Interest Rate Swaps:
A New Tool For Managing Risk

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INTRODUCTION

Sharp movements of interest rates in recent years have created serious problems for firms in which the maturity of their assets does not match the maturity of their liabilities. For example, some financial institutions and other corporations have long-term, fixed-rate assets financed with short-term liabilities. Such firms experience an earnings squeeze whenever market interest rates rise unexpectedly, because their cost of borrowing rises faster than the yield on their assets. As a result, many firms look for ways to reduce the sensitivity—or exposure—of their earnings to interest rate fluctuations. A recent technique that allows firms to hedge (reduce) this exposure is the "interest rate swap." Used first in the Eurobond market during 1981, interest rate swaps have taken the market by storm; and now the volume of interest rate swaps in the United States alone is close to $80 billion.

Why are interest rate swaps so popular? What are the advantages of this instrument over other hedging techniques, such as refinancing the firm's debt or purchasing interest rate futures? The answers to these questions require first an explanation of what interest rate swaps are and how they can be used to reduce interest rate risk.

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WHAT ARE INTEREST RATE SWAPS?

An interest rate swap typically involves two firms that want to change their exposure to interest rate fluctuations in opposite directions. For example, one firm has long-term assets that yield a fixed rate of return; but it also has liabilities with interest payments that fluctuate with market rates of interest (that is, floating rate liabilities).[1] This firm loses when interest rates rise unexpectedly, because the interest cost of its liabilities rises but the revenue from its (fixed-rate) assets remains the same. Conversely, this firm gains from an unexpected drop in interest rates. This sensitivity of a firm's net earnings to interest rate fluctuations is the firm's *exposure to interest rate risk.* The other firm involved in the swap faces the opposite situation: its assets yield a return that fluctuates with market rates, but the interest payments on its liabilities are fixed for a longer period of time. A rise in interest rates benefits this firm, because its revenues rise faster than its cost of borrowing; but a drop in market rates reduces its net earnings.

When two firms such as these have opposite interest risk exposures, one has the makings of a swap. In a typical swap the two firms get together—sometimes through an intermediary—and, in effect, exchange some of their interest payments. A firm with floating-rate liabilities essentially takes over some of the interest payments of a firm with fixed-rate liabilities, and in return the firm with the fixed-rate liabilities takes over some of the interest payments of the firm with floating-rate liabilities. For example, a firm that has liabilities on which the interest rate fluctuates with the 3-month Treasury bill (T-bill) rate could agree to pay another firm a fixed rate of 12 percent on an agreed upon dollar amount (principal) in exchange for a floating-rate payment of 50 basis points over the 3-month T-bill rate on the same principal. *In effect,* one firm converts the interest payments on its liabilities from a floating-rate to a fixed-rate basis, and the other converts its liabilities from fixed to floating rate. (For a more detailed discussion of the mechanics of swap arrangements, see HOW A SWAP WORKS.) Parties to a swap agree to make *interest payments* to each other—they do not actually swap liabilities, nor do they lend money to each other. Each firm remains responsible for paying the interest and principal on its own liabilities. Therefore, swaps do not appear on a firm's balance sheet; instead they are used to alter the exposure to interest rate risk implied by the balance sheet.

In just a few years, interest rate swaps have become very popular as a hedging instrument (see FROM ZERO TO $80 BILLION IN THREE YEARS p. 21). But why are firms using swaps rather than other more established hedging techniques, such as purchasing interest rate futures?

SWAPS: LONGER THAN FUTURES, BUT MORE EXPENSIVE

Futures are contracts that generate cash flows that can be used to reduce a firm's interest risk exposure. An interest rate futures contract is an agreement to buy or sell a certain financial asset, such as a T-bill, for a specific price at a specific date in the future. During the life of the futures contract, each time the market value of the asset falls (interest rates rise), the seller in the contract makes a profit, and receives cash, and the buyer takes a loss, and pays cash, and vice versa if the asset's market value rises.[2]

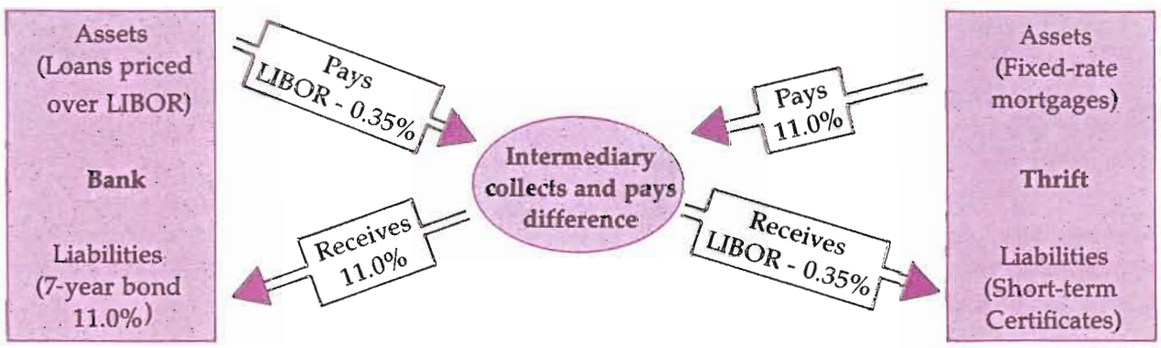
[1]There are two types of floating-rate debt: one is a short-term liability that has to be refinanced frequently; the other is a long-term liability on which the interest rate fluctuates with the interest rate of a specific market instrument.

[2]Cash flows are generated because the exchange where the contract is traded requires that both the buyer and seller in a futures contract post a certain margin. If the price of the underlying asset falls, the buyer has to deposit additional funds with the exchange to maintain the margin requirement, and the seller has his account credited by the same funds. Margins may consist of Treasury securities. For more details, see Howard Keen, Jr., "Interest Rate Futures: A Challenge for Bankers," this *Business Review* (November/December, 1980), pp. 13-25; Mark Drabenstott and Anne O'Mara McDonley, "Futures Markets: A Primer for Financial Institutions," Federal Reserve Bank of Kansas City *Economic Review*

HOW A SWAP WORKS

The following example is based on an actual transaction that was arranged by an investment bank between a large thrift institution and a large international bank; it is representative of many swaps that have been arranged since 1982. "Thrift" has a large portfolio of fixed-rate mortgages. "Bank" has most of its dollar-denominated assets yielding a floating-rate return based on LIBOR (the London Interbank Offered Rate).

On May 10, 1983, the "Intermediary," a large investment bank, arranged a $100 million, 7-year interest rate swap between Thrift and Bank. In the swap, Thrift agreed to pay Bank a fixed rate of 11 percent per year on $100 million, every 6 months. This payment covered exactly the interest Bank had to pay on a $100 million bond it issued in the Eurodollar market. Thrift also agreed to pay Bank the 2 percent underwriting spread that Bank itself paid to issue this bond. In exchange, Bank agreed to make floating-rate payments to Thrift at 35 basis points (.35 percent) below LIBOR. Intermediary received a broker's fee of $500,000.



Twice a year, Intermediary (for a fee) calculates Bank's floating-rate payment by taking the average level of LIBOR for that month (Col. 2), deducting 35 basis points, dividing by 2 (because it is for *half* a year), and multiplying by $100 million (Col. 3). If this amount is larger than Thrift's fixed-rate payment (Col. 4), Bank pays Thrift the difference (Col. 5). Otherwise, Thrift pays Bank the difference (Col. 6).

[1] Date	[2] LIBOR	[3] Floating-rate payment 1/2 (LIBOR -0.35%)	[4] Fixed-rate payment 1/2 (11%)	[5] Net Payment from Bank to Thrift	[6] Net Payment from Thrift to Bank
May 1983	8.98%	—	—	—	—
Nov 1983	8.43%	$4,040,000	$5,500,000	0	$1,460,000
May 1984	11.54%	$5,595,000	$5,500,000	$95,000	0
Nov 1984	9.92%	$4,785,000	$5,500,000	0	$ 715,000
May 1985	8.44%	$4,045,000	$5,500,000	0	$1,455,000

The swap allows both Bank and Thrift to reduce their exposure to interest rate risk. Bank can now match its floating-rate assets priced off LIBOR with an interest payment based on LIBOR, while the fixed-rate interest payments on its bond issue are covered by Thrift. At the same time, Thrift can hedge part of its mortgage portfolio, from which it receives fixed interest earnings, with the fixed-rate payment it makes to Bank. However, the floating-rate payment that Thrift receives is linked to LIBOR while its cost of borrowing is more closely linked to the T-bill rate. Since LIBOR and the T-bill rate do not always move in tandem, Thrift is still exposed to fluctuations in the relation between LIBOR and the T-bill rate.

Consider again the case of a thrift institution that has long-term fixed-rate assets, like mortgages, that it funds with short-term liabilities, like certificates of deposit (CDs). If interest rates rise unexpectedly, this thrift will lose—it suffers reduced net earnings. But the thrift could hedge its interest rate risk with a futures contract to deliver (sell) a CD. Then, if interest rates rise, the market value of the CD falls, and the thrift receives a cash flow. This cash inflow offsets the reduced net earnings from the higher interest cost of the thrift's short-term liabilities. When interest rates *drop*, the futures contract produces a cash outflow, but this loss is offset by a lower interest cost on the thrift's short-term liabilities. By buying enough of these futures contracts, the thrift can, in principle, fully hedge its exposure to interest rate fluctuations.

One disadvantage of futures is that they are standardized contracts that exist only with certain specific delivery dates and deliverable types of financial instruments.[3] In particular, futures are available only for delivery dates at 3-month intervals out to about 2-1/2 years. This makes it impossible to hedge interest rate risk beyond 2-1/2 years.[4] Interest rate swaps, in contrast, are private contracts with virtually every aspect of the agreement open to negotiation. Consequently, a swap can be tailor-made to fulfill one firm's particular needs, assuming another firm can be found to fit the other end of the contract. This flexibility allows firms to set up long-term arrangements—most swaps have a final maturity of three to ten years—thereby filling the gap left by futures.

The ability to customize interest rate swaps does not come without its disadvantages. The lack of product standardization makes it more difficult to find another party and to negotiate a mutually agreeable contract. It also costs more to close out a swap contract if the need arises, than a futures contract position, which can be closed out readily. Apart from certain fixed costs of setting up an account with a trader and meeting regulatory requirements, the brokerage costs of initiating and eventually closing out a futures contract are 2 to 5 basis points. This is much lower than the arrangement fee of about 25 basis points that most swap brokers charge (not including additional fees for settling and guaranteeing the agreement).

Because swaps are agreements between private parties, they also have the disadvantage that one of the parties may default and thus be unable to continue the agreement. Although the other party has no principal at risk, it would again be stuck with an interest risk exposure. It could negotiate a new swap arrangement with another firm, but the terms of that agreement would depend on current market interest rates, which may be more or less advantageous to the firm. Default risk can be reduced by requiring collateral, standby letters of credit, or a third-party guarantee—all of which are costly.[5] Fu-

(November 1984), pp. 17-23; and Nancy Rothstein (ed.), *The Handbook on Financial Futures*, (New York: McGraw-Hill, 1984).

[3]The four delivery dates are March, June, September, and December. The deliverable assets are Treasury bills, notes, and bonds; Bank and Eurodollar CDs; Sterling CDs and Gilts; and Ginny Maes. However, there are no interest rate futures on the prime rate or on the London Interbank Offered Rate (LIBOR), although many firms have their cost of borrowing tied to either of these two rates. Firms that use, say, a T-bill futures to hedge their LIBOR-based borrowing are still exposed to fluctuations in the relation between the T-bill rate and LIBOR. Swaps, though, frequently have the same problem as it is difficult to find two firms with opposite exposure to the same market rate of interest (see the example in HOW A SWAP WORKS).

[4]As a practical matter, a firm that wants to hedge as closely as possible, say, a 5-year fixed-rate asset when only 2-1/2 year futures contracts are available, has to buy the contract with the longest available delivery date and then replace it every three months with the new 2-1/2 year contract. In this way, the firm can keep the delivery date of its futures contract as close to 2-1/2 years as possible. The firm will keep doing this until the remaining maturity of the asset reaches 2-1/2 years.

[5]Often the third-party guarantee is provided by the intermediary who would be required to step in and take over the obligation of the defaulting party. So far, there have been no reports of defaults on a swap agreement.

FROM ZERO TO $80 BILLION IN THREE YEARS

Interest rate swaps first emerged in the Eurobond market in late 1981.[a] Large international banks, which do most of their lending on a floating-rate basis, were involved in the first swaps so that they could use their fixed-rate borrowing capacity to obtain lower-cost floating-rate funds. Initially, the swapping partners consisted mainly of utilities and lower-rated industrial corporations that preferred fixed-rate financing. During 1982, the first domestic interest rate swap occurred between the Student Loan Marketing Association (Sallie Mae) and the ITT Financial Corp., with Sallie Mae making floating-rate payments to ITT. Since then, the market has grown tremendously; in 1984 about $80 billion in swap agreements were concluded.[b] Any large corporation can now use interest rate swaps as an instrument for asset-liability management.

Both investment banks and commercial banks have been active in arranging interest rate swaps. These intermediaries earn fees by bringing the different parties together, by acting as settlement agent (that is, collecting and paying the net difference in the interest payments), and by serving as guarantor of the agreement. Most intermediaries have recently gone beyond their initial role of merely bringing different parties together and function also as dealers. As a dealer, the intermediary is also the counterparty to each swap it "sells." That is, each party has an agreement only with the intermediary and is totally unaware of who might be on the other side of the swap. This arrangement allows the intermediary to sell one leg of the swap before selling the other and to work with an inventory of as yet unmatched swap agreements. The existence of dealers also facilitates an informal secondary market in swaps, where parties to a swap can sell their position to the intermediary or to another party, thereby increasing the liquidity of this instrument.

A typical swap involves a bond issue for $25 to $75 million with a 3 to 10 year maturity on one side, and a floating-rate loan on the other side. Initially, this floating rate loan was priced at a fraction over LIBOR, the London Interbank Offered Rate. Recently floating-rate loans have also been using the prime rate, the T-bill rate, or other indices of the cost of short-term borrowing.

The most common type of swap is the one described above: a dollar fixed-rate loan swapped for a dollar floating-rate loan, otherwise called the "plain-vanilla" swap. However, several variations on this basic swap have emerged in the market. One such variation is a floating-to-floating swap where parties agree to swap floating rates based on different indices. For example, a bank with assets tied to the prime rate and liabilities based on LIBOR may want to swap the interest payments on its liabilities with payments on a prime-tied, floating-rate loan. Another type of arrangement involves currency swaps such as a swap of a sterling floating-rate loan for a dollar fixed-rate loan. For firms whose assets are denominated in a different currency than are its liabilities, this type of swap may be more appropriate. Finally, rather than exchanging interest payments on liabilities, swaps can also be used to exchange yields on *assets* of different maturities or currencies.

The interest rate swap market has proven to be very flexible in adjusting its product to new customer needs. This innovativeness all but guarantees that swaps will remain a permanent feature of international capital markets.

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[a] For more technical and institutional details on interest rate swaps, see Carl R. Beidleman, *Financial Swaps: New Strategies in Currency and Coupon Risk Management*, (Homewood, Illinois: Dow Jones-Irwin, 1985); and Boris Antl (ed.), *Swap Financing Techniques*, (London: Euromoney Publications Limited, 1983).

[b] Since there are no official reporting requirements on swaps, estimates of the size of this market vary tremendously. The amount of $80 billion, as estimated by Salomon Brothers (see *The Economist*, March 16, 1985, p. 30, Table 16), appears to be somewhere in the middle.

tures, on the other hand, are guaranteed by the exchange in which the contracts are traded and by the funds that both parties to a futures contract must hold on margin with the exchange.

To reduce the costs stemming from the customized nature of swaps, many intermediaries have started to standardize the contract terms of swap agreements, such as the type of floating interest rate, repricing dates, and margin or collateral requirements.[6] As a result, interest rate swaps may become similar to futures contracts, but with longer periods available for hedging.

Given a choice, firms that want to reduce their exposure to interest rate fluctuations for up to 2-1/2 years may be better off with interest rate futures than with swaps because futures are less costly to use than swaps.[7] For longer-term hedges, interest rate swaps are a more appropriate, though relatively more expensive, hedging instrument.

SWAPS: MORE FLEXIBLE AND CHEAPER THAN REFINANCING

Rather than using complicated instruments such as swaps and futures, it may seem a lot less trouble for a firm to adjust its exposure directly by issuing liabilities (debt) with the pricing characteristics it desires. For example, a firm that has only floating-rate liabilities but now desires more fixed-rate liabilities, could buy back some of its floating-rate liabilities and issue fixed-rate liabilities instead; that is, it could refinance some of its liabilities. However, "sellers" of interest rate swaps claim that swaps may be less costly than refinancing for several reasons. One is that firms with lower credit ratings may have to pay relatively higher interest rates—that is higher quality spreads—in the fixed-rate market than in the floating-rate market. Thus, they claim, such firms should borrow in the floating-rate market and then swap, if they desire fixed-rate liabilities. Another reason is that swaps circumvent transactions costs associated with refinancing—such as legal fees, advertising, and regulatory restrictions—because swaps do not involve new borrowing; they only involve the exchange of interest payments on existing liabilities. To understand the advantages swaps can have over refinancing requires a closer look at these quality spread differentials and transactions costs.

Quality Spread Differentials. A quality spread is the premium that a borrower with a low credit rating has to pay over a borrower with a high credit rating. For example, during 1982 when interest rate swaps first became popular in the U.S., the quality spread between Aaa and Baa rated firms in the fixed-rate corporate bond market was over 2 percentage points, a post-war high.[8] At the same time, these quality spreads were less than 1 percentage point in the floating-rate market.

To see how interest rate swaps could exploit this apparent difference in quality spreads, consider an example typical of many of the early swaps. "Company" is a manufacturer whose assets yield a fixed rate of return. Company finances a major part of its assets by borrowing at a floating rate of 1 percentage point above the 3-month T-bill rate. Company prefers to finance its assets with a fixed-rate bond issue, but because of its low Baa credit rating it would have to pay, say, 16 percent.

On the other side is "Bank," a large inter-

[6]For more details, see "Swaps: Managing the Future," *Euromoney* (October 1984), pp. 201-221; and "Making a Market in Slightly Used Swaps," *Institutional Investor* (November 1984), pp. 77-84.

[7]Firms could also use options in this case. An option is the right (rather than the commitment) to buy or sell an asset before a certain date in the future. Options are not discussed in this paper because a comparison of options with swaps is very similar to a comparison of futures with swaps. Options, like futures, are mostly standardized products, traded mostly on organized exchanges, and available only up to 2 years. However, certain over-the-counter options are increasingly available for longer periods.

[8]Aaa and Baa are credit ratings assessed by Moody's Investors Services, Inc., a major credit-rating agency. This rating system consists of 10 grades, ranging from Aaa (highest quality) to Baa (medium quality) to Caa (poor quality) to D (default).

national bank, with a portfolio of commercial loans on which it charges a rate based on the 3-month T-bill rate. Bank currently finances its portfolio by issuing CDs at 1/2 percentage point above the 3-month T-bill rate. Given its high Aaa credit rating it has the option of borrowing in the bond market at a fixed rate of 14 percent. Table 1 shows the different alternatives for the two firms. Note that the quality spread is 1/2 percentage point in the floating-rate market, and 2 percentage points in the fixed-rate market.

If each simply wanted to match maturities, Bank would borrow in the floating-rate market at 1/2 percentage point above the T-bill rate and Company would borrow in the bond market at 16 percent. But both borrowers could reduce their cost of borrowing if Bank borrows at a fixed rate and Company borrows at a floating rate and they swap interest payments, with Company agreeing to pay Bank, say, an additional 1 percentage point. In effect, this means that Bank borrows at a 14 percent interest rate, pays Company the T-bill rate plus 1 percentage point (Company's borrowing cost), and receives payments from Company at a 15 percent interest rate. On net, Bank makes interest payments at the T-bill rate [14% + (T-bill rate + 1%) - 15%].

TABLE 1
QUALITY SPREAD DIFFERENTIALS

	Interest Rate on Liabilities	
Issued By:	**Floating Rate**	**Fixed Rate**
Company (Baa)*	T-bill + 1.0%	16.0%
Bank (Aaa)*	T-bill + 0.5%	14.0%
Quality spread:	0.5%	2.0%

*Credit ratings are in parentheses. Baa is the lower rating.

On the other side of the transaction, Company in effect borrows at the T-bill rate plus one percentage point, pays Bank a 15 percent interest rate, and receives payments from Bank at the T-bill rate plus one percentage point. On net, then, Company makes interest payments at a 15 percent interest rate [(T-bill rate + 1%) + 15% - (T-bill rate + 1%)].[9] As a result, Bank effectively borrows at the T-bill rate, better than it could do by itself, and Company borrows at a fixed 15 percent, less than the 16 percent it would have to pay if it had entered the bond market on its own. The source of this reduction in borrowing costs is the difference in quality spreads between the fixed-rate and the floating-rate market. By being able to borrow at a fixed rate through Bank, Company saves more than enough over its own fixed-rate cost of borrowing to compensate Bank for Company's higher (than Bank's) cost of borrowing in the floating-rate market (1/2 percentage point).

The reduction in borrowing costs made possible by these quality spread differentials has been a major selling point for swaps. These cost reductions may be more apparent than real, however. There is a lot of evidence that financial markets are efficient, and that pure arbitrage profits are not readily available.[10] Market efficiency suggests that the difference in quality spreads between fixed-rate and floating-rate markets—200 vs. 50 basis points in the example—reflects differences in risk to lenders in these respective markets. Indeed, the quality spread that is typically quoted does not refer to debt of the same maturity. The floating-rate debt that firms use as a basis for swaps is mostly short- to medium-term, while the fixed-rate debt consists

[9] As explained in HOW A SWAP WORKS, only the *difference* between these two flows of payment actually changes hands. Unless the T-bill rate is above 14 percent, company pays the difference between 14 percent and the T-bill rate.

[10] For a survey of the evidence, see Thomas E. Copeland and J. Fred Weston, *Financial Theory and Corporate Policy*, Second Edition, (Reading: Addison-Wesley, 1983).

of long-term bonds.[11] Debt-holders consider *short-term* debt less risky than long-term debt because they have the option not to renew the debt if the firm looks shakier than anticipated. Therefore, debt-holders require smaller quality spreads on short-term debt than on long-term debt. The possibility that debt will not be renewed, however, makes issuing short-term debt rather than long-term debt more risky to *equity-holders*. Issuing short-term rather than long-term debt therefore merely shifts risk from debt-holders to equity-holders.[12] A firm that considers swapping the floating-rate interest on its short-term debt for a fixed-rate interest payment as an alternative to borrowing directly long term must take into account that the lower cost of borrowing produced by the swap comes at the cost of increased risk to the firm's equity-holders.

Quality spread differentials may seem to offer profit opportunities, and they may look like a good reason to use swaps instead of refinancing. But market efficiency suggests that true profit opportunities are likely to be short-lived at best, and that most of the time they are illusory. But there are more solid reasons why refinancing is more costly than interest rate swaps, and they are transactions costs and other non-interest costs (as opposed to interest costs in the form of high quality spreads).

Transactions Costs. Refinancing can take a lot of time, while a swap can be arranged within a few days. To refinance, a firm has to buy back its outstanding liabilities, which can be expensive, or wait until these liabilities mature. Then the firm must try to convince its regular lenders to provide a different type of funds. A thrift, for example, may have to expend much time, effort, and expense to convince its depositors of short-term funds to invest instead in long-term time deposits.

If a firm's regular customers are unwilling to provide, say, fixed-rate funds, the firm can look to alternative markets, such as the domestic or the Eurodollar bond market. Bond markets, however, are costly to use. Domestic bond markets, for one, are highly regulated. To issue a new domestic bond, a firm has to register with the Securities and Exchange Commission (SEC) and meet its disclosure requirements.[13] In addition, a prospective bond issuer is well-advised to obtain a credit rating from the major rating agencies, such as Moody's, or Standard and Poor's, which requires additional expense. The actual selling of a bond issue involves other costs such as advertising, legal fees, and an underwriting spread—that is, the difference between what the firm issuing the debt receives and the (higher) price that ultimate investors pay for the debt. This spread, which runs anywhere from 25 to 500 basis points and which averages about 80 basis points for investment grade debt, serves as payment to the underwriter (or underwriter's syndicate) for distributing the issue to the ultimate investors, and for committing himself to buy that part of the issue that is not bought by the public at a given price.

[11]The floating-rate debt that firms use as a basis for a floating-to-fixed interest rate swap consists mostly of bank credit, commercial paper, certificates of deposits (CDs), and floating-rate notes (FRNs). More than 90% of commercial and industrial loans by U.S. banks are short term. Commercial paper usually has a maturity of 3 to 6 months, while most large negotiable CDs of financial institutions are for 6 months or less. Although FRNs have stated maturities of 7 to 15 years, almost all FRNs issued in the U.S. have covenants that give the holder the right to redeem the note at 3-year intervals, thereby reducing the effective maturity of these FRNs to 3 years. Some of the FRNs that do show large quality spreads usually give the issuer the option to exchange the issue for fixed-rate debt before a certain date. Thus, these last FRNs are more like fixed-rate bonds.

[12]For a formal treatment of this issue, see Thomas Ho and Ronald Singer, "Bond Indenture Provisions and the Risk of Corporate Debt," *Journal of Financial Economics* (1982), pp. 375-406.

[13]Under SEC rule 415 firms can shortcut the normally lengthy registration procedure by filing a single registration statement covering securities they expect to sell from time to time within two years. These firms can then sell securities "off the shelf" whenever they choose. However, this procedure is only available to the largest and most creditworthy corporations.

As an alternative to the domestic bond market, a firm also can try the Eurodollar bond market. Eurodollar bonds are dollar-denominated bonds issued by international syndicates anywhere outside the United States. The Eurobond market has the advantage that it is almost totally unregulated (that is, there are almost no registration or disclosure requirements), so that issuing a bond does not take a lot of time. On the negative side, however, underwriting spreads on Eurodollar bonds are three to four times those on domestic bond issues. Also, because there are no disclosure requirements in Eurobond markets, investors are reluctant to lend to firms that do not have an excellent credit rating. Therefore, for relatively unknown firms the Eurodollar bond market is even less accessible than the domestic bond market.

The existence of interest rate swaps makes it possible for firms to borrow in the markets in which they have a comparative advantage rather than refinancing in markets in which they don't. These firms can then swap interest payments with firms that have a comparative advantage in another market to achieve the interest payments characteristics they desire. Comparative advantage can take the form of lower interest costs and lower transactions costs. Such lower costs can be the result of name recognition, an established retail network for issuing liabilities, government subsidies and regulations, or other attributes associated with borrowing or lending in certain markets. For example, international banks have the name recognition that allows them to borrow in the Eurodollar market. Domestic banks and thrifts, on the other hand, have the retail network and deposit insurance that give them a comparative advantage in attracting retail savings-type deposits. Interest rate swaps allow banks and thrifts to protect themselves against interest rate risk without having to give up the retail (short-term) savings market in which most of them specialize.

SUMMARY

The high interest rate volatility of recent years has induced many firms to look for ways to protect their profit margins—to hedge—against interest rate fluctuations. A recent and popular technique is the interest rate swap, in which different parties *in effect* swap the interest rate payments on each other's liabilities. An interest rate swap typically allows a firm with floating-rate liabilities to exchange its floating-rate interest payments with another party for fixed-rate payments, thereby effectively acquiring a fixed-rate cost of borrowing.

In only a few years, interest rate swaps have become very popular hedging instruments because frequently they are better suited or less expensive than other hedging techniques, such as purchasing interest rate futures or refinancing the firm's debt. Because interest rate futures are standardized products traded on an organized market, they are inexpensive to use. But because of their standardization, they do not always meet a firm's specific requirements to hedge its interest rate risk exposure. In particular, futures have delivery dates only out to 2-1/2 years, while there is no such limit for swaps. Swaps are freely negotiated agreements between private parties, and, therefore, they can be tailor-made. But this customization makes swaps more expensive to use than futures.

Interest rate swaps can also be very useful when the high costs of entering a market as a new borrower make it too expensive for a firm to obtain directly the type of financing it needs to achieve its desired interest risk exposure. A firm may find that attracting fixed-rate financing in the bond market, for example, is very costly because of high underwriting fees, disclosure costs, or the high risk premium that relatively unknown borrowers may have to pay. An interest rate swap allows a firm to exchange interest flows in order to achieve the desired characteristics of its interest payments without changing the structure of its balance sheet. Interest rate swaps are thus an indirect way of entering financial markets in situations where firms find it very costly to obtain financing directly.

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MARKET PERCEPTIONS OF MONETARY POLICY AND WEEKLY M1 ANNOUNCEMENTS

Jan G. Loeys

The way financial markets react to money announcements depends upon how financial markets think the Fed decides and executes monetary policy. This paper investigates when and how the response pattern of interest rates to money announcements changed in recent years in order to find out how markets have altered their perceptions of policymaking. We find that markets react fast (once even before the fact) and consistently to Fed announcements of major shifts in monetary policy. Also, bond markets seem to become very uncertain about long-run money growth whenever the Fed announces major changes in the way it implements monetary policy.

84-4
GOVERNMENT DEBT, THE MONEY SUPPLY, AND INFLATION: THEORY AND EVIDENCE FOR SEVEN INDUSTRIALIZED ECONOMIES

Aris Protopapadakis and Jeremy J. Siegel

This paper analyzes the theoretical and empirical relation between the growth of government debt and monetary policy for seven industrialized countries: France, Germany, Italy, Japan, Switzerland, the U.K., and the U.S. After analyzing the data we find that:

(i) rates of monetary growth frequently differ sharply from the rate of growth of nominal government debt, so that there is no evidence that a rapidly growing level of government debt encourages immediate monetization;

(ii) the rate of inflation is approximately equal to the difference between the rate of growth of the money supply and real output in all countries over all subperiods, so there is no evidence that an increase in government debt is a significant independent cause of inflation; and

(iii) 1974 signals a turning point in postwar data trends, marked by a decline in the rate of growth of real output and a sharp rise in the rate of growth of nominal debt for all the countries.

84-5
THE EQUILIBRIUM PRICING OF EXCHANGE RATES AND ASSETS WHEN TRADE TAKES TIME

Aris Protopapadakis and Simon Benninga

This paper shows that in a two-country monetary model with the following characteristics: (i) generalized uncertainty, (ii) complete markets, (iii) each country producing one good and trading for the other, (iv) trade in goods takes time, but (v) trade in assets is instantaneous, the Law of One Price holds only infrequently. Foreign exchange risk exists in this model because the exchange rate deviates regularly from its Law of One Price value. Thus, residents of different countries perceive the riskiness of an asset differently, because of foreign exchange risk. The forward premium depends both on foreign exchange risk and on the relative inflation risk in the two countries.

84-7
CLEARINGHOUSES AND THE ORIGIN OF CENTRAL BANKING IN THE U.S.

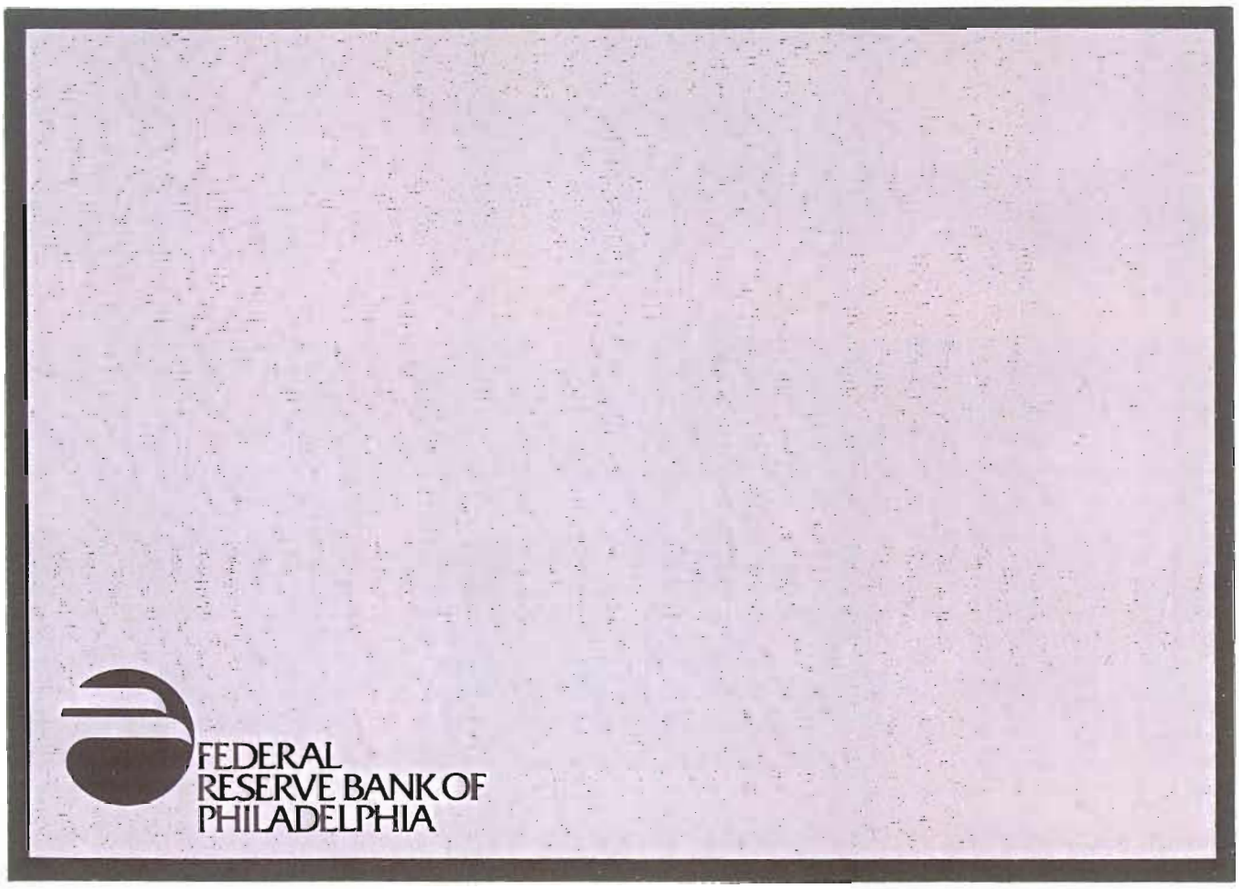
Gary Gorton

The pre-1914 U.S. banking industry is not easily characterized as a market operating through a price system. The endogenous development of the clearinghouse as the industry's organizing institution can be explained by inherent characteristics of demand deposits. During banking panics the clearinghouse united banks into an organization resembling a single firm which produced deposit insurance.

84-8
BANK SUSPENSION OF CONVERTIBILITY

Gary Gorton

A banking panic occurs when depositors at all banks seek a large reduction in their deposit holdings. Suspension of convertibility of demand deposits into currency was the banking system's response to a banking panic. When depositors are incompletely informed about the state of bank investments, a panic can occur when depositors expect capital losses, conditional on having observed noisy indicators of the state of bank investments. Banks, with superior information about the investments, can signal to depositors, by suspending convertibility, that continuation of the long-term investments is mutually beneficial.



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