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Chicago Fed Letter

The role of securitization in mortgage lending

by Richard J. Rosen, senior economist and economic advisor

Recent media coverage on the problems in the subprime mortgage market has featured an alphabet soup of abbreviations, such as MBS, CDO, and SIV. What do these terms stand for? And how do they fit into the mortgage financing process?

The process by which most mortgage loans are sold to investors is referred to as securitization.

In this *Chicago Fed Letter*, I discuss the sources of financing for mortgages. My focus is on the role of securitization in financing mortgages, which includes mortgage-backed securities (MBSs), collateralized debt obligations (CDOs), and structured investment vehicles (SIVs). I first outline the process by which a mortgage becomes part of an MBS, touching on the role of Ginnie Mae, Fannie Mae, and Freddie Mac (secondary market lenders, described in detail later). I then explain how MBSs are repackaged into CDOs and SIVs.

Mortgage origination and securitization

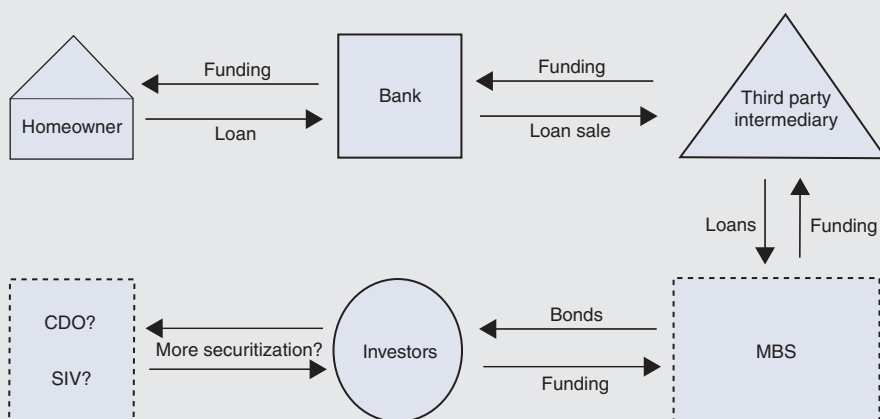
Thirty years ago, if you got a mortgage from a bank, it was very likely that the bank would keep the loan on its balance sheet until the loan was repaid. That is no longer true. Today, the party that you deal with in order to get the loan (the originator) is highly likely to sell the loan to a third party (see figure 1). The third party can be Ginnie Mae, a government agency; Fannie Mae or Freddie Mac, which are government-sponsored entities (GSEs); or a private sector financial institution. The third party often then packages your mortgage with others and sells the payment rights to investors. This may not be the final stop for your mortgage. Some of the investors may use their payment rights to your mortgage to back other securities they issue. This can continue for additional steps. In effect, the eventual buyers of

the mortgage—the parties that provide the funding—can be many steps removed from the originator of the mortgage.

The process by which most mortgage loans are sold to investors is referred to as securitization. In the mortgage market, securitization converts mortgages to mortgage-backed securities.¹ An MBS is a bond whose payments are based on the payments of a collection of individual mortgages. The initial sales of the bonds are put together either by the two GSEs or by private financial institutions, such as Countrywide Financial, Lehman Brothers, or Wells Fargo (all among the top six private issuers in 2006).² The MBS origination process typically begins when the issuer purchases a collection of mortgages from the originators. As payments are made on the mortgages, they are passed through the trust to bondholders.

As an example of an MBS issuance, assume that an issuer has collected 1,000 mortgages, each worth \$100,000 with a 30-year maturity and a fixed interest rate of 6.50%. This \$100 million pool of mortgages can be used to back 10,000 bonds, each worth \$10,000 with a 30-year term and a fixed coupon rate of 6.00%. Each bond shares the same coupon rate and other features, and importantly, each has a similar claim on all payments. The MBSs are structured so that interest payments on the mortgages are at least sufficient to cover the

1. Mortgage funding process



NOTES: MBS means mortgage-backed security. CDO means collateralized debt obligation. SIV means structured investment vehicle.

interest payments due on the bonds (plus the fees of the intermediaries). Principal payments (either scheduled payments or prepayments) on the mortgages are used to pay down the principal on the bonds.

Since investors can invest in MBSs directly or indirectly (e.g., through mutual funds), these asset-backed securities allow a broad investor base to help fund home mortgages. In part for this reason, an increasing share of home mortgages have been securitized, with the ratio of MBSs to total mortgages now over 50% (see figure 2).

Participants in securitization

In addition to private firms, the participants in the mortgage securitization process are the government agency Ginnie Mae and the government-sponsored entities Fannie Mae and Freddie Mac.

Ginnie Mae facilitates the securitization of home mortgages backed by federally insured or guaranteed loans, such as those issued by the Federal Housing Administration (FHA) or the U.S. Department of Veterans Affairs (VA). Ginnie Mae guarantees the timely payment of mortgages' principal and interest, thereby reducing the risks for MBS investors. That said, it guaranteed the mortgages underlying only 4% of all MBSs issued in 2006.

The GSEs Fannie Mae and Freddie Mac accounted for a more substantial 40%

of MBSs issued in 2006. They purchase what are known as conforming mortgages from originators. Conforming mortgages are those that meet certain borrower quality characteristics and loan-to-value ratios and are smaller than the conforming loan size limit (\$417,000 as of January 1, 2007). These GSEs use these conforming loans to back the MBSs they issue, adding guarantees that principal and interest on the mortgages will be paid.³

The remaining 56% of MBSs issued in 2006 were packaged by private sector financial institutions. Most of these MBSs included securities backed by high-quality (prime) loans, subprime loans, or "Alt-A" loans. The problems with mortgages in recent months have been largely confined to the subprime and Alt-A sectors, and it is the MBSs backed by pools of these loans that have had the most problems.

The difference between prime and subprime mortgage loans hinges on borrower quality. A prime loan indicates that the borrower has a good credit rating (an "A" grade), while the subprime borrower has a lower credit rating. Many of the prime

loans that back private sector MBSs are jumbo loans; such loans are issued to high-quality borrowers, but they are too large to meet the conforming loan size limit of the two GSEs.

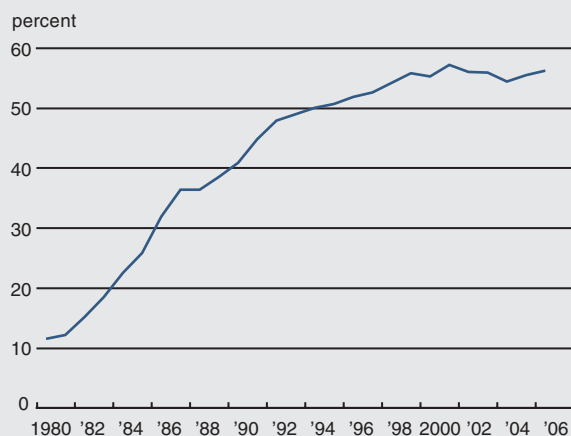
Alt-A loans are issued to borrowers that appear to have good credit, but these loans do not meet the definition of prime or conforming. Often, Alt-A loans are issued to borrowers with limited or no income and asset verification. In recent years, the Alt-A sector has increasingly included loans for which the loan-to-value ratio was too high.

The share of MBSs backed by subprime and Alt-A mortgage loans increased rapidly in the last decade. From 1996 through 2006, the share of subprime and Alt-A MBSs rose from 47% to 71% of total private sector MBS issuances.

The structure of securitizations

The illustrative example of a securitization backed by mortgages given previously has a much simpler structure than the typical securitization issued by a private sector firm. The basic pass-through nature of most MBSs is the same: Interest payments on the underlying mortgages are used to pay interest on the bonds, and principal payments are passed through to pay down the principal on the bonds. However, the structure of a typical issue is much more complicated. In part, the complications are there to more finely allocate the risks of the underlying mortgages to investors.

2. MBS share of total mortgage debt outstanding



NOTE: MBS means mortgage-backed security.

SOURCE: Inside Mortgage Finance Publications Inc., 2007, *The 2007 Mortgage Market Statistical Annual*, 2 vols., Bethesda, MD.

3. Sample six-pack structure for jumbo mortgage-backed security

Bond class	Percent of total pool	Rating
A	94.15	AAA
B1	2.00	AA
B2	1.50	A
B3	1.00	BBB
B4	0.65	BB
B5	0.40	B
B6	0.30	Not rated

SOURCE: Mark Adelson, 2006, "MBS basics," *Nomura Fixed Income Research*, March 31.

There are three major risks to MBS investors. The first is interest rate risk, and it is common to all bondholders. If interest rates change, the value of a bond changes in the opposite direction. The second risk is prepayment risk. Many mortgages in the United States can be prepaid without penalty. Prepayments introduce timing risk, since investors do not know when their bonds will be repaid (thereby eliminating future interest payments). Additionally, prepayments are generally larger when investors want them to be smaller. That is, when the interest rates on new mortgages fall, investors like the fact that they continue to receive the old, higher interest rates on existing MBSs. But this is precisely when borrowers are most likely to prepay loans by refinancing their mortgages. Interest rate risk and prepayment risk are common to all MBSs.

The third risk faced by MBS investors is default risk—that is, the risk that homeowners will default on the mortgages that back the MBS. As noted earlier, Ginnie Mae, Fannie Mae, and Freddie Mac offer guarantees against default risk. Private sector MBS issuers may obtain direct insurance against default, but often they structure their MBSs to allocate default risk toward parties willing to bear it.

Among the tools used to distribute default and payment timing risk are subordination, overcollateralization, and excess spread. Subordination refers to a securitization that issues multiple classes of bonds that differ in bankruptcy priority. Some bonds are senior, while others are subordinated. Senior bonds have priority in bankruptcy, meaning that as mortgages default, the first losses are taken by the subordinated classes. For

example, some MBSs backed by jumbo loans use a "six-pack" structure, with six layers of subordination (see figure 3).⁴

The first default losses are allocated to the most junior class of bond (B6 in the example in figure 3) until that class is exhausted; then

losses move up the line. The A class does not suffer from default losses until all the B classes are completely written down. Because of this, ratings are higher for the more senior classes. Early prepayments are allocated to the A class (to keep the other classes around as loss buffers). Of the MBSs issued by private firms in 2006, 93% had subordination (according to the Inside Mortgage Finance MBS Database).

The MBS issuers also use overcollateralization and excess spread to provide a default buffer. Overcollateralization refers to the difference between the principal balance on the loans in the pool and the principal balance on the outstanding MBSs; excess spread is the difference between the interest payments coming in (loan payments minus servicing fees) and the weighted average payments going to bondholders. They are related in that excess spread can be used to build up overcollateralization. The first use of excess spread is to cover default losses. If any excess spread is left, it can be used to build up a cushion against future losses (e.g., one way to do this is to pay down the principal on senior bonds). Excess spread varies by deal, but it averaged 2.5% for subprime MBSs in 2006 (according to Bear Stearns). Overall, 61% of MBSs issued by private firms in 2006 were overcollateralized (according to the Inside Mortgage Finance MBS Database). Traditionally, subordination is more common in prime (jumbo) MBSs, while subprime and Alt-A MBSs are more often structured to include significant excess spread.

The MBSs can be structured also to allocate the timing of payments. An MBS

can include multiple classes of bonds that differ in the order in which they are repaid (these classes are typically referred to as "tranches"). For example, all principal payments could be allocated to the A bonds until those are completely repaid. Then, principal payments would start being allocated to the B bonds. The MBSs broken up in this fashion are called collateralized mortgage obligations.

Resecuritization

Mortgage-backed securities are not the end of the line. Pools of MBSs are sometimes collected and securitized. Bonds that are themselves backed by pools of bonds are referred to as collateralized debt obligations. The CDOs can look like MBSs, except that the assets are bonds or other assets.⁵ In recent years, a number of CDOs have purchased MBSs and the securities of other CDOs. The issuers of CDOs were the major buyers of the low-rated classes (similar to the B classes in the previous example) of subprime MBSs in 2006.⁶ Many recently issued CDOs contained mortgage securities (e.g., 81% of those issued in 2005 did).⁷

Structured investment vehicles are similar to CDOs. The difference between SIVs and CDOs is essentially in the type

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of debt they issue. The SIVs are structures backed by pools of assets, such as MBSs and CDO bonds. The SIVs issue short- and medium-term debt rather than the longer-term debt of most CDOs. The short-term debt is referred to as asset-backed commercial paper.⁸

Conclusion

When subprime mortgages started to experience problems, a variety of organizations that supported or owned CDOs and SIVs began to suffer losses. A number of hedge funds and banks (including many non-U.S. banks) reported losses related

to investments in U.S. subprime mortgage loans or subprime-loan-based securities. As a result, news reports began to feature terms such as MBS, CDO, and SIV. This article demystifies these terms by explaining what the abbreviations stand for and how these financial instruments work.

¹ For a discussion of why assets such as mortgages are securitized, see Ronel Elul, 2005, "The economics of asset securitization," *Business Review*, Federal Reserve Bank of Philadelphia, Third Quarter, pp. 16–25. For mortgages, both liquidity and regulatory arbitrage play a role in the popularity of securitization.

² The MBSs backed by mortgages guaranteed by Ginnie Mae are issued by private sector financial firms.

³ Fannie Mae and Freddie Mac also purchase and sell MBSs in secondary markets.

⁴ All privately issued securitizations are rated by the bond rating agencies. A rating is based on the agencies' assessments of the risk of the particular bond, so different classes of bonds in the same structure can have different ratings.

⁵ The CDOs are issued as different classes of bonds, with subordination, overcollateralization, and excess spread.

⁶ Jody Shenn, 2007, "Overlapping subprime exposure mask risks of CDOs, Moody's says," *Bloomberg*, April 4.

⁷ David E. Vallee, 2006, "A new plateau for the U.S. securitization market," *FDIC Outlook*, Fall, pp. 3–10.

⁸ Commercial paper (CP) is short-term debt (maturity not more than 270 days) that can only be purchased by sophisticated investors. Asset-backed commercial paper is CP backed by pools of assets rather than a general claim on the issuer.