to 16 percent of FHA multifamily mortgages were securitized (Seiders, 1983, p. 278).

[2] The retail commitment rate and points are those obtained by the Federal Home Loan Mortgage Corporation in a weekly survey of 125 major lenders conducted since the spring of 1971.

[3] The rates in this table are not adjusted for points, i.e., they are the coupon rates consistent with whatever points were charged. The adjustment would not affect the differences between actual and perfect rates because the adjustment to both rates would be identical.

[4] The one-year Treasury rate was down to 9 percent in early 1983, versus 8 percent in the summer of 1990, and the Fannie Mae share price was up from a low of 2½ in 1981-82. Freddie Mac stock was not freely traded until around year end 1988. Since then the share price has moved much like Fannie Mae's.

[5] The FRM also reflects the cost of the borrowers default option to the lender.

[6] This overstates the cost to the borrower because the actual FRM coupon rate does not costlessly decline when interest rates fall and this gain to the lender should be priced in a lower coupon. The same gain means that the cost of the borrower's call option is less than if the borrower could costlessly refinance.

[7] Changes in FRM-ARM rate spreads reflect changes in the Treasury term structure (seven-year rate less one-year), in the values of the FRM call option and the ARM rate caps, and in the initial ARM discount. Thrifts increased the attractiveness of ARMs throughout 1987 and 1988 by raising the average initial discount from one-half to three-and-one-half percentage points (Peek, 1990). With thrifts no longer able to qualify borrowers for larger loans based upon deep discounts, the initial discount plummeted in 1989 to less than one percentage point.

[8] The 1986 Tax Law has also contributed to these losses, but overbuilding is the primary culprit.

References

Brueckner, Jan K. and James R. Follain, "ARMs and the Demand for Housing," Regional Science and Urban Economics, 19 (2), May 1989, pp. 163-187.

Cassidy, Henry J., "A Review of the Federal Home Loan Bank Board's Adjustable-Rate Mortgage Regulations and the Current ARM Proposal," Research Working Paper No. 113, Federal Home Loan Bank Board, August 1984.

Hendershott, P.H., "The Composition of Mortgage Originations in the Year 2000," forthcoming in FNMA publication, 1990a.

_____, "The Future of Thrifts as Home Mortgage Portfolio Lenders," The Future of the Thrift Industry, Proceedings of the 14th Annual Conference, Federal Home Loan Bank of San Francisco, 1990b, pp. 152-163.

Hendershott, P.H. and J.D. Shilling, "The Continued Interest Rate Vulnerability of Thrifts," presented at NBER Conference on Financial Crisis, March 1990, forthcoming in NBER volume.

_____, "The Impact of the Agencies on Conventional Fixed-Rate Mortgage Yields," The Journal of Real Estate Finance and Economics, 2, 1989, pp. 101-115.

Hendershott, P.H. and R. Van Order, "Integration of Mortgage and Capital Markets and the Accummulation of Residential Capital," Regional Science and Urban Economics, 19 (2), May 1989, pp. 188-210.

Hendershott, P.H. and K.E. Villani, "Secondary Residential Mortgage Markets and the Relative Cost of Mortgage Funds," AREUEA Journal 8, 1980, pp. 50-76.

Kane, Edward J., The S&L Insurance Mess: How Did It Happen?, The Urban Institute Press, Washington, D.C., 1989.

O'Keefe, Michael and Robert Van Order, "Mortgage Pricing: Some Provisional Empirical Results," AREUEA Journal 18, 1990.

Peek, Joe, "A Call to ARMs: Adjustable Rate Mortgages in the 1980s," New England Economic Review, March/April 1990, pp. 47-61.

Roth, H.L., "Volatile Mortgage Rates -- A New Fact of Life," Economic Review, Federal Reserve Bank of Kansas City, 1988, pp. 16-28.

Seiders, D.S., "Mortgage Pass-through Securities: Progress and Prospects, AREUEA Journal 11, 1983, pp. 264-87.

Woodward, Susan E., "Policy Issues in the Privatization of FNMA and FHLMC," Expanded Competitive Markets and the Thrift Industry, Proceedings of the 13th Annual Conference, Federal Home Loan Bank of San Francisco, 1989, pp. 169-174.

Table 1

The Growth in the Securitization of FHA/VA 1-4 Family Loans

	1 FHA/VA Originations ($bil.)	2 GNMA Issues ($bil.)	3=2/1 Share of Originations Securitized	4 Mortgage Banker Share of Originations
1971-73	15.6	2.7	.17	.70
1974-75	13.5	5.8	.43	.75
1976-79	28.3	17.6	.62	.78
1980-82	21.5	16.6	.77	.81
1983-86	55.0	55.6	1.01	.78
1987-89	54.9[a]	70.3	1.28[a]	.71[a]

[a]Mortgage banker issues are likely understated. Thus originations and the mortgage banker share are too low, and the share of originations securitized is too high.

Source: Hendershott and Van Order (1989), updated from DataBase, Secondary Mortgage Markets, FHLMC.

Table 2:

The Agencies Increased Role in the Conforming FRM Market

A. Pass-throughs Issued by FHLMC and FNMA($ bil.)

	1	Pass-Throughs Backed-By		
		2	3	4 = 1 - 2 - 3
	Total Issues	Seasoned FRMs	New ARMs, Multis, and FHA/VAs	New FRMs
1977-1981	4.6	0.6	-	4.0
1982	38.2	28.8	-	9.4
1983	33.0	17.1	1.8	14.1
1984	32.2	17.7	3.7	10.8
1985	62.3	25.5	5.1	31.7
1986	160.1	29.7	10.7	119.7
1987	138.2	21.2	16.3	100.7
1988	94.7	4.5	29.8	60.4
1989	145.1	11.7	36.2	97.2

B. Percentage of New 1-4 Family Conventional Originations Securitized

	5	6	7 = 5 x 6	8 = 4/7	9 = 8/0.75
	Total Originations ($bil)	Fraction Fixed Rate	FRM Originations ($bil)	% New FRMs Securitized	% New Conforming FRMs Securitized
1977-1981	125.0	1.00	125.0	3	4
1982	77.8	0.65	50.6	19	25
1983	154.2	0.69	106.4	13	17
1984	176.0	0.46	81.0	13	17
1985	204.6	0.55	112.5	28	37
1986	362.1	0.77	278.1	43	57
1987	376.2	0.66	248.3	41	55
1988	338.5	0.47	159.1	38	51
1989	296.0	0.63	186.5	52	69

Source: Hendershott (1990a, Table 4)

Table 3

Correlation Between Mortgage Rates and Capital Market Rates

Year	Correlation*
1972	-0.22
1973	0.19
1974	0.46
1975	-0.18
1976	0.16
1977	-0.49
1978	0.42
1979	0.34
1980	0.33
1981	0.42
1982	0.80**
1983	0.81**
1984	0.65**
1985	0.76**
1986	0.58**
1987	0.91**
1988	0.87**
1989	0.92**

*Correlations are between month-to-month changes in the FHLMC commitment rate and the 10-year Treasury rate.

**Significantly different from zero at a 5-percent confidence level.

Source: Roth (1988, Table) for 1972-87; 1988 and 1989 computed by the author.

Table 4

The Time Response of Conventional Commitment Rates
to Fictional Perfect Market Rates

	Adjustment to One Point Rise in Perfect Rate				
Time Period	Current	3 weeks	5 weeks	7 weeks	9 weeks
1986-88	.59	.95	.96	.87	.84
1983-85	.16	.55	.68	.83	.88
1980-82	.08	.45	.75	.93	1.05
1976-79	.01	.36	.62	.66	.86
1971-75	.06	.17	.37	.56	.74

Sources: Hendershott and Van Order (1989, Table 5).

Table 5

Actual and Perfect Market Effective Conventional Commitment Rates (%)

	Actual	Perfect Market	Difference
1971	7.54	8.33	-.79
1972	7.38	7.92	-.53
1973	8.04	8.97	-.93
1974	9.19	9.78	-.60
1975	9.05	9.92	-.87
1976	8.86	9.22	-.35
1977	8.84	9.09	-.24
1978	9.64	10.08	-.44
1979	11.20	11.34	-.14
1980	13.76	14.24	-.48
1981	16.69	16.55	.13
1982	15.97	15.24	.73
1983	13.23	12.86	.37
1984	13.89	13.52	.37
1985	12.43	11.95	.48
1986	10.19	9.69	.49
1987	10.21	10.01	.20
1988	10.23	10.21	.02

Sources: Hendershott and Van Order (1989, Table 6).

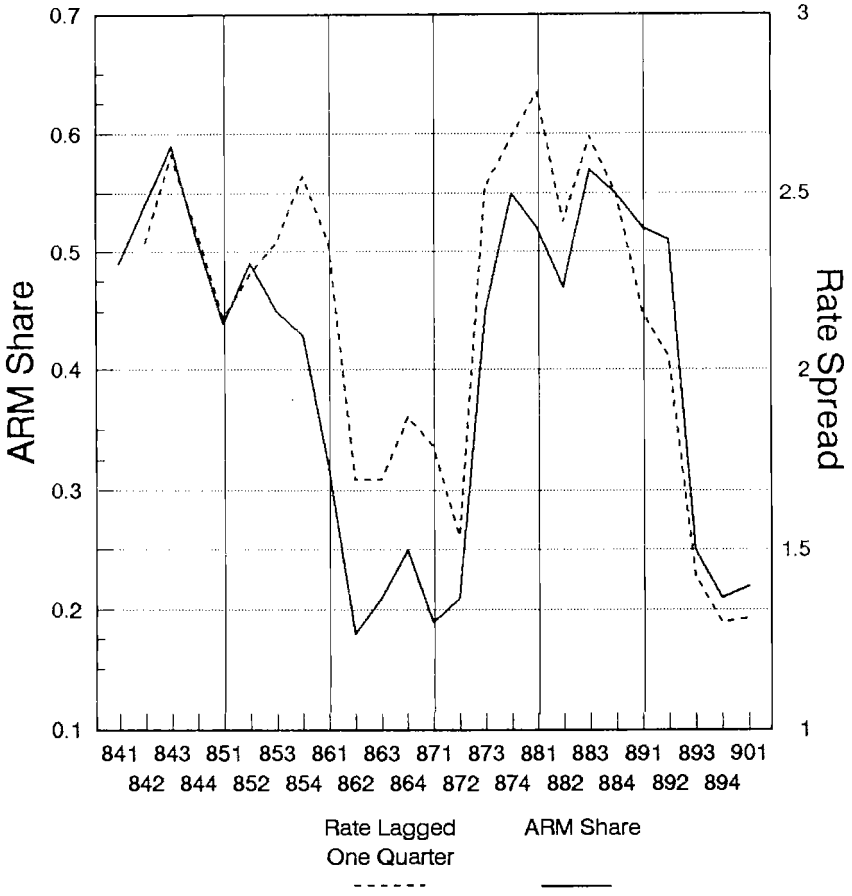
Table 6

Effective Loan Rates for California FRMs with Loan-to-Value Ratios of 75 and 80 Percent by Loan Size, Selected Years

Percent of Conforming Loan Limit	1978	1985	1986	1987
0.0-50.0	10.12	11.75	10.65	9.83
50.1-67.0	10.04	11.87	10.53	9.82
67.1-80.0	9.97	11.98	10.51	9.77
80.1-90.0	9.97	11.66	10.40	9.63
90.1-100.0	9.95	12.22	10.36	9.62
100.1-115.0	9.94	11.13	10.62	9.63
115.1-130.0	9.97	11.46	10.65	9.91
130.1-145.0	9.95	11.39	10.68	9.80
Over 145.0	9.94	10.97	10.70	9.83
Number of Loans	3,590	710	1,157	1,706
Percent of Dollar Volume Securitized	4	37	57	55

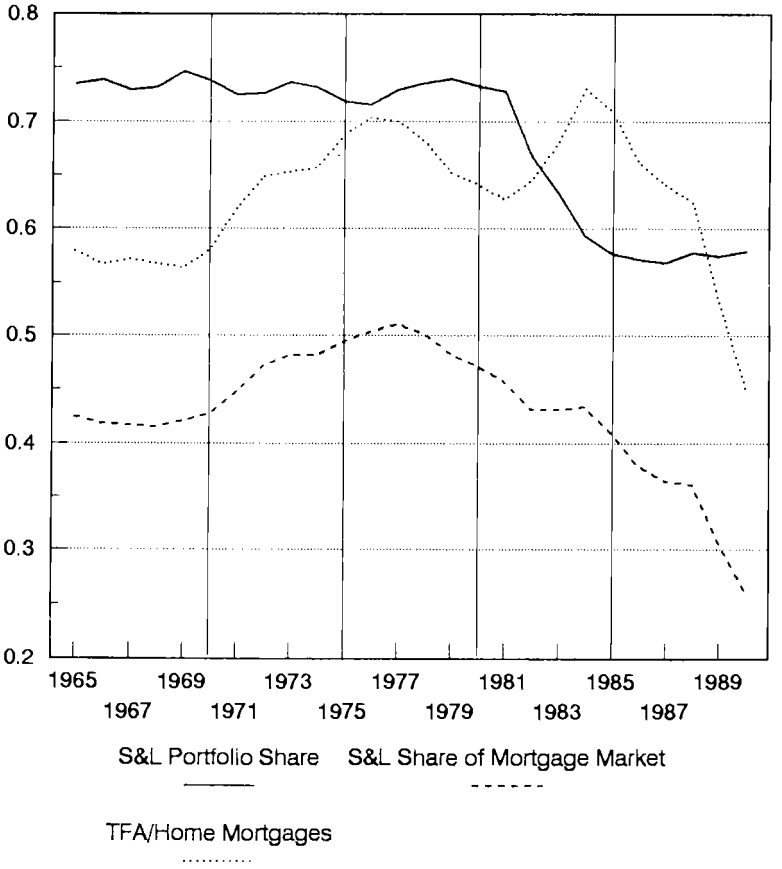
Source: Hendershott (1990b, p. 156)

Figure 1: ARM Share and FRM minus ARM Rate Spread Quarterly, 1984-1989



Source: FHLMC

Figure 2: Share of S&L TFA in Home Mortgages, S&L Share of Total Home Mortgage Market, and Ratio of S&L TFA to Total Home Mortgages Outstanding



Source: Flow of Funds Accounts. First quarter of 1990 annualized.

Figure 3: FRM and Treasury Rates