

Mortgage-Backed Securities: The Revolution in Real Estate Finance

The rapid development of a variety of mortgage-backed securities has led to a radical transformation in real estate finance in recent years. By integrating the mortgage market into the traditional capital markets, these securities have broadened the financial base for home mortgages. During 1978, the \$40 billion of mortgage-backed securities issued in this national market financed nearly one quarter of all home loan originations.

There are two major types of mortgage-backed securities: *bonds* with scheduled principal repayments that are secured by mortgage collateral and *pass-throughs* which provide ownership interest in the monthly payments from a pool of mortgages. Until recently, the market has been dominated by the bonds issued by the Federal National Mortgage Association (FNMA or "Fannie Mae") and the pass-through securities guaranteed by the Government National Mortgage Association (GNMA or "Ginnie Mae"), both backed by Government-insured mortgages. However, a variety of mortgage-backed securities are now financing conventional mortgage lending as well. Building on the success of pass-through securities issued by the Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"), pass-throughs backed by conventional loans are now being issued publicly by banks, savings and loan associations, and mortgage companies. Mortgage-related bonds are being used to finance mortgage loan portfolios of thrift institutions and various government-sponsored housing programs.

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Mortgage-backed securities allow firms dealing in real estate finance either to specialize in originating and servicing mortgage loans (seller/servicing) or to focus on providing the long-term capital investment funds to finance lending activities (investment). Traditionally, commercial banks, savings and loan associations, and mutual savings banks performed both of these functions. Mortgage companies, on the other hand, mainly originated and serviced mortgage loans which they packaged for sale to such permanent investors as insurance companies and pension funds.

The widespread acceptance of mortgage-backed securities has encouraged a broad variety of institutional investors to invest in the mortgage market, once dominated by individuals and thrift institutions. This new market for mortgage-backed securities has reduced geographic and institutional barriers to mortgage lending by distant investors. By attracting a variety of new types of investors to the mortgage market and by integrating the mortgage market into the broader, more highly developed capital markets, mortgage-backed securities promise to stabilize the supply of funds to the housing sector of the economy—once an early casualty in any period of credit stringency.

The changing home mortgage market

The unique financing requirements brought about by widespread homeownership have caused a continuing evolution in mortgage lending practices. But until recently the housing sector has been plagued by an insecure financial base. The real estate collapse of the 1930's led to a reorganization of mortgage lending practices, sparked by the creation of the mortgage

guarantee program of the Federal Housing Administration (FHA) in 1934 and later by the Veterans Administration (VA) mortgage insurance program in 1944. The programs encouraged underwriting of mortgages with standardized terms, relatively low downpayments, and long maturities on properties meeting high-quality standards. Since low-risk FHA-VA loans could be sold to investors across the country, the programs facilitated the early development of an integrated, national mortgage market at little direct cost to the Government.

By encouraging the widespread adoption of the long-term, fully amortized, fixed-payment mortgage as the standard lending agreement, the FHA-VA programs also contributed to an increased role for institutional investors in home loans. The long-term nature of the contract lowered monthly payments, making home-ownership affordable for a larger segment of the population, while monthly amortization of principal resulted in a gradual buildup of each homeowner's equity, reducing default risk. For investors, however, this type of contract presented several difficulties. The long maturity made evaluation of the future collateral value of the property particularly difficult, required the loans to be serviced over a long period, and emphasized the need for escrow of taxes and insurance. Liberal pre-

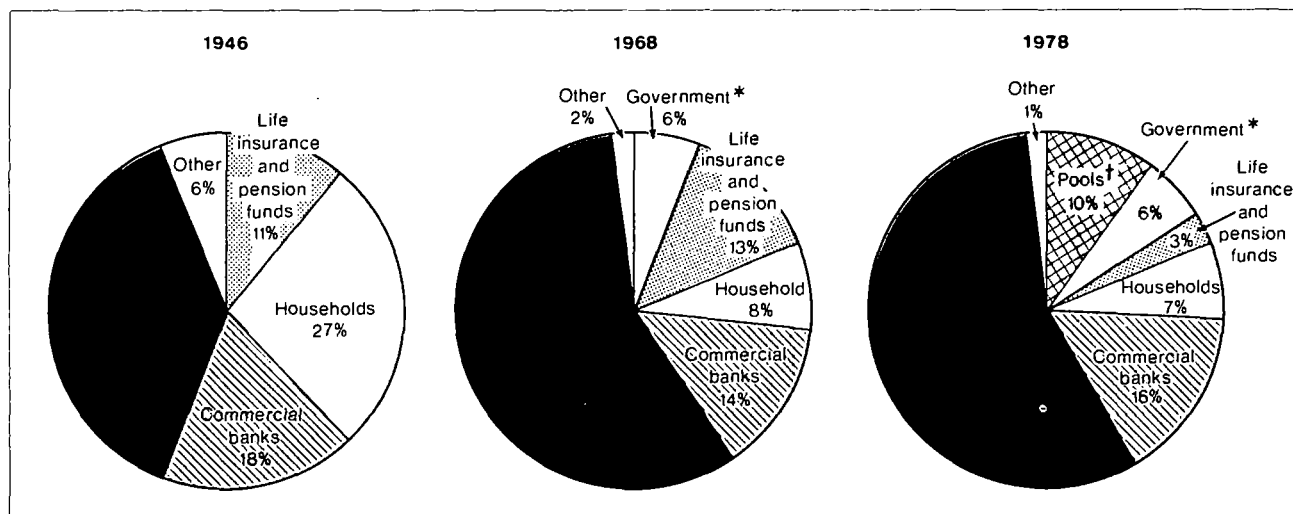
payment clauses, which were desired by borrowers to facilitate future real estate sales, created uncertainty of investment maturity. In addition, amortization resulted in relatively small but continuous principal repayments, complicating reinvestment options. These factors made mortgage investment attractive primarily to savings institutions and life insurance companies with larger portfolios than most individual investors.

The growth of institutional dominance in the mortgage market continued from the postwar housing boom into the mid-1960's. In 1946, households held over one quarter of the outstanding home mortgage debt (Chart 1). Commercial banks held about one fifth of the total, while thrift institutions and insurance companies held nearly half.

During the next twenty years, savings and loan associations provided most of the conventional financing in the rapidly growing sections of the country while households' relative mortgage holdings shrank. Over this period, strong housing demand made mortgage yields attractive, relative to the returns available to institutional investors on many other long-term investments. Banks and thrift institutions, closely tied to their local markets, saw little need for FHA-VA insurance and tended to concentrate on conventional home loans.

Chart 1

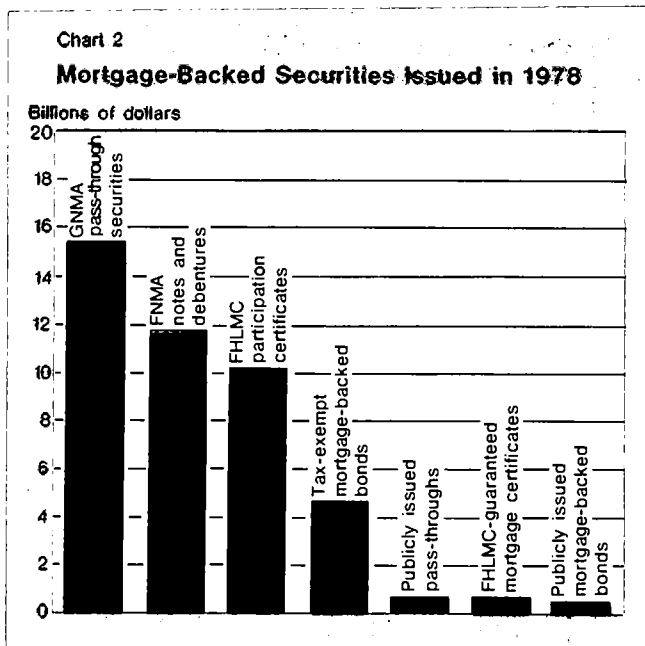
Holders of Home Mortgages



*Federal, state, and local, including directly held mortgages and holdings of sponsored credit agencies.

†Pass-through securities backed by these pools are ultimately held by a variety of investor groups, including those listed here, but are carried on the books separately from direct mortgage holdings.

Source: Board of Governors of the Federal Reserve System. *Flow of Funds*.



Life insurance companies, on the other hand, saw these Government-insured loans as a new type of high-yield, low-risk, long-term investment. Mainly to meet the needs of insurance companies for seller/servicing of FHA-VA loans in local communities, many mortgage companies were created during the postwar housing boom. These mortgage companies originated loans, nearly at cost, and sold them to final investors, continuing to earn servicing income over the life of the loan. Home mortgage investments of thrift institutions and insurance companies reached nearly three quarters of the outstanding total by the mid-1960's.

The activities of mortgage companies began to change in the mid-1960's, when general increases in interest rates (in the face of FHA-VA ceilings which were held below market levels) encouraged life insurance companies to shift their lending focus away from one- to four-family houses toward multifamily dwellings and commercial buildings. Mortgage companies responded by becoming more active in multifamily and commercial lending, but they also were forced to seek new investors for home loans. At first the slack in the home loan market was taken up by the various Federally sponsored credit agencies (mainly FNMA) whose holdings of mortgages on one- to four-family dwellings increased from \$2.5 billion in 1965 to \$15.5 billion in 1970. Most of the loans sold to these agencies were originated and serviced by mortgage companies and consisted mainly of FHA-VA mortgages.

The search by mortgage companies for new inves-

tors took a new turn in the late 1960's with the creation of the first publicly traded pass-through securities backed by pools of mortgages. These new securities—mostly GNMA pass-throughs (see below)—in effect allowed mortgage companies to sell mortgages to investors who were located in other sections of the country and to institutions which had not invested in real estate loans in the past. By 1978, 15 percent of all newly originated home loans was placed in pass-through pools. These pools contained 10 percent of total home mortgage debt by the year-end. Meanwhile, as home mortgage rates declined relative to corporate bond yields, insurance companies and pension funds all but stopped buying home mortgages directly, although they continued to invest in pass-through securities and mortgage-backed bonds.

The invention of mortgage-backed securities

The Government-related agencies—FNMA, GNMA, and FHLMC—may be credited with the development and widespread adoption of mortgage-backed securities as a means of financing home loans. Each agency fulfills a variety of roles, servicing one or more sectors of the mortgage market.¹ Some agencies subsidize certain types of housing. Some provide securities guarantees. Others purchase mortgages from originators and either package these loans into participation pools for resale to final investors or hold them in portfolio, financing the acquisitions by issuing notes and bonds. Some deal mainly in conventional loans, while others specialize in FHA-VA loans, which typically are made in connection with lower priced or older homes.

The FNMA was organized as a Government agency in 1938 to purchase Government-guaranteed mortgages. After its reorganization as a privately owned corporation in 1968, it began in 1971 to buy conventional mortgages. FNMA programs have been popular with mortgage bankers, who originate most of the loans it purchases, but it also buys from other approved FHA-VA lenders. In 1978, it purchased over \$12 billion in mortgages, about half of which were conventional loans. At the end of 1978 it held mortgages with an unpaid principal balance of over \$43 billion, one quarter of which were conventional loans. To finance its portfolio, FNMA issues short-term discount notes and intermediate-term debentures, effectively transforming mortgages into securities with a fixed maturity and a

¹ The twelve Federal Home Loan Banks (FHLBs), while not usually treated as credit agencies, issue debt and lend the proceeds primarily to savings and loan associations on mortgage collateral. FHLB advances, which totaled \$30 billion at the end of 1978, effectively increase the liquidity of mortgages held in savings and loan association portfolios but do not directly contribute to the marketability of mortgages.

single principal repayment at the end.² Its short-term debt rose by \$2.5 billion in 1978, and it issued debentures totaling \$9.3 billion (Chart 2). FNMA purchases facilitate the separation of the seller/servicing and investment aspects of real estate finance, allowing local real estate markets to attract funds indirectly from distant geographic regions and from investors who do not wish to originate, service, or hold mortgage loans.

When FNMA was rechartered as a private corporation in 1968, programs requiring Government subsidies or other direct Federal support were assumed by GNMA, a newly organized Government corporation within the Department of Housing and Urban Development. There are now two major GNMA programs. One is the purchase of mortgages to support housing for low-income families for which private financing is not readily available. These special assistance programs provide mortgage funds at below market rates of interest. In its "tandem plan" operations, GNMA issues commitments to purchase certain types of loans with interest rates below prevailing market levels and simultaneously sells these mortgages to FNMA or to private investors at prices resulting in market yields, absorbing as subsidy the difference between the prices paid and received.

The second major GNMA activity is its mortgage-backed securities program, which has revolutionized the secondary mortgage market. Under GNMA sponsorship beginning in 1970, the Government guarantees the timely payment of principal and interest on securities issued by private mortgage institutions and backed by pools of Government-insured or -guaranteed mortgages. These pass-through securities are designed to appeal to pension funds and other institutional investors not wishing to originate and service mortgage loans themselves. Pass-throughs are considered eligible real estate investments by most agencies that regulate commercial banks and thrift institutions, and for purposes of determining the tax status of thrift institutions. The securities provide a safe, easily marketable investment with an attractive long-term yield and a high cash flow each month resulting from interest and principal repayment.

GNMA pass-through securities provide for monthly instalments of interest on the unpaid balance at the securities' stated certificate rate plus payment of scheduled principal amortization, whether or not col-

lected by the servicer, together with any prepayment or other recoveries of principal. All mortgages placed in a pool must be issued at the same interest rate and cannot be more than one-year old. The GNMA certificate rate is 50 basis points below the contract rate of the underlying mortgages, 44 basis points going to the originator for servicing and 6 basis points to GNMA for providing its guarantee. Pass-throughs are issued in registered form with coupons. The issuer mails checks for interest and principal repayments to holders of record as of the end of each month to reach the recipient by the fifteenth.

Mortgage pools backing GNMA securities most frequently contain FHA-VA single-family mortgages, although pools may also be formed from other types of FHA-insured or VA- and Farmers Home Administration-guaranteed mortgages, subject to somewhat different terms than those described above. Single-family pools are formed in \$1 million minimum amounts (pools for other mortgage types may be half that size), but many pools are substantially larger, containing \$25 million or more in mortgages. Pass-through securities are issued in \$25,000 minimum denominations with \$5,000 increments, although in the national market a round-lot transaction is \$1 million.

GNMA pass-through securities are issued by mortgage bankers (who account for three fourths of the annual total) as well as by thrift institutions and commercial banks that originate FHA-VA mortgages. Instead of selling the mortgages outright or financing them through deposits or other debt, the issuer forms a pool, sells pass-through securities, and continues to earn servicing income on the loans. Newly issued securities are marketed for immediate or forward delivery either directly by the issuer or, more typically, a securities dealer. There is a sizable annual volume of trading in seasoned issues, a direct result of the large volume of outstanding securities and their widespread distribution among all types of investors. In addition, there is an active futures market for the securities on the major commodities exchanges.

Until recently, GNMA pass-throughs have dominated the mortgage-backed securities market. There are over 800 active issuers of GNMA pass-throughs and over 33,000 pools. New issues in 1978 totaled \$15 billion, financing over half of all new FHA-VA home loans and raising the outstanding unpaid principal balance of GNMA pass-throughs to \$52 billion. In the first nine months of 1979, GNMA issues totaled over \$16 billion.

FNMA and GNMA securities backed mainly by Government-guaranteed mortgages have dominated the mortgage-backed securities market during the past decade. Now, over 90 percent of all newly originated FHA-VA mortgages on single-family homes is placed

² In the past, FNMA issued a few bonds explicitly collateralized by designated mortgages—the forerunner of mortgage-backed bonds now being used by savings and loan associations—but most of its debentures are not explicitly collateralized. All FNMA debt is treated as mortgage backed in this discussion. FNMA currently is considering the feasibility of marketing pass-through securities for conventional mortgages.

in pass-throughs or sold to FNMA, but FHA-VA fixed-payment mortgages represent a declining fraction of total home loans. In May 1979, GNMA began to guarantee pass-through securities backed by graduated payment mortgages³ insured by FHA, a potential fast-growth area for GNMA securities. However, the key to continued rapid growth of mortgage-backed securities lies in the conventional loan market and the housing bonds of state and local governments.

Mortgage-backed securities have been used only recently to finance conventional loans, which account for four fifths of all home mortgages. The FHLMC, created by the Congress in 1970 and wholly owned by the Federal Home Loan Banks (FHLBs), has as its primary goal the development of a national secondary market in conventional mortgages. As a general rule, the FHLMC purchases conventional mortgage loans from savings and loans associations (four fifths of its total purchases), mutual savings banks, commercial banks, and mortgage banks. At first the FHLMC purchased mainly participations and whole loans for its own portfolio, financing the acquisitions by borrowing from the Treasury and the FHLBs and by issuing its own mortgage-backed bonds. In 1974, however, the focus of its operations was shifted toward the sale of mortgage participation certificates (PCs) and guaranteed mortgage certificates (GMCs).

In many respects, PCs are similar to GNMA pass-through securities, although they are not backed by the full faith and credit of either the United States Government or the FHLBs. These certificates represent ownership interest in pools of conventional mortgages purchased by the FHLMC, which guarantees the monthly pass-through of interest, scheduled amortization of principal, and ultimate repayment of principal. Like GNMA pass-throughs, PCs are considered direct mortgage investments for most tax and regulatory purposes. PCs are marketed directly by the FHLMC and through a group of securities dealers who also maintain a secondary market in seasoned issues. The originator retains the obligation to service the loans for a fee of $\frac{3}{8}$ percent and the spread between the price paid and received by the FHLMC, usually 30 to 50 basis points, provides a return to cover FHLMC insurance and administration costs.

PCs differ from GNMA pass-throughs in several respects because they are issued by the FHLMC rather than by individual mortgage lenders throughout the country. The mortgage pool underlying a typical PC comprises about 5,000 mortgage loans with a total

value of about \$100 million to \$300 million. A given pool may contain mortgages issued at several rates, allowing PCs to contain loans issued in different sections of the country. Although the minimum PC denomination is \$100,000, \$5 million denominations are particularly popular since the unpaid principal balance will remain comfortably above the \$1 million round-lot trading size for many years. In 1978, \$5.6 billion in PCs was issued, bringing the outstanding unpaid balance to \$10.2 billion at the year-end.

In 1974 the FHLMC created a new type of instrument, the GMC, to provide a mortgage investment instrument with much of the convenience of a bond. Like a GNMA pass-through, a GMC represents ownership interest in a pool of mortgages, but the interest on a GMC is paid semiannually and principal repayments are made annually, like some sinking fund bonds. The FHLMC guarantees timely payment on interest, full payment of principal, and promises to repurchase any principal that remains unretired after fifteen years. At irregular intervals, GMCs backed by mortgage pools totaling \$200 million-\$300 million are issued in minimum denominations of \$100,000. In 1978 new issues totaled \$700 million, bringing the outstanding unpaid balance to about \$1.9 billion by the year-end.

New types of mortgage-backed securities

The success of mortgage-backed securities guaranteed by the Federally related credit agencies has encouraged private mortgage originators to issue both mortgage-backed bonds and pass-through securities without Government involvement. Since 1975, thrift institutions have issued mortgage-backed bonds patterned after bonds issued by various Government-related credit agencies. The securities are similar in most respects to other corporate bonds. They are general obligations of the issuer with a stated maturity and fixed semi-annual interest payments. The bonds are collateralized by pools of mortgages, with a covenant obligating the issuer to maintain a stated level of collateral even when discounted to market value and adjusted for amortization and prepayments. Collateral maintenance levels are normally so high (usually 150 percent or more) that mortgage-backed bonds receive highest ratings.

Mortgage-backed bonds allow thrift institutions to borrow against their mortgage assets to obtain funds for new loans during periods of slow deposit growth, instead of borrowing from commercial banks or the FHLBs. These bonds are particularly attractive when the cost of alternative financing is above the bond rate, provided mortgage yields are higher than bond yields. Moreover, since the thrift institutions do not sell the mortgages outright, they may pledge old, relatively low-yielding loans as collateral without showing capital

³ Graduated payment mortgages are a new and rapidly growing type of instrument having a lower monthly payment in the first few years than standard fixed-payment home loans.

losses on their books. Most mortgage-backed bonds are issued with original maturities of five to ten years, roughly comparable to the expected average maturity of new mortgages. On the whole, these bonds allow thrift institutions to match more closely their asset and liability maturities and to broaden their funding base. Mortgage-backed bonds issued publicly in 1978 totaled \$465 million, bringing the amount outstanding to \$1.7 billion. In 1979, bonds totaling \$1.0 billion were issued publicly in the first nine months.

Mortgage-related bonds have also become a prominent feature in the tax-exempt sector of the capital markets. State governments have supported single-family housing through general obligation bonds for a number of years (usually associated with veterans' benefit programs) and since 1970 through revenue bonds issued by housing finance agencies.⁴ Housing-related revenue bonds were first issued by municipalities in 1978. These three types of bonds, designed to appeal to individuals and institutions who purchase other types of tax-exempt municipal securities, are used mainly to finance loans for low- and middle-income housing at below-market rates. New issues supporting single-family housing totaled \$4.7 billion in 1978 and \$6.5 billion in the first nine months of 1979.

The use of tax-exempt securities to finance mortgage lending has sparked considerable public debate. Proponents assert that the tax-exempt mortgage bond programs benefit the home buyer, the locality, and the housing industry by making homeownership affordable to more people. As a result, local neighborhoods are stabilized and, with demand pushing house prices higher, the tax base of the locality is enhanced. Critics charge that the use of tax-exempt bonds to finance housing increases borrowing costs to state and local governments for other purposes and reduces Treasury tax revenues and that mortgage funds generated in some programs are not channeled to those most in need of government subsidies. In response to these objections, Congressional legislation, H.R. 3712 and related bills, was introduced in April 1979 to restrict the use of tax-exempt revenue bonds to finance homeownership. The uncertainty about the outcome of this pending legislation has raised questions about the tax status of forthcoming issues.

In a promising application of mortgage-backed securities to the conventional loan market, banks, savings and loan associations, and subsidiaries of private mortgage insurance companies have placed a number of publicly issued pass-through securities

(PIPs)⁵ without any form of Government guarantee. PIPs provide a means for market pricing and public distribution of mortgage loans, substituting for private placement of whole loans and participations, or sale to a Government-related agency. The issuer forms a mortgage pool or trust, obtains private mortgage and hazard insurance and secures a rating, and sells the securities through an underwriting group—often to customers who regularly buy corporate bonds.

The first PIP was sold by Bank of America in September 1977, followed quickly by an offering of the First Federal Savings and Loan Association of Chicago in October. Securities totaling \$728 million were sold in 1978 by four issuers and an additional \$445 million was publicly placed in the first nine months of 1979. In a major extension of this market, "conduit" companies recently have begun to issue pass-through securities backed by conventional mortgages and serviced by thirty to forty lenders. This allows smaller originators access to the market, creating pools with broad geographic diversity.

PIPs offer several advantages over other loan sale alternatives. Public distribution provides a broader and deeper investment base than private placements, allowing large amounts of loans to be sold quickly at relatively attractive rates. In addition, details of the offering can be tailored to match the needs of the issuer rather than those of the Government-related credit agencies. For example, some agencies currently place limits on the maximum size of individual home loans that may be pooled as well as limit the amount of commitments accepted from any one seller. The agencies purchase loans in quantities determined by their own investment goals and require sellers to contract for delivery well in advance. Finally, many issuers feel they can provide insurance and administration at lower cost than the spread retained by the FHLMC when it issues PCs.

Forward commitments

PCs and GNMA securities are sold mainly for forward delivery and settlement. These forward commitment procedures present a variety of new portfolio management options to investors more familiar with the immediate delivery conventions of the bond and equity markets. The necessity for a forward market arises from the special problems of originating home loans and packaging them for sale to final investors. Mortgage companies, thrift institutions, and other mortgage originators make commitments to lend funds in the future to builders

⁴ Although six states formed housing finance agencies before 1970, only the New York housing finance agency issued bonds prior to that date. Such agencies are now found in forty states.

⁵ A number of issuers have coined names for their securities—Connie Mac (Ticor), Pennie Mae (PMI), Maggie Mae (MGIC).

and developers and to home buyers, although the borrowers are not obligated to take down the loans. Since home loans have long maturities and are often large relative to the borrowers' net worth, the time-consuming process of checking collateral and creditworthiness is particularly important.

It may take three to six months to accumulate a bundle of completed mortgage loans and process the necessary paperwork before selling the loans to a final investor. During this time, a mortgage originator bears the risk of capital loss if interest rates rise. For highly levered mortgage companies, even a small rate increase could be disastrous, making a purchase commitment from a future buyer desirable in many cases. "Firm" commitments require the loan seller to deliver mortgages at the commitment price; under a "standby" commitment, delivery is optional at the seller's discretion. Standby commitments are usually associated with more distant delivery horizons (often twelve months) and are accompanied by a nonrefundable fee of about 1 percent. To meet the demand for purchase commitments, particularly for twelve-month horizons or during tight money periods, standby commitments are often issued by banks and thrift institutions that may not desire delivery of the underlying mortgages but are willing to bear some price risk in return for the commitment fee. This can be done by fixing the strike price—the price at which delivery is made—at such a low level that the delivery option will not be exercised unless rates increase sharply.

In 1968 FNMA instituted a program for market determination of strike prices on its firm and standby forward commitments. FNMA now holds biweekly auctions in which lenders specify the rate at which they will offer various dollar amounts of mortgages. The volume of accepted offers is based on FNMA's cost of funds and the general tone of the mortgage market. Commitments are issued to successful bidders offering mortgages to FNMA at the highest yields (lowest strike prices). Since October 1971 four-month firm commitments have been auctioned biweekly, and since October 1972 twelve-month convertible standby commitments have been available as well. At the loan seller's option, these standby commitments may be converted to firm four-month commitments at the average price established in the most recent auction. These auction-market commitment procedures have not been imitated by other government or private loan purchasers, but an active over-the-counter forward market for pass-through securities serves much the same purpose.

This over-the-counter forward market—often called the "cash" market to differentiate it from the GNMA futures market on the commodities exchanges—is most active for GNMA securities, but similar procedures are

followed in all pass-through markets. Dealers issue firm commitments to purchase or sell securities with stated certificate rates for delivery one to six months or more in the future.⁶ The bid-asked spread is normally $\frac{1}{8}$ percent for recently issued securities and somewhat higher for seasoned issues. Dealers may hedge their commitments with each other, with final investors, or in the futures market.

Some dealers also offer standby commitments that are essentially "put" options traded over the counter.⁷ A potential seller of GNMA securities obtains a standby purchase commitment from the dealer for a negotiated fee, about 1 percent for the popular twelve-month contract. The strike price is usually negotiated at a spread below the firm forward commitment price. The dealer may offset such a commitment by obtaining a standby commitment from a potential buyer, passing along most or all of the commitment fee.

Futures contracts—similar in many ways to firm GNMA forward commitments—may be arranged on the Chicago Board of Trade (CBT) and the Amex Commodities Exchange (ACE). At each exchange, contracts are available for delivery at three-month intervals going forward about two and one-half years. Delivery is guaranteed by the exchange, reducing the risk of delivery failures, and investors are required to post margin in the form of cash, securities, or a letter of credit. Contracts are evaluated at current market prices—marked to market—each day, and a maintenance margin is required to cover accumulated losses.

The contracts are issued in terms of a standard 8 percent GNMA certificate rate, but pass-throughs bearing other rates are deliverable according to an established price adjustment schedule. Because this schedule does not preserve equality of true yield to maturity for securities with different certificate rates, market participants generally find it advantageous to deliver a security with the highest allowable certificate rate. Under the new CBT contract and the ACE contract, only securities selling at or below par are deliverable, so that the "8 percent future", in fact, trades as if

⁶ These forward interest rates must be adjusted to get an unbiased estimate of future mortgage rates. As in any forward market for a durable commodity, forward prices tend to be lower than the cash prices expected to prevail on the delivery date when the cost of carry—anticipated capital gains plus any accrued interest less short-term interest rates and storage costs—is positive. With the usual upward-sloping yield curve and an unchanged interest rate forecast, forward commitment prices would normally be below prices quoted for immediate delivery.

⁷ Although there is still some confusion on this point, the Commodity Futures Trading Commission is not expected to treat GNMA forwards as leverage instruments falling under its regulation. However, most regulations of financial institutions treat forward commitments as "puts" that may be questioned by examiners.

it were a contract for a GNMA issued at the current certificate rate.⁸

Because GNMA securities are Government backed, the forward market is exempt from most SEC (Securities and Exchange Commission) regulations. Unfortunately, it also has been associated with several well-publicized financial failures, leading to moves toward a restructuring of market practices.⁹ Some dealers now request initial margin and mark outstanding contracts to market, requiring maintenance margins to cover accumulated losses.¹⁰ Dealers also attempt to monitor the credit risk of customers, but a dealer generally has no means to determine a customer's total market exposure on a timely basis.

The risks inherent in issuing forward commitments for the purchase of pass-through securities (or taking the long side of a forward or futures contract) have caused regulators to question whether such activities are consistent with the fiduciary responsibilities of banks and thrift institutions. Firms may issue firm commitments with the hope of selling them prior to delivery at a speculative profit and may issue standby contracts for the fee income. Since delayed delivery contracts are an integral part of mortgage lending, the goal of regulation is to prevent abuses, while allowing financial intermediaries to perform this necessary role. To prevent portfolio managers from accumulating larger losses than can be accommodated at the time of settlement, most regulators and market participants support rules requiring all over-the-counter forward contracts to be marked to market and obligating buyers and sellers to post maintenance margins in the form of cash, securities, or letters of credit to cover any

accumulated losses.¹¹ This would reduce the potential for the failure of one firm to create a chain reaction in the market but does little to insure that forward positions taken by individual investors are authorized by top management and are appropriate to the investment goals of the firm. Most market participants agree that, since little cash changes hands immediately, relative to the price exposure that is assumed in entering into a forward contract, operations of financial firms in either the forward or futures markets should be supervised at the highest management level.

Outlook

The mortgage-backed securities market is coming of age. Up to this point, the market has been dominated by bonds issued by FNMA and by GNMA pass-through securities—both backed by FHA-VA loans. However, the relative importance of most types of Government-insured mortgages in the housing market is declining. Future growth of the pass-through market depends on the popularity of pass-through securities sold by the FHLMC and publicly issued by banks, savings and loan associations, and mortgage companies that are financing conventional mortgage loans. A second type of instrument, the mortgage-backed bond, is being used by thrift institutions to gain access to the capital markets, and tax-exempt bonds are being sold by state and local governments to support housing.

Mortgage-backed securities have important implications for economic efficiency and policy. By reducing geographic and institutional barriers to the movement of funds, the market facilitates a more efficient distribution of available financing to areas where housing demand is strongest. By allowing home buyers to compete for funds on favorable terms with corporate and governmental borrowers, the market contributes to general economic efficiency. Both of these effects increase the ability of the capital markets to generate mortgage funds by reducing the dependence of housing finance on interest-sensitive deposit flows. Thus, mortgage-backed securities help moderate the traditional "boom and bust" cycles in the housing sector by spreading the burden of high interest rates more evenly across all sectors of the economy.

⁸ Under the original CBT contract there was no "par cap", so that market participants tended to deliver securities with the highest available certificate rates.

⁹ The three most widely publicized problems in GNMA trading have centered on forward commitment speculation resulting in delivery failures: The Winters Government Securities case involved questionable sales practices by a dealer. The University of Houston case resulted from overzealous investment plans of an investment officer. Most recently, the Reliance case involved massive failures by a mortgage banker to meet purchase commitments.

¹⁰ The Justice Department has said that mandatory margin requirements proposed by the Mortgage-Backed Securities Dealers Association could constitute restraint of trade. Various forms of Government- and self-regulation are pending. These issues are discussed at length in *Analysis and Report on Alternative Approaches to Regulating the Trading of GNMA Securities* (November 7, 1978), prepared for GNMA by R. Shriver Associates.

¹¹ There is some feeling that contracts made by an approved mortgage issuer to sell any loans generated within the normal "production cycle" could be exempt from mark-to-market rules without undue risk of speculative abuse.

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Appendix: Estimating Pass-Through Yields and Maturities

The likelihood that many mortgages placed in a pass-through pool will be prepaid sometime before maturity creates uncertainty about the yield and average maturity of such an investment. Yields commonly quoted for pass-through securities are computed assuming there will be no prepayments until the twelfth year, at which time the entire remaining principal balance will be paid off. Monthly payments are assumed to be reinvested at the average yield, compounded monthly, until the end of the twelve-year horizon. This yield calculation probably does not give the best estimate of the rate of return, and a security's average maturity may differ significantly from twelve years.

To obtain a better estimate of the true yield of a pass-through security, a more realistic prepayment assumption must be employed. But, since pass-through securities are a relatively recent innovation, there is little direct prepayment evidence available. One strategy is to use the prepayment history of Federal Housing Administration (FHA) loans as a bench mark against which other mortgage pools may be measured.

Although few pools are likely to pay down precisely at the historical FHA rate, one plausible assumption is that the pattern of prepayments will be the same but will come in proportionately faster or slower. A "100 percent FHA" pool pays down at the historical FHA rate; a "200 percent FHA" pool pays down twice as fast (percentage of remaining balance that is prepaid each month, not dollar amount); a "0 percent FHA" pool has no prepayments (Chart 3).

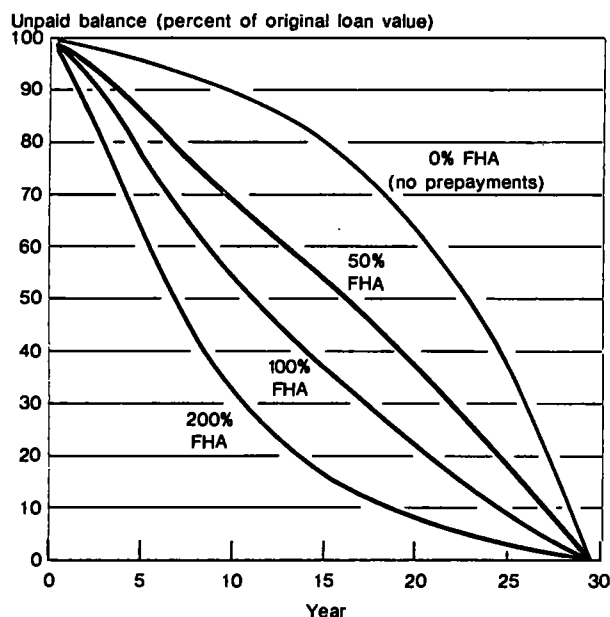
Existing GNMA pools show a wide variation in prepayment experience. For example, 8 percent GNMA pass-throughs issued on December 1, 1970 had unpaid principal balances after eight and one-half years ranging from 70 to 29 percent of the original investment, corresponding to FHA paydown rates ranging from 50 to 200 percent. As the various types of pass-through securities have time to establish prepayment track records, it should be possible to determine more precisely which geographic, demographic, and financial factors affect the prepayment profile. Until such factors are analyzed more fully, buyers of newly issued pass-throughs will be unable to compute expected yields and average maturities with much precision. Similarly, the prepayment rate over the early years of the life of a pool need not give a good estimate of the subsequent prepayment rate.

Some prepayment assumption must be employed to produce a yield estimate well suited for comparison with returns on other types of instruments. If pass-through yields are to be compared with bonds, an adjustment must also be made for semiannual compounding. For example, a 9½ percent GNMA security priced at 96 has a quoted yield of 10.04 percent with the twelve-year paydown calculation. On a "true yield" basis, this security would yield 10.08 percent with a 100 percent FHA paydown or 10.21 percent with a 200 percent paydown. For securities such as this one, selling at prices close to par because they have certificate rates close to current market yields, the assumed prepayment rate does not have a large effect on yield. For securities selling at a deep discount (or premium), however, the prepayment assumption is a critical determinant of yield because the cash flow is assumed to be reinvested at the average yield rather than the certificate rate. As a result, an investor buying a deep discount GNMA pass-through would be willing to pay a premium price for a security backed by a "fast pay" pool expected to prepay at, say, a 400 percent FHA rate.

Because the cash flow from a pass-through security is concentrated in the early years, comparing pass-through yields with returns available in the bond market is not a straightforward exercise. The average

Chart 3

Unpaid Balance at Different Paydown Rates 10 Percent GNMA Certificate Rate



maturity of a pass-through security—the proportion of the loan repaid each month times the number of months since the loan was originated—is sensitive to the prepayment assumption. A 9½ percent GNMA pool with no prepayments has an average life of 21.6 years. The average life under a standard twelve-year prepayment assumption is about 11.2 years, two years shorter than the 13.1-year average with a 100 percent FHA paydown. For a 200 percent FHA paydown, the average life drops to 8.9 years. These calculations suggest that most pass-through yields are roughly comparable to returns available on intermediate-term bonds.*

However, since pass-throughs return both principal and interest throughout their lives, reinvestment options must be considered carefully in light of interest rate expectations. When short-term interest rates are higher than the certificate rates on pass-throughs, fast pay

pools appear attractive but, if short-term rates are expected to fall, investors would value such pools less highly. Rather than comparing pass-through yields with returns on bonds of similar average maturity, analysts can provide more useful information for investment decisions by comparing pass-through yields with returns on strips of bonds of various maturities weighted to produce a similar expected cash flow. This information may then be combined with estimates of possible reinvestment options, to decide whether the cash flow and yield characteristics of a particular pass-through are superior to the alternative presented by a given bond or combination of bonds.

*The calculation of average maturity and yield was recently discussed by Dexter Senft in "The 'True Yield' of a Pass-Through Security", *The Mortgage Banker* (September 1979).