Chapter 6

United States*

Current Status

Before the 1980s, thrift institutions dominated the funding of residential mortgages in the United States. Thrifts were constrained by regulation and provided incentive through the tax code to invest almost exclusively in fixed-rate, level-payment mortgages funded by insured deposits. Thrifts enjoyed a cost advantage in funding mortgages that may have lowered the cost of mortgage credit to borrowers. Other institutions were discouraged from investing in mortgages, however, and the market was characterized by periodic shortages of funds. These shortages were caused by a combination of disintermediation and restrictions on mortgage pricing. Disintermediation occurred when market rates of interest rose above the interest-rate ceilings, causing funds to flow from regulated institutions to unregulated alternatives. Mortgage prices were unable to adjust sufficiently to attract new investors, in part because of state usury laws and Federal Housing Administration (FHA) rate ceilings.

The 1980s brought a complete turnaround in the funding of mortgages in the United States. Financial deregulation and elimination of interest-rate ceilings improved the financing options and the supply of credit available to home buyers. Deregulation of liabilities in the late 1970s and early 1980s allowed banks and thrifts to compete for funds at market rates of interest and reduced the likelihood of disintermediation and shortages. Deregulation of the asset side of the balance sheet facilitated the widespread introduction of adjustable-rate mortgages (ARMs), which improved affordability for borrowers. Reduced tax incentives for investment in mortgages and rising competition for funds reduced the thrift advantage in funding mortgages and encouraged other investors to enter the market. With elimination of state usury laws, mortgage price adjustments became more market-determined.

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1Drawn largely from Lea (June 1990).

2The term “thrift” refers to savings and loans formerly insured by the Federal Savings and Loan Insurance Corporation [now insured by the Federal Deposit Insurance Corporation (FDIC)] and savings banks insured by the FDIC. Both institutions have traditionally focused on retail deposit gathering and mortgage lending.
The 1980s also witnessed the coming of age of the secondary mortgage market, which expanded the investor set for mortgages. The growth of the mortgage-backed securities (MBS) market, dominated by securities guaranteed by agencies with either direct or indirect U.S. government backing, stimulated the interest of nonthrift investors. Nontraditional investors, such as mutual funds, life insurance companies, and pension funds, funded 42 percent of the growth in mortgage debt outstanding in the 1980s, up from 19 percent during the 1970s. These new sources of funds more than offset the declining importance of thrift investment. These developments allowed the mortgage market to meet a record urge in demand in the mid-1980s, when the “Baby Boom” generation reached home-buying age and refinancing activity surged dramatically as interest rates declined. Mortgage pricing became market-determined as the U.S. mortgage market was increasingly integrated with worldwide capital markets. No longer were mortgage borrowers shut out of the market by arbitrary regulations. Rather, they now competed with corporate and government borrowers for access to the world supply of savings. As a result, availability of mortgage funds is no longer the major issue affecting the market. In today’s market, in which mortgage rates can adjust hourly to changes in U.S. Treasury bond rates, the focus is on the cost of mortgage credit.

This transition was not without cost, however. Most thrifts were bankrupt at the time of deregulation in the early 1980s, reflecting their asset-liability mismatch at a time of high short-term interest rates. Thrifts were encouraged to grow out of their problems, and many took on high-risk assets. By the end of the decade, the federal government found itself with hundreds of billions of dollars in expected costs to honor its guarantees to thrift depositors; at the same time, it faced the problem of disposing of hundreds of insolvent institutions and billions in assets.

As a legacy of the thrift debacle, the U.S. government is paying much closer attention to the contingent liabilities of the activities of the institutions it supports. Risk-based capital requirements have been adopted for both thrifts and banks. In addition, deposit insurance premiums have been substantially increased. Recently, changes in the FHA program have increased the cost of mortgage insurance to recipients. Increased capital requirements have been proposed for government-sponsored secondary mortgage market enterprises. These changes may slightly increase the cost of mortgage credit in the United States, but are unlikely to alter the market structure or disrupt market-priced provision of credit.

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3Thrifts funded 55 percent of the growth in mortgage debt in the 1970s and only 33 percent in the 1980s. See Nothaft (1989).
Integration of the domestic mortgage and global capital markets suggests that mortgage prices are determined principally by market interest rates and risk factors specific to mortgage instruments. Although the yield spread between the benchmark 30-year, fixed-rate mortgage (FRM) and 10-year Treasury bond varied significantly throughout the period of analysis (fig. 6-1), most of this spread can be explained by mortgage risk factors. Thus, institutional factors affecting the demand for and supply of credit are less important today than they were 10 years ago. Unlike the circumstances surrounding deregulation of the thrift industry in the early 1980s, the severe contraction of the 1990s is not having a significant effect on mortgage pricing.

Figure 6-1. U.S. Fixed-Rate Mortgage to 10-Year Government Bond Yield Spread

Sources: U.S. Treasury and Office of Thrift Supervision.

Background

Macroeconomic

The United States has the largest and one of the most diverse economies in the world. U.S. real gross national product (GNP) expanded at an average annual rate of 2.9 percent during the 1980s, close to the rate recorded in the 1970s. Beginning in late 1990, however, the U.S. economy recorded several quarters of negative economic growth. Although real GNP growth returned in late 1991, weak rates of aggregate economic growth are expected to persist, for some time, reflecting several factors: sizable debt overhangs at personal, corporate, and government levels; anticipated further consolidations in sectors such as aerospace and defense contracting, financial services, and commercial real estate; and procyclical fiscal policy at state and local governmental levels. Despite the slowdown in the economy, the U.S. ratio of total mortgage debt and
Douglas B. Diamond, Jr., and Michael J. Lea

single-family mortgage debt to GNP continued to expand, reaching 68 percent and 47 percent, respectively, in 1991.

**Housing Markets**

Housing demand in the United States was strong during the mid-1980s. Lower mortgage interest rates and higher household incomes made housing more affordable, releasing pent-up demand from previous years. Housing activity was further boosted by demographic factors, most notably the sustained growth in household formations during the postrecession years. Household formations rebounded to an average annual rate of 1.5 million during the 1984-87 period, following the sharp decline to a 30-year low of 400,000 new households formed in 1983.

However, total starts fell perceptibly after the 1.8 million units recorded in 1986; by 1991, only about 1 million new homes were started, the lowest rate of construction since the end of World War II. A wide variety of adverse influences served to depress the demand for housing by the decade's end, including reduced expectations of housing investment return, continued affordability constraints in various high-priced areas, weak household income growth, and dampened levels of consumer confidence. On the supply side, housing starts were reduced when the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) induced thrift rationing of credit for builder land acquisition, development, and home construction (ADC) loans. In the wake of continuing weakness in aggregate economic output and diminished inflationary concerns, conventional FRM interest rates fell to below 9 percent in the second half of 1991, the lowest level recorded since 1977. Despite the easing in housing finance costs, residential real estate provided little impetus to economic growth during 1991.

During the 1980s, homeownership rates in the United States fell by approximately 2 percentage points to about 64 percent. This contraction occurred in the wake of an increase in homeownership that had been steady since the end of World War II. Disaggregation of homeownership rates by age group indicates that rates declined primarily among households under the age of 40; among those younger groups, homeownership rates fell by about 5 percentage points between 1981 and 1987. In that period, the user cost of homeownership rose significantly relative to the residential rent component of the consumer price index. The increase in homeownership user costs was due in large measure to reduced rates of quality-adjusted housing asset inflation during the 1980s, relative to

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4See Wachter (1990).
those rates that prevailed in the late 1970s. Younger people as a group appear to be more sensitive to the relative costs of owning and renting; older households typically have already purchased a home and do not respond to the higher user costs of homeownership by changing to renter status.

House prices have displayed significant variation over time and among regions. As shown in figure 6-2, real house prices increased sharply during 1975 to 1979 and 1985 to 1988. The regional rates of change during the two periods, however, were quite different. During the earlier period, all regions enjoyed a sustained real increase, with the western U.S. (Westchg) substantially outperforming the rest of the country. Performance during the second boom period was much more uneven. Real house prices rose sharply in the northeast region (NEchg) from 1983 to 1987, before falling sharply in 1988. Real house prices in the rest of the country did not show the rate of change that characterized the Northeast—only the West enjoyed rates of real rates of increase above 5 percent before falling sharply in 1990. By the end of 1990, all regional housing markets in the United States were displaying negative real house price change, a pattern that continued in 1991.

**Figure 6-2. U.S. Real House Price Change***

![Graph of U.S. Real House Price Change](image)

*Derived from sales/existing houses. Trends may reflect changes in composition of houses sold as well as fluctuations in house price inflation.

**Tax Policy**

Various longstanding provisions of the U.S. tax code have served to reduce significantly the user cost of homeownership and, in so doing, provide a sizable incentive for homeownership. Those provisions include
the deductibility of mortgage interest and property tax payments from taxable income, the tax exemption of capital gains from the sale of owner-occupied housing if used for a subsequent home purchase within two years, and the one-time exemption from taxes of up to $125,000 in capital gains after age 55 if not reinvested in owner-occupied housing.

During the 1980s, a variety of tax law changes served to affect dramatically the availability and the price of housing, particularly multifamily units. The 1981 Economic Recovery Tax Act (ERTA), passed in the midst of the severe economic downturn of the early 1980s, included several provisions which substantially increased investor returns to rental housing, including: reduced taxation of investor capital gains; accelerated depreciation writeoffs; and increased allowance for individuals to shelter earned income with “passive” real estate losses. Those tax law changes further spurred the rapid expansion of real estate limited partnerships; during 1984-85, the combined equity funds raised in public and private partnerships totaled $20 billion.

A 1980 amendment to the Internal Revenue Code further encouraged the use of tax-exempt mortgage revenue bonds (MRBs) as a means of providing housing to lower- and moderate-income individuals. Payments to the holders of those bonds (often issued by a state or local government) were typically free of federal income taxation. Accordingly, the bonds could be issued at relatively low interest rates and their proceeds used to promote affordable housing. The annual issuance of MRBs surged from about $1 billion in 1981 to about $20 billion by 1985; estimates from the General Accounting Office suggest that MRBs issued in 1983-84 financed about 200,000 new multifamily units, almost one-quarter of all multifamily units started during that period.

In response to tax code changes, falling interest rates, and a sharp rebound in household formations (and hence a release of pent-up demand for housing), production of multifamily housing surged during the postrecession years of the mid-1980s. Starts of multifamily units moved up from 378,000 units in 1981 to 635,000 units in 1983, with the largest gains accruing to the rental sector.

The Tax Reform Act of 1986, however, included numerous provisions which served to reverse the incentives for multifamily construction contained in the 1981 ERTA. The 1986 legislation raised the tax on capital gains, restricted the sheltering of earned and “portfolio” income with losses arising from passive investments, and scaled back even further the writeoffs of depreciation which had been diminished by earlier legislation. During this same period, the federal government imposed binding constraints on state issuance of mortgage revenue bonds and further limited the type of housing qualifying for that subsidy.
By the late 1980s, various factors—including elevated vacancy rates and concomitant low rents of multifamily units in a number of major markets, reduced tax incentives for multifamily investment, evidence of constraints in the availability of construction finance, and a general slowing of aggregate economic activity—served to dampen multifamily construction severely. The weak pace of construction in this market segment is expected to persist well into the 1990s.

**Mortgage Market**

*Primary Market Institutions*

As figure 6-3 shows, a sizable real expansion in both single-family and total mortgage debt occurred during the 1980s. Mortgage demand during the postrecession years of the 1980s reflected a strong cyclical rebound in housing demand and record levels of refinancing activity, spurred in part by an approximate halving of conventional mortgage interest rates, from about 18 percent in 1981 to approximately 9 percent in 1987. The refinancing boom of 1986 and 1987 may have resulted in a degree of equity withdrawal, spurring real growth in single-family debt. New financial instruments for home buyers and investors (notably the proliferation of ARMs) may also have aided the surge in housing activity and mortgage demand.

*Figure 6-3. U.S. Mortgage Debt: Real Change*


Evolution

Large-scale federal government intervention in the U.S. housing finance system dates to the Great Depression. Government efforts during that period sought to spur mortgage originations by portfolio lenders, who during the 1930s reduced their mortgage portfolios in exchange for government securities. This period also witnessed the provision of FHA default insurance to speed market acceptance of a fully amortizing, long-term FRM. The federal government also sought to improve mortgage market efficiency through establishment of a secondary market in mortgages. Those early efforts focused on enhancing the flow of funds to the housing sector as well as on improving the efficiency of mortgage market function.

Recent years have witnessed substantial evolution and significant transformation of institutions serving the mortgage market. The continuing crisis among savings and loan associations, together with the 1989 passage of FIRREA (imposing strict regulatory controls on thrift operations) portends a continued trend downward in the thrift share of home mortgage originations. However, the post-FIRREA experience suggests that the decline of thrift institutions as primary mortgage lenders likely will have little effect on the pricing of mortgages in the primary market.

Figure 6-4 provides information on the evolution in market share of single-family loan originations by major institutional lenders. The most important trend has been the significant continuing decline in market share of savings and loan institutions, from a high of about 53 percent in

Figure 6-4. U.S. Single-Family Loan Originations by Lender Type

Source: U.S. Department of Housing and Urban Development.
1975 to about 30 percent in 1990.\textsuperscript{5} Most of the decline occurred in 1980s, a decade of loss in the thrift industry.

During the 1970s, thrifts originated mostly fixed-rate mortgages, which were funded by federally insured retail deposits. However, periodic shortages of mortgage funds emerged during those years, owing to mortgage interest-rate ceilings as well as to disintermediation at thrifts. Empirical studies pertaining to that period point to the significance of thrift credit rationing in explanations of cyclical fluctuations in housing activity.\textsuperscript{6} Those cyclical fluctuations in mortgage availability at thrifts were diminished by the early 1980s, due to financial market deregulation and to the elimination of interest-rate ceilings at thrifts.

The deregulation of financial markets during the early 1980s included some reduction in thrift tax subsidies for investment in mortgages and, accordingly, prompted thrifts to diversify out of home loans. Thrift capital requirements (and hence thrift cost of funds) were lowered during this period as well, enabling the industry to substitute federally guaranteed deposits for more expensive capital. In hindsight, this regulatory structure led to widespread institutional abuse; many thrifts speculated in relatively risky investments, with only the government-insured deposits at risk.

In the wake of mounting losses in the industry, FIRREA imposed strict regulatory requirements which served to reduce significantly both thrift mortgage originations and thrift ADC lending. One intent of the legislation was to subject thrifts to the national bank lending statute. Accordingly, FIRREA introduced a risk-based capital compliance standard and raised thrift required capital to levels on par with those of national banks. FIRREA further tightened the Qualified Thrift Lender Test, whereby thrift institutions were required by July of 1991 to hold a minimum of 70 percent of their assets in a restricted list of categories, composed largely of residential mortgages and mortgage securities. Because FIRREA put constraints on thrifts that did not apply to banks, the legislation severely depreciated the value of the thrift charter.\textsuperscript{7}

The FIRREA-legislated changes attached a relatively high risk weight- ing to thrift ADC lending; accordingly, relatively higher levels of capital were required for those assets. The legislation also prohibited thrifts

\textsuperscript{5}Including mutual savings banks.

\textsuperscript{6}Disintermediation occurred when market rates of interest rose above thrift interest-rate ceilings, causing funds to flow out of those institutions to unregulated alternatives. See Jaffee and Rosen (1979) and Penner and Silber (1973).

\textsuperscript{7}See Lea (June 1990). There has been discussion about restoring the pre-FIRREA Qualified Thrift Lender ratio of 60 percent.
from making direct equity investments in real estate, and limited thrift ADC lending to any one borrower to no more than 15 percent of unimpaired (core) capital. Before the legislation, few limits were imposed on thrift lending to a single borrower. The elevated risk-weighting of ADC loans was prompted in part by thrift industry data indicating that delinquency and foreclosure rates on those loans during the late 1980s were about eight times greater than those for permanent one- to four-family loans. Following passage of the legislation in late 1989, thrift shares of both net acquisitions and new commitments for residential construction loans fell significantly. Given the tightening of regulatory restraints and weakness in real estate markets, thrift presence in the construction and home mortgage markets is expected to register further decline.

During the second half of the 1980s, the share of commercial banks of single-family mortgage originators rose significantly, from 22 percent in 1985 to 33 percent in 1990. This increase reflected implementation of risk-based capital rules favoring single-family mortgages. Commercial banks, like savings and loan institutions, originate both adjustable- and fixed-rate loans, both to hold in portfolio and for ultimate sale in the secondary mortgage market. In fact, the commercial bank market share jumped perceptibly during 1989, in the wake of the continuing thrift crisis and the passage of FIRREA. In fact, the commercial share of residential mortgage debt (including MBS) surpassed thrifts in 1990 and their share of originations surpassed thrifts in 1991.

The mortgage banking company market share of single-family originations has been volatile. After falling in the late 1980s, it has since risen significantly, surpassing other originator shares in late 1991. Mortgage banks are primarily originators of, and not investors in, home mortgages. In contrast to portfolio lenders, mortgage banking firms primarily originate and service residential and income property mortgage loans. Typically, originated loans are held in portfolio by mortgage bankers only until an investor is found and a delivery date established. As such, a large proportion of mortgage bank originations are FRMs. The share of originations by mortgage bankers tends to rise when FRMs are attractive and fall when ARMs are popular. During 1991, the mortgage bank share of single-family originations exceeded 40 percent.

**Market Share Analysis**

Recent research has examined the implications of the demise on the thrift sector for the pricing of mortgages in the primary market. Various

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8The thrift share of net acquisitions, including MBS, is the ratio of thrift mortgage originations, plus purchases, minus sales, plus the change in MBS, to total net acquisitions for all lenders.
analysts have argued that the distinguishing characteristic of savings and loan institutions (the holding of mortgages in portfolio) may no longer be economically viable.\textsuperscript{9} In particular, developments in the secondary mortgage markets have reduced the spread between rates of return on mortgage assets and the all-in financing costs of thrifts to the point where the extensive holding of mortgages in portfolio may longer be profitable.

Results of a recent analysis by Bradley, Gabriel, and Wohar (1991) suggest that the sharp reduction in thrift provision of mortgage credit during the early 1980s served to increase the mortgage-Treasury interest-rate spread by as much as 50 basis points, thereby serving to exacerbate the cyclical downturn in housing activity. By contrast, results of the authors’ analysis for more recent years indicate that mortgage credit provision by the thrift sector no longer has a perceptible effect on mortgage interest rates. Based on this analysis, the continued demise of the thrift sector is likely to have little effect on the availability or the cost of mortgage finance and, hence, will have minimal effect on cyclical fluctuations in housing activity.

One consequence of the development of the secondary mortgage market has been the separation of the origination, servicing, and investment functions. Traditionally, lending institutions such as thrifts performed all three functions. Today, mortgage loan servicing is often performed by an institution other than the originator or investor. In fact, servicing rights are actively traded in the United States. Servicing has become more concentrated in recent years, with the percentage of total outstanding mortgage debt serviced by the top 100 servicers increasing from 11 percent in 1980 to 20 percent in 1989.\textsuperscript{10} Increased consolidation has been driven by a combination of factors, including financial weakness of servicers and economies of scale.

\textit{Secondary Market Institutions}

The primary function of the secondary mortgage market is to provide liquidity to holders of long-term mortgages and in so doing to reduce credit-rationing-induced fluctuations in housing activity. Through the purchase of mortgages from the primary market originators of those loans, the secondary market provides a means of converting those loans into cash. Illiquid residential mortgages are then transformed by secondary market agencies into actively traded capital market


\textsuperscript{10}See Follain & Zorn (1990).
securities. The scope of secondary market operations has grown significantly over time; of the $3.8 trillion in mortgage debt outstanding at year end 1990, about one-third was held by federal and related agencies or in mortgage pools or trusts. The increased liquidity provided by the secondary mortgage market serves to improve overall capital market efficiency and to facilitate the flow of funds to the mortgage market.

Secondary markets in residential mortgages are promoted largely by three federally sponsored agencies. The Federal National Mortgage Association (Fannie Mae), the Government National Mortgage Association (GNMA), and the Federal Home Loan Mortgage Corporation (Freddie Mac). Viewed in terms of mortgage debt outstanding, Fannie Mae is by far the dominant of the secondary market agencies; at year end 1990, it held some 47 percent of the $248 billion in mortgage debt outstanding at federal and related agencies. Freddie Mac, in contrast, held only about 8 percent of the mortgage debt outstanding at those agencies. In terms of mortgage pools and trusts, GNMA accounted for $404 billion, or about 37 percent of the $1,102 billion in total residential mortgage passthrough securities outstanding. Fannie Mae and Freddie Mac, respectively, accounted for 28 and 27 percent of shares of those mortgage pools or trusts.

Although originally a government agency, Fannie Mae is now a publicly sponsored, private corporation. It obtains funds to purchase mortgages through the sale of its own debt and MBS. Fannie Mae provides a corporate guarantee of timely payment of principal and interest on these securities. However, by virtue of its special status and connection to the government, Fannie Mae enjoys the important advantage in the debt market of investor perception that there is no default risk on its debt. That perception derives not from high corporate ratings in measures of risk, but rather from Fannie Mae’s origins as a public agency and belief that the federal government is not likely to let it fail.

GNMA is a federal government agency that was established in 1968 to maintain certain secondary market operations subsequent to the privatization of Fannie Mae. The agency effectively functions as a pool insurer for government-insured FHA and Department of Veterans Affairs (VA) mortgages. GNMA is also actively involved in the operation of an MBS market; the agency is authorized to provide a U.S. government full faith and credit guarantee of timely interest and of principal payments made on MBS issued by financial institutions.

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11 The mortgage passthrough certificate represents an ownership interest in a pool of mortgage loans. The holder of a passthrough certificate receives regularly scheduled monthly payments of principal and interest from the mortgages in the pool.

12 See Board of Governors of the Federal Reserve System (July 1991) (Table A37).
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Freddie Mac was established in 1970 to purchase conventional mortgages from thrift institutions for purposes of improving the liquidity of their mortgage portfolios. Since that time, Fannie Mae has also been authorized to buy conventional mortgages; as a result, these two agencies actively compete. Freddie Mac has created its own MBS, the most common form of which is the participation certificate (PC). Freddie Mac finances the vast majority of its mortgage purchases through sale of its PCs in the capital markets.

Mortgage Market Funding

Deposits

Traditionally in the United States, mortgages were funded by retail deposits. Retail deposits are typically short-term, with a large proportion of bank and thrift deposits having maturities of less than two years. Commercial banks fund those loans through relatively stable accounts such as demand deposits and passbook savings as compared with the more volatile certificates of deposit (CDs) or money market accounts traditionally used by thrift institutions.

Unlike depositories in the other countries in this study, U.S. institutions pay rates for deposits above those of comparable maturity government bonds. As shown in figure 6-5, spreads between six-month CDs (the most popular deposit account) and six-month Treasury bills ranged between

Figure 6-5. 6 Month CD to Treasury Bill Yield Spread

Source: Federal Reserve.
40 basis points between 1983 and 1987 and 83 basis points between 1987 and early 1991.\textsuperscript{13}

**Wholesale Funding**

Debt-financing activities of Fannie Mae and the Federal Home Loan Banks (FHLBs) augment the deposit funds of retail-based lenders. Typically, depository institutions borrow through these sources on a collateralized basis.

The development of the secondary mortgage market has greatly expanded the investor base in U.S. mortgages. Not only have commercial banks greatly increased their holding of residential mortgages in recent years, but life insurance companies, pension funds, and mutual funds have all become active investors in MBS. In addition, foreign investment in MBS became significant during the 1980s. Although no reliable statistics about foreign ownership of mortgage securities exist, market observers suggest that foreign investors hold between 1 and 2 percent of outstanding mortgage securities.\textsuperscript{14} Foreign investors hold as much as 25 percent of Fannie Mae debentures, and both the agencies and thrifts issued foreign currency-denominated debt during the decade.

**Mortgage Loans**

*Instruments*

The prevalent mortgage instrument available in the United States today is a relatively high loan-to-value (LTV), long-term, fully amortizing, conventional (not government-insured), fixed-rate loan with no prepayment penalty (table 6-1). This self-amortizing loan is an outgrowth of difficulties experienced by borrowers in refinancing balloon payments on principle mortgage debt during the Great Depression.\textsuperscript{15} Those difficulties in loan rollover occurred despite LTV ratios during the 1920s of 50 to 60 percent, and served to prompt the introduction of a fully amortizing loan.

\textsuperscript{13}The CD yields are secondary market, or brokered deposit yields. As such, they are used as a marginal source of funds for depositories. Retail CD yields are typically lower but entail a marginal cost in branch operation to obtain.


\textsuperscript{15}It is interesting to note that there has been a resurgence in issuance of balloon mortgages in the United States in the early 1990s.
### Table 6-1. U. S.: Mortgage Contract Description

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<th>Feature</th>
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| Mortgage rate         | Fixed (74%)
|                       | Adjustable (26%): reference-rate loans tied to Treasury bond or cost of funds index, with annual or more frequent adjustments, periodic and life-of-loan caps |
| Mortgage payment      | Amortizing, constant payment (some graduated payment and negative amortization)                                                              |
| Term                  | 30 years/15 years (some 5–7 year balloon)                                                                                                    |
| Loan-to-value         | Up to 80% without insurance
|                       | Up to 95% with private mortgage insurance and 100% with government insurance                                                                  |
| Payment-to-income     | 28% monthly housing expense to income; 33% monthly housing expense & other debt payments to income                                           |
| Prepayment            | Allowed without penalty                                                                                                                     |
| Assumability          | Allowed with credit verification                                                                                                              |
| Default               | Incidence: varies by LTV, region & year of origination
|                       | Procedures: vary significantly among states
|                       | Insurance: FHA (income & loan limits); VA (income & loan limits); private (over 80%): varies with LTV & contract type; typical fee 35 basis points/yr. or 2% of balance up front |
| Title insurance       | Required                                                                                                                                  |
| Fees                  | 1% loan origination; charges for title, appraisal, loan registration (in sum around 1%)                                                      |

Low rates of expected inflation worked to restrain interest rates on conventional loans during the post-World War II period; also, growing household incomes worked to reduce the burden of mortgage payments over the holding period. Thus, the FRM remained the only instrument available to U.S. borrowers, despite numerous recommendations to allow...
Depositories to offer ARMS. During the 1970s, however, a combination of dampened economic growth, higher rates of inflation, and increases in inflationary expectations served both to elevate the burdens associated with FRMs and to encourage the development of alternative mortgage instruments. The high rates of expected inflation during the late 1970s led lenders to add higher inflationary premiums to long-term FRM interest rates; also, the unexpected run-up in long-term interest rates reduced the value of FRMs held in thrift portfolios and effectively reduced the institutional equity of these mismatched institutions.

Difficulties that borrowers and lenders encountered with the FRM led to the belated introduction of the ARM. The Federal Home Loan Bank Board authorized the nationwide issuance of ARMs by savings and loan institutions, and the Comptroller of the Currency authorized national banks to originate ARMs for owner-occupied, one- to four-family homes in 1981. ARMs grew from only a small share of mortgage originations before the cyclical downturn of the early 1980s to almost two-thirds of all conventional mortgages closed during 1984. ARM market share has continued to fluctuate widely; in early 1991, the share had declined to about one-fifth of conventional mortgage originations (fig. 6-6). Empirical research suggests that both the level of FRM interest rates and the

![Figure 6-6. ARM Share of Home Loans Closed (Percent of Conventional Loans)](image)

Source: Office of Thrift Supervision.

For example, the Commission on Money and Credit recommended ARMs in its 1961 report, as did the Hunt Commission in 1971 and numerous academic studies. For a history, see Weicher (1988).
interest-rate spread between fixed- and adjustable-rate credit are important factors influencing the share of ARM loans.\textsuperscript{17}

ARMs have proven to be attractive to borrowers for a variety of reasons. First, the lower initial interest rate on the adjustable-rate loan enables more borrowers to qualify for the purchase of a given home, thereby increasing the effective demand for housing. ARMs eliminate the need for oftentimes costly refinancing in the event of declines in interest rates, and are accordingly attractive to those borrowers expecting a decline in rates. Also, ARMs are more attractive to potential home buyers with shorter expected stays in the home, given the low initial ARM rates and the annual caps on rate adjustments. Those ARM features serve to reduce household mortgage payments over a shorter duration of residence. Because of these features, ARMs may have modestly boosted homeownership rates during the 1980s.\textsuperscript{18}

Depository institutions benefit from ARMs by shifting part of the interest-rate risk associated with mortgage lending to the borrower. Origination of and investment in ARMs serve to reduce the interest-rate mismatch between assets and liabilities. In addition to reducing the fluctuations in their net income, ARMs may dampen the sensitivity of depository asset values to fluctuations in market rates. However, these motivations may experience an increase in credit risk to achieve this reduction in interest-rate risk; during a period of rising interest rates, sharp upward adjustments in ARM mortgage payments may work to increase borrower default risk relative to that of fixed-rate mortgages.\textsuperscript{19}

Also available in the conventional mortgage market are a variety of hybrid loans, including graduated-payment mortgages (GPMs), convertible ARMs, and reverse annuity mortgages. The negative amortization feature of the GPM enables payments to be lower than required to amortize the loan fully in the early years, so as to ease buyers’ affordability problems. The convertible ARM has become increasingly popular in recent years. This instrument enables borrowers to qualify at lower initial ARM rates, then to convert to a fixed-rate loan (at a nominal fee) in the event of a decline in long-term interest rates, thereby avoiding the relatively costly refinancing of the loan. Recent years also have witnessed an increase in the popularity of shorter-term 15- and 20-year mortgages, as well as five- to seven-year balloon mortgages. Empirical research suggests that long-term, fixed-rate conventional loans are typically prepaid in seven to ten years; accordingly, ten-year U.S. government security yields provide a benchmark in the pricing of those mortgages.

\textsuperscript{17}See Goodman (1991).

\textsuperscript{18}See Gabriel and Rosenthal (forthcoming).

\textsuperscript{19}See Zorn and Lea (1989).
Underwriting

LTV ratios on conventional mortgage loans for new homes averaged close to 80 percent of property value during the mid-1980s. By late in the decade and in 1990, however, loan amounts had eased down to about three-fourths of property value. Conventional mortgage lenders typically require private mortgage insurance on LTVs in excess of 80 percent. Conventional loans up to 95 percent LTV were common during the mid-to late 1980s, but recently conventional lenders have been funding fewer mortgages with LTVs in excess of 90 percent.

Recent years have witnessed some tightening of loan qualification and underwriting standards. Loan qualification requirements eased during the high house price inflation years of the late 1970s, as lenders came to expect significant trending up over time in the value of the underlying housing collateral. During that period, lenders as well as secondary market purchasers of mortgages accepted payments-to-household income ratios in excess of 40 percent. By the mid-1980s, however, originators of conventional loans conforming to secondary market guidelines required housing payment-to-gross household income ratios of not more than 36 percent. More recently, in the wake of some lender losses on adjustable-rate loans and dampened rates of house price appreciation, qualification and underwriting guidelines on the ARMs have been further tightened.

Mortgage Pricing

Cost of Funds

FRM loans are priced off agency securities in the capital markets. In figure 6-7, the yields of conventional MBS securities and 10-year Treasury securities are plotted. The MBS yields track government bond yields closely. However, the difference between the two tends to move inversely with interest rates.

With the increased integration of the U.S. mortgage and global capital markets during the 1980s, fluctuations in the spread between mortgage and comparable-duration government bond yields reflect primarily changes in the market prices of the prepayment, marketability, and assumability options in mortgages. Earlier in the decade, relatively wide spreads between fixed-rate MBS and comparable-duration Treasuries served to increase investment by nontraditional investors. As a result, by the end of the decade, there was no discernible effect of thrift market share on the pricing of conventional, conforming FRMs.
Recent research indicates that the surge in securitization of conforming fixed-rate loans during the 1980s lowered the rates on those loans by approximately 30 basis points relative to their likely level in the absence of eligibility for Fannie Mae and Freddie Mac purchase. The effect of the agencies on mortgage rates is an ongoing source of speculation. Spreads between agency MBS and comparable private market securities have been 25 to 40 basis points. However, the liquidity of private market securities is significantly less than that of agency securities, making it difficult to quantify the effect of agencies on rates.

Increased reliance on the secondary market as a source of mortgage funding, coupled with deregulation of interest rates at financial institutions, has linked FRM interest rates more closely to passthrough yields. As a result, the price of mortgage credit in the United States depends largely on changes in secondary market spreads. Abstracting from taxes and servicing costs, the positive yield differential between mortgage

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20Hendershott & Shilling (1989). Conforming loans are those eligible for purchase by Freddie Mac and Fannie Mae. Only loans subject to certain guidelines can be purchased by the federally backed agencies. The most important restrictions are a maximum loan amount ($202,300 in 1991, adjusted annually according to changes in a house price index) and the use of private mortgage insurance for loans with LTVs over 80 percent.
passthrough securities and Treasury securities reflects the market pricing of the risks and the costs of mortgage lending.\textsuperscript{21}

By way of contrast, ARM pricing is more closely related to thrift cost of funds (COF). These instruments are typically priced at a fixed spread over an index. A number of large thrift institutions use a COF index to price their ARMs, most commonly the average COF of all member institutions of an FHLB district.\textsuperscript{22} The other major index used to price ARMs is the one-year constant maturity Treasury yields. However, as shown in figure 6-8, yields on ARMs using this index do not necessarily track the one-year Treasury note yield. From 1985 to early 1987, the yield spread widened during a period of falling market interest rates. Not surprisingly, the ARM share of originations fell sharply during this period. The spread tightened considerably between 1987 and late 1989 during a period of rising interest rates and the ARM share of originations increased to 60 to 70 percent. Initial period discounts were widespread during this period, accounting for the negative spread in late 1988 and early 1989.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure6-8.png}
\caption{One-Year Adjustable-Rate Mortgage and One-Year Treasury Rates}
\end{figure}

\textit{Source:} Federal Home Loan Mortgage Corporation.

\textsuperscript{21}See Hendershott and Van Order (1987) and Rothberg et al. (1989).

\textsuperscript{22}By far the most common such index is the 11th District COF, which is based on the average interest expense of member institutions of the 11th FHLB district, encompassing California, Arizona, and Nevada.
Credit Risk

As shown in figure 6-9, mortgage delinquency and foreclosure rates trended upward during the early to mid-1980s, peaking in 1986. This trend reflected underlying economic conditions (a nationwide recession in the early 1980s, along with continued weakness in certain regions, particularly the Southwest) and liberalized underwriting. Mortgage delinquency and foreclosure rates vary with local and regional economic conditions. In 1990, delinquency rates in the recession-stricken Northeast were almost twice those in the West.

![Figure 6-9. U.S. Delinquency and Foreclosure Rates](image)

Source: Mortgage Bankers Association.

Mortgage default risk is borne primarily by monoline mortgage insurance companies in the United States. With this insurance, conventional mortgage loans can be issued with LTVs above 80 percent, with insurance coverage on the top 20 percent of loss exposure. Borrowers pay for this insurance through a combination of upfront fee and monthly incremental spread. Typical private mortgage insurance premiums for 90 percent LTV loans with 20 percent coverage range between 150 and 300 basis points depending on the length of coverage (e.g., five to fifteen years). Premiums on graduated payment loans and most ARMs are higher, reflecting an expected higher default rate. A combination of upfront and annual premium can also be offered.

Direct government mortgage insurance (available through either FHA or the VA) enables selected mortgage loans to approach the full market value of the underlying housing collateral. Mortgage insurance is offered
by the FHA to enhance the homeownership opportunities of moderate- and lower-income households which may lack the downpayment necessary for a conventional loan. Consistent with those distributional objectives, legislated ceilings on FHA loans remain well below those mortgages typically funded by conventional lenders. Recent concern about the actuarial soundness of the FHA program led to increases in premiums and a reduction in coverage. Borrowers obtaining FHA insurance are charged 0.5 percent of the outstanding loan balance annually as well as a 3.8 percent upfront fee. The upfront fee is slated to fall to 3 percent in 1993, and to 2.25 percent in 1995. The VA guarantees only a percentage of the qualified borrower’s loan amount, up to a currently specified maximum of $27,500.

The secondary mortgage market agencies provide credit enhancement for MBS. Investors in conventional MBS enjoy a timely interest and principal payment guarantee from Fannie Mae and Freddie Mac. These securities also benefit from the market perception that the government implicitly stands behind their corporate guarantees. However, the fact that their debt securities trade 10 to 20 basis points above comparable maturity Treasuries suggests that the market charges a credit risk (or political uncertainty risk) premium. GNMA securities, like U.S. Treasury obligations, provide a full U.S. government guarantee of timely payment of interest and principle and hence are considered to be of the highest credit quality.

**Prepayment Risk**

From the mortgagor’s perspective, prepayment is the option to call the mortgage at par. Both the volatility and the term structure of interest rates are used as proxies of the call option’s value. In that regard, significant volatility in rates serves to enhance the value of the call option by raising the probability that rates will decline to levels that make prepayment worthwhile. The slope of the Treasury yield curve is typically viewed as a proxy for the market’s expected course of interest rates. The magnitude of the mortgage-Treasury yield spread is taken to vary inversely with the expected course of interest rates; declining rates enhance the value of the call option which, ceteris paribus, should increase the magnitude of the Treasury-mortgage yield spread.

Prepayment risk for investors is reflected in mortgage rates for all borrowers, regardless of their propensity to prepay. However, U.S.

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23 Individual security prices can vary according to market prepayment expectations. Investment banks track the geographical composition of mortgage security pools in order to estimate prepayment rates. Also, prospective prepayment is adjusted for the age of the mortgage pool, reflecting the “burn-out” of borrowers with above-average mobility and sensitivity to rate differences.
borrowers are not given a choice between mortgages with and without prepayment penalties. Allowance of such penalties would increase the efficiency of market pricing, as borrowers would self-select according to their likelihood of prepayment. But prepayment penalties are precluded by a number of states as part of consumer protection legislation.

**Marketability Risk**

U.S. Treasury securities trade in extremely liquid markets because of their relative homogeneity and large volumes outstanding. Analyses of bid-ask spreads suggest that mortgage passsthrough securities were only slightly less liquid than Treasuries during the mid- to late 1980s; however, during the early years of the passsthrough programs, investors apparently faced significant liquidity constraints. Evidence from Black, Garbade, and Silber (1981) suggests that expansion of the GNMA market during the 1970s had a statistically significant dampening effect on GNMA-Treasury yield spreads. Corroborating statistical results are found in Rothberg et al., who found that the expansion of the GNMA market between 1971 and 1976 resulted in a narrowing of the GNMA-Treasury yield spread by more than 8 percent, or about 60 basis points at rates prevailing during that period. As such, investors in MBS during the early years of the program apparently required substantial compensation for perceived marketability risk. Results of the latter analysis for the decade of the 1980s indicate that marketability risk no longer plays a significant role in the determination of mortgage-Treasury yield spreads.

Another development in U.S. secondary mortgage markets has been the introduction of a new breed of instruments, collectively known as derivative mortgage securities. These securities restructure the cashflows from the underlying pool of mortgages and are typically backed by MBS guaranteed by one of the major secondary market agencies. One of the initial and most widespread of the derivative securities is the collateralized mortgage obligation (CMO), which separates mortgage cashflows into multiple maturity classes. This maturity-slicing feature is said to enhance investor choice, thereby attracting market participants who might otherwise avoid mortgage market instruments. Particular CMO classes attempt to minimize the variability of cashflows associated with prepayment options; accordingly, this mortgage investment vehicle may attract investors who limit their purchases to certain maturities.

The 1986 Tax Reform Act authorized a further vehicle for issuance of derivative mortgage securities, known as the real estate mortgage investment conduit (REMIC). The REMIC is a tax-advantaged entity that addresses certain tax, accounting, and regulatory constraints
associated with the issuance of CMOs; the sponsor of the REMIC holds MBS and has substantial flexibility in the issuance of multiclass MBS.

The combined issuance of agency CMO and REMIC securities rose from less than $5 billion in 1983 to over $200 billion by 1991.\textsuperscript{24} One hypothesis suggests that, by broadening the investor base for secondary market mortgage securities, CMOs may have caused some downward pressure on mortgage interest rates.\textsuperscript{25}

As a consequence of these developments in secondary mortgage markets, conventional FRM interest rates now respond more fully and more quickly to movements in comparable maturity Treasuries than they did in earlier years. During the mid- to late 1970s, only 20 percent of a change in 10-year Treasury yields was mirrored in mortgage rate movements within a week. Short-term responsiveness increased significantly by the late 1980s; during that period, nearly 80 percent of any change in Treasury yields was reflected in mortgage rates within a week.

**Mortgage Costs**

*Transactions Costs*

Lenders in the United States typically charge origination fees of 1 to 1.5 percent in addition to nominal fees for appraisals and credit reports. Title insurance is also required on most U.S. mortgages, and mortgage recording fees are charged by local governments. These fees, along with attorney’s fees, normally add 1 percent to the upfront costs.

*Intermediate Costs*

Intermediation costs include the costs related to the origination, servicing, and funding of residential one- to four-family mortgages. Because of the institutional structure of the primary mortgage participants, there are no data available that clearly identify those operating costs specific to housing finance. For example, the average thrift noninterest expense-to-average assets ratio in 1991 was 221 basis points. This figure includes the costs of originating and servicing assets other than residential mortgages, including consumer loans, commercial property loans, and multifamily mortgages. Commercial banks had a ratio of 368 basis

\textsuperscript{24}See Jaffee and Rosen (1990).

\textsuperscript{25}In the Rothberg, Nothaft, and Gabriel (1989) analysis, the CMO proxy had the expected negative effect on the GNMA-Treasury yield spread but was not statistically significant.
points, reflecting their more diversified portfolio and greater proportion of commercial business loans and transaction deposits.

A recent study by Passmore (1991) attempted to estimate the marginal costs of mortgage origination and servicing for thrifts between 1988 and 1991. For all thrifts with tangible capital greater than or equal to 2 percent, the marginal cost of servicing mortgages was 101 basis points per year, and the marginal cost of origination was 139 basis points (for all types of mortgages). Efficient thrifts (top quartile) had a marginal cost of servicing of 62 basis points and a marginal cost of origination of 76 basis points.

Mortgage banks specialize in the origination and servicing of mortgages. A 1991 survey by the Mortgage Bankers of America found an average cost of servicing of 17 basis points (including costs of servicing delinquent and foreclosed loans). Origination activities generated a net loss of 130 basis points (as average expenses of 259 basis points more than offset average origination fee income of 130 basis points). Origination losses are generally offset through the sale of servicing.

References


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