

Derivative Mechanics: The CMO

by Joseph G. Haubrich

The current interest in financial derivatives sometimes appears to be driven by the same tastes that support police and doctor dramas on television: many crashes and a lot of blood. Though undeniably exciting, such shows do not teach you how to drive safely or how to administer first aid. Likewise, a concentration on the blowups of financial derivatives slights the more basic information needed for policy decisions or corporate risk management.

This *Economic Commentary* looks under the hood of one particularly important type of financial derivative, the Collateralized Mortgage Obligation, or CMO (sometimes known as a REMIC, or Real Estate Mortgage Investment Conduit¹). CMOs have prominence both because of their wide use (\$650 billion in 1994) and because of their role in a series of major financial setbacks. Wall Street professionals, including the investment bank of Kidder Peabody and mortgage guru Lew Ranieri's Hyperion Capital Management, lost money investing in CMOs. So did small towns and counties (some as close to home as Sandusky County and Jackson, Ohio), colleges, and even an Indian reservation.² To understand what went wrong, it is necessary to understand how CMOs work. This, too, has its own rewards, at least for those whose taste runs more toward the dazzle of gleaming machinery and the challenge of complexity.

■ Mortgage-Backed Securities

The story begins as ordinary mortgages become securitized, or bundled into a pool and then sold. It's a bit ironic that some of the most sophisticated financial derivatives ultimately depend on a very common, even mundane, instrument — the homeowner's mortgage. These mortgages provide the underlying collateral backing up the security.

The first type of mortgage-backed security, still quite common, is the "pass-through." Investors get a pro rata share of payments — some fraction of the monthly mortgage payments made by the myriad homeowners in the pool. Since each monthly payment includes both principal and interest, investors get a mixture of those elements "passed through" from the homeowners. This presents a problem in that the security has a very long maturity — it takes years until the last homeowner completely pays off the last mortgage and returns the full value of the principal. Since homeowners have the option to pre-pay their mortgages, pass-throughs also face the risk that payments may arrive on a different schedule than investors initially expected.

In the summer of 1983, market participants developed the CMO to solve these problems. CMOs break the mortgage-backed security into a series of bonds known as "tranches" (French for trench). Each tranche gets its share of interest payments, but the principal is repaid sequentially. That is, principal payments go exclusively to the first tranche until it

Collateralized mortgage obligations (CMOs), first introduced in 1983, are a form of financial derivative created to provide more stability and predictability for those investing in mortgage assets. Although some investors have profited handsomely from CMOs, others have lost millions of dollars. This article describes how CMOs work, looking at both their advantages and disadvantages, and explains how even savvy, seasoned market participants have gotten into trouble by investing in these interest-rate-sensitive financial instruments.

is paid off, then to the second tranche until it is paid off, and so forth. This breaks the security into several shorter bonds (see figure 1). For example, an investor holding \$10 million of a \$100 million pass-through would not get all of his principal back until every mortgage had been paid off. The holder of a \$10 million first tranche, by contrast, would get his principal back from the first \$10 million paid. This structure makes CMOs derivatives. Their value depends on, or derives from, the value of the underlying mortgage pool.³

■ Risk Remains

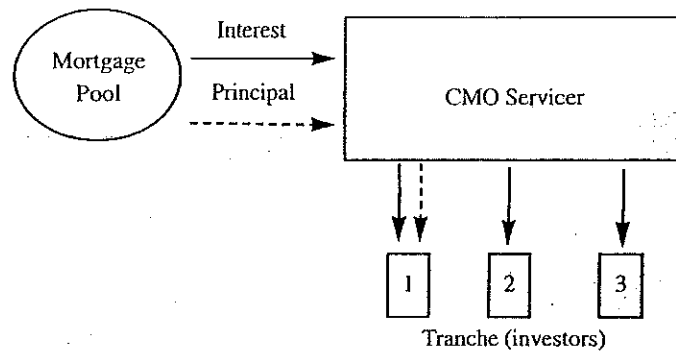
The standard CMO still exhibits two types of risk. Interest-rate risk exists because market rates can change, making the present value of the payment stream worth different amounts. Pre-payment risk still exists, and it continues to make the maturity of the bond uncertain. For example, as interest rates fall, more people pre-pay their mortgages, so each tranche has a shorter maturity. As interest rates rise, fewer people pre-pay their mortgages, so each tranche has a longer maturity.

Why do people care about pre-payment risk? On the simplest level, slow pre-payments mean that the investor does not get his money back as quickly, and the value of the bond declines. When interest rates rise, even ordinary bonds drop in price as the present discounted value of their payments falls. CMO tranches take another hit, because now their payments also come later as pre-payment rates fall. Market participants refer to this as extension risk.

Extension risk has two additional downsides. One is that it subjects investors to reinvestment risk. Normally, investors holding a bond want interest rates to drop because it gives them a capital gain: The present discounted value of the cash stream is worth more. Bond prices rise as interest rates fall. But the pre-payment effect makes CMOs work somewhat differently. When interest rates rise, the CMO extends at exactly the wrong time, that is, when interest rates are high and investors would like to reinvest at the higher rate. When rates fall, the CMO tranche pays off quickly, again at the wrong time. The investor receives more principal today, when interest rates are down, and so must trade the high interest on the original CMO for lower interest on something else. This reinvestment risk offsets, and may dominate, the capital gain or loss stemming from a change in interest rates.

Furthermore, the extended (or shortened) bond now has a new, different sensitivity to risk, with a five-year bond behaving differently from a two-year or 10-year bond. With a change in pre-payments, investors now hold a bond that reacts to

FIGURE 1 BASIC CMO STRUCTURE



SOURCE: Frank J. Fabozzi, ed., *The Handbook of Mortgage-Backed Securities* (footnote 3).

interest rates in a manner unlike the original, so it may be less useful for hedging liabilities or fitting into their portfolio.

■ Fancy CMOs

To mitigate these risks, market participants created a new type of tranche—the accrual bond, or Z-bond. This bond gets neither principal nor interest until all previous tranches are paid off. The interest due accrues, and like a zero-coupon bond, it initially makes no interest payment. The Z-bond acts as a stabilizing influence on the other tranches. The interest that would otherwise go to the Z-bond tranche (recall that standard CMOs pay interest to all tranches) instead goes to the other tranches and counts as a principal payment. This constant flow of payments has a steadying effect, offsetting some of the variability from pre-payment. As pre-payments rise, the tranches pay off ahead of schedule and the Z-bond starts making payments earlier than originally anticipated. Because it is the last tranche, however, pre-payment fluctuations often average out by the time the Z-bond comes due.

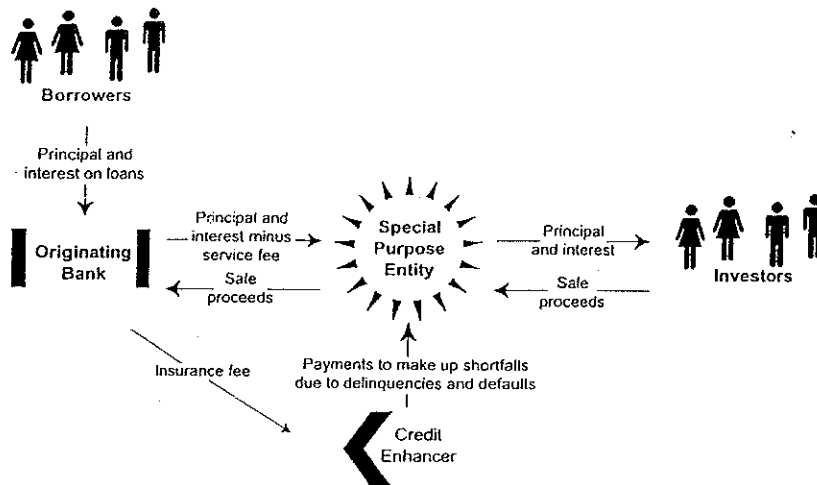
Some investors wanted even more certainty about their bonds, so the market responded with PACS and TACS: Planned Amortization Classes and Targeted Amortization Classes, two fancier tranches. PACs provide principal payments according to a pre-specified schedule. They stick to this schedule as long as pre-payments stay in some broad range (for example, 50 to 350 percent PSA [see box]). Furthermore, the PAC is exempt

from the serial paydown pattern of the tranches, so that other tranches may receive principal payments at the same time as the PAC. In effect, the PAC has priority over the other tranches through having first claim on the money available. For example, if PAC investors are scheduled to receive \$1 million each month and the underlying mortgages produce \$2 million, then \$1 million can go to the “companion” tranche. If pre-payments fall so that the mortgages generate only \$1.25 million, the companion tranche gets only \$250,000. If pre-payments fall even more so that the mortgages generate only \$800,000, even the PAC winds up short, although it receives the entire \$800,000.

How, then, does a PAC provide protection against both high and low pre-payment? The issuer calculates the available cash flows in the protected range (known as the collar) and restricts PAC payments to that spread. Thus, to continue the above example, the 50 to 350 percent PSA range may have allowed for payments of between \$800,000 and \$4 million for the month in question, so the planned payment should fall within that range.⁴

It is important to note that although PACS are fairly safe bonds, the process of creating them necessarily shoves more risk into the other tranches. Companion bonds, which receive payments only after the PAC schedule is met, are particularly risky.

FIGURE 2 SUMMARY OF AN ABS



stock will depend not only on the success of the credit card business, but also a whole bunch of other activities, from commercial and real-estate loans to off-balance-sheet activities. If the investor is only interested in the credit card business, he needs to create a "homemade" credit card portfolio; that is, he needs to find a way of undoing the effect of the unwanted bank activities on the stock price.

In practice, this is not an easy task. In the same way the investor cannot buy a share of the bank's credit card receipts, he also may be unable to find a security that will undo the effect of, say, real estate loans on the stock price. Consequently, the investor may never be able to build an exact replica of the bank's credit card business. Even if we assume that the homemade portfolio is good enough in the absence of a better alternative, there are transaction costs associated with buying and selling multiple securities. So, the presence of a security that represents an ownership claim on a certain class of the bank's assets is advantageous to the investor because it is exactly what he wants, it is a security he could not have created by himself, and it can be purchased and sold in one transaction.

■ **More Than an Ownership Claim**

So far, we have described an asset-backed security as a certificate that allows the investor to collect payments from an asset pool. But this is an oversimplification because this type of security has many quality enhancements that would, once again, be too costly for the investor to achieve by

himself. In order to understand how securitization adds value, let's review the various risks associated with the ownership of a credit card portfolio.

By assuming ownership of the credit card receipts, the investor takes on two types of risk. First, he bears the default risk; every uncollectible credit card debt is money out of his pocket. Second, he assumes the prepayment risk; when interest rates go down, consumers prepay their credit card bills by switching to a lower-interest credit card. So, an income-generating credit card receipt converts into cash, which the investor must reinvest and thereby incur additional transaction costs.

An asset-backed security lessens the impact of these two risks. As a protection against default risk, banks issue securities against only a fraction of the asset pool. The rest of the pool is used to absorb any loan defaults. For example, the bank may put \$300 million worth of credit card receipts in the special-purpose entity and sell securities against \$260 million. The remaining \$40 million is excess collateral that loan defaults are deducted from, while the investors' claim remains intact. At maturity, whatever is left from the excess collateral goes back to the bank. This kind of overcollateralization protects the investor from the occasional loan default, although the investor still has an exposure to the large, industry-wide fluctuations in the credit card business.

As a protection against prepayment risk, the bank replenishes the asset pool with new credit card receipts whenever a payment occurs. Again, as with default

insurance, the protection from prepayments is limited—usually to a prescribed percentage of the asset pool. In other words, the goal is to protect the investor from the occasional prepayment and not to completely eliminate his exposure to the industry.

But how much protection is optimal? After all, investors' taste for risk varies over a wide spectrum. If an investor is not very sensitive to cash flow disruptions due to prepayments, for example, and wishes to track the performance of the credit card portfolio more closely, the protection provided by the bank may seem excessive.

Banks have found a creative way to make securities more attractive to investors with different risk preferences: They issue securities with multiple bondholder classes against the same asset pool, with each class attractive to one type of investor. In the case of mortgages, for example, Freddie Mac and First Boston issued in 1983 the first collateralized mortgage obligation (CMO) that had three classes of securities (A, B, and C) against the same mortgage pool. While all classes received regular interest payments, Class A bonds were first to receive principal payments and any prepayments. Class B bondholders began to receive principal payments only after all Class A investors were paid off, and Class C bondholders received principal payments after Class B bondholders were completely paid off. The important point to remember is that, at any one time, prepayments are directed to retiring only one class of bonds while the remaining classes are protected from prepayments. So an investor who has a long investment horizon (such as an insurance company) and dislikes prepayments would be more interested in a Class C bond, while an investor who would like to track the real estate business more closely would purchase the Class A bond and expose himself to the vagaries of mortgage prepayments.

Although CMOs were the first multiple-class securities, multiple classes are not a peculiarity of mortgage securitization. They are also common in auto loan and credit card asset-backed securities. In addition, other multiple-class securities allow investors to choose the degree of default risk they prefer, with credit ratings ranging from investment grade

TACs offer a similar sort of protection, but only against pre-payments rising. The TAC has priority over other tranches and hence can keep to its schedule if pre-payments increase. If they drop off, however, the TAC has no protection. It is effectively a PAC with one side of the collar at the expected pre-payment rate, that is, 100 to 350 percent or 125 to 350 percent.

CMOs entail a second type of risk — default risk — because some people will not (or cannot) make their mortgage payments. To compensate, issuers over-collateralize CMOs. For instance, a CMO with a face value of \$10 million may have mortgages backing it worth

\$11 million, for a 10 percent overcapitalization rate. This means that investors will get their money even if some homeowners default. What happens to this extra collateral if people do not default? Known as equity in the CMO, or the residual, it too can be bought and sold. Per usual in the mortgage-backed market, variations have developed, and it is now possible to invest in bullish, bearish, humped, stable, *De Minimus*, and smile residuals.

■ Exotic CMOs

Once market participants got the idea of splitting up the cash flows from a pool of mortgages, there was no stopping them. One innovation quickly spawned others, just as PACs and TACs spawned the companion classes that made them possible.

The market created IOs, or interest-only bonds, in which investors get interest payments as long as the underlying tranche gets principal payments. POs are the inverse, paying principal only.

Fancier still are the floaters, bonds whose coupon (interest payment) is linked to some interest-rate index, such as LIBOR or the 11th District Cost of Funds.⁵ A standard floater may be quoted at something like LIBOR+1, meaning that the interest payment is 12 percent if LIBOR is 11 percent, and so forth. A superfloater responds to the index with a multiple greater than one. Thus, when the LIBOR rate moves from 10 percent to 11 percent to 12 percent, the interest rate on the bond moves from 10 percent to 12 percent to 14 percent.

(Of course, the reverse is also true: A 2 percent drop in LIBOR sends the rate down 4 percent.) With an inverse floater, an increase in the index decreases the rate on the bond. And, yes, you can have a super inverse floater.

Z-bonds have also gotten more complicated. One innovation is the jump Z. That's where a Z tranche can jump to the head of the tranche line. For example, the Z tranche is last in line unless interest rates rise above 10 percent, at which point it moves up and becomes the tranche getting the principal payments. We have a sticky jump Z if the Z stays in that position. We have a non-sticky jump Z if the Z moves back to the end of the line when interest rates fall below 10 percent. And the market has adopted even more complicated Z-bonds, such as the toggle Z.

Exotic CMO constructs can make it easier for the unwary to get into trouble. As with any interest-rate-sensitive financial instrument, if an investor does not properly hedge, changes in interest rates will imply big changes in asset value. Exotics only make these changes happen faster. Thus, when interest rates fall, interest received by superfloater falls even more, and their value (and corresponding resale-price) drops. In the past, some investors consciously took an exposed position, knowing the consequences if their interest-rate predictions proved wrong. Others did not realize how fast or how far CMO prices could change. Still others failed to account for the complicated effects of pre-payment risk. Of course, guessing wrong and not understanding your investment are two classic ways to lose money.

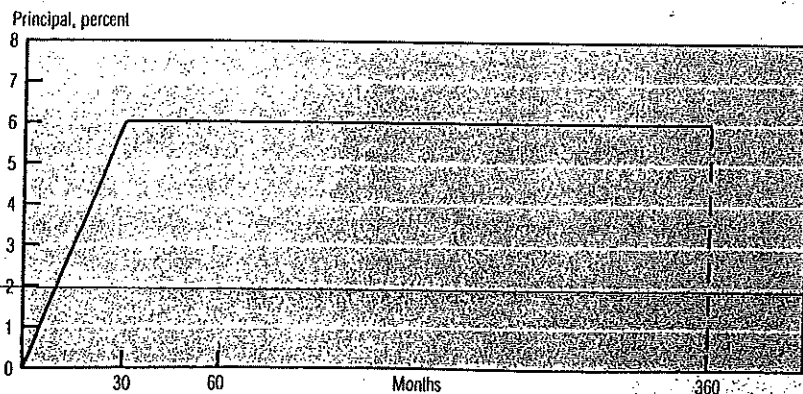
■ Conclusion

This brief overview perhaps paints the CMO market as one vast poker game, so it is particularly important to point out the social benefits of CMOs. Mortgage-backed securities, by bringing investors into the mortgage market, reduce housing costs for all mortgage holders. The major innovations in the market have allowed investors to reduce their risk, decreasing the chance of bankruptcy and further lowering costs to homeowners.

MEASURING PRE-PAYMENT SPEED

Market participants measure pre-payment speed as a percentage of PSA, the Public Securities Association pre-payment model. The model assumes that pre-payments start at zero at the beginning of the mortgage and rise linearly to 6 percent at 30 months (see figure 2), where they remain constant until the end, at 360 months. 150 percent PSA means that pre-payments rise to 9 percent at 30 months (150 percent of 6 percent = 9 percent), remaining constant thereafter, and 50 percent PSA means that pre-payments rise to 3 percent at 30 months, remaining constant thereafter. Some investors have developed their own, more complicated models.

FIGURE 2 PSA PRE-PAYMENT MODEL



SOURCE: Author's calculations.



Initially, investors who wished to buy mortgage-backed securities faced a variety of problems. A pure pass-through security had a longer maturity than many investors liked. All mortgage-backed securities entailed not only interest-rate risk and default risk, but pre-payment risk as well. A sequence of ingenious innovations helped investors both protect against and speculate in these risks.

Readers need not plan on adding sticky jump Zs to their portfolio, but looking under the hood of CMOs may help investors understand—and later avoid—financial crashes.

■ **Footnotes**

1. A provision of the Tax Reform Act of 1986 created REMICs. The provision changed the tax liability of particular types of CMOs issued by private firms, as opposed to those issued by public agencies such as the Government National Mortgage Association, or Ginnie Mae. For more details, see Robert Gerber, "Adjustable-Rate Mortgages: Products, Markets, and Valuation," in Frank J. Fabozzi, ed.,

The Handbook of Mortgage-Backed Securities. 3d ed., Chicago: Probus Publishing Co., 1992, pp. 155-96.

2. For interesting journalistic accounts of these episodes, along with some additional information on the mortgage-backed securities market, see Michael Carroll and Alyssa A. Lappen, "Mortgage-Backed Mayhem," *Institutional Investor*, vol. 28, no. 7 (July 1994), pp. 81-96. See also Lillian Chew, "Backing Down," *Risk*, vol. 8, no. 1 (January 1995), pp. 20-25.

3. This article makes no attempt to offer investment advice. For more details on the CMO market and bonds, consult Frank J. Fabozzi, ed., *The Handbook of Mortgage-Backed Securities*, 3d ed., Chicago: Probus Publishing Co., 1992.

4. For other months, the payments will differ. For high pre-payment rates, a lot of money will be available early on, then less in later months when most people have already paid off their mortgages. The reverse is true for low pre-payment rates.

5. LIBOR is the London Interbank Offered Rate, or the rate that large international banks charge each other for short-term loans. The 11th District Cost of Funds is an index produced by the 11th Federal Home Loan Bank District. Adjustable-rate mortgages are often tied to this index.

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ECONOMIC COMMENTARY

Federal Reserve Bank of Cleveland

Securitization

by O. Emre Ergungor

Securitization is the process of pooling and repackaging loans into securities that are then sold to investors. Although the practice of selling loans among banks is quite old—beginning in the late nineteenth century—sales to investors are more recent, dating back to 1970 when the Government National Mortgage Association (Ginnie Mae) offered investors a new type of bond—a *mortgage pass-through*. This security promised investors the principal and interest payments generated by a pool of Federal Housing Administration and Veterans Administration single-family mortgage loans. Beginning with this first Ginnie Mae pass-through, the list of securitized assets has expanded to commercial mortgage loans, car loans, computer and truck leases, loans for mobile homes, credit card receivables, trade receivables, and student loans.

Despite the wide variety of assets that can be securitized today, government agencies and government-sponsored enterprises were the main issuers of asset-backed securities early on (see figure 1). Ginnie Mae began doing so as a way to increase homeownership: By buying banks' mortgage loans and selling them to investors, it provided the banks with fresh funds to make additional mortgages. Bank of America issued the first private-sector pass-through backed by conventional mortgages in 1977, but other financial institutions showed little interest in the area until the mid-1980s. In 1983, privately securitized assets totaled less than \$4 billion. Then, private issues took off sharply, reaching more than \$2 trillion in total assets at the end of 2002—a more than 600-fold increase in 19 years.

Such remarkable growth would not have been possible without some economic and regulatory incentives. This *Economic*

Commentary describes the mechanics of asset-backed securities. In doing so, it reviews how regulatory changes bolstered the privately issued asset-backed-security industry by allowing the creation of new securities that benefit both issuers and investors.

■ What Is an Asset-Backed Security?

"Asset-backed security" is a broad name given to a wide variety of financial instruments that give investors a claim on the interest and principal payments generated by a pool of loans. The securitization process begins when a lender (usually a bank or a finance company) creates a special-purpose entity, such as a corporation, a limited liability corporation, or a business trust, and transfers to it the ownership of a portfolio of loans that are similar in type (mortgage, auto loan, and so on), maturity, interest rate, and their likelihood of default. Ownership shares in the special-purpose entity can be sold to investors (a pass-through security), or, alternatively, the bank can retain ownership but issue securities that promise investors interest and principal payments after these are collected from borrowers (a pay-through security). From the investor's point of view, the former is similar to owning the stock of the special-purpose entity, and the latter is similar to owning a debt security. In either case, the lender uses the sale proceeds to make new loans or for other corporate purposes. It also continues to service the loans—collect principal and interest from borrowers—for which it deducts a servicing fee (see figure 2).

As described thus far, investors would quickly recognize a major conflict of interest in this structure. The lender could keep all the good loans for itself and dump all the bad ones into the special-

Obscure just 20 years ago, the securitization of loan portfolios by private and government-sponsored enterprises is a \$5 trillion business today. This *Commentary* explains why the use of asset-backed securities has grown so spectacularly.

purpose entity. Because investors don't originate the loans, they cannot verify the quality of every loan being securitized. To reassure investors, the lender asks a credit-rating agency to certify the quality of the loan portfolio. The rating agency estimates the default risk of the portfolio relative to that of an investment-grade (low-risk) security and decides how much default protection the lender must provide to investors to make the asset-backed security investment grade. The lender can enhance the quality of the loan pool in several ways. It can create a reserve fund that makes up for defaults; it can post excess collateral by setting some loans aside to replace loans that default; or it can purchase loan-default insurance up to a prespecified percentage of the pool. For example, a 10 percent credit enhancement would pay for the defaults up to 10 percent of the value of the loan pool. In any case, a credit-enhanced, asset-backed security can be made investment grade and more easily sold to investors.

As one can easily imagine, each step in this securitization process costs the lender money. There are legal costs associated with the formation of the special-purpose entity. Dealing with a rating agency and credit enhancement also cost money. Then, there is the cost of issuing securities. How do lenders benefit from such a deal? Let's consider the case of banks for an explanation.

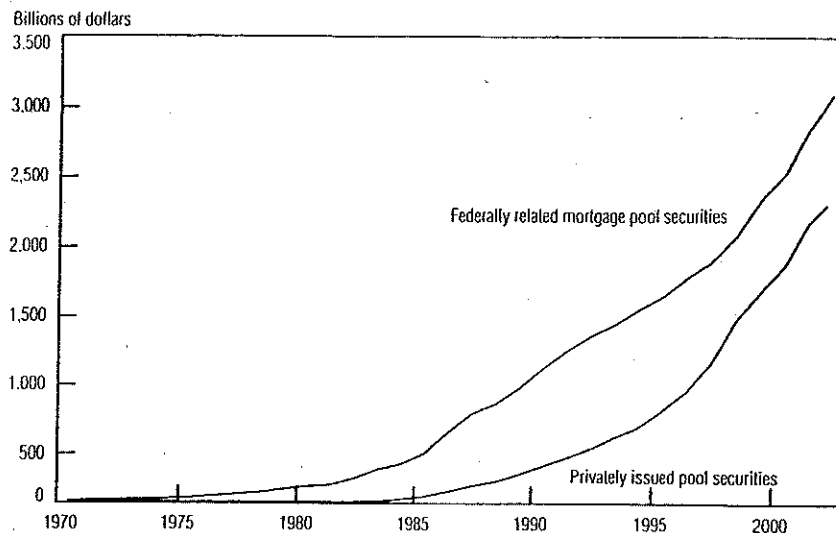
■ Why Securitize?

Banks began to securitize a large volume of their loan portfolios in response to changing regulations and market forces during the 1980s. Starting with the International Banking Act of 1978, and partially in response to debt problems of the less-developed countries during the early 1980s, federal regulators ratcheted up minimum capital requirements for commercial banks. By the mid-1980s, banks were required to hold primary capital (basically shareholder equity and reserves set aside for future loan losses) of at least 5.5 cents for every dollar of assets carried on the balance sheet. Capital requirements limit the risks banks will take by putting bank owners' own money at risk. However, raising capital is costly for the bank owners. For example, regulators may force the bank to raise equity when stock market conditions are not favorable for a new stock issue, or the bank may have to retain its earnings instead of distributing them to shareholders as dividends.

But there is a way to circumvent capital requirements, and it hinges on the fact that the bank does not have to hold capital against the loans it *originates*, only those it actually carries on its balance sheet. So, there is no capital requirement if the bank originates loans and transfers their ownership to a special-purpose entity, effectively removing them from its balance sheet. Unless there is an arrangement in the securitization deal whereby investors can demand compensation from the bank for loan defaults in the securitized asset pool (recourse), regulators allow banks to keep these loans off the balance sheet, reducing the need for additional capital.

The ability to remove loans from the balance sheet was especially handy for credit card banks because the Competitive Equality Banking Act of 1987 limited their total asset growth to 7 percent a year. Major lenders in this market had to find a way to remove their credit card receivables from their balance sheets. Securitizing those receipts helped banks to keep their asset growth under control, while they collected fees for servicing the securitized loans. It should not come as a surprise that credit card asset-backed securities first appeared in the public debt market in 1987.

FIGURE 1 TOTAL FINANCIAL ASSETS OF ABS ISSUERS



SOURCE: Board of Governors of the Federal Reserve System. "Flow of Funds Accounts of the United States."

Z.1. Federal Reserve Statistical Releases.

NOTE: Privately issued pool securities include those that are backed by federally related mortgage pools.

In addition to these changes in the regulatory environment, the deposit market—banks' traditional funding source—went through significant changes in the 1980s. With the Great Depression and bank failures a distant memory, depositors were willing to take more risk in return for higher rewards by shifting their money into money market funds and other uninsured investments. As deposits became increasingly scarce and expensive, banks had few options. One was to give up lending opportunities—not a first choice. Another was (and still is) to finance loans with short-term borrowings from the money markets. Yet, unlike deposits, these are not a stable source of financing. Short-term lenders in this highly liquid market chase the highest rate of interest and pull their money out at the slightest sign of trouble. Under these circumstances, recycling existing resources—by selling existing loans and using the proceeds to make new loans—is an invaluable capability.

Yet even with the impetus from regulatory costs and funding constraints, securitization by private issuers remained subdued until the mid-1980s; there were only \$10 billion in private-sector pass-throughs outstanding at the end of 1984, amounting to just 3.5 percent of the value of all federal agency pass-throughs outstanding at the time. A major inhibiting factor was uncertainty about whether securitization was banned by the Glass-Steagall Act's prohibition of commercial banks' underwriting of corporate securities. This

uncertainty was resolved by the Office of the Comptroller of the Currency when it decided that banks could sell interests in a pool of loans. A court of appeals upheld that decision in 1985 and ruled that these instruments were not corporate securities but investments in the underlying loans; therefore, Glass-Steagall did not apply. This ruling and the Supreme Court's refusal to hear an appeal by the Securities Industry Association opened the floodgates. By 2002, private issuers had securitized more than \$2 trillion in assets compared with \$37 billion in 1985.

The incentives banks have to sell their loan portfolios to investors is, however, only half of the story. The spectacular growth of asset-backed securities is also explained by the reasons investors have for embracing this instrument.

■ Why Buy Asset-Backed Securities?

In general, investors do not like to put all their eggs in the same basket lest something awful happen to that basket and they lose all their eggs. Therefore, they diversify their holdings among a number of unrelated baskets that are not all likely to get knocked down at the same time. Now, suppose an investor wishes to invest some money in a bank's credit card business for diversification purposes. In the absence of asset-backed securities, what are the investor's alternatives? The easiest thing to do is to buy the bank's stock. But the return on the

AAA (last to absorb the loan defaults in the pool) to default grade C (first to absorb defaults).

■ Engine of Growth

Pools of loans securitized by government-sponsored enterprises and private financial institutions are worth more than \$5 trillion today. Banks were attracted to this business to reduce their funding costs, whereas investors benefited from the new investment opportunities that did not exist before and which offered a cheaper alternative to homemade portfolios.

Furthermore, because securitization also involves cash-flow partitioning and credit enhancement, the asset-backed security is more than a basket of bank loans. It is a new kind of security that caters to the diverse cash flow and risk preferences of investors.

With these characteristics, securitization provides an ever-growing funding source to banks and may well be the most important engine of growth in bank lending.

■ Recommended Readings

Charles T. Carlstrom and Katherine A. Samolyk, 1992, "Securitization: More than Just a Regulatory Artifact," Federal Reserve Bank of Cleveland, *Economic Commentary*, May 1.

Frank J. Fabozzi, 2001, "Accessing Capital Markets through Securitization," Frank Fabozzi Associates, New Hope, Pa.

Joseph G. Haubrich, 1995, "Derivative Mechanics: The CMO," Federal Reserve Bank of Cleveland, *Economic Commentary*, September 1.

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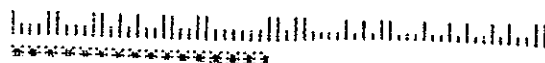
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Finance 141: "Securitization," Economic Commentary, Federal Reserve Bank of Cleveland, O. Emre Ergungor and "Derivative Mechanics: The CMO, Joseph G. Haubrich

Respond to the following:

- 1. What is securitization? Why has it been such an important concept to the growth and development of the money and capital markets?**
- 2. What are the benefits of the securitization process from both an issuer and investor perspective?**
- 3. What is a CMO? How did the CMO expand the appeal of mortgage securities?**