

The Economics of Securitization

Without question, one of the most prominent recent features of the financial sector has been the very strong growth in securities markets transactions. These transactions take a wide variety of forms. Investors may hold security market claims on borrowers directly or buy shares in mutual funds that acquire most, if not all, of their assets in the financial markets. Alternatively, they may own securities representing an undivided interest in a pool of loans. Or, investors may hold either securities issued by banks or deposit claims on banks that own securities rather than loans.

All of these transactions are types of securitization. Securitization is a process hard to define generally. In its broadest sense, securitization is financial intermediation that involves at some stage the buying or selling of financial claims. That definition is wide enough to include the sale of loan participations among banks or packages of commercial mortgages among thrifts, and yet it excludes not only traditional bank lending but also similar activities at finance and insurance companies. A narrower definition refers to the packaging of generally illiquid assets of banks, thrifts, and other intermediaries for sale in securities form.

But perhaps the best definition of securitization is the matching up of borrowers and savers wholly or partly by way of the financial markets. Such a definition covers issuance of securities such as bonds and commercial

paper—a practice that entirely replaces traditional financial intermediation—and also sales of mortgage-backed and other asset-backed securities—transactions that rely on financial intermediaries to originate loans but use the financial markets to seek the final holders.

Securitization is different in kind from disintermediation and the difference provides some important clues to the economic forces behind securitization. To draw this distinction, it is necessary to define some terms used in this paper. *Financial intermediation* is defined very broadly as the bringing together of borrowers and savers. Banks, thrifts, and finance companies, among others, carry out *traditional financial intermediation*. These institutions make a large number of loans and fund them by issuing liabilities in their own name. *Disintermediation* refers to a displacement of traditional financial intermediation away from banks and thrifts primarily to arrangements that are similar to bank lending—loans by other financial intermediaries or direct lending between agents in the same sector (for example, trade credit)—rather than financial market transactions. In the United States, disintermediation usually took place when market interest rates rose above the ceilings set by the old Regulation Q.

Broadly, securitization breaks with traditional financial intermediation, while disintermediation tries to emulate it. Unlike securitization, disintermediation does not change the form of financial claims to any great extent. Rather, it shifts the holding of particular kinds of claims when the traditional holder is temporarily constrained by institutional features such as deposit interest rate

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ceilings. Securitization, by contrast, changes the form of claims, and through that change also alters the distribution of holdings among types of investors. Still, securitization and disintermediation are not entirely distinct, since both involve a shift of intermediation away from banks and thrifts.

The range of transactions that replace traditional financial intermediation today suggests that no single economic force lies behind securitization. For example, an increase in the relative cost of bank intermediation in the wholesale lending markets may explain why some firms issue more bonds and commercial paper but cannot explain why some banks are major purchasers of floating rate notes (FRNs) and Euronotes.

To identify the forces driving securitization, we break traditional financial intermediation into three key elements: (1) the agreement between borrower and intermediary, (2) the service provided by the intermediary (its value-added), and (3) the agreement between the intermediary and the investor.

In traditional bank lending, one financial claim, a loan, represents the agreement between a borrower and the bank, while a deposit represents the agreement between the bank and the investor. The service of the bank is matching up borrowers and lenders, which it can do cheaply both by reducing search costs and by realizing economies of scale in gathering and allocating funds. The bank manages risks that arise in matching up borrowers and lenders, because their preferences, and thus the instruments the bank offers them, are not identical. These risks include funding, market, and credit risk. Frequently, the bank's size gives it the capacity to pool and thus reduce risks. In addition, the bank can offer its customers payments services that enhance customers' liquidity.

The three elements of traditional financial intermediation suggest that securitization covers three separate kinds of substitutions: securities for loans, direct placement of debt claims for traditional financial intermediation, and securities for deposits. In turn, three economic forces emerge as important contributors to securitization. The first is upward pressure on the cost of bank intermediation, especially higher capital requirements not accompanied by a fall in the cost of capital at a time when transactions costs for both securities placement and risk management are falling. Second is an increase in financial risk, especially in the volatility of interest rates. Third is increased competition to relationship lenders from banks and nonbank financial institutions.

Loans versus securities

No clearcut definition distinguishes a loan from a security. The features associated with securities and not

with loans are transferability, a degree of standardization and of disclosure imposed by securities laws, and often, liquidity. But the real difference between loans and securities lies not in the explicit contracts of the loan agreement and the bond but in the existence of an implicit contract between the borrower and the bank in the case of a loan and the virtual absence of such an implicit contract between the borrower and the investor in the case of a security.

A loan is essentially a private, unpublicized agreement between lender and borrower. While the loan agreement is a legally binding document, both borrower and lender understand that they can renegotiate the agreement. The loan agreement thus offers great flexibility and considerable discretion. The flexibility, discretion and durability of these arrangements is what is termed a "banking relationship." Nor does the relationship stop at a loan agreement, it also includes deposit, payment and currency services.

Consider the commercial lending relationship. There the bank can be viewed as writing options for its loan customer. Through devices such as credit lines or lending commitments, the borrower can choose the timing and the amount of a loan; the borrower can often prepay or refinance the loan with a small or even no fee. Most important, the bank makes an implicit and sometimes explicit commitment to provide funds in times when the borrower finds them difficult to obtain: when the borrower is experiencing difficulties or when liquidity has dried up. In return, the borrower may agree to allow the lender to monitor its performance over the life of the loan and agree to financial covenants restricting its behavior. While such covenants exist in bond indentures as well, they are less flexible and less meaningful.

The economics literature has tended to emphasize the importance of the bank's access to private information in distinguishing bank lending from other financial intermediation.¹ But provision of continuous access to funds in banking relationships is also crucial. In particular, the development of instruments like note issuance facilities (NIFs) and FRNs that replace bank lending underscores its importance. A NIF provides more liquidity to investors than a syndicated loan but still assures the borrower medium-term access to funds. The FRN replaces generally short-term interbank deposits with a medium-term instrument that, unlike interbank lines, cannot be cut back.

A debt security is an agreement between a borrower and lenders who are usually unspecified before the

¹See, for example, Eugene F. Fama, "What's Different about Banks?" *Journal of Monetary Economics*, vol. 15 (1985), pp. 29-39, and Joseph E. Stiglitz, "Credit Markets and the Control of Capital," *Journal of Money, Credit and Banking*, vol. 17, no. 2 (May 1985), pp. 133-52.

terms of issue are set. No agreement is negotiated by borrower and lenders. Instead, the underwriter negotiates the terms with the borrower and attempts to find investors at somewhat more favorable terms. The security holders also have no implicit contract with the borrower. They are not expected to purchase new issues of securities or hold onto securities permanently. The terms of securities issues are seldom renegotiated and the borrower's right to prepay exists only if there is an explicit call option. The debt security's documentation may obligate the borrower to provide information to its creditors or allow a third party to monitor its performance, but the security holders are under no obligation to keep such information confidential.

These conditions do not rule out the development of a relationship in the issuance of a security. Borrowers have relationships with their investment bank insofar as the borrower provides confidential information and the investment bank counsels the borrower and supports its issues in order to assure continuous and low cost access to the financial markets. But the investment bank is not itself a source of funding nor is it a credit monitor in the same sense that a bank is. To provide these services, additional parties such as banks or rating agencies must be drawn in.

Similarly, the investor has an implicit contract with the investment bank. The investment bank may be expected to make markets in its customers' securities. In addition, securities laws require underwriters to perform "due diligence" to assure that disclosures represent the truth fairly.

The distinction drawn here between loans and securities is extreme, of course. Syndicated loans are well-publicized agreements between a borrower and a large number of banks, many of which will have no other customer relationship with the borrower. Private placement securities generally require less disclosure and also lack the liquidity associated with publicly-offered securities. Since they are placed with a small number of investors, issues can be tailor-made to investor preferences. The investors may actively monitor the creditworthiness of borrowers and manage any credit problems. Moreover, the implicit contract nature of a loan is not its only distinguishing feature. The structure of transaction costs means that securities issues are much larger in size than most loans.

Erosion of the banking relationship

One determinant of the degree to which securitization can replace traditional bank lending is the relative importance of relationship to both bank and borrower. Recently many factors have reduced the value of the banking relationship. Among these are the rise in interest rate volatility, historically high nominal interest

rates in the early 1980s, asset quality problems at banks, shifts in the international flows of funds, and increased competition among banks and from other financial firms.

For banks, the sharp rise in interest-rate volatility in the late 1970s and early 1980s made the options embedded in loan agreements much more expensive. The unanticipated high level of interest rates increased both the (foregone interest) cost of reserve requirements and the effective cost of capital. As a result, the cost of holding a loan on the balance sheet in many cases exceeded the agreed lending rate, usually a base interest rate plus a spread. Thus, if the borrower exercised its right to borrow, the bank would be forced to make an unprofitable loan.

Banks responded to the higher cost of the options by withdrawing them in whole or in part where they could. In particular, they could cancel or reduce credit lines. Uncommitted lines eventually were replaced by commitments for which borrowers had to pay. These could be purchased separately from other banks that were not the traditional relationship banks. For thrifts and banks holding long-term assets that could not be called—but that exposed the institutions to much greater interest rate and prepayment risk than experienced before—selling loans grew more attractive. In extending new loans, thrifts and banks shifted from fixed-rate term lending to floating-rate loans, passing the interest rate risk to the borrower.

Interest rate volatility affected nonbank intermediaries as well. For example, life insurance companies traditionally provided implicit and explicit options in their contracts. With higher rates, however, policyholders let low-yielding policies lapse and took out low-interest policy loans in volume. The insurance companies responded by altering their liabilities to resemble those offered by depository institutions and mutual funds. To match the duration of these new liabilities more closely and to reduce their interest rate risk, life insurers have sold off part of their long-term commercial mortgage portfolio.

While banks sought to eliminate the unprofitable or risky aspects of the traditional lending relationship, the value to the bank of its other aspects has probably increased, especially as the emphasis in measuring bank performance has shifted from asset growth to rate of return on equity. Many of the nonlending services provided by banks produce fee income and are not covered by capital requirements. Customers tend to concentrate their purchases of financial services with one provider or a few. Usually the main provider is a lender. The need to offer the key service of lending pushes banks to reshape their lending activity to retain the element crucial to the borrower (access to funds).

and eliminate the element unprofitable to the bank (retention on balance sheet). Thus origination of loans for sale as participations emerges as a business line.

For the borrower, the value of the banking relationship has more clearly declined for a variety of reasons. Actions such as cutting credit lines have reduced the attractiveness of banks. Legally binding commitments have replaced credit lines; NIFs and other underwritten facilities have replaced some short-term and syndicated lending; and the FRN market has replaced part of the interbank market, as even bank borrowers have tried to ensure their medium-term access to funds. In these cases, the borrower is looking for less flexibility and more certainty in the lending arrangement than under a system of bank credit lines. But the demise of the implicit contract means the demise of the distinguishing feature of a loan

The perception that asset quality has declined at many banks and that some may be vulnerable to liquidity problems in difficult market conditions has also undermined bank credibility and the value of the banking relationship. Many of the largest, most creditworthy borrowers find that they can tap the markets at rates more favorable than those offered by most of the largest banks.

International flows of funds also affect the value of the banking relationship by changing the identity of the major lenders in the world. Traditional banking has eroded much less overseas than in the United States. In a country such as Germany, for example, banks' equity investments in major borrowers help cement the borrower-lender relationship. In addition, some foreign banks, especially Japanese banks, have acquired assets aggressively in the past few years.

But domestic borrowers may view foreign banks as less credible in a banking relationship than domestic banks for many reasons: questions regarding the lender of last resort, a history of capital controls, or even conflicts of national interest. In these cases, the borrower may prefer to use an investment bank rather than replace a domestic banking relationship with a foreign one.

Since banks chiefly provide short-term funds, corporate and other borrowers will turn away from banks when their needs call for longer-term finance. Following increased reliance on short-term debt in the latter half of the 1970s, firms turned to the long-term market in 1982 and again in 1984 through 1986, as long-term rates declined.

Finally, sharper competition among banks, including foreign banks, as well as encroachment by finance companies and thrifts on traditional bank activities such as consumer loans and commercial real estate lending, has reduced the perceived cost of severing a banking

relationship. Large, high-quality borrowers now have little difficulty in finding new lenders. And the view that plenty of liquidity is around in the banking system amplifies that effect.

In particular, increased competition and a trend away from specialization by financial institutions allow borrowers to unbundle the banking relationship. By shopping for individual services such as credit lines, loans, and deposit services, the borrower can reproduce the relationship at lower cost. This kind of unbundling is separate from the unbundling of risks seen in the financial markets, which is related to the development of derivative products such as futures and options.

The weakened role of relationship is seen both in the reduced share of large U.S. banks in the prime wholesale lending market and also in the decline of loyalty among medium-size corporate customers. A recent Board survey pointed to a decline in the share of medium-size firms that bank with the institution from which they borrowed.²

Moreover, as the palette of services offered by non-bank financial firms grows to resemble that offered by banks, the customer views the "relationship" as more similar. The loss of uniqueness means a loss of market power. Banks can respond by bolstering their ability to offer better access to funds or they can emulate to the extent legally possible the unique product of investment banks, underwriting, by selling loans or placing commercial paper. That choice will depend on the cost of intermediation.

Bank versus market intermediation

Forms of intermediation

Almost all financial transactions are intermediated in some form. The most significant exception is the direct issuance of commercial paper, although even here the holders are often financial intermediaries. The term intermediation covers a number of functions. In its simplest form, it is brokerage: borrowers are matched with lenders for a fee. A second form of intermediation is underwriting. Borrowers are again matched with lenders, but the borrower receives a certain sum at a certain interest rate at a certain time. The underwriter therefore bears and absorbs uncertainties about the demand for the securities in return for an uncertain spread.

A third kind of intermediation is carried out by mutual funds. It involves selling shares in a pool of assets, where returns to the investor are based on the return of the portfolio of assets the fund holds. Maturities of assets and liabilities are generally matched and are

²Senior Loan Officer Opinion Survey, August 1986, Board of Governors of the Federal Reserve System

either based on some agreed-upon future date when the fund will be liquidated, as in a closed-end fund, or on the preferences of the fund's investors, with assets liquidated as shareholders make withdrawals. As the fund grows in size, actual asset liquidation costs are minimized by the reasonably predictable flow of payments in and out of the fund and the continual reinvestment of part of the portfolio. Besides matching lenders with borrowers, the principal social benefit of a mutual fund is that it can offer an investor a liquid and diversified investment with a low minimum denomination.

A fourth kind of intermediation is that performed by depository institutions, insurance companies, and finance companies. Such financial firms make loans and issue liabilities against the intermediary as a whole. They absorb the interest rate and funding risk over the life of their loans. They will generally also transform maturities and absorb credit losses, and in the case of banks, thrifts, and finance companies, issue fairly liquid liabilities against rather illiquid assets.

The ability to offer a liquid liability with low credit risk against illiquid, risky assets derives from the intermediary's economies of scale, which enable it to pool risks and generate liquidity, as well as from its capital, which buffers losses. (A mutual fund makes use of these economies of scale as well.) A sizable portfolio allows diversification and thus a reduction of the variability of returns and a minimization of capital needs. Since only a fraction of depositors' liabilities will be converted to cash at any one time, cash or clearing balance needs are fairly predictable and depositors do not usually have to fear for the liquidity of their claims. The existence of a lender of last resort and the presence of deposit insurance or other forms of "safety net" arrangements provide an added layer of protection.³

These four types of intermediation should not be identified too closely with types of institutions, however. An investment bank that funds a large inventory of corporate and government bonds with overnight securities loans is carrying out maturity transformation. But the business purpose of an investment bank is not to bear credit risk or to fund a stock of assets, as it is for other financial intermediaries.

A simple model of bank and market intermediation

Two key questions raised by the spread of securitization are: Has the cost of maturity and liquidity transformation performed by depository institutions risen so much that it is no longer economically profitable? And has it risen sufficiently to allow the proliferation of substitute forms of intermediation? Answers to these

questions require a systematic analysis of costs.

This section presents a simple model of banking and the commercial paper market, which is meant to be a representative securities market. The model views the cost of bank intermediation as the spread between lending and deposit rates needed to cover costs and earn a normal profit. The wider the spread, the greater the opportunities for securities underwriting to channel funds from investors to corporate borrowers.

A bank takes deposits from small and large investors, makes commercial and other loans, perhaps conducts nonloan fee income business, and holds capital. The depositor searches for investments that provide an attractive combination of liquidity, safety, and rate of return. Convenience and flexibility in managing other financial assets may also be important. The loan customer has a fixed borrowing need and can choose between the loan or commercial paper market. The banking and commercial paper markets are reasonably competitive, so that prices are close to marginal costs.

For a given deposit rate, the bank must earn an interest rate that will cover its marginal costs and a normal return to capital, the sum of which we will denote BSC, the cost of holding a loan on balance sheet. That cost is:

$$BSC = kE + \frac{(1-k)(R+D)}{(1-q)} + A + LL$$

where k = capital to asset ratio

E = required rate of return on equity

R = market interest rate on deposits

D = FDIC insurance premium

q = required reserve ratio

A = origination and servicing cost, expressed as a rate per dollar

LL = expected loan loss rate, net of recoveries.

For simplicity, this ignores income taxes and loan fees.

Changes in reserve and capital requirements, when the requirements are binding, will influence the spread between BSC and the deposit rate, which we denote s_b . The influence of these key variables is summarized in Table 1. Movements in the spread s_b may have a loose connection to interest rate cycles. When nominal interest rates rise, the cost of reserve requirements (foregone interest) rises. A change in the cost of capital, that is, the required rate of return determined in the stock market, will also influence s_b . The cost of capital is tied only indirectly to interest rates. As interest rates approach a cyclical peak, it seems likely that the required return would rise since returns on alternative investments will have increased. In general, the required rate of return will always be at least as high as the riskless rate of return, since the investor will view ths:

³Originally, commercial loans were made against short-term bills. This type of lending probably involved little maturity transformation and possibly less credit risk than commercial lending today.

as the opportunity cost of funds. But the required rate of return may at times stay high as interest rates begin to fall, because capital gains raise the return on existing long-term instruments.

At its narrowest, the spread s_b may still be large enough to allow some borrowers to finance more cheaply in the commercial paper market. As s_b widens, the commercial paper market becomes attractive to a broader group of borrowers. The cost of a commercial paper borrowing will be

$$CCP = R_{cp} + U,$$

where R_{cp} is the rate of return to the investor and U is the underwriting cost, expressed as a spread. The borrower will prefer to use the commercial paper market whenever BSC is greater than CCP. If we assume for a moment that R_{cp} is greater than R , the deposit rate, securitization will occur whenever

$$s_b > U + (R_{cp}-R).^4$$

⁴With marginal cost pricing, the borrower pays $R_L = R + s_b$ in the loan market and $R'_L = R_{cp} + U$ in the commercial paper market. The borrower will be indifferent between them when $R_L - R'_L = 0$. That implies $R + s_b = U + R_{cp}$ or $s_b = U + (R_{cp}-R)$ at the margin.

To make a commercial paper offering attractive to investor and borrower, the marginal cost of underwriting commercial paper must be less than s_b , since the investor must earn a higher rate of return than on a bank deposit to compensate him for the somewhat higher risk and the borrower must pay a rate below the bank lending rate. If large investors at the margin require a lower rate of return on commercial paper than on bank deposits, this is an additional advantage to the commercial paper market.⁵

If there are large fixed fees involved in setting up a commercial paper program (for example, to obtain a rating), then the discounted present value of interest savings from borrowing through commercial paper must be large enough to compensate for the fixed costs. A narrow spread s_b would allow access to the commercial paper market only to large borrowers; a wider spread would allow access to many more. In other words, the borrower is likely to look at the total cost of a discrete amount of borrowing and choose the cheapest alternative.

If the spread s_b becomes sufficiently wide, more complex arrangements can link borrowers and lenders. Money market mutual funds can collect savings and purchase commercial paper. Since the fund managers will collect a fee that we can think of as a spread, hold some funds in cash at a prudential level of reserves, and earn a return to whatever capital underlies the fund (generally none), the spread s_b has to be wide enough to accommodate both the underwriting cost of the commercial paper and the cost of intermediating through the mutual fund. If we denote the mutual fund's spread as s_{mf} , then the spread is wide enough when $s_b > U + s_{mf}$ and $R_{cp}-s_{mf}$ is greater than the deposit rate available to retail investors.⁶ The fairly simple structure of a mutual fund suggests that the mutual fund's spread is probably low, and certainly lower than at a bank. Some money funds charge only 50 basis points.

This framework can be generalized further to include the decision of an intermediary to sell its assets. An investor is willing to purchase a risky asset or pool of assets if the investor believes it has adequate protection against the risks assumed. If the investor is a financial institution used to assessing and bearing credit risk, it considers its own capital and its funding costs in determining the price to pay and the rate of return it

⁵Over the last ten years, top-grade commercial paper rates have sometimes been below both bank certificate of deposit (CD) rates and the London interbank offered rate (LIBOR).

⁶The spread $s_b = R_L - R$. A borrower will switch to the commercial paper market when $R_L > R_{cp} + U$. A depositor will switch to mutual funds if $R_{cp}-s_{mf} > R$, if an institutional investor, or if $R_{cp}-s_{mf} > R_D$, the retail deposit rate, if a retail investor.

Table 1

Factors Influencing the Spread between Loan and Deposit Interest Rates

In a competitive market, price will equal marginal cost

$$R_L = kE + \frac{(1-k)(R-D)}{(1-q)} + A + LL$$

(The variables are those defined in the text.) The spread between the bank lending rate and the deposit rate, s_b , is

$$s_b = kE + \frac{(1-k)(R+D)}{(1-q)} + A + LL - R$$

In addition, we assume that the required rate of return on equity is always higher than deposit interest rates by at least a small margin. The table below summarizes the direction of change in the spread s_b when key variables increase:

Variable That Changes	Direction of Change in s_b	Comments
Deposit rate (R)	+	a rise in nominal rates raises s_b
Cost of capital (E)	+	a rise in the capital asset ratio raises s_b
Capital to asset ratio (k)	+, if $E > \frac{R+D}{1-q}$	a rise in the cost of capital raises s_b if the rate of return on equity is above the deposit rate by a sufficient margin, which will generally hold
Reserve requirements (q)	+	a rise in the reserve requirement raises s_b
Deposit insurance premium (D)	+	a rise in the deposit insurance premium raises s_b

earns. Most other investors, often lacking capital to absorb losses, seek to avoid nonpayment of principal by requiring greater protection from the seller: larger price discounts or a recourse provision, possibly in the form of a reserve fund. These investors also consider funding or opportunity costs.

The bank selling the asset can express the charge to income from a price discount or from setting up a reserve fund as the equivalent of a level of capital held over the life of the loan. It can compare this level with the capital it is required to hold against the loan if the loan is on its balance sheet. It can also compare the return on the asset required by investors and the bank's cost of funds.

When the amount of credit protection required by the investor is equivalent to less capital than the bank's targeted capital-asset ratio, or there are other funding cost savings, there are potential gains in selling off the asset to investors. Increases in the bank cost of capital also promote a shifting of assets to holders requiring less capital or having a lower cost of capital.

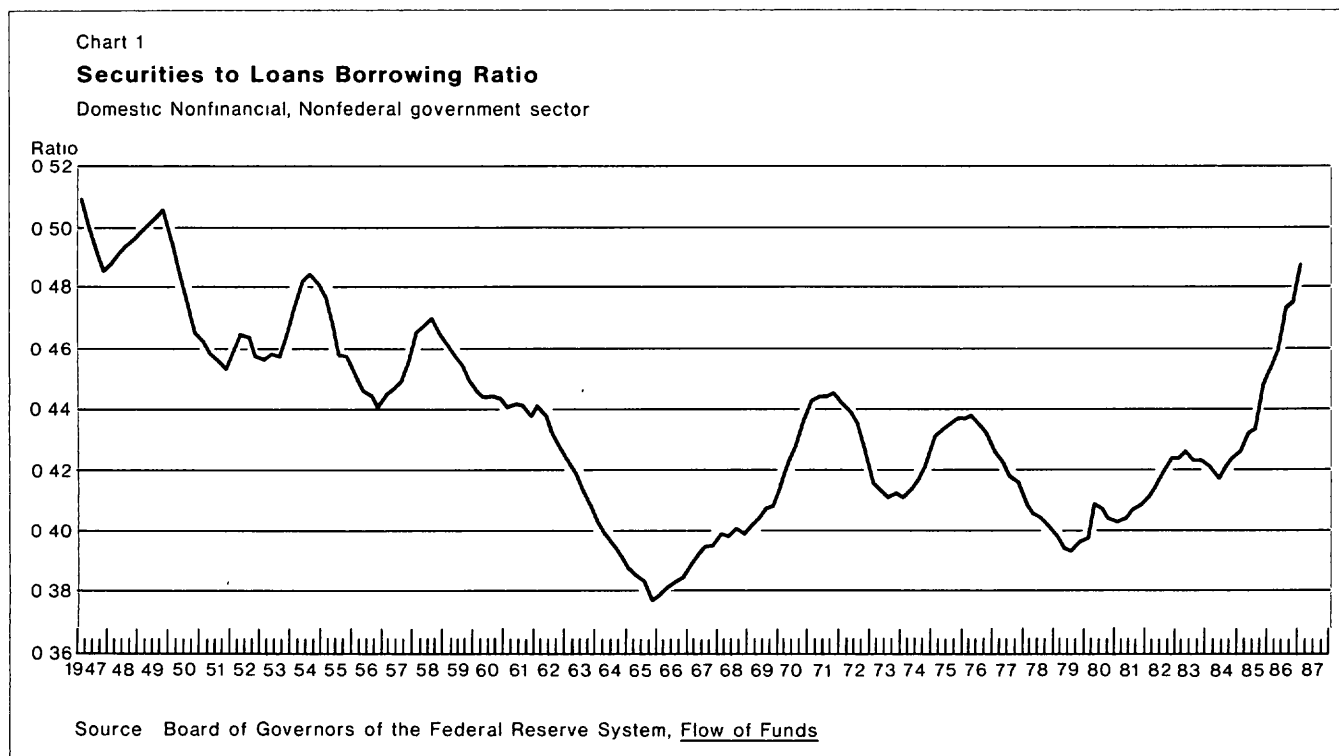
Funding and capital costs are not the only determinants of asset sales. Sales of asset pools have also grown because of the sharp reduction of costs in packaging and servicing the assets.

If the spread between the cost of holding loans and

the deposit rate is loosely tied to the level of interest rates, then the share of securities in total credit extended rises as interest rates are peaking and falls as interest rates reach their trough. A certain amount of cyclicity can be observed (Chart 1).⁷ Two factors work to dampen this cycle, however. First, periods of high interest rates usually coincide with periods of scarce liquidity, low private borrowing, and a shift by investors to safer, more liquid investments. Second, profitable operation of a mutual fund requires large size in order to take advantage of economies of scale inherent in many forms of financial intermediation. To gain sufficient size takes time, and the interest rate cycle in an unregulated environment may normally be too short to attain such a large scale.

These impediments to the securitization cycle have weakened in the last decade. The combination of high inflation and Regulation Q in the latter half of the 1970s created ample opportunity for money market funds to flourish. With low marginal and average costs once they reach a large size, money market funds are unlikely to

⁷Monthly and quarterly data suggest that securitization takes off just as corporate bond rates reach their peak. This pattern probably reflects both increased bank intermediation costs and the resurgence of bond demand in anticipation of capital gains. Aggregating to annual data obscures this pattern, and an inverse relationship between securitization and interest rates emerges



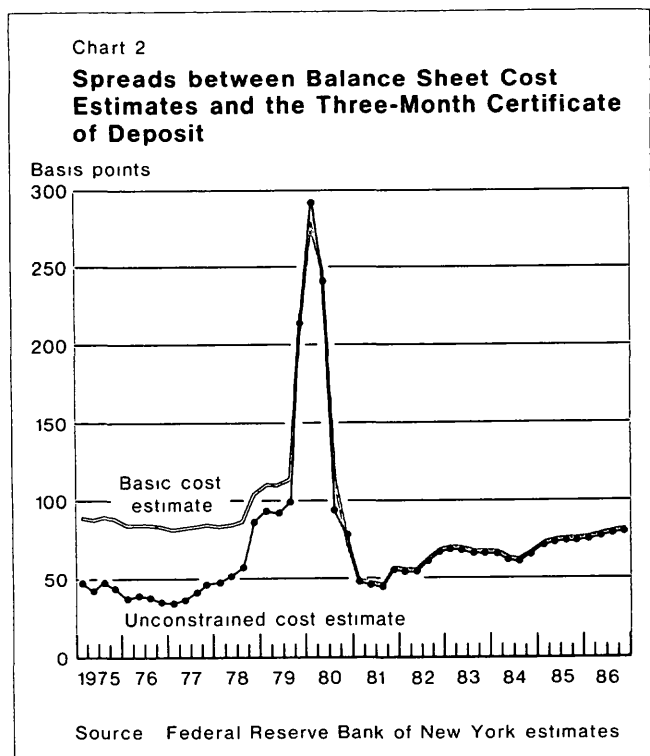
disappear. Their growth has expanded the market for commercial paper, which might otherwise be limited by the large minimum denomination of the instruments.

Behavior of the cost of bank intermediation

In the late 1970s, the spread s_b widened to unprecedented postwar levels and remained large (Chart 2). Since then, the spread has fallen. Under conservative assumptions, s_b was no wider in 1985-86 than it was in 1975-76. Under other assumptions, the spread since 1982 has risen beyond the 1975-78 levels (see Appendix).

In particular, the assumptions about the target level of capital at banks and the target rate of return on equity affect our perception of the importance of bank intermediation costs since 1982. The base case assumptions are that the desired bank capital-asset ratio is fairly represented by actual capital-asset ratios up to 1981 and by bank regulatory guidelines since then and that the rate of return on market equity has been constant at 15 percent over the whole period. The assumption about bank capital ratios after 1981 would seem to understate the case somewhat since most banks are targeting capital-asset ratios above the minimum required.

Under the base case assumptions, s_b averaged 85



basis points in 1975-78, spiked in 1980-81 under the influence of the temporary imposition of marginal reserve requirements on managed liabilities, and averaged 70 basis points from 1982-85, with a rising trend. Movements in s_b have been larger than the movements in the difference between high-grade 90-day commercial paper and CD rates, which fluctuated trendlessly in a range of -10 to 10 basis points over the whole period, except for a brief dip to -20 basis points in 1978.

The base case assumptions suggest at most that bank intermediation costs remained at their high late-1970s level and thus allowed securitization to spread to new financial transactions. An argument for a cost-driven wave of securitization after 1982 needs to assume that banks were largely unconstrained by capital in the period before 1981 or that their required rate of return on capital rose after 1981. If these assumptions are plausible, the role of bank intermediation costs may be important in the latest wave of securitization.

Indeed, the rise in bank capital requirements alone cannot explain the perceived increased cost of maintaining a loan on the balance sheet. Higher capital requirements should reduce the perceived riskiness of banks and bring about a fall in the required rate of return on equity. This fall does not appear to have occurred, however, for several reasons. First, the rise in capital requirements coincided with a reassessment of the overall riskiness of banks—thus the increased capital may have prevented a larger rise. Second, banks expanded their off-balance sheet exposures even as they raised their capital, undercutting much of the effect. Third, the market for bank capital is most likely imperfect. The required rate of return may be slow to adjust to positive changes and quick to respond to potentially negative developments.⁹ Fourth, the relatively high interest rates in the early 1980s no doubt put a floor under bank capital costs, preventing higher capital requirements from quickly producing a reduction in the bank cost of capital.

But the most important reason may be common to all financial firms and helps to explain the breadth of the securitization phenomenon: strong upward pressures on the cost of capital in the financial sector as a whole. Many financial firms share a tendency to fund in shorter-term markets and to hold assets that are longer-term; they tend to have some sort of negative gap. This links their returns on equity and makes their equities close substitutes in investor portfolios. In the 1980s, a broad range of financial firms have sought to raise capital: commercial banks, investment banks seeking public

⁹In particular, the required rate of return on equity may not fall if the capital requirement of the regulator is higher than that required by the market. Higher capital ratios provide a social benefit for which investors cannot be compensated.

ownership, finance companies, and a host of foreign institutions. Falling barriers to entry, especially overseas, a wave of new products, and the growth of secondary market activity have all opened up opportunities that require more financial capital. Moreover, the rate of return on investment bank equities has been much higher than on bank stocks, which puts additional pressure on banks to raise return on equity.

Indeed, as banks have lost business in the prime wholesale and in other loan markets, the loss overall has been not so much to other financial intermediaries as to institutional investors for whom capital is not really a constraint.⁹ That is, as argued earlier, the loss of bank share is not a symptom of classic disintermediation.

The sustained high level of bank intermediation costs has occurred at the same time that many of the costs of transacting in the securities markets have been declining. The introduction of shelf registration through Rule 415 and the opening up of the Euromarkets significantly reduced the cost of underwriting and eased access to the markets. The growth of risk management product markets has made it easier for investment banks to hedge risks in making markets, although higher volatility may have raised those risks. Over the last 15 years, underwriting costs have fallen modestly in the commercial paper market, and more considerably in the bond markets, especially the Eurobond market. Information costs have generally fallen, so that investors are better able to evaluate borrowers. Orders are executed more rapidly.

But capital requirements are not entirely beside the point. Forms of securitization such as loan sales to foreign banks, the expansion of thrift assets where capital requirements until recently have been low (3 percent or less), and the growth of mutual funds with essentially no capital show that capital constraints matter. Even among finance companies, much of the growth has been among special purpose issuers with very thin capitalization.

As a consequence, the financial markets are intermediating a large volume of transactions. Increasingly complex chains of transactions are replacing lending by intermediaries, including mutual funds that purchase mortgage-backed bonds, high-return low-quality corporate bonds, and other securities. Ample liquidity has meant that the surge of securities issuance has not come fully at the expense of bank lending, so that overall credit has grown sharply.

⁹According to the flow of funds accounts, between 1975 and 1985 banks and thrifts lost about 7 percent of market share (measured in holdings of total financial assets), while finance companies gained 1 percent, pension funds and insurance companies, 2 percent, and mutual funds, 4 percent

The analysis so far points to three conclusions. First, a chain of transactions that uses less capital to intermediate a financial claim than is needed to retain an asset on a bank's balance sheet can substitute for bank lending. Thus, even complex or highly illiquid assets could be securitized if the transformations needed to make them marketable (for example, credit and liquidity enhancements) and the underwriting cost involve lower capital costs and fees than bank lending.

Second, even highly profitable lines of bank lending could be sold to investors through the securities markets if the costs of packaging, underwriting, and protecting against credit losses are less than the difference between the cost of booking the loan and the cost of deposits. By selling the asset, the bank could capture some part of the profits of lending and the reduction of intermediation cost.

Third, the expectation that high spreads in traditional intermediation will persist encourages a lasting shift toward securitization. In the short run, a rise in s_b directs borrowers to the commercial paper market, increases the demand for investment banking services, and raises the rate of return on investment bank capital. If the high returns persist, capital is attracted to investment banking and rates of return begin to decline, enhancing the competitiveness of securities relative to bank lending. In the longer run, the investment bank sector is larger and the commercial bank sector is smaller. Securitization then becomes a structural feature of the financial markets.

Gaining access to the securities market

Some bank loans are not really suitable for replacement by securities. Such loans may be too small; information about the debtor may be scarce; risks assumed by the creditor may be too difficult to assess. Nevertheless, certain kinds of asset-backed securities can overcome these difficulties.

Pooling loans is one important means to reduce transactions costs and improve risk assessment. Some securities, such as mortgage-backed and auto-loan-backed issues, rely on the law of large numbers to provide more reliable statistical probabilities of events that affect the rate of return on the securities. These events include default and prepayment. Pooling implies that certain regularities of behavior can be observed among the population at large. For example, while the individual probabilities of default among all consumer borrowers at a bank may be unknown, the distribution of defaults is revealed over time and is not expected to change much. Further, aggregating a large number of loans reduces the investor's transactions cost.

The process of pooling reduces uncertainty, but in general it cannot be done without introducing new credit

exposures. Most pooling arrangements lead to multiparty exposures: the investor is relying on the past and future performance of an originator, a servicer, a trustee, the "due diligence" staff at the underwriter, and the ultimate borrowers. Even if all the participants are top-quality and entail only minor credit risks, these risks accumulate.¹⁰ Thus, the risk of multiple exposures is still greater than any single exposure.

A second method of gaining access to the market is collateralization or, more loosely, asset-backing.¹¹ Collateralization refers to a perfected security interest in real or financial assets that could be liquidated if the borrower defaults. Asset-backing is weaker than collateralization. The investor has no security interest in the assets but can rely on a transactions structure that removes the assets from the control of the debtor to assure repayment. Both methods substitute either the credit standing of the issuer of the underlying claims or the value of real property (or its cash flow) for the credit standing of the borrower. The substitution may be in whole or in part.

Except for first and refunding mortgage bonds, collateralized securities have never been very common in the United States. They have been common abroad, and in some domestic markets, such as Japan, they are the main form of corporate debt allowed. Recent efforts to increase the use of collateral in the United States have met with mixed success. Frequently, collateralized funding is expensive enough to compare unfavorably to other sources. For example, mortgage repurchase transactions are now generally a cheaper source of funds than collateralized commercial paper. The conservative reinvestment and prepayment assumptions of the ratings agencies account for most of the higher cost of a collateralized security. These conservative assumptions reflect real risks that are hard to quantify.

The less stringent form of asset-backing reduces this problem. In a typical asset-backed transaction, the firm originates and sells assets to a special purpose entity that is structured to be legally independent of the firm and unaffected by the firm's bankruptcy. The assets sold are generally high-quality and self-liquidating. The entity then issues a security that is backed by a letter of credit from a bank or a guarantee from an insurance company. The bank or guarantor looks to the assets to provide a cushion if the commercial paper is not paid off. In

many ways, the letter of credit resembles a performance bond since the main reason the funds generated by the receivables would not be paid over to the commercial paper holders would be if the seller/servicer failed to perform the servicing function. It may also be a way to deal with assets that are not self-liquidating.

Collateralization and asset-backing both reflect a theory of segregation of the originating firm's assets and liabilities into pools or classes. Such a theory claims to offer more security to new creditors, but it does so at the expense of the firm's existing creditors and perhaps its owners. The theory would only work if all the streams of income and expense of the firm were exactly correlated. If the income streams produced by a firm's assets are random and even somewhat uncorrelated, then the firm gains by diversification and the sum of the flows is less variable than the individual flows. Even if assets and liabilities were matched exactly and each pair packaged as an asset-backed transaction, the gains from pooling cash flows having a random component would be foregone.

A disadvantage of collateralization and asset-backing is that it may weaken the internal risk-pooling at already weak firms. The reason for pledging or isolating assets is that the overall sum of the flows is viewed as "too risky." In other words, the originating firm is not of sufficiently high credit standing to gain access to the market. The collateralized or asset-backed technique removes the higher-quality and presumably more certain income flows, weighting the firm's remaining cash flows toward more risky income. The firm can make this problem better or worse depending on how it structures the liabilities to take on interest rate risk. If asset sales or pledges sufficiently reduce its total funding risk, the firm could lower its overall risk.

In many cases, financial institutions are transforming or reducing risk by assisting in securitizing assets (for example, providing a letter of credit) and adding their own credit exposure to them. As a consequence, classes of very unrelated securities may in fact become related. For example, if bank ABC issues commercial paper, guarantees the commercial paper of XYZ, acts as paying agent for AAA's bond issue, and is trustee for auto-loan-backed securities of a major auto finance company, these securities have in common a credit exposure to bank ABC. If the "weakest link" theory is applied, as it is by rating agencies such as Standard and Poor's, a downgrading of a financial institution may lead to downgradings of securities in which the institution plays a part.

This is not to say that investors may not benefit from asset-backed securities. Such securities may offer a better risk-return trade-off than many others. But the reduction of risk—either by pooling or by segregation

¹⁰The risk of a failure of the security is the risk that any participant fails. Assuming participant failures are independent and disjoint events, the probability of default is the sum of the individual probabilities of failure.

¹¹Some pools are sold through collateralized bond issues (for example, collateralized mortgage obligations) for tax reasons. Here we mean that assets of various types are pledged to back a bond issue with no reference to any pooling properties.

from the parent—cannot be achieved without introducing new credit risks, however small they may be. Failure to take account of these credit risks can lead to overpricing of securities in the markets.

If the firm uses the asset-backed market to expand its activities without expanding its balance sheet—a reason cited for some mortgage-backed and receivables-backed transactions—it may also weaken existing creditors. A firm expanding its activities does not increase the burden on its capital if the expanded activity is riskless. But activities financed by asset-backed securities are not riskless. No matter how short the time period in which assets are accumulated for packaging in securities form, some risk exists that interest rates will change and the firm will incur some loss. Unless it is hedged, more risk is borne by the existing creditors and owners of the firm. Moreover, assessing this additional risk is probably difficult.

In summary, complex transactions can replace bank lending if the costs of intermediation are low enough. But some transactions have spillover costs to existing creditors, the firm's owners, and the financial system. They may have hidden risks that are hard to analyze and price. The apparent cost of these transactions might be well below the true cost.

Deposits versus securities

The last link between investor and borrower in the traditional bank lending relationship is between the bank and the investor. Typically, savers have held claims on a bank in the form of deposits. Investors have chosen from an array of bank claims that includes subordinated debt, preferred stock, and equity, as well as deposits. But increasingly, savers and investors are replacing deposits with securities claims on banks or bypassing banks altogether. Ironically, the shift toward securities comes at a time when banks have great freedom in the type of deposit services they can offer.

The essential features of a deposit as opposed to a security of any type are the absolute absence of price risk and the low transactions costs. Certain types of deposits, such as demand and some time deposits, have a high degree of liquidity as well. Between FDIC insurance and the supervision of the banking system, bank deposits also have a very low level of credit risk.

Certificates of deposit (CDs) do not fit into this picture very neatly, since they are deposits but have many of the characteristics of securities. In particular, they can be traded over their life and therefore involve some price risk. Like other deposits, CDs have low transactions costs and the credit risk benefits of supervision.

In general, securities offer a higher rate of return and the potential for sale before maturity but carry far greater risk than bank deposits. Investors assume price,

liquidity and credit risk. In well-developed, liquid markets, securities also increase flexibility in managing assets.

A number of factors have served to weaken the position of deposits as against securities. Investors have learned that some of the ostensible advantages of deposits do not in fact exist. While deposits are not subject to nominal price risk, depositors suffered heavy real losses in the highly inflationary years of the late 1970s and early 1980s. In this respect, deposits are no different from any instrument with fixed nominal value. The perception that deposits are extremely safe has probably also diminished, at least in the eyes of some large depositors. The decline in banking relationships could lead to a reduction in required bank deposits such as compensating balances held in lieu of fees for services.

But these are not the major forces that are changing the balance between deposits and securities. If they were, then new securities would probably be largely index-linked bonds or government-risk securities. Index-linked securities could provide considerable protection against inflation; government securities have no credit risk. In fact, however, the markets have taken a different direction.

Three major factors seem to be behind the stronger growth of securities demand. The first is the institutionalization of savings in the United States and other industrial countries. Savers increasingly hold claims on pension funds, insurance companies, savings plans and mutual funds—all institutional investors that manage large portfolios of assets and usually pay rates of return on liabilities related to portfolio performance. Many such holdings are favored by their tax-exempt status when provided as part of employee compensation, but these institutions also offer lower transactions costs and greater diversification than individual investors can achieve. Such institutionalization leads to the possibility of diversification and management of a portfolio of financial claims within the institution, instead of reliance on deposit-based intermediaries. Institutionalization of savings abroad, especially in Japan, is also important in a period of strong capital inflows into the United States.

Institutionalization of savings is enhanced by the growth of wealth and by investor sophistication. Indeed, the increase in investor sophistication has itself been an important reason for growing securities demand. Individual investors, motivated in part by income tax considerations and by risk/return characteristics, have shown particular interest in zero coupon bonds and equity shares.

A second factor is the development of techniques using options, futures and other hedging instruments to

manage risks, especially price risks. This means that institutional investors again are less reliant on banks to achieve relatively liquid, safe portfolios; they can perform more transformation within their portfolio and hedge any resulting risks. If banks earn economic rents in providing this transformation or are inefficient in their use of capital or other resources, then the process of transformation will shift outside the banks, not just to near-banks like finance companies but also to the portfolios of investors.

The development of risk management techniques has been lopsided, however. Growing wealth and ample liquidity have given investors the wherewithal to take more risk into their portfolios. Still, no new method has been found to hedge or diversify away credit risk any more efficiently than banks have done for decades. This lies behind the paradox of the simultaneous growth of credit enhancement and development of the market for "junk" bonds, bonds with higher returns reflecting presumably higher credit risk.

Some investors are unable or unwilling to bear much credit risk. Examples are money market funds, which publish a prospectus stating that they invest only in top-quality assets so as to attract risk-averse shareholders; some institutional investors that have fiduciary responsibilities; and small retail investors. As their portfolios expand rapidly, perhaps in response to favorable tax benefits or a shift in intermediation costs, they begin to exhaust the supply of quality credits. And this problem can be made worse by a decline in the number of good names, as has occurred in the United States.

With credit enhancement, lower-quality borrowers can be made acceptable to such investors. Thus, if the demand for high-quality credits expands faster than the supply, demand for credit enhancement increases, returns to capital in the credit enhancement sector rise, and new capital is attracted, as seen in the entry of foreign banks into the letter of credit business and the incorporation of new bond insurers.

At the same time, some larger investors, including less constrained institutional investors and high net worth individuals, can manage their portfolios much like banks, holding securities of all types and using the diversification principles that banks use. Higher capital requirements reduce the efficiency of banks relative to many institutional investors, offsetting their comparative advantage in credit analysis. If other efficiencies do not counterbalance these higher capital needs, more banklike portfolios are built up outside the banking system. This expands the market for low quality assets. Junk bonds become cheaper to borrowers than a bank loan paired with a swap that fixes the interest rate.

The final type of change contributing to stronger securities demand is an apparently sharply enhanced

desire for liquidity or transferability on the part of investors. When a security is compared to a deposit of equal maturity, the security offers the option of resale into a secondary market if conditions appear to be changing adversely. The deposit generally does not, although the CD is an important exception. Sometimes it is possible to borrow against a deposit or to withdraw it before maturity after paying a fee. But high penalties, highly leveraged balance sheets, or the wide spread between bank lending and deposit rates may make those alternatives unattractive. Increased volatility in interest rates—or even in the underlying creditworthiness of borrowers—makes the option to transfer a security more attractive to investors. This also helps to explain why more capital is being employed to make markets and enhance secondary market liquidity.

Developments in the last few years can account for changes in the choice between securities and deposits by savers. The wider spread for bank intermediation and the advent of new risk management techniques mean that management of banklike portfolios by investors can also substitute for the transformation performed by banks. That transformation has become more expensive for the banks because of higher capital costs. Finally, the higher volatility of interest rates experienced in recent years, along with more volatility in perceived credit quality, has enhanced the value of liquidity in the market.

Conclusion

The degree of securitization appears to depend on the relative importance of relationship in financial transactions, on the cost of traditional financial intermediation, especially bank intermediation, compared to the cost of intermediation through securities markets or private placement, and on the ability of institutional and other large investors to manage or reduce financial risks. In all three areas, changes in the last few years have hastened the development of securitization.

Relationship with borrowers and with depositors, a key aspect of commercial banking, has probably declined in value over the last few years. The response of banks and thrifts to the higher volatility of interest rates—cutting credit lines, increasing prepayment penalties, and selling assets—has resulted in contractual arrangements more easily reproduced by the market. In addition, increased competition in the financial sector has reduced both the market power of banking institutions and the cost of severing ties to banks.

The spread between deposit rates and the cost of holding loans on the balance sheet widened substantially in the late 1970s and early 1980s at the major commercial banks. By conservative measures, it has remained large or even risen above the 1975-78 levels.

The widening spread reflects the generally high level of interest rates in the early 1980s, the higher capital requirements imposed by bank regulators, and the high cost of capital. This last factor has probably contributed to higher marginal costs at all financial intermediaries and helps to explain securitization's broad base.

These higher costs allow firms specializing in underwriting and placement to capture business from traditional financial intermediaries. Underwriting securities, which has traditionally been expensive relative to bank lending, has become relatively less so. Increased competition among underwriters has lowered fees; new hedging techniques and shelf registration have reduced underwriting cost. A combination of commercial paper underwriting and mutual fund operations by money market funds can in many cases intermediate short-term commercial borrowing more cheaply than a bank.

The change in relative costs is large enough to make it attractive to shift to the market even those activities that are now profitable at banks, such as automobile financing and credit card lending. The shift occurs in part because such sales conserve on expensive capital and in part because the cost of packaging small loans has dropped so sharply. Moreover, banks can help less creditworthy borrowers tap the financial markets by backing securities issues with letters of credit. Banks still exploit their absolute advantage at credit analysis, while tying up relatively little capital.

The final major factor, the preference for securities over deposits, stems from the institutionalization of

savings, improved techniques for analyzing and managing risk, and strong demand for liquidity. Institutional and retail investors are willing to assume risks that previously had been taken largely by banks and other depositories. This appetite for more complex instruments has had the perhaps unintended result of increasing the demand for credit enhancement, since no technological breakthrough in analyzing and managing most forms of credit risk, especially commercial credit risk, has been made.

Some factors have been pervasive throughout this analysis and by their nature suggest that securitization is driven by both long- and short-run forces. Increased competition from foreign banks and other intermediaries, the institutionalization of savings, growing investor sophistication, and declines in information and transactions costs in the securities markets are clearly long-run secular changes that on balance favor securitization. Other factors, such as higher volatility in financial asset prices or a higher cost of capital in the financial sector, may not be permanent and give securitization only a temporary impetus. Together, these factors have permitted the securities markets to replace traditional financial intermediation in many ways. Once established, these new intermediation methods are unlikely to disappear soon.

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Appendix: Assumptions behind the Marginal Cost of Capital in Chart 2

Base Cost Assumptions

Return on equity: 15 percent assumed target rate of return on market equity

Capital/asset ratio: Before 1981, annual weighted averages for a banking universe of 13 banks: Bank of Boston, Bank America, Bankers Trust, Chase Manhattan, Chemical Bank, Citicorp, Continental Illinois, First Chicago, Harris, J.P. Morgan, Manufacturers Hanover, Mellon, and Northern Trust, after 1981, minimum capital-asset guidelines and requirements, as recommended by the Federal Reserve System

Three-month CD rates:

Quarterly averages from Federal Reserve Bank of New York

Marginal reserve requirements:

The reserve requirement on non-personal time deposits with original maturity of 18 months or less for the largest banks, Federal Reserve Bulletin

FDIC premium:

Federal Deposit Insurance Corporation rate, including rebate

Unconstrained Cost Assumptions

Same as above, except the capital/asset ratio is assumed to be a nonbinding constraint before 1981, represented by a value of zero.