

# Mortgage-Backed Securities: Another Way to Finance Housing<sup>\*</sup>

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## Abstract

The introduction of mortgage-backed securities (MBS) as a channel for housing finance is a relatively recent event for the United States, having occurred less than three-and-a-half decades ago. This paper provides a brief overview of the MBS process in the U.S. The paper places the MBS process in the larger contexts of finance in general and housing finance in particular, discusses its special features and its advantages and disadvantages, addresses its special infrastructure requirements, and describes the historical and recent experiences in the U.S.

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## I Introduction

The provision of finance for the purchase of residential housing is, or should be, an important part of any society's financial structure. Because a housing unit is inevitably a relatively large purchase, compared with most households' incomes, finance is unavoidable -- especially if self-finance is included as a possibility.

Efficient finance for residential housing can encourage a better matching of households' preferences for housing with the available and potential supply of housing, improving social welfare. Further, to the extent that efficient finance encourages more widespread ownership by occupiers, there are likely to be additional social benefits.<sup>1</sup>

This essay will be about one specific form of finance for the purchase of residential housing: mortgage-backed securities (MBS). This form is relatively new. It has been in existence in the U.S. for less than three-and-a-half decades.<sup>2</sup> Nevertheless, it has become an important part of the housing finance system of the U.S. -- as of 2003, MBS accounted for more than half of all single-family residential mortgages in the U.S. -- and has spread to a few other countries. It is certainly worthy of consideration as part of any housing finance system.<sup>3</sup>

The remainder of this essay will proceed as follows: In Section II we will review the general problem of finance and why it deserves special attention. Section III will briefly outline the major alternative forms of finance for housing, including MBS. Section IV will delve more deeply into the MBS system, describing its major features, its advantages and disadvantages, and its contextual underpinnings. Section V will provide some data on the development of MBS in the

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<sup>1</sup> There is a small but convincing literature as to the social benefits from home ownership. See, for example, Rohe and Stegman (1994), Rohe and Stewart (1996), Rossi and Weber (1996), Green and White (1997), and DiPasquale and Glaeser (1999).

<sup>2</sup> It has, however, existed in Denmark for considerably longer.

<sup>3</sup> Extensive discussion of MBS can be found in Bruskin and Sykes (1997), Bruskin et al. (2000), Fabozzi et al. (1997, 2000), Fabozzi and Dunleavy (1997), Hu (1997), Fabozzi (2001), and Hayre (2001a, 2001b).

U.S. housing finance context.<sup>4</sup> And Section VI will offer some conclusions.

## II. The General Problem of Finance

Financial transactions, except for self-finance, always involve at least two parties. Though financial transactions can attain great complexity, their essence can be portrayed in terms of a simple loan transaction: Party A lends money or resources to Party B at time  $t$  and expects to be repaid at some future time  $t+1$ .

At one level, this simple example may seem to be trivial and uninteresting. But it conveys the essence of finance: *the time dimension, and the lender's expectation of repayment*. Because repayment occurs at a future date, separated in time from the initial loan, the lender generally must be concerned about the assurance of repayment. Before making the loan, the lender will want to be assured that the prospective borrower is likely to repay the loan (and any interim interest that is charged); and even during the period of the loan the lender is likely to want to be assured that the borrower's actions are consistent with timely repayment. But the lender faces problems of "asymmetric information": The borrower is likely to know more about its own proclivities with respect to repayment than does the lender. Consequently, finance is associated with extensive efforts involving before-the-loan information gathering and assessment of potential borrowers and during-the-loan monitoring of actual borrowers, with institutions and practices arising so as to facilitate these information-intensive processes.

In general terms, the processes of finance can be described in terms of the informational transparency or opacity of potential borrowers, as portrayed in Figure 1. In that figure, potential borrowers are arrayed along the horizontal line, according to how informationally transparent (or

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<sup>4</sup> For discussion of the role of MBS in the residential finance systems of the United Kingdom and of Australia, see Hayre and Thompson (2001) and DiMartino and Young (2001), respectively.

opaque) they are with respect to the finance-related information that a potential lender would want to know. At the left side would be, for example, a young adult who is entering the labor force and has had no previous financial transactions; he/she has little in the way of a "track record" that can assure a lender as to repayment and is thus highly opaque. At the right side would be, for example, the U.S. Government, whose track record for repayment is transparent and well regarded. In between would be individuals, enterprises, organizations, and governments of varying degrees of transparency.

These potential borrowers can be matched with various categories of lenders. At the far left, highly opaque borrowers are likely to have to rely for their finance on family and friends, who may have special information about the individual or special means of extracting repayment or who may be willing to provide "concessional finance" by converting a loan into a grant. At the far right, highly transparent (and reliable) borrowers can access the securities/bond markets, where bonds are purchased by investors (who thus lend to the borrower) who rely heavily on the publicly available information about and reputation of the borrower.<sup>5</sup> In between, financial institutions that are information gathering and assessment specialists (such as banks and other depositories, finance companies, insurance companies, venture capital firms) are likely to be the sources of finance for borrowers of intermediate transparency/opaqueness.

The legal framework and the institutional and historical context in which the financial transactions are embedded are likely to influence the specific mix of which kinds of lenders provide what kinds of finance to which borrowers. This indeterminacy is indicated by the two shaded rectangles that separate the three categories of providers of finance.

Finally, the arrows that are placed through the separation rectangles point to the left. This is meant to indicate the direction in which technological change in finance -- primarily, improvements

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<sup>5</sup> Bond buyers are likely also to be aided by the information generated by financial advisors, securities analysts, and bond rating firms.

in data processing and telecommunications, but also encompassing intellectual advances such as the Black-Scholes-Merton option-pricing model<sup>6</sup> and the capital asset pricing model (CAPM)<sup>7</sup> -- has pushed the boundaries. The right-hand boundary has moved to the left as technological change has permitted the securities markets to "invade" the "territory" of financial transactions that used to be the exclusive domain of the information specialist finance providers (such as banks); this is the process of "securitization", of which the MBS expansion has been a major part. The left-hand boundary has moved to the left as well, as technological change has permitted banks and other lenders to provide finance (e.g., through credit cards) to individuals who previously could rely only on family and friends.

In sum, finance is intricate, interesting, and important. We now turn to the specifics of housing finance.

### III. Housing Finance

There are essentially three major elements involved in any loan:

- (1) Origination: the initial granting and funding of the loan;<sup>8</sup>
- (2) Ultimate holding and funding: the eventual holding (and thus funding) of the loan;<sup>9</sup> and

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<sup>6</sup> See Black and Scholes (1973) and Merton (1973).

<sup>7</sup> See Sharpe (1964) and Lintner (1969).

<sup>8</sup> Preceding the actual origination of the loan will be information gathering by the borrower, so as to find the best terms, and information gathering by the originator, so as to assure itself of the creditworthiness of the borrower. Each side may hire specialists to help in this process: The buyer may employ a "mortgage broker" to help find the best deal; the lender may employ a credit bureau to investigate the financial history of the borrower and an appraiser to estimate the value of any collateral (such as the house, for a residential mortgage) that is pledged to support the loan in the event of direct payment default by the borrower.

<sup>9</sup> Again, the holder of the loan will want to collect information about the creditworthiness of the borrower, so as to assure itself of timely repayment. Also, the holder may be able to transfer (at a cost) the credit risk of default by the borrower to another party.

(3) Servicing: the arrangements to facilitate timely payment of principal and interest.

In addition, lenders will want some agreed-to arrangements for default contingencies: the procedures that will be followed in the event that the borrower fails to make timely payments.

Housing finance is no exception to this pattern, and we will describe the institutional arrangements that have arisen for housing finance.

The three elements of finance can all be performed by the same entity; this is often described as "vertical integration". Or they can be separately performed by different, "vertically disintegrated" entities. Though the former pattern is more traditional and more common, the latter has grown in frequency with the advent of MBS as a finance alternative.

There are at least eight major ways of providing housing finance. Though MBS are the major focus of this paper, the other seven are worth considering briefly, so as to highlight the special features of MBS.

(1) Owner self-finance. The buyer-owner provides the finance, through prior personal saving; the other elements are irrelevant.

(2) Seller finance. The seller provides the finance. In essence, the seller accepts payment for the sale of the house in a stretched-out schedule, thereby extending an implicit loan to the buyer. The seller originates the loan, funds it, and services it. The residential unit that is being financed will almost always serve as the collateral for the loan, which in this form would be described as a mortgage.

(3) Third-party finance: family or friend. A family member or friend extends the loan (mortgage) to the owner and thus originates, funds, and services it.

(4) Third-party finance: a bank or other depository. A bank extends the loan (mortgage) to the owner and thus originates, funds, and services it.<sup>10</sup> In turn, the bank receives most of its

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<sup>10</sup> The bank could (in principle) buy the loan from a specialist originator and contract out the servicing to a non-bank specialist -- perhaps, the originator. But, at least through the 1970s banks and other depositories in the U.S. (especially savings institutions, such as savings and loan institutions) that did engage in mortgage lending tended to be vertically

financing from depositors; but the depositors' claims for repayment of their funds are directly on the bank, not on the borrowers to whom the bank has extended mortgages.

(5) Third-party finance: an insurance company.<sup>11</sup> Most insurance companies that hold mortgages do not originate them. Accordingly, origination would be by a mortgage bank (an origination specialist), which would sell the mortgage to the insurance company. The latter funds and services it.<sup>12</sup> The insurance company, in turn obtains its funding from the premiums paid by its insureds and from any additional borrowing that it may undertake.

(6) Third-party finance: a finance company. If a finance company holds mortgages, it is unlikely to originate them; again, origination would be by a mortgage banker, who would sell it to the finance company that funds and services it. The finance company's funding, in turn, comes from its borrowings in capital markets.

(7) Third-party finance: government. In principle, government could provide the mortgage (with either direct origination, or origination by a mortgage bank), with funding ultimately by taxpayers or by government borrowing.<sup>13</sup>

(8) Third-party finance: MBS. The originator either "packages" the mortgage (with other mortgages) into a security, or sells the mortgage to another entity that does the packaging. The "pass-through" security (so-named because the borrower's interest and principal payments<sup>14</sup> are passed through to the buyer) is then sold to a party that wishes to hold the security and receive the interest and repaid principal and is thus the funder. That party may be a private investor, a mutual

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integrated and thus to undertake all three functions.

<sup>11</sup> A similar pattern would apply to a pension fund that chose to hold mortgages.

<sup>12</sup> Again, the insurance company may contract out the servicing, perhaps to the originator.

<sup>13</sup> In the U.S., the Federal National Mortgage Association (Fannie Mae) was, until 1968, an entity within the U.S. Government that bought mortgages that were originated by mortgage banks.

<sup>14</sup> Minus any servicing fees and other transactions fees related to the securitization process.

fund, a pension fund, a bank, an insurance company, or any other entity that is attracted to the MBS as an investment. The servicing may be done by the originator, or the servicing may be sold to a specialist servicer. Since the MBS are securities, they may be readily sold to other investors in a "secondary market".

We now turn to further discussion of the MBS process.

#### IV. Mortgage-Backed Securities for Housing Finance

Because, even in the U.S., the MBS process that was described at the end of the previous section is still relatively new and less familiar -- especially as compared with the "traditional" form of housing finance, which involves a bank or other depository as the originator, funder, and servicer -- some additional discussion of the special features and concerns of the MBS process is surely warranted.

##### A. Lender concern about timely repayment (credit risk).

Recall that a central focus of all of finance is the lender's concern about repayment by the borrower. This concern is paramount in the case of MBS, where the borrowers are households that are unknown to the investors who purchase the MBS.<sup>15</sup> Consequently, the MBS process in the U.S. involves a number of steps that offer assurance to investors that they will receive timely payment of interest and principal -- and that thus widen the potential market for this category of securities.

First, the nature of the loan itself -- a mortgage, with the housing unit itself providing the collateral that offers some reassurance of repayment -- provides a major form of assurance (as

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<sup>15</sup> This contrasts with the bank-focused method of housing finance, where the bank as originator, servicer, and funder of the mortgage loan acquires extensive knowledge about the borrower; and the depositors (the ultimate funders) rely on the solvency of the bank, its reputation, and safety-and-soundness governmental regulation for the safety of their deposit "investment".



compared with, say, personal loans that have no specific collateral).<sup>16</sup>

Second, the mortgages are bundled into pools of hundreds (or sometimes thousands) of mortgages each, so that there is greater safety in large numbers and diversification.

Third, underwriting standards for mortgage lending usually require loan-to-value (LTV) ratios (percentages) that are significantly below 100%, so as to allow for some loss in value in the collateral that would still permit the loan to be repaid in full, or the standards insist on third party mortgage insurance to cover potential losses. In the U.S., a maximum LTV ratio of 80% is the norm, with any higher LTV (up to 95%) requiring mortgage insurance.<sup>17</sup>

Fourth, the packager of the mortgages (who is the issuer of the MBS) may place the mortgages in a "special purpose entity" -- usually a trust -- that is wholly owned by the issuer but that is legally separate ("bankruptcy remote") from the issuer. This separation allows the mortgages (which are, of course, the underlying assets that support the issued MBS) to be unaffected by any adverse financial events that might affect the issuer. Again, this provides additional assurance for investors.<sup>18</sup>

Fifth, the packager/issuer will seek assurances (including a recourse option to return unsatisfactory mortgages) from the originator that high standards of origination have been maintained, so that the packager/issuer can offer these assurances to investors.

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<sup>16</sup> Implicit, but very important for any kind of mortgage finance, is the clear establishment of property rights and title in residential housing and a clear process of foreclosure in the event of borrower default. Also important is the availability of market information about housing buy/sell transactions, supplemented by appraisals, so that lenders can be comfortable that the value of the collateral exceeds the mortgage. Finally, the fact that residential housing in most areas in the U.S. has been rising in value since the 1930s (albeit with some local dips at some specific times) has provided further assurance to lenders that the collateral is likely to continue to exceed the value of the loan during the life of the loan.

<sup>17</sup> The average LTV ratio for newly issued mortgages in the U.S. for the years 1994-2003 was 77.8%; for 2001-2003 the average was 74.9%.

<sup>18</sup> In the U.S., the quasi-governmental nature of the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Credit Corporation (Freddie Mac) has allowed these two MBS issuers to avoid the necessity of using trusts for their MBS.

Sixth, despite the protections just described, investors are still likely to be concerned about the certainty and timeliness of repayment. This demand for certainty has been addressed in two ways. First, the overwhelming majority -- over 80% -- of MBS in the U.S. has been issued with guarantees by governmental or quasi-governmental entities. In the direct governmental category are the MBS of the Government National Mortgage Association (Ginnie Mae), which is a part of the U.S. Department of Housing and Urban Development (HUD). In the quasi-governmental category are the MBS of the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac), which are special corporations<sup>19</sup> that have been chartered by the Congress. Though Fannie Mae and Freddie Mac are publicly traded corporations, their special national charter and special privileges<sup>20</sup> have convinced the financial markets that the U.S. Government would be unlikely to allow the two companies to default on their obligations in the event of financial difficulties.<sup>21</sup>

A second method of assurance to investors, offered by non-governmental ("private label") issuers of MBS, is for the issuer to provide some form of credit enhancement for the securities. The credit enhancement can be "external", such as third-party guarantees or insurance; or they can be internal to the pool of mortgages itself: a structuring of the pool of securities into "senior" and "subordinated" components, with the senior securities being the MBS that are sold to investors and

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<sup>19</sup> A common phrase that is used in connection with Fannie Mae and Freddie Mac (and a few other similar entities) is "government sponsored enterprise" (GSE). Their debt and MBS are usually described in the credit markets as "agency" issues.

<sup>20</sup> Those privileges include the authorization of the U.S. Treasury to lend each up to \$2.25 billion; exemptions from state and local income taxes; exemptions from the Securities and Exchange Commission's registration requirements and fees; the ability to use the Federal Reserve as their fiscal agent; the eligibility of their debt for use as collateral for public deposits, for purchase by the Federal Reserve in open-market operations, and for unlimited investment by banks and other depositories; the designation of their securities as government securities under the Securities Exchange Act of 1934; the exemption of their securities from many state investor protection laws; and lower regulatory (safety-and-soundness) capital requirements for holding mortgages than apply to banks and other depositories.

<sup>21</sup> Further discussion of the special nature of Fannie Mae and Freddie Mac can be found in USCBO (2001a), White (2003), and Frame and White (forthcoming).

the subordinated component held by the issuer (or sold to someone who is prepared to absorb the risks, which may be considerable, of non-payment).<sup>22</sup> The subordinated component absorbs the first default losses, up to some percentage (which can range between 4% and 20%), which provides greater assurance to the holders of the senior MBS.<sup>23</sup> Almost always, bond rating firms (Moody's, Standard & Poor's, and/or Fitch) are asked to provide a rating that provides a judgment as to the safety of the senior MBS; the issuer's desire to obtain a high rating (so as to appeal to investors that seek safety), in turn, is usually the determinative factor of the extent of the default losses that the subordinated component is required to absorb.

#### B. Lender concern about early repayment (interest-rate risk).

A mortgage is a long-lived debt instrument. The usual term of a mortgage in the U.S. is 30 years, and few mortgages are issued with terms of less than 15 years.<sup>24</sup> They are level-payment (i.e., constant monthly payments) and self-amortizing, so that principal is being repaid throughout the term of the mortgage (small amounts at first, and gradually increasing amounts over time). They generally can be repaid, partially or fully, without any penalty for "prepayment".<sup>25</sup> Finally, most of the mortgages issued in the U.S. carry fixed interest rates (rather than rates that adjust with

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<sup>22</sup> In the 1980s, the external forms of enhancement were the dominant means of enhancement. But mortgages are long-lived and the financial health of the guarantor could (and did) change. Consequently, these methods became less popular in the 1990s. As of the late 1990s, well over 70% of the credit enhancements came through the senior-subordinated structure described in the text, and in 1999-2001 well over 90% of enhancements were structured this way. The rising financial sophistication of MBS investors and the increased financial engineering prowess of the securities industry surely contributed to this trend.

<sup>23</sup> The subordinated component itself may be divided into separate tranches that represent earlier or later absorption of the risks of default losses.

<sup>24</sup> The average maturity of newly issued mortgages in the U.S. for the years 1994-2003 was 27.5 years; for 2001-2003, the average maturity was 27.2 years.

<sup>25</sup> In essence, the borrower has an embedded "call" option that allows the borrower to "call" (repay) the mortgage at any time.

some index of market interest rates),<sup>26</sup> and an even higher fraction of the MBS issued has fixed-rate mortgages underlying them.<sup>27</sup>

The fixed-rate characteristic of the mortgages, combined with the absence of prepayment penalties, imply that the holders of such mortgages, or the MBS based on such mortgages, are exposed to substantial risks of "premature" repayment. Some early repayment would be expected for any kind of mortgage, since a fraction of households per time period would be expected to move to other locations, as a consequence of employment changes or other family demands, thereby selling their houses and repaying their mortgages. But the fixed-rate element provides an incentive for borrowers to refinance their mortgages when interest rates decrease below their original contractual rate by a sufficient amount so as to cover the transactions costs of the refinancing.

Such "prepayments" are an inconvenience in any event for investors, since the prepayments mean that the investors must incur the transactions costs of reinvestments. More important, for fixed-rate MBS, since refinancing-motivated prepayments are likely to swell when interest rates decline, such prepayments will mean that the investor will be forced "prematurely" to reinvest at a lower interest rate than was embodied in the MBS that is being prepaid.<sup>28</sup> Conversely, prepayments are likely to decrease when market interest rates rise above the original contract rate of the mortgage, at just the time when the investor wishes that the borrower would prepay, so that the investor could reinvest at the higher market rates.

Accordingly, investors would be expected to be concerned about and interested in

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<sup>26</sup> For the years 1994-2003, 78% of newly issued mortgages carried fixed rates of interest; for 2001-2003, 84% carried fixed rates of interest.

<sup>27</sup> Because banks and other depositories have become generally reluctant to bear significant amounts of interest-rate risk on their balance sheets, they are likely to sell most of the fixed-rate mortgages that they originate into the secondary market, whereas they are more likely to hold in their portfolios all or most of the adjustable-rate mortgages (ARMs) that they originate.

<sup>28</sup> The repayment (call) option that is embedded in a residential mortgage thus adds considerably to the interest-rate risk that normally accompanies any fixed-rate long-term debt instrument.

understanding the prepayment characteristics of MBS in general and of specific kinds of MBS, so as to be able to place accurate values on MBS. Specific factors that would be likely to affect the prepayment proclivity of an outstanding mortgage (and thus of the MBS derived from it) would include:

- Whether the mortgage is fixed-rate or adjustable, and its specific terms;
- The difference between the mortgage's interest rate and current market rates;
- The LTV ratio of the mortgage;
- The time since its origination (its "seasoning"); and
- Specific demographic factors of the borrowers.

Not surprisingly, the considerable talents of the U.S. securities industry have been marshaled in two ways to address these concerns. First, a substantial amount of analytical effort has been devoted to measuring and modeling the prepayment experiences of mortgages, so as to provide predictions of the prepayment proclivities of specific MBS pools.<sup>29</sup> Second, and at least as important, since the early 1980s many MBS have been structured as “collateralized mortgage obligations” (CMOs).<sup>30</sup> These are multi-tranche securities, where (for example) one class receives all of the principal repayments from the mortgages in the pool, including prepayments, until that class is paid off, then a second class receives its principal repayments until it is paid off, etc. Investors can thereby choose whether they want a shorter-term or a longer-term security and have greater assurance and buffering from the vagaries of prepayments.

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<sup>29</sup> A substantial fraction of the discussion in the general "handbooks" and other treatises on MBS -- such as Fabozzi et al. (1997, 2000), Fabozzi and Dunleavy (1997), Hu (1997), Fabozzi (2001), and Hayre (2001b) -- is devoted to analysis of the prepayment characteristics of MBS.

<sup>30</sup> Prior to 1986, some CMOs faced tax complications. Legislation passed in that year eliminated those complications for multi-tranche securities that were labeled "real estate mortgage investment conduits" (REMICs). Since then, these multi-tranche securities have been interchangeably described as CMOs or REMICs.

### C. The advantages of the MBS channel.

The advantages of the MBS process can now be seen. By converting the hitherto (generally) nontraded and nontradable mortgage into a liquid security,<sup>31</sup> the MBS process widens the potential market for funding mortgages beyond just the depositor-driven funding that underlies a bank-oriented mortgage system. It thereby increases the supply of finance for housing: The ultimate providers of funds have the choice of investing directly in housing finance through the purchase of MBS (or through the purchase of shares in intermediaries that invest in MBS, such as mutual funds) or investing indirectly in housing finance through deposits in banks. In turn, the increase in supply of funds should lower interest rates. Further, the added depth of the securities markets should make that supply generally more elastic, which should allow the overall mortgage finance system to be more flexible, more accommodating of fluctuations in the demand for finance, and less prone to supply-driven liquidity "crunches".<sup>32</sup>

There are, however, tradeoffs with respect to widening the supply of housing finance beyond a bank-focused system. On the one hand, when only banks -- or perhaps even a more narrowly focused depository institution, such as savings and loan (S&L) institutions in the U.S. or building societies in the U.K. -- are the suppliers of housing finance, they are expected to "be there, through good times and not-so-good times". But this means that their supply of finance is relatively inelastic and will be inflexible in dealing with the waxing and waning of the demand for housing finance. Further, the narrow focus for the institution may be dangerous for its long-run health, as was the case for the S&Ls in the U.S.<sup>33</sup> And the improved technologies of finance may weaken

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<sup>31</sup> Technically, the MBS is not the mortgage itself but a claim on the "pass through" of the cash flows of the mortgage, less any fees charged by servicers, packagers, etc.

<sup>32</sup> Whether an MBS system is inherently more efficient than a depository-oriented system, absent the special governmental and regulatory advantages that attach to Ginnie Mae, Fannie Mae, and Freddie Mac, remains an open question. For competing views on this topic, see Van Order (2000a, 2000b, 2000c, 2001) and White (2003).

<sup>33</sup> See White (1991).

their specialness in any event. A widening of the supply of finance to encompass MBS reduces these problems. On the other hand, the introduction of the MBS system will mean that interest rates in the housing finance sector are now linked to the wider securities markets, and any fluctuations that affect those markets, rather than being determined solely by the specialized lenders.

Equally important, the creation of securities based on the mortgage cash flows permits a "slicing and dicing" of those flows into more finely structured securities that can appeal more closely to the preferences and tolerances of investors with respect to credit risk, maturity, and prepayment risk. Two methods of slicing and dicing have already been mentioned: the senior/subordinated structure to deal with credit risk, and the CMO multi-tranche structure to deal with prepayment risk. Another straightforward way of dividing the cash flows is to separate them simply into principal repayments (principal only, or PO) and interest payments (interest only, or IO), and to sell the PO and IO securities separately. Other variations are limited only by the imaginations of securities financial "engineers" and the preferences of investors.

By more closely aligning the properties of specific securities with the preferences of investors, the MBS process again broadens the investor base for housing finance, with the consequent beneficial effects mentioned above.

#### D. The disadvantages of MBS.

There are three potential disadvantages to a system that uses MBS for residential housing finance. First, as compared with a bank-based system, the vertical disintegration of the finance process that accompanies the MBS approach has the potential for creating additional problems of asymmetric information. In the MBS system, the securities packager must rely on the originator to deliver good mortgages, and the securities buyer must rely on the packager to deliver good securities and also on the servicer to forward cash flows honestly and to pursue delinquent

borrowers conscientiously. If incentive mechanisms for good performance, the reputations of the parties involved, and/or penalties for non-performance are inadequate, the MBS system may disintegrate, with losses for "burned" investors and social adjustment costs for replacing the MBS system with something else.

Second, the U.S. MBS system has relied heavily on governmental and quasi-governmental entities for MBS issuance. It is no accident that the governmental and quasi-governmental entities have been important in the MBS process. As was noted above, MBS involve securities that are backed by mortgages issued to homeowners that the securities holders do not know. A concern about the credit risk underlying such securities is understandable. The credible guarantees of governmental and quasi-governmental issuers provide an instant solution to that problem. However, such guarantees do not come free. Though the Ginnie Mae, Fannie Mae, and Freddie Mac MBS programs have thus far not required taxpayer funds, they nevertheless continue to represent a contingent liability of the U.S. Government. The implicit cost of the government's likely backing of Fannie Mae and Freddie Mac, as of 2003, was around \$13 billion per year.<sup>34</sup>

Third, the introduction of an MBS system into a housing finance system that is already bank-oriented will inevitably produce some political economy frictions with the incumbent finance providers. Though this type of friction is inevitable whenever any new technology brings new entrants into an industry, the banking sector is especially prone to frictions because of its high degree of leverage, its extensive regulation, and the special nature of banks' balance sheets, with deposits as the core liabilities that are likely to have an explicit or implicit government guarantee in

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<sup>34</sup> See Frame and White (forthcoming). As White (2003) and Frame and White (forthcoming) point out, in the U.S. context, where other governmental actions already heavily subsidize residential housing, the implicit government backing for Fannie Mae and Freddie Mac is simply providing additional support for housing finance that tends to encourage the purchase of additional amounts of housing by purchasers who would likely become owners anyway, while having only modest effects on expanding home ownership by the segment of the population (lower and moderate income households that are first-time buyers) where the social value of encouraging ownership would be the greatest.



the event of a bank's insolvency.<sup>35</sup> Such potential frictions are not an argument against the introduction of an MBS system that would be otherwise sensible, but they do argue for extra regulatory care with respect to the safety-and-soundness of the banks during any transition phase.<sup>36</sup>

#### E. The pre-requisites for a well-functioning MBS system.

A well-functioning MBS system first needs the pre-requisites that are essential for any well-functioning housing finance system:

- A legal system of clear property rights in housing and clear reporting of title and of liens against the title;

- A legal system that permits relatively rapid foreclosure by the lender in the event of borrower default, with well understood rights and procedures for all parties;

- A tax system that does not unduly tax the transactional steps that are necessary for the provision of finance;

- An institutional and legal framework that does not hinder the development of institutions and support personnel for efficient housing finance (e.g., brokers to help bring borrowers and lenders together; mortgage insurers; credit bureaus; appraisers; etc.)

- An institutional and legal framework that does not hinder the gathering of information about borrowers by lenders; and

- A functioning market in house sales that provides comparison-based housing value data that, supported by appraisals, provides the basis for lenders' valuations of the housing collateral that supports mortgage loans.

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<sup>35</sup> See, for example, White (1991, 2002).

<sup>36</sup> In the U.S., the expansion of the MBS channel of residential housing finance was partly a response to the rigidities in the 1970s and early 1980s that had developed in the traditional S&L-focused channel, then partly an additional source of competition to and exacerbation of the problems of the S&Ls in the mid and late 1980s, and then finally a response to the relative decline of the S&Ls as a source of housing finance in the 1990s. See White (1991) and Van Order (2001).

In addition to these elements, an MBS system requires:

- The institutional development of a set of specialized originators, servicers, and securities packagers;
- A legal and institutional framework that provides incentives and penalties to motivate these parties to perform their roles honestly and efficiently;
- A legal and tax framework that does not hinder the specific steps that are necessary to create securities and to structure securities so as to deal with credit risk and prepayment risk;
- A legal and institutional framework that does not hinder the standardization of mortgage arrangements, including terms and documentation;
- A legal and tax framework that does not discourage investors of all kinds -- individuals, banks and other depositories, insurance companies, pension funds, mutual funds, finance companies, overseas investors, etc. -- from buying and holding MBS; and
- A securities markets institutional framework (brokers, dealers, market makers, analysts, etc.) that facilitates the buying and selling of securities.

## V. The Historical and Recent Experience in the U.S.

### A. The issuance of MBS.

From its beginning, the issuance of MBS in the U.S. has been dominated by governmental and quasi-governmental entities, although "private label" MBS have been growing in relative importance after a late and slow start. The experience of MBS in the U.S. began in 1970, with MBS issued by Ginnie Mae.<sup>37</sup> Freddie Mac, newly created in 1970, issued its first MBS in 1971.

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<sup>37</sup> The collateral for the Ginnie Mae MBS was and continues to be mortgages that are insured by two other government organizations, the Federal Housing Authority (a part of the U.S. Department of Housing and Urban Development) and the Veterans Administration. Ginnie Mae adds its guarantee of timely payment of principal and interest on top of the insurance provided by the other two government entities.

Fannie Mae, though in existence since 1938, issued its first MBS in 1981. Finally, the first "private label" MBS was issued in 1977, by Bank of America.

Table 1 provides time series data on the overall size of the residential mortgage market, as measured by the stock of mortgages outstanding, and the fraction of mortgages accounted for by holders of various kinds, including mortgages that are converted into MBS. As can be seen, the fraction of mortgages that have been converted into MBS have continued to rise; as of 2003, MBS of all kinds accounted for over half of single-family residential mortgages and a third of multi-family residential mortgages.<sup>38</sup> Further, the data indicate that nongovernment (i.e., privately issued) MBS, after starting later than government MBS, has been growing more rapidly, especially in the multi-family area.<sup>39</sup> Nevertheless, the data clearly indicate that the overall government presence in mortgages -- government MBS plus "federal and related agencies" -- is substantial: over 50% for single-family mortgages, and just under a third for multi-family mortgages.

#### B. Holding MBS.

Table 2 shows the recent distribution of the holdings of "agency" securities, which includes the MBS of Ginnie Mae, Fannie Mae, and Freddie Mac but also the straight debt issues of Fannie Mae, Freddie Mac, and the Federal Home Loan Bank system. Though these data go beyond just the agencies' MBS (and exclude the holdings of non-agency MBS), the agencies' MBS are the majority asset in the mix, and thus the data give an approximate picture of investor interest in MBS. As can be seen, banks are the leading holder of these securities, followed by non-U.S. investors.

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<sup>38</sup> These fractions overstate somewhat the MBS presence in the market, since they include MBS that are held by Fannie Mae and Freddie Mac in their portfolios. But the trends are quite clear.

<sup>39</sup> That there would be faster growth by non-governmental MBS in the multi-family area is understandable. This is an area with greater heterogeneity, and it is less susceptible to the "cookie cutter" approach of much of the single-family "conforming loan" market that is the staple of the MBS of Fannie Mae and Freddie Mac, which should give other MBS issuers a greater relative advantage.

Households and mutual funds are the next two largest holders, and these leading four groups together account for over 50% of the holdings of these securities. A big change from fifteen years earlier has been the increase in holdings by non-U.S. investors. In 1988, this group held only 3.0% of the total, as compared with the 13.5% that they held in 2003.

### C. The effects on housing finance.

As was discussed above, the addition of an MBS channel to an already established depository-oriented channel, as happened in the U.S., would be expected to expand supply and reduce interest rates, as compared with what otherwise would have occurred in the absence of that addition. There have been a number of efforts to analyze the consequences of the introduction and expansion of the MBS channel in the U.S.<sup>40</sup> Almost all of the quantitative efforts do show the expected result: that more securitization results in lower mortgage rates. However, much of this research has involved the MBS issued by Ginnie Mae, Fannie Mae, and Freddie Mac, without an effort to disentangle the effects of the explicit or implicit government support for the MBS from the pure effect of the addition of MBS (even if nongovernmental) on mortgage rates.<sup>41</sup> Further, many of the studies focus on the marginal effects of MBS issuance,<sup>42</sup> and there have been no explicit efforts to quantify the overall effects of MBS (with and without governmental support) on the residential mortgage market.

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<sup>40</sup> Summaries are provided in Kolari et al. (1998) and USCBO (2001b).

<sup>41</sup> There have been efforts to identify the specific effects that the presence of Fannie Mae and Freddie Mac have on the interest rates of the residential mortgages that conform to their underwriting standards and to the mortgage amount ceiling (\$333,700, as of 2004) to which they must adhere. Recent estimates (USCBO 2001a, 2001b) estimate the reduction at about 25 basis points. The differential tends to vary over time as conditions in the credit markets have varied. Estimates in the mid 1990s placed the differential in the range of 25-35 basis points. See Hendershott and Shilling (1989) and Cotterman and Pearce (1996). But, again, these studies do not isolate the pure effects of MBS on mortgage rates and do not provide an overall quantitative assessment.

<sup>42</sup> For example, Kolari et al. (1998) find that an increase of MBS issuance by 10% (e.g., an expansion of the MBS share of the residential mortgage market from 50% to 55%) has the effect of lowering mortgage yield spreads (against comparable Treasury yields) of 20 basis points.

Consequently, one can only offer the conclusion that the effects of the introduction of MBS into the U.S. residential housing finance system have surely been substantial, especially when one includes the elements of governmental support, but an exact quantification of those effects still remains to be done.

## VI Conclusion

An MBS system can be a valuable part of a country's residential housing finance arrangements. For someone who is steeped in a traditional bank-oriented method finance, the MBS approach will surely seem strange and unfamiliar. Keeping track of the vertically disintegrated functions -- which parties perform which functions and have which responsibilities and bear which risks -- is certainly more complicated than in a vertically integrated bank-focused system. The MBS system needs much of the same legal and institutional infrastructure that a bank-oriented system needs; but the MBS system also needs additional legal and institutional arrangements and support, with the dangers that breakdowns of that support can unravel an MBS system. And the MBS system in the U.S. has been heavily dependent on government and quasi-government entities, with the continuing risk of potential claims on taxpayers in the event of losses.

However, the advantages of an MBS system -- that it can supplement a bank-oriented finance system and allow the housing finance system to access the capital markets directly and thus expand the supply of finance for housing -- are substantial and make an MBS system worthy of serious consideration for any country.

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Table 1: The Percentage Distribution of Residential Mortgage Debt Outstanding, 1970-2003

	1970	1975	1980	1985	1990	1995	2000	2003
<b>Single-family residential mortgages (total amount, \$B)<sup>a</sup></b>	\$294	\$491	\$987	\$1,524	\$2,619	\$3,469	\$5,142	\$7,171
Commercial banks	14.4%	16.1%	16.5%	13.9%	16.4%	19.6%	18.8%	18.8%
Savings institutions	55.7%	56.4%	49.7%	36.9%	22.9%	13.9%	11.6%	9.8%
Life insurance companies	9.1%	3.7%	1.9%	0.8%	0.5%	0.3%	0.1%	0.1%
Federal and related agencies <sup>b</sup>	7.4%	8.5%	7.9%	8.6%	5.8%	6.6%	4.3%	5.4%
Individuals and others <sup>c</sup>	12.6%	10.0%	12.9%	14.5%	14.5%	9.1%	9.6%	9.8%
MBS, government <sup>d</sup>	0.8%	5.3%	11.1%	23.7%	37.8%	44.5%	47.2%	47.0%
MBS, non-government	0.0%	0.0%	0.0%	1.6%	2.1%	6.0%	8.4%	9.7%
<b>Multi-family residential mortgages (total amount, \$B)</b>	\$60	\$101	\$142	\$206	\$288	\$276	\$401	\$544
Commercial banks	5.4%	5.9%	9.0%	11.3%	12.3%	15.4%	19.4%	19.3%
Savings institutions	35.9%	39.0%	38.0%	43.3%	31.8%	22.5%	15.3%	14.3%
Life insurance companies	26.6%	19.5%	13.7%	9.7%	10.1%	10.4%	8.4%	7.0%
Federal and related agencies <sup>b</sup>	5.7%	12.3%	12.0%	9.1%	12.5%	13.1%	9.7%	11.1%
Individuals and others <sup>c</sup>	26.4%	22.1%	23.1%	23.2%	33.0%	24.4%	18.8%	14.9%
MBS, government <sup>d</sup>	0.0%	1.2%	4.2%	3.4%	10.0%	9.8%	16.5%	21.1%
MBS, non-government	0.0%	0.0%	0.0%	0.0%	0.3%	4.4%	11.9%	12.3%

Note: The percentages for each category, such as commercial banks, represent the “whole loans” that are held and that have not been securitized.

<sup>a</sup> Includes 1-4 residential units.

<sup>b</sup> Includes the portfolio holdings of Fannie Mae, Freddie Mac, Ginnie Mae, FHA, VA, the Farmers Home Administration, the Federal Land Banks, and other federal agencies.

<sup>c</sup> Other holders include mortgage companies, real estate investment trusts, state and local credit agencies, state and local retirement funds, credit unions, and finance companies.

<sup>d</sup> Includes MBS that is held in portfolio by Fannie Mae and Freddie Mac.

Source: Federal Reserve

Table 2: The Percentage Distribution of Ownership of Agency MBS and Other Agency Debt Securities, 2003<sup>a</sup>

Banks	20.9%
Rest of the world	13.5%
Households	10.0%
Mutual funds	9.4%
Money market mutual funds	6.8%
Life insurance companies	7.6%
Asset-backed securities issuers	6.5%
Private pension plans	5.2%
State and local governments	4.2%
Savings institutions	4.2%
State and local government retirement funds	3.3%
Other insurance companies	2.6%
Credit unions	2.4%
Brokers and dealers	1.8%
Bank personal trusts and estates	0.7%
Real estate investment trusts	0.5%
Nonfinancial corporations	0.3%
Federal government retirement funds	0.1%

<sup>a</sup> At year end; includes the Federal Home Loan Bank (FHLB) system, Farmer's Home Administration, and Tennessee Valley Authority; excludes Fannie Mae's and Freddie Mac's holdings of their own MBS and the FHLBs' holdings of MBS.

Source: Federal Reserve