Chapter 4

The Financial Markets

The existence of broad-based, active financial markets in the United States is very important to Federal Reserve policy implementation. The markets provide a place where the Federal Reserve can buy and sell Treasury debt instruments in carrying out open market operations. The Federal Reserve uses such transactions to make large-sized reserve adjustments quickly. If active markets in financial instruments did not exist, the Federal Reserve would not be able to make open market operations its primary policy instrument, and a very different, less efficient set of monetary policy procedures would have developed. Moreover, without large-scale financial markets, the economic conditions addressed by Federal Reserve policy would barely resemble the complex system that has evolved in the United States, since the variety and efficiency of means of borrowing and lending have affected the course of economic development.[1]

The financial markets encompass a vast array of techniques and instruments for borrowing and lending that facilitate investment, consumption, saving, and the convenient timing of purchases and sales of goods and services. The borrowers are mostly businesses, individuals, and governmental units with a variety of needs for funding. Lenders are businesses and individuals with savings or excess cash to invest. Many entities fall into both categories. Financial institutions, including commercial banks, investment banks, and insurance companies, intermediate between borrowers and lenders. In addition, a wide variety of financial instruments have been developed that permit borrowers to sell their own securities, usually with

the assistance of investment banks, without relying on the intermediary services of commercial banks.

Active financial markets help potential borrowers and lenders find the most advantageous terms and interest rates. The market-making processes allocate savings to the uses offering the highest return and search out the interest rates that bring supplies and demands into balance. The determination of the overall level and the structure of interest rates according to the maturity of the instrument is a complex process (see the discussion in Chapter 8). For any maturity, rates will differ among instruments if they are perceived to have different credit risk, tax, or marketability characteristics, or if they are available to different classes of purchasers (lenders). The spread between interest rates on two financial instruments of the same maturity may change if perceptions about such characteristics change.

The highly developed nature of financial markets in the United States and the wide range of choices for borrowing and lending have facilitated a massive expansion of outstanding debt. The large volume of debt can be seen as a sign of economic and financial vigor, but at times it can also be worrisome. Servicing the debt could be a problem in a period of economic retrenchment, when corporate profits and personal income tend to weaken. In addition, with market development has come increased integration among the various financial instruments, an outcome that may speed the transfer of credit problems from one part of the financial markets to another.

Market participants often distinguish financial instruments with maturities of a year or less from those with longer initial maturities. The market in which instruments with shorter maturities are issued and traded is referred to as the money market. The money market is really a market for short-term credit, or the option to use someone else's money for a period of time in return for the payment of interest. The money market helps the participants in the economic process cope with routine financial uncertainties. It assists in bridging the differences in the timing of payments and receipts that arise in a market economy. Borrowers rely on it for seasonal or short-term cash requirements; lenders use it to offset uneven flows of funds. By providing a means for funds to be placed temporarily, the money market also permits borrowers to time their issuance and lenders to time their purchases of bonds and equities in accordance with their forecasts of stock prices and long-term interest rates. (Table 1 lists characteristics of a number of money market instruments.)

Markets dealing in instruments with maturities that exceed one year are often referred to as capital markets, since credit to finance investments in new capital would generally be needed for more than one year. The time division is arbitrary. A long-term project can be started with short-term credit, with

additional financing arranged at a later date. Furthermore, two- or three-year credit instruments may need to be renewed before a project is completed. Debt instruments that differ in maturity share other characteristics. Hence, the term "capital market" could be—and occasionally is—applied to some shorter maturity transactions. (Table 2 gives examples of capital market instruments.)

A distinction is also made between primary and secondary markets. The term "primary market" applies to the original issuance of a credit market instrument. There are a variety of techniques for such sales, including auctions, posting of rates, direct placement, and active customer contacts by a salesperson specializing in the instrument. Once a debt instrument has been issued, the purchaser may be able to resell it before maturity in a "secondary market." Again, a number of techniques are available for bringing together potential buyers and sellers of existing debt instruments. They include various types of formal exchanges, informal telephone dealer markets, and electronic trading through bids and offers on computer screens. Often, the same firms that provide primary marketing services help to create or "make" secondary markets. The development of active secondary markets has increased the attractiveness of debt instruments to potential purchasers.

Table 1. **The Money Market**

Instruments	Typical Maturities	Principal Borrowers	Secondary Market
Federal funds	Chiefly 1 business day	Depository institutions	Active brokers' market
Negotiable certificates of deposit (CDs)	1 to 6 months and longer	Depository institutions	Modest activity
Bankers' acceptances	90 days	Financial and business enterprises	Limited
Eurodollars			
Time deposits (non-negotiable)	Overnight, 1 week, 1 to 6 months, and longer	Banks	None
CDs (negotiable)	1 to 6 months and longer	Banks	Moderately active
Treasury bills	3 to 12 months	U.S. government	Very active
Repurchase agreements	1 day, and terms of 2 days to 3 months typical; 6 months less typical	Banks, securities dealers, other owners of securities, nonfinancial corporations, governments	None, but very active primary market for short maturities
Federal agencies		Federally sponsored agencies:	
Discount notes	30 to 360 days	Farm Credit System, Federal Home Loan Banks, Federal National Mortgage Assn.	Active
Coupon securities	6 to 9 months		Active
Commercial paper	1 to 270 days	Financial and business enterprises	Moderately active
Municipal notes	30 days to 1 year	State and local governments	Moderately active for large issuers

Firms can keep some of their liquid working balances in short-term instruments, which they can then sell before maturity if they need cash. This source of liquidity has affected money and bank credit because it has reduced firms' needs to keep funds on deposit and to obtain short-term loans from the banks.

In addition to making outright purchases and sales in the secondary market, entities with money to invest for a brief period can acquire a security temporarily, and holders of debt instruments can borrow short term by selling securities temporarily. These two types of transactions are repurchase agreements (RPs) and reverse RPs, respectively. In the wholesale market, banks and government securities dealers offer RPs at competitive rates of return by selling securities under contracts providing for their repurchase from one day to several months later. Finally, a variety of derivative instruments, including

Table 2. **The Capital Market**

Instruments	Typical Maturities	Principal Borrowers	Secondary Market
U.S. Treasury			
Notes	2 to 10 years	U.S. government	Very active
Bonds	30 years (currently)	U.S. government	Very active
Federal agencies			
Bonds	3 months to 10 years	Farm Credit System, Federal Home Loan Banks, and related institutions	Moderately active for recent issues, less active for older issues
Debentures	2 to 30 years	Federal National Mortgage Assn., Federal Home Loan Mortgage Assn.	Moderately active depending on maturity
Master notes	Up to 10 years—negotiable	Federal National Mortgage Assn., Student Loan Marketing Assn.	Active
Zero coupons	Long-term	Federal National Mortgage Assn., Student Loan Marketing Assn.	Limited
Fixed- and floating-rate swaps	2 to 10 years	Student Loan Marketing Assn.	Active (see swaps below)
Corporate bonds	2 to 30 years	Financial and business enterprises	Active
Municipal bonds	2 to 30 years	State and local governments	Active
Derivative products			
Futures contracts	Contracts mature every 3 months out to 2 years	Dealers, banks (users)	Very active (arbitrage with cash market)
Options	Exercise at strike price on or before prearranged expiration date	Dealers, banks, nonbanks	Very active
Swaps	Exchange of interest streams over the lives of underlying debt issues	Dealers, banks, nonbanks	Very active (sales termination, reverse swaps)
Strips	Semiannually on each coupon date and bond maturity date out to 30 years	U.S. government (indirectly—stripping done by dealers)	Active

swaps, futures, and options contracts on various financial instruments, can be used for hedging interest rate risk or for speculating.

The financial markets are international in scope. Banks of many nations bid for deposits and make loans throughout the world. Foreign borrowers may raise funds in the U.S. credit markets and U.S. borrowers can raise money abroad by issuing securities denominated in U.S. dollars or in other currencies and then swapping them into dollars. Foreign central banks and others hold U.S. dollar securities in large volume as part of their dollar reserves. U.S. Treasury securities trade virtually around the clock in major financial centers in Europe and Asia as well as in the United States. The U.S. dollar is the main international currency, although some financial instruments are denominated in other currencies or occasionally in a basket of currencies. Currency risk can be managed through various hedging techniques, encouraging investments in many currencies.

Financial Intermediaries and the Financial Markets

The development of financial markets has allowed large, creditworthy commercial entities to avoid traditional intermediaries and to borrow directly from investors, either through investment banking firms or by direct placement. Corporations and municipalities can often borrow by issuing unsecured commercial paper at rates lower than those charged by banks.

Commercial banks, nonetheless, continue to play several important roles in the financial markets. In addition to providing traditional deposit transfers and loans, they create and deal in financial market instruments. Large U.S. banks are particularly active in the money market. They figure importantly in the markets for Federal funds, Eurodollars, RPs, and bankers' acceptances (BAs). They also deal in certificates of deposits (CDs), deposit notes, and some short-term derivative products. Their holding companies issue commercial paper. Money center banks are typically the principal domestic traders in the worldwide foreign exchange market. They also furnish the transfer, record keeping, and credit facilities needed by nonbank participants. Many banks act as dealers in money market securities, while others meet customer investment needs through a short-term investment desk. A handful of banks serve as clearing agents for dealers. Most specialize in certain types of instruments. They deliver and receive securities and make related payments. A number of large banks meet the residual financing needs of money market dealers. American affiliates of foreign banks are active, too, in trading Federal funds and other money market instruments. These affiliates also provide access to the U.S. money market for their head offices abroad, for

their global branch networks, and for the U.S. operations of their overseas clients. Most depository institutions participate in the capital markets through purchases and sales of government securities for their investment portfolios. In some instances, subsidiaries of bank holding companies serve as dealers in U.S. government securities and as underwriters of other securities.

Descriptions of the various financial instruments follow. The instruments are classified as primarily bank or primarily nonbank instruments, although the differences between these two categories are becoming blurred.

Bank-Related Financial Markets

1. The Federal Funds Market[2]

The Federal funds market is the market for immediately available reserve balances at the Federal Reserve.[3] Depository institutions that maintain accounts at the Federal Reserve, either directly or through a correspondent, can borrow (buy) or lend (sell) reserve balances.[4] Depository institutions hold reserve balances at the Federal Reserve to meet their reserve requirements—on average over a two-week maintenance period—and to cover any overnight overdrafts that may arise from transactions with other depository institutions. Because the Federal Reserve does not pay interest on reserve accounts, depository institutions have an incentive to hold their reserve balances to the minimum levels necessary to meet their various needs.

Regular flows of business to a bank are unlikely to leave it with the desired level of reserves. A bank that is short of reserves has a number of adjustment options, including purchasing enough Federal funds to offset the shortage (see Chapter 3). Such borrowings are not classified as deposits, so they are subject neither to reserve requirements nor to the statutory prohibition against paying interest on demand deposits. A bank with reserve balances in excess of its needs may lend them in the Federal funds market.

Most banks tend to be routinely either net buyers or net sellers of funds although some shift back and forth. Large banks may be either net buyers or net sellers. Small commercial banks, thrift institutions, and credit unions are more often sellers.[5] The institutions that are routine sellers often view the monies sold in the Federal funds market as part of their liquidity.

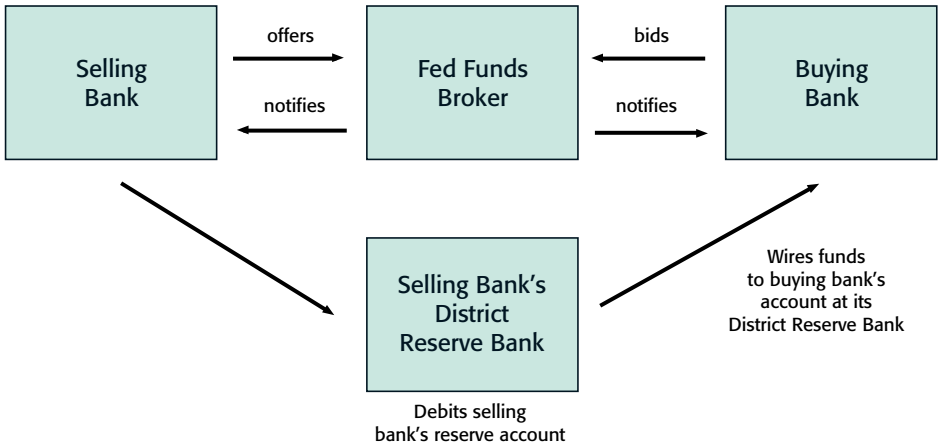
There are two methods for buying and selling Federal funds. Depository institutions can deal directly with each other, or brokers can bring together financial institutions with shortages and those

with excesses of reserves. Direct transactions most commonly consist of sales by small-to-medium-sized institutions to larger correspondent banks. Small institutions rarely generate reserve excesses large enough to allow them to participate in the brokers' market. Instead, they arrange to have a correspondent bank buy from them directly. Often these transactions take place on a regular basis: if the respondent institution routinely generates more reserve balances in its business than it needs, it may make daily sales to its correspondents through an automatic mechanism. Usually, the transaction takes place at the opening rate, at a discretionary rate based on brokers' market trading, or at the average effective rate set in the brokers' market the day before less a fraction. Some large-sized direct transactions do take place when two institutions are aware of each other's likely status as a buyer or seller.

A substantial share of large transactions are arranged in the brokers' market. Trades through the brokers are typically for $25 million or more, although smaller trades may be executed on occasion. Brokers provide an essential service to the thousand or so financial institutions that are regular participants. The Federal funds brokers do not take positions themselves but bring together potential buyers and sellers. They take bids and offers from banks by phone, charging each party to the trade a commission of 50 cents per $1 million. Generally either 1/16 or 1/8 percentage point separates the bid from the offer (with occasional spreads of 1/32). If the market is very one-sided or rates are changing rapidly, the spread may be much greater, as large as several percentage points. Since these loans are unsecured, depository institutions establish credit limits for each potential buyer. Once the terms of the exchange are agreed upon, the selling institution notifies its District Reserve Bank to debit its account and wire the funds to the buying bank. The banks entering into the contract, rather than the broker, are responsible for making sure the transactions are completed. Typically, the transaction is reversed and the interest is paid the next business day (see diagram).

Participants in the Federal funds market can get an idea of the rates at which funds are trading by looking at on-line information screens provided for a fee by various financial service firms. Brokers report the current bid and offer rates for Federal funds and the rate at which the most recent transactions took place. Participants phone the brokers to get their views on the market and to place bids or offers. Brokers will indicate whether the market is "better bid" or "better offered." They will try to get bidders to step up their rate or sellers to accept a lower rate when they observe a concentration of bids or offers.

Federal Funds Transaction with Broker



Note: The transaction is reversed the following business day.

Staff members at the Trading Desk of the New York Reserve Bank also watch the news screens and telephone the brokers routinely during the day to keep abreast of the rates, the volume of activity, and the balance between supply and demand. In 1996, the daily volume of Federal funds trades arranged through the brokers reporting to the Federal Reserve Bank of New York averaged around $45 billion. No measure is available of the total volume of Federal funds transactions—that is, both brokered and direct trades. The Federal Deposit Insurance Corporation (FDIC) call reports, which cover all insured banks, report only the sum of overnight Federal funds and repurchase agreements.[6]

Although most activity in the market involves purchases and sales for that day's delivery with the return the next business day, trades for future delivery and for extended terms also take place. Trading for future delivery is most common ahead of quarter ends. Heavy flows of funds through the banking system on those days inflate cash needs and increase uncertainty about cash needs; some banks may be anxious about their ability to borrow large amounts if their financial position is uncertain. (Quarter-end balance sheets are published.)

The market for "term" Federal funds is a wholesale market in unsecured interbank lending. Maturities range from a few days to more than a year, although most transactions mature in six months or less. The term funds market is considerably smaller than the overnight market; the volume of activity varies, but the amount of term Federal funds outstanding is probably on the order of one-tenth of the amount of overnight funds arranged on a given day. The term market is less liquid than the overnight market. On occasion the broker may need hours or even days to find a counterparty willing to meet the rate bid or offered. For a bank with an extended need for funding, buying funds for a specified term is similar to issuing a time deposit, except that such borrowing is not assessed for deposit insurance. Banks can thus afford to pay a higher rate than they would be willing to pay on a time deposit. The sellers in the term market are members of the same group that participates in the overnight Federal funds market. Some banks situated abroad lend term Federal funds whenever the rate is sufficiently above that available on term RPs to compensate them for the lack of collateral against the loan. Savings and loan associations and the supervising Federal Home Loan Banks also use the term funds market to invest liquid reserves. Term Federal funds transactions are not subject to early termination except in unusual circumstances when both parties agree.

2. Certificates of Deposit

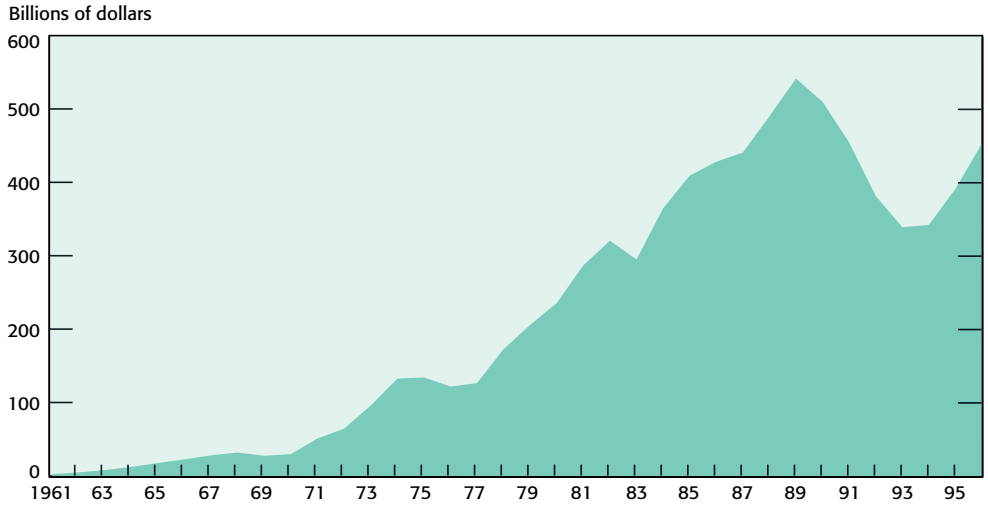
After its introduction in 1961, the large negotiable bank CD grew rapidly in importance and often served domestic banks as a major source of funds. Banks could borrow by issuing CDs, principally to nonbanks. The CD, like a U.S. Treasury bill, could be sold before maturity. Its secondary market, however, was never as liquid as the bill market and became less liquid in the mid-1980s. CDs became more like nonnegotiable large time deposits, and data collection ceased to distinguish between them. Because a CD carries some credit risk and earnings are subject to state and local taxes, it must offer investors a higher rate of interest than a Treasury bill of the same maturity. The initial success of the domestic CD was followed by the growth of an active market for Eurodollar CDs, or dollar-denominated CDs issued by banks or branches located outside the United States, primarily in London (see section 3). Dollar-denominated CDs are also issued by foreign banks located in the United States and are known as Yankee CDs.

The domestic CD and time deposit markets have grown rapidly, with a few notable interruptions (Chart 1). During the 1960s, rates were subject to interest rate ceilings specified under

Federal Reserve Regulation Q. When market rates rose above the ceiling rates in 1966 and again in 1969, demand for domestic CDs dropped. In both instances, the Eurodollar market, which was exempt from the ceilings, got a boost. Then, in 1970, the collapse of the Penn Central Transportation Company caused a crisis in the commercial paper market. To ease the resultant liquidity problems, the Federal Reserve took the first in a series of steps to remove interest rate ceilings: it eliminated ceilings on short-term time deposits of $100,000 or more in value. Growth in large CDs resumed, with growth becoming particularly rapid whenever market rates significantly exceeded ceiling rates on consumer deposits.

In December 1982, depository institutions were able to begin issuing money market deposit accounts (MMDAs) and Super NOW accounts, which paid unrestricted interest rates on consumer deposits with no minimum maturity. The rapid inflows to these accounts reduced many banks' needs for wholesale funding, and they cut back on their issuance of large domestic CDs. Issuance subsequently climbed again until the late 1980s, then declined for several years before a recent pickup. Volume has been heavily influenced by the banks' needs to fund their lending activity, by periodic concerns about the health of many banks and the public's

Chart 1. **Large Time Deposits**
Annual Averages



Source: Board of Governors of the Federal Reserve System.

consequent discomfort with holding largely uninsured deposits, and by the temporarily high costs of paying FDIC insurance premia between 1991 and early 1995.[7]

Most primary market sales of large CDs are negotiated between banks and their customers. Most banks still post the rates at which they are prepared to accept deposits for the most popular maturities—generally one to three months—although they will post attractive rates only when they are anxious to issue CDs. In many cases, dealers will act as brokers, finding customers for a bank's CDs but not taking them into their own positions. Sales handled through dealers tend to be in round lots of $25 million or more, although smaller pieces are occasionally placed. In addition to issuing short-term CDs, primarily with fixed interest rates, banks offer a considerable volume of longer term variable-rate CDs priced off a variety of short-term interest rate indexes such as the London interbank offered rate (LIBOR) and the Federal funds rate.

The intermittent worries about the health of large banks, which began with the Continental Illinois National Bank crisis in 1984 (discussed in Chapter 2), effectively eliminated the active secondary market in large CDs that had existed previously. Active trading had depended on market participants' willingness to consider the CDs of a group of large banks to be interchangeable, so that the seller could deliver CDs of any member of the specified group. Once the public concluded that some banks were riskier than others, potential buyers would no longer accept such an arrangement. Even though concerns about the health of the banking system eased after the early 1990s, an active secondary market has not reemerged.

Banks also issue what are known as deposit notes or CD notes, a hybrid of ordinary CDs and corporate bonds. Most of these notes mature in eighteen months to about five years. Like deposits, they are free of the Securities and Exchange Commission (SEC) registration requirements that apply to bonds. Banks must pay insurance premiums on deposit notes, although some of the notes do not use the term "deposit" and thus avoid the insurance premium. Although the FDIC does not collect insurance on such notes, it could do so if it believed conditions warranted. The notes would be subject to reserve requirements if positive requirements were reimposed on time deposits. Banks must report their deposit note volume to the Federal Reserve as part of their total large time deposits. Like bonds, deposit notes pay interest semiannually, and they are often purchased by traditional bond buyers. Sizable issuance began in l985, the year CD notes were first rated by major bond rating services.

3. The Eurodollar Market

Eurodollars are U.S. dollar deposits at banking offices in a country other than the United States. Eurodollars came into existence in the 1950s when Soviet bloc governments placed dollar deposits in London in order to conduct transactions in Europe and avoid the potential risk that the U.S. government might, for political purposes, freeze deposits held in the United States. Eurodollar deposits soon proved attractive to a wide range of depositors, including banks and internationally oriented corporations. Unlike U.S. deposits, they were not subject to interest rate ceilings, reserve requirements, or FDIC insurance premiums. The Eurodollar market—the process through which banks solicit these deposits and place the proceeds—grew spectacularly in the 1960s. Negotiable Eurodollar CDs were introduced in 1966 and quickly grew in popularity. U.S. money market mutual funds (MMMFs) were major purchasers of Eurodollar CDs during their period of greatest expansion, in the late 1970s and early 1980s.

Although regulatory restrictions were important to the early expansion of the Eurodollar markets, they have played a declining role in recent years. Interest rate restrictions were gradually removed from domestic time deposits beginning in 1970 and reserve requirements were dropped at the end of 1990; insurance premiums remained a factor until the end of 1995. Nonetheless, the Eurodollar market has continued strong. The dollar finances international trade and investment, so investors have found it convenient to hold deposits in the time zones where trade-related dollar transactions are taking place.

Eurobanks—banks dealing in Eurodollar or some other non-local currency deposits, including foreign branches of U.S. banks—originally held deposits almost exclusively in Europe, primarily London. While most such deposits are still held in Europe, they are also held in such places as the Bahamas, Bahrain, Canada, the Cayman Islands, Hong Kong, Singapore, and Tokyo, as well as other parts of the world. International Banking Facilities (IBFs) located in the United States also deal in Eurodollars for nonlocal customers. Eurodollar deposits may be either nonnegotiable time deposits or negotiable CDs, but nonnegotiable deposits predominate. Both types of deposits come in a broad range of maturities, from overnight to several years or more in the future. Although the majority are from one week to six months, multiple-year maturities are considerably more common than in the domestic market. There are no Eurodollar transactions deposits. The banks bid for the deposits of international corporations, investors, and governmental units to fund the loans being

made to businesses and governments. They also bid for the deposits of other banks or place funds with them, using the huge interbank market to manage the balance between the maturities of their assets and their liabilities. Loans and interest rate swaps are frequently priced against various maturities of LIBOR.

U.S. banks and resident foreign banks help keep Eurodollar rates closely parallel to rates in the domestic money market. Changes in Federal funds and other short-term U.S. rates rapidly affect Eurodollar rates. Interest rate differentials between Eurodollar and domestic funds that are not based on differences in regulations or other characteristics are quickly eliminated through arbitrage and substitution among funding sources. Same-day settlement of Eurodollar transactions, introduced in the l980s through the clearing house interbank payments system (CHIPS), has reduced arbitrage costs.

U.S. banks may place domestically generated funds in the Eurodollar market for varying terms when interest rate relationships favor such actions. They may simultaneously lend term Eurodollars and borrow overnight Eurodollars to use in their domestic banking operations if rate relationships encourage such transactions.

4. The Interest Rate Swap

The interest rate swap, developed in the early part of the 1980s, allows lenders and borrowers to transform the nature of their interest payments or receipts. For example, two bond issuers can exchange commitments to make interest payments over the lives of the debt instruments that they issue, although each remains responsible for its own bonds. It would have to pay its own interest if the other party failed to pay and is obligated to redeem its bonds at maturity. One borrower issues fixed-rate debt while the other issues floating-rate debt with similar maturities. Under the swap, the borrower that issued the fixed-rate debt will pay the floating-rate interest and receive the fixed-rate payments, while the party that sold the floating-rate debt will pay the fixed-rate interest and receive the floating rate payments.

Swaps can be profitable because of inconsistencies between fixed- and floating-rate debt market rates. Potential lenders at floating rates may differ from potential lenders at fixed rates in their credit evaluation of borrowers. Sometimes borrowers find it cheaper to borrow in the fixed-rate market when the revenue streams they will use to service the debt are more closely related to a floating rate; in other instances, the reverse may be the case. Swaps

bring together borrowers with opposite revenue patterns. They allow each to borrow in the sector permitting the lower rate option and to hedge the interest rate exposure.

A commercial bank is often the intermediary in a swap, acting as counterparty to two borrowers with opposite mismatches in their borrowing and cash flow structures. In this role, the bank assumes potential credit risks, which become actual risks if interest rate changes unmatch the payment commitments in the offsetting deals. Banks can avoid this interest rate risk by astute offsetting of swap agreements or by hedging with Eurodollar futures or Treasury securities. Sometimes they do not achieve precise matches and therefore assume some residual rate risk.

According to call report data as of fourth-quarter 1996, the notional amounts of interest rate swaps on the books of commercial banks in the United States amounted to $7.6 trillion. Although the notional amount can be a useful benchmark, it overstates the economic value of swaps because it is only a reference amount used to determine the cash flows in swap contracts. The market value of outstanding swaps, which is the value of the cash flows between counterparties over the life of a swap, typically amounts to only 2 to 3 percent of the notional amount. According to the call report data, the outstanding interest rate swaps that had positive market values to commercial banks in the United States had a market value of $123 billion, while the contracts with negative values amounted to $117 billion. (These numbers should not be added together because doing so would involve some double counting.) Although these numbers are large, they fall far short of $17 trillion, the principal amount of outstanding credit market debt in the United States.

5. Bankers' Acceptances

The Federal Reserve Act authorized U.S. banks to engage in acceptance financing of the domestic and foreign trade of their customers. As described in Chapter 2, the Federal Reserve nurtured the market and was an active buyer of BAs from the beginning of the Federal Reserve System through the early l930s and again after World War II until the mid-l970s (although in the postwar years, BAs met only a small proportion of reserve needs since Treasury issues had taken over the dominant role). The Federal Reserve gradually reduced and then ended its involvement in the BA market in the 1970s and 1980s when it concluded that the acceptance market had become self-sufficient. In 1977, the Fed discontinued outright purchases. In 1984, it discontinued purchases of acceptances under RPs because the volume of government securities available was sufficient to

meet reserve management objectives. Federal Reserve regulations still govern the issuance of most acceptances, limiting their use to short-term, self-liquidating commercial transactions.

The BA market was a major means of financing trade denominated in dollars in the United States and foreign countries for many years, but recently, it has become relatively inactive. A series of developments diminished the attractiveness of BAs, including the introduction of asset-backed and Euro-commercial paper, the narrowing of spreads between rates on Eurodollar deposits and rates on acceptances, and the ending of favorable reserve-requirement status.

The BA available from banks or in the dealer market is a prime short-term investment because both the bank and its customer are legally obligated to pay it at maturity. Acceptances are written in varying amounts based on the underlying transaction, but they are put together for sale in round lots of $1 million to $5 million. The odd lots remaining, in pieces down to about $50,000, are sometimes sold to individual investors and sometimes held by the accepting bank. About a half dozen firms currently make markets in these instruments, buying acceptances from the accepting banks and retailing them to corporations, government agencies, foreign investors, banks, and other financial institutions. The spread between the prices at which they buy and sell is typically 2 to 4 basis points. (A basis point is 1/100 of a percentage point.) Dealers finance their positions with bank loans or RPs arranged with a wide variety of investors.

BAs trade in a tiered market at rates reflecting the size of the accepting banks, market perceptions of the banks' creditworthiness, and the perceived liquidity of the paper in the market. Membership in the tiers changes from time to time as market conditions and perceptions of credit risk and liquidity are altered. The spread between the top names and the final group is 10 basis points or more and depends on market conditions.[8]

Nonbank Financial Instruments

1. The U.S. Treasury Debt Market

A. The primary market

The U.S. Treasury is the dominant issuer of debt instruments in the financial markets. It sells both marketable and non-marketable debt, the former representing the larger share of

its issuance. It sells bills that mature within a year, notes that mature in two to ten years, and bonds with maturities out to about thirty years. The Treasury's regular issuance of securities is an important part of its program for managing the U.S. public debt, which stood at $5.3 trillion at the end of 1996. Of this amount, just over $3.4 trillion was in the hands of the public, while almost $0.4 trillion was held by the Federal Reserve and about $1.5 trillion was held in Treasury trust accounts. Treasury debt issues are purchased by a wide range of investors who are attracted by the securities' perceived freedom from credit risk, ready marketability, exemption from state and local taxes, and wide range of maturities. Banks, thrift institutions, foreign central banks, other financial and nonfinancial businesses in the United States and abroad, and individuals buy marketable Treasury securities. As of December 1996, the Treasury estimated that of the Treasury debt held by the public, 10 percent was held by banks and mutual funds, 10 percent by individuals, 14 percent by private nonfinancial businesses (including insurance companies), 33 percent by foreigners, 10 percent by state and local governments, and 21 percent by other miscellaneous investors.

The Treasury has sold bills at competitive auctions since bills were introduced in 1929. Beginning in the early 1970s, auctions became the predominant sales technique for notes and bonds as well. Nonmarketable debt is sold to specific purchasers under prearranged terms.[9] The Treasury auctions bills most frequently, offering three- and six-month bills each Monday for settlement that Thursday when existing bills mature. It sells fifty-two-week bills (referred to as year bills) every fourth week, also with Thursday maturities and settlements. In time, they become interchangeable with three- and six-month issues with the same maturity date. The Treasury also sells cash management bills of varying maturities to bridge cash low points, often ahead of major tax dates.

Bills are discount instruments for which the purchaser pays an amount below the face, or par, value. The Treasury repays the face value at maturity. The interest earned, referred to as the rate of discount, is computed approximately as the amount below the face value divided by the fraction of the year that the bill is outstanding.[10]

To obtain bills at an auction, bidders must submit tenders on a timely basis to the Treasury Department or to any Federal Reserve Bank or Branch serving as fiscal agent for the Treasury. Tenders can be either competitive or noncompetitive.

Currently, noncompetitive tenders are due before noon and competitive tenders before 1:00 p.m. eastern time on the day of the auction. The maximum size for a noncompetitive bid is $1 million in a bill auction. Bidders receive the full amount of their tender at the average rate that emerges in the competitive bidding. Bidders cannot submit both competitive and noncompetitive tenders in the same auction. The minimum tender size is $10,000, with additional amounts permitted in $1,000 increments.

Competitive tenders must show both the amount being tendered for and the rate of discount that the bidder is willing to accept. The Treasury limits both the maximum bid size at any one rate and its issuance to any one bidder or related bidders to 35 percent of the amount of the auction available to the public (exclusive of awards to the Federal Reserve and foreign official institutions). This restriction is designed to prevent any one party from taking so much of an issue in the primary market that it would be in a position to manipulate the price in the secondary market.

Most tenders are submitted electronically to the Federal Reserve Banks and branches. The computer sorts the bids in ascending rate order. Questionable bids are reviewed and any needed modifications are made. Next, each Federal Reserve Bank electronically forwards the tenders it received to the Treasury, where the figures are combined. The Treasury accepts all tenders at the rates that are bid, starting with the lowest rate, until it covers the preannounced amount of the auction. If there are more tenders than needed at the highest accepted rate—referred to as the stopout rate—the Treasury makes partial awards, proportionate to the sizes of the bids.

Treasury notes and bonds pay principal at maturity and interest in the form of a semiannual coupon. To date, all notes and bonds have paid both interest and principal in nominal terms set at the time they were initially issued. In January 1997, the Treasury also began issuing notes with a coupon rate set at the time of sale that is applied to principal that is indexed to the consumer price index. These new securities are intended to give investors a means of protecting themselves against the risk of unexpected inflation. In addition, the difference between rates of indexed and nonindexed notes should provide an indication of the market's expectation for inflation.

Notes and bonds are auctioned in a similar way to bills, except that the bidder indicates a yield to maturity rather than

a rate of discount on the tender, and yields are expressed to three decimals rather than two. Currently, two of the note series—the two- and five-year maturities—are handled as single price auctions, sometimes referred to as Dutch auctions, with all winning bids awarded at the stopout rate. Tenders below the stopout rate are awarded the full amount, with those at the stopout rate receiving partial amounts. The other maturities are sold in multiple price auctions, with winning bidders paying a price equivalent to the yield they bid. The minimum tender size is $5,000 for maturities of three years and less and $l,000 for longer maturities (both with increments of $1,000 after that). The Treasury generally sets the coupon rate at the nearest 1/8 percentage point that produces an average auction price at or slightly below par. The maximum noncompetitive tender is $5 million for notes and bonds.

The Treasury announces the results of the auction as soon as they are computed. Considerable efforts were made in the early 1990s to shorten the time between the bidding deadline and the release of results. Bidders are at particular risk from yield changes during that interval because they do not know their awards and are therefore not sure how to hedge. In the late 1980s, it could take up to two hours to announce the auction results. Today it generally takes about 30 minutes. Depository institutions and primary dealers must pay the full amount on the delivery date, usually a few days later. Others must either have a bank or dealer guarantee their payment, or submit full payment with the tender.

Dealers can judge what rates to bid for a new issue by talking to customers and by trading in the secondary market. Trading begins in new Treasury securities as soon as the Treasury announces the details of an upcoming auction, normally about a week before the auction.[11] Dealers trade the securities between the formal announcement and the issue date in the so-called when-issued market. Instead of the usual settlement a day or two after the trade, settlement of such trades takes place on the day that the Treasury delivers the security. The when-issued market allows dealers to sell "short" to customers (that is, to pre-sell) ahead of the auction date and to cover the sale in the auction.[12]

B. The Secondary Market

The secondary market for Treasury securities consists of a network of dealers, brokers, and investors who effect transactions either by telephone or electronically. Telephone trades are

generally between dealers and their customers. Electronic trading is arranged through screen-based systems provided by some of the dealers to their customers. It allows selected trades to take place without a conversation. When dealers trade with each other, they generally use brokers. Brokers provide information on screens, but the final trades are made by telephone.

The market was essentially unregulated until 1986, when the Government Securities Act (GSA) introduced regulation setting financial responsibility and custody rules for brokers and dealers in government securities. The rules were designed to preserve the efficiency of the market and to encourage wide participation. The oversight authority given to the Treasury under the GSA expired in October 1991. Before measures were taken to renew that authority, however, some significant developments triggered intense scrutiny of the market for government securities. In August of that year, Salomon Brothers, a large securities dealer, disclosed that it had discovered irregularities in connection with certain Treasury auctions. In that and in subsequent announcements, the firm acknowledged that it had submitted unauthorized customer bids in Treasury auctions during 1990 and 1991. In certain instances, these actions resulted in Salomon Brothers' being awarded more than 35 percent of the auction amount, a violation of auction rules.

In this atmosphere, various administrative and regulatory reforms were approved to address a broad range of issues that arose from these events. These reforms included steps aimed at broadening participation in auctions, stronger enforcement of auction rules, more formal surveillance of the Treasury market, changes to Treasury auction policies, and modifications of requirements for primary dealers.[13]

Competition is keen in the trading of Treasury bills. The spread between the bid and asked rates quoted to customers is generally only 1 to 2 basis points—$25 to $50 per million dollars on a three-month maturity—while the most recently auctioned "on-the-run" bills may trade with a 1/2 basis point spread. Coupon issues trade on a price basis (except for pre-auction when-issued trading, which is on a yield basis). Prices are quoted relative to the par value of 100 and in increments of 1/32 of a point—frequently 1/64 in the shorter maturities. A price of 99 31/32 means that the issue is 1/32 point below par. As the price falls, the yield rises. The amount of yield increase associated with a 1/32 drop in price is largest for short maturities: for example, it is close to 2 basis

points for a note maturing in two years. By contrast, a 1/32 drop in price lifts the yield on a thirty-year bond by only 1/3 of a basis point.

Bid-ask spreads on coupon issues depend on how actively the issue trades and when it matures. Market spreads tend to widen with maturity because the risk of price fluctuation increases. Spreads generally range from 1/32 to 1/8 point or so, with small, older issues at wider spreads. For on-the-run issues, spreads may be narrower, around 1/64 point. The spreads also depend somewhat on recent market volatility. Trades can be for any size, although transactions smaller than $1 million face value are considered odd lots and subjected to an extra charge. Most dealers will "make markets" to customers on the telephone for amounts that are routine in size at that time. Generally, larger orders will be accommodated, but occasionally the dealer may need time to assess the market before quoting a price, particularly right after the release of key economic data.

The dealers trade actively with each other to achieve inventories consistent with customer demands and with interest rate expectations. Most interdealer trading is arranged through half a dozen brokers specifically serving the dealer community. Dealers post anonymous bids and offers through the brokers on issues they wish to trade. Even after the trade is completed, the dealers do not know their counterparties; they know only that they must be members of the group that has access to the broker. The broker is compensated by the dealer that hits a bid or takes an offering.

Trades are most commonly for settlement the next business day (regular delivery), with about 10 to 20 percent settling two days later (skip-day delivery); some same-day transactions (cash delivery) are arranged for bills in the morning. Treasury securities are held in computerized "book entry" accounts. The transfer of ownership between two parties using different banks for clearing or custody services is effected by depository institutions through the Federal Reserve's Fedwire transfer network. (Treasury securities may be moved between accounts within a bank if both parties to the trade have accounts at the same bank.) Other owners must arrange to have a depository institution, generally a large bank, make transfers for them. Securities are transferred in one direction and reserve balances in the other direction simultaneously so that the party selling the securities does not give up possession until payment is assured and the

party buying the securities does not give up the money until the securities are transferred.

Foreigners are major participants in the U.S. Treasury debt market. Interest by Europeans in owning and trading U.S. securities encouraged the expansion of trading in London. Japanese participation fostered a market in Tokyo. Trading also occurs to a lesser extent in Australia, Singapore, and many western European centers. The international trading in U.S. Treasury issues has led to expanded participation by foreign-based dealers and lengthened trading hours. Trading hours have never been strictly controlled. Convention currently holds that normal trading in the United States takes place between 7:30 a.m. and 5 p.m. eastern time, although trading often continues later if significant developments encourage it. Securities now trade in some markets almost around the clock, with trading beginning in Asia shortly after it winds down in the United States. Brokers operate during the Asian and European trading days to serve those markets, and U.S. firms can make trades through the brokers by way of their Tokyo or London operations.

Government securities dealers perform a variety of tasks. In addition to buying or selling securities at the request of customers, they provide information, analysis, and advice to stimulate trading activity and customer loyalty. To meet customer needs, they maintain inventories of government and other securities. Thus, financing of positions (described below) is a sizable part of the operation. They manage their securities positions with a view to profiting from both short- and long-term swings in interest rates. They also engage in "arbitrage" transactions by making offsetting purchases and sales to take advantage of price disparities. For example, dealers can capitalize on the price differences between securities of varying maturities or on price differentials between cash markets and futures and options markets (discussed below).

Profitability for a dealer firm potentially arises from several sources. A firm can realize a financing or "carry" profit when it earns a return on securities owned that exceeds its costs to finance the securities. A firm may make a position profit from having sold short (sold securities it did not own and borrowed securities to make delivery) in falling markets and having gone long (held inventories of securities) in rising markets. A firm may, in principle, make a trading profit from the spread between bid and offer prices in trading

with customers and other dealers, although the business is sufficiently competitive that bid-ask spreads are generally too narrow to serve as a significant source of profit. Arbitrage transactions can produce profits or protect against losses. Such transactions are often quite complicated, involving offsetting transactions in the cash, futures, and options markets. Dealers generally have in-house traders who specialize in arbitrage. Such transactions are often kept separate from the trading positions of those making markets to customers.

Achievement of substantial profits involves taking risks, since competition limits the returns from risk-free operations. Hedging strategies can be used to manage that risk, but implementing those strategies can be costly. Consequently, dealer operations inevitably show sharp fluctuations in returns, making it necessary for firms to be well capitalized if they are to succeed under a variety of market conditions.

Government securities dealers are extremely sensitive to the interest rate outlook because their positions at risk can be very large relative to their equity. A multiple of securities held to capital as large as fifty (aside from the matched book described below) is not uncommon for a dealer expecting a decline in interest rates. A 1 percent rise in the price of securities held in such a situation would increase the dealer's capital by 50 percent; a similar drop would wipe out half of present capital. In practice, dealers tend to make substantial gains by acquiring and financing an outright position when rates are declining. When interest rates are choppy or rise persistently, however, dealers sometimes encounter moderate-to-large losses, in part because maintaining effective markets for customers while holding a sizable net short position is difficult. Moreover, borrowing securities to sell short requires using scarce capital.

For most dealers, maintaining a sizable customer base is essential to success in the business. Knowing what customers prefer, what securities they hold, and what they are doing (or thinking of doing) enables the dealer to make markets intelligently, to anticipate the likely market impact of news developments, and to manage the firm's own positions profitably. The key people in the effort are the traders, who bid and offer close enough to the competition to do business; the sales staff, who keep the firm in touch with its customer base; and the money market economist, who keeps the traders informed of recent and prospective economic developments and the likely implications for the market.

Many dealer firms have branches in important domestic and international centers to maintain close personal contact with both large and small customers; some of the major stock brokerage firms also draw in retail customers through registered representatives in their large network of stock-oriented branches. Other nonbank dealers and most of the banks rely principally on direct telephone or telex contacts, followed up with periodic personal visits. Leased wire information systems, which keep the customer abreast of the latest market and news developments, have greatly reduced the need for routine informational calls by sales staff. The sales effort has shifted toward providing computerized information on trading spreads and arbitrage possibilities, as well as up-to-the-minute analyses of economic developments and the Federal Reserve's policy posture. The rapid availability of information and analysis has eroded the dealers' comparative advantage in day-to-day trading.

C. Short-Term Financing of Securities: RP Markets

The financing of dealer positions has developed into a market all its own. Years ago, the dealers searched out the cheapest source of financing to increase the positive interest rate carry earned on their positions. The dealers tried to minimize the negative carry in periods when short-term financing rates were higher than the longer term rates being earned on the security. To improve their returns, dealers developed the sale of government and federal agency securities to corporations and other lenders under agreements to repurchase the securities a day, a week, or several months later at an agreed rate of interest for the period. Such RPs enabled investors to earn a return above the risk-free rate available from Treasury securities over very short intervals. Most lenders allowed the dealers the right to substitute collateral, so that the dealer could sell securities on demand, replacing them with others.

The mechanics of this market are best illustrated with an example. Suppose a government securities dealer purchases a particular Treasury security. The dealer then needs to finance that position. It may use its own capital, issue term debt, or borrow from a bank. More commonly, however, the dealer uses the RP market to obtain financing. The dealer can use the Treasury security as collateral for a loan at the specified term and rate of interest. At the same time, a customer of the dealer may have excess funds that it is willing to "lend" under those terms. The dealer then agrees to deliver ("sell") the security to

the customer for an amount determined by the RP rate and buy ("repurchase") the same security from the customer when the term of the loan expires. When the term is one day, the agreement is referred to as an overnight RP (or "repo" in common parlance); a loan for more than one day is called a term repo. (About 70 percent of RP activity is for contracts maturing within a month, and a large portion of that percentage consists of overnight contracts.) The advantage to the dealer of using the RP market for borrowing on a short-term basis is that the rate is generally lower than the cost of bank financing. Meanwhile, from the customer's perspective, the RP market offers an attractive yield on a short-term secured transaction.

A variety of institutional investors, including banks and thrifts, nonfinancial corporations, mutual funds, pension funds, and state and local government authorities use the RP markets. In addition to providing the opportunity to earn attractive yields without sacrificing liquidity, RPs also allow greater flexibility than other money market instruments because their maturities can be tailored precisely to meet the irregular cash flow patterns often experienced by many of these investors.

Steps have been taken in the RP market to prevent losses from the transaction itself. Safeguards have been put in place to ensure that collateral is sufficient and that promised collateral actually exists. These procedures were developed after a series of fraudulent operations during the early and mid-1980s led to serious losses.

Dealers use the RP market to run so-called matched books, a practice introduced in the 1950s and widely used beginning in the 1970s. They buy government securities for an extended period under a reverse RP from a holder in need of funds. Then they lend the securities on RP for an equivalent period at an interest rate lower than the one they charge the seller. The matching of maturities minimizes risks from price fluctuations. In effect, dealers have gone into the banking business, taking care that the credit standing of both customers ensures the reversal of the transaction. Dealers also protect themselves by taking a greater margin of collateral on the securities acquired than they give when lending the securities.

Dealers may also run an "unmatched book." In this case, dealers finance securities acquired under reverse RPs with shorter (or longer) term RPs to increase the interest rate spread

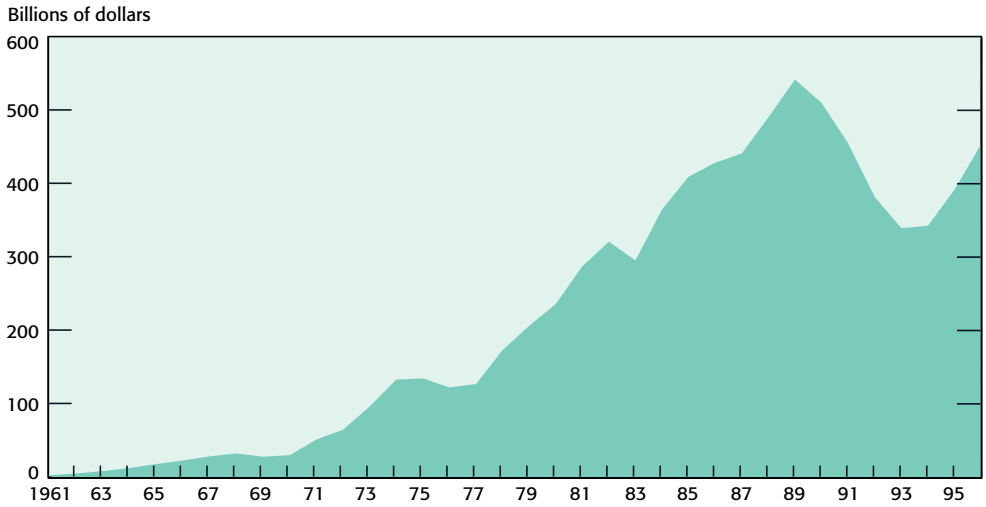
earned. Such activity runs the risk, of course, that financing costs may rise (or fall) in the interim and result in a loss rather than a profit. Just as dealer position taking is basically a bet on the future course of interest rates, the unmatched book is a bet on future financing costs. The resale value of the securities is fixed in the original contract, the reverse RP. In a straightforward position play, a dealer may purchase six-month Treasury bills at auction, expecting to finance at a positive carry for three months and then sell the bills at three months to maturity for a gain that, over time, should equal the average difference between three- and six-month bill rates over the cycle. If interest rates fall over the interval, the carry earned and the yield-curve-based sales gain will both be larger. But if interest rates rise sharply, the carry can become negative at the same time the bill's price is declining.

Although most of the parties lending money on RP are indifferent as to which issue they receive, some seek particular securities to fulfill sale or loan commitments. A specific issue or "specials" RP market has developed to handle this situation. When an issue is in heavy demand, holders of that issue may be able to borrow against it at a rate below the "general collateral" RP rate. Occasionally an issue may become very scarce, prompting participants to lend money for little or no interest to obtain that security.

For many years, the overnight RP rate for financing general collateral Treasury debt was almost always below the Federal funds rate. RP rates were lower because a lender using an RP contract has a security that can be liquidated if the loan is not repaid, while a lender of Federal funds has no such protection. During the 1980s, however, several events changed the relationship between RP and Federal funds rates. (Chart 2 shows average spreads between overnight RP and Federal funds rates.) Large cumulative Federal deficits greatly enlarged the total amount of Treasury debt outstanding, tending to expand the amounts in trading inventories. The consequent enlarged needs for financing of dealer positions lifted RP rates relative to the overnight Federal funds rate.

Commercial banks can participate in both markets, so they should have been in a position to arbitrage between them, borrowing Federal funds and lending under RP until the rates came at least into line. In the late 1980s, however, banks were facing increased capital requirements, and such arbitrage would have expanded the size of their balance sheets, thus

Chart 1. **Large Time Deposits**
Annual Averages



Source: Board of Governors of the Federal Reserve System.

further raising their need for capital. While some shifting of funding did occur in response to the rate differentials, the capital constraint kept it from being sufficient to end the anomalous rate relationship quickly. During the early 1990s, capital was rebuilt to the point where the constraints on banks eased, and the RP and funds rates have remained closer together. Dealers have also made increased use of other types of funds, such as issuing their own commercial paper.

D. Derivative Products

Financial innovations during the past twenty years have provided new means of hedging interest rate risk or speculating on the future course of interest rates. The instruments have helped dealers to manage their positions and have enabled a wide variety of businesses to lock in costs or returns consistent with expected cash flows.

Financial futures markets began to develop in the mid-1970s and expanded in the early 1980s as interest rate volatility rose. They were patterned after existing futures contracts in agricultural products and other commodities. The first financial futures were in Treasury securities. A host of new financial futures have appeared since, ranging from

contracts on Federal funds and other money market instruments to stock index futures. Today, financial futures rank among the most actively traded of all futures contracts. The growth of financial futures market activity has spawned so much arbitrage and trading between cash and futures that the two markets function as a unit most of the time. Futures markets provide a means of hedging against the effects of volatility, but by making speculative bets easier, they may contribute to volatility at times. Treasury bill and Eurodollar futures trade on the International Monetary Market of the Chicago Mercantile Exchange. Futures on Treasury notes and bonds and Federal funds trade on the Chicago Board of Trade.

Futures contracts help increase liquidity and flexibility. They allow dealers to offset the positions they must maintain to service customers—or to establish short positions—by entering futures contracts to deliver the specified securities on a limited number of specified dates over two years. The commission cost is very small—as low as $5 per contract on a "half turn," or single side of the futures transaction. The futures exchanges, which are private corporations of exchange members, issue contracts to buyers and sellers, each of which must meet the low initial margins set by the exchange.[14] Initial margins are in a range of 1 to 5 percent of the value of the instrument to be delivered. As the price of the futures contract fluctuates, the value of the investor's equity in the position changes accordingly. At the close of each trading day, a clearing corporation marks each contract to market to determine the net change in an investor's equity position. Should the position fall below the required maintenance level, which is somewhat lower than the initial margin amount, additional margin would be required. If, on the other hand, an investor's equity increases, funds could be withdrawn.

Options on Treasury securities and options on Treasury futures contracts have been available since the latter part of 1982. They expanded the range of hedging strategies that could be used to manage interest rate risk. Call options give the purchaser the right, but not the obligation, to purchase from the seller the indicated security or futures contract at a specified (strike) price at any time before the maturity of the contract (a process known as exercising the option). The purchaser benefits if the security or contract price rises above the contract strike price, while the risk from price declines is limited to the price of the option contract itself. Put options give the purchaser the right, but not the obligation, to sell the

security or the futures contract at a set price within the period of the contract; thus they benefit the purchaser in a falling market. Put options are like a short sale, but with limited downside risk for the purchaser. Options on futures contracts are much more actively traded than the straight options on securities. The writers of options contracts take open-ended risks from a price rise in the case of a call or a price fall in the case of a put. Writers may hedge this risk through diversification or other techniques, but these techniques may have costs that offset the gains from writing options.

Another form of derivative product based upon Treasury debt instruments is the stripped security. Stripped notes and bonds are zero-coupon instruments created by separating the coupons from the "corpus," or principal, of a security and trading them separately. Zero-coupon debt instruments are sold at a discount to par. The return to the investor comes from increases in price until maturity, when the instruments pay the face amount. (As interest rates rise and fall, the actual price of stripped securities will fluctuate around a rising trend line.) With no periodic interest payments to reinvest, these securities have an assured yield to maturity that is not dependent upon a reinvestment return on intervening interest payments. They are often attractive to pension funds and other entities with known future payment commitments. Nevertheless, because all the return is deferred to the maturity date, larger price changes will result from a given change in the general level of interest rates than would occur if the security returned interest periodically. Consequently, stripped securities can be attractive as a vehicle for speculation.[15]

Stripping of Treasury notes and bonds began during the 1970s. Initially, dealers physically removed the coupons from the corpus, since at the time coupon issues could be bought in definitive (paper) form. Because stripping reduced tax revenues, the Treasury discouraged the practice until 1982, when the tax laws were changed. The revised tax laws forced holders of zero-coupon and stripped Treasury securities to pay taxes each year on the portion of the accrual representing the movement toward the par value to be paid at maturity. The changes also required new coupon debt to be sold only in book entry and not definitive form. Physical stripping of older issues expanded once the practice was no longer discouraged. The holding of stripped issues mostly attracted entities that were not heavily taxed, because the revised laws made the tax burdensome.

Since the new book-entry securities could not initially be stripped, a number of government securities dealers created derivative instruments; they purchased Treasury issues, then placed them with a custodian and sold separate rights to the various coupons and the corpus. These receipts, called by a variety of proprietary names, were popular for a time. Although the receipts created from the coupon-stripping process were not a direct obligation of the U.S. Treasury, the underlying bond deposited in the bank custody account was, so the cash flow from the underlying security was considered certain.

In 1985, the Treasury began what is known as the STRIPS program (Separate Trading of Registered Interest and Principal of Securities). It permitted separate registration of the coupons and corpus of the book-entry securities and thus allowed dealers to sell them to different purchasers. All new Treasury notes and bonds with maturities of ten years and longer were eligible. Later, the Treasury provided the means to reconstitute a complete security if a party had accumulated all the needed pieces. The STRIPS form soon came to dominate the zero-coupon market. Its popularity has varied with the interest in zero-coupon products generally, which rises and falls with perceptions of the future course of interest rates.

2. Federally Sponsored Agency Securities

A. Markets for Direct Debt of Federally Sponsored Agencies

A number of special-purpose agencies with varying degrees of federal government sponsorship sell debt to finance their support of designated sectors of the economy, primarily agriculture and housing. As of fourth-quarter 1996, regular debt outstanding (excluding mortgage-backed pass-through securities, described in the next section) totaled about $897 billion in more than 200 issues. The principal agencies are the Farm Credit System (FCS), the Federal Home Loan Bank System (FHLB), the Federal Home Loan Mortgage Corporation (FHLMC, or "Freddie Mac"), the Federal National Mortgage Association (FNMA, or "Fannie Mae"), the Government National Mortgage Association (GNMA, or "Ginnie Mae"), and the Student Loan Marketing Association (SLMA, or "Sallie Mae"). Except for mortgage-backed securities and some special issues noted below, agency debt obligations are not explicitly backed by the full faith and credit of the U.S. government, even though the agencies are federally spon-

sored. Other government agencies have access to the Federal Financing Bank (FFB), which is funded by direct Treasury borrowing. These agencies have raised funds through the FFB since 1974, and most of them do not sell debt in their own names.

The FCS consists of a number of regionally based institutions that provide credit to farmers. It issues primarily short-term debt. Financial difficulties at a number of these institutions in the mid-1980s disrupted the system, leading to new legislation to recapitalize and restructure the Federal Farm Credit Bank System.[16] As part of this legislation, Congress created the Farm Credit Financial Assistance Corporation (FACO) in 1987, which issued government-guaranteed debt until 1992 to assist financially troubled Farm Credit Banks. The banks that borrowed from the agency are obligated to repay the loans in full, although interest payments on the loan are paid in part by the Federal government.

The FHLB, supervised by the Federal Housing Finance Board, provides loans to member institutions as a means of fostering the flow of funds into home mortgages; the FHL Banks are owned by the member associations. The FHLB system sells mostly short- and medium-term debt to finance itself. The thrift institution crises of the 1980s resulted in substantial restructuring.[17] Deposits of savings and loans were once insured by the Federal Savings and Loan Insurance Corporation (FSLIC), an entity supervised by the Home Loan System. But in 1987, when difficulties surrounding the savings and loan industry raised concerns about FSLIC's ability to insure deposits, the Financing Corporation (FICO) was established to provide funding for FSLIC by issuing debt. Originally, the primary source for FICO interest payments was to be the insurance premiums paid by members of the thrift industry. The amount of deposits held by these insured institutions has declined, however, as some thrift institutions have merged with banks while others have closed. In consequence, doubts have arisen over FICO's ability to continue satisfying its obligations. Proposals to restructure FICO's escrow account and identify additional funding sources are being evaluated.

FNMA is the nation's largest supplier of funds for American home mortgages and the second largest corporation in the United States, with a net portfolio, as of December 1994, of about $220 billion in mortgage loans. The corporation purchases government-insured and government-guaranteed

mortgages and conventional mortgages in the secondary market. It issues its own debentures and notes. (It also participates in the pass-through market described in the next section.) FNMA sells mostly intermediate-term debt with an occasional long-term issue. It also sells short-term discount notes. Now fully owned by private investors with shares publicly traded on the New York Stock Exchange, FNMA operates with guidance from the Secretary of Housing and Urban Development.

SLMA provides a variety of support services to institutions making loans to students. Before l982, it borrowed directly from the FFB, but since then it has borrowed in the market under its own name. It issues primarily floating-rate debt. Occasionally it sells fixed-rate debt, then converts its payment stream to a floating-rate obligation through the use of swaps. Currently, SLMA is pursuing a charter restructuring under which it would give up its status as a government-sponsored entity and become a state-chartered corporation. The administration has voiced support for the rechartering of SLMA and has stated its intention to introduce such legislation. In addition, SLMA may enter into additional lines of business related to the higher education market.

In recent years, federal agencies have increasingly issued so-called structured notes. Agencies issue medium-term notes (MTN) and simultaneously enter into one or more swap agreements to satisfy the terms of the specific cash flow obligations. For example, an agency might issue a three-year floating-rate MTN that pays LIBOR plus some premium on a semiannual basis. At the same time, the agency negotiates a swap transaction in which it agrees to pay a fixed rate of interest semiannually for three years in exchange for receiving LIBOR from a swap counterparty. As a result of the swap, the borrower has synthetically created a fixed-rate note because the floating-rate payments are offsetting. Many structured transactions originate when an investor has demand for a security of one type while the potential issuer prefers an obligation with different characteristics.

Most agencies also borrow short term through a discount note program. The federal agency discount note market is very liquid. Current daily programs range in size from $150 million to more than $5 billion. Discount note securities offer attractive opportunities for investors who want yields above Treasury issues as well as liquidity.

Federal agencies generally use a designated fiscal agent to manage sales to investors.[18] The fiscal agents sell

their coupon securities to the public either through selling groups, currently composed of about thirty to eighty-five members, or through private placements. The fiscal agents rely on members of their selling group for advice in choosing the maturities to be offered and the interest coupons necessary to sell the securities. Because of the long-term profitability of this relationship, members of the group characteristically agree to sell the securities even when they think the pricing is aggressive.

Agency issues have attracted wide investor participation during periods when their credit quality has not been a source of concern. Because of their government sponsorship and supervision, the securities of the sponsored agencies generally trade at yields only modestly above those on comparable maturity Treasury issues. Within the past several years, the range of spreads has been anywhere from 5 to 35 basis points for noncallable securities with maturities of one to five years and 15 to 40 basis points for longer maturities. The yield differentials also reflect a number of other factors, including structure, size of the issue, shape of the yield curve, level of interest rates, tax treatment, and overall market trends. Income from the FCS, FHLB, SLMA, and FICO issues is exempt from state and local taxation, while income from FNMA, GNMA, and FHLMC issues is not.

Most dealers in government securities make secondary markets in these issues, although trading in many outstanding issues is inactive. The size of some issues is small—as little as $200 million. Bid-ask spreads are related to the amount of activity in the secondary market. They are generally wider than those on Treasury securities of corresponding maturity.

B. Mortgage-Backed Securities

Techniques for mortgage finance have changed dramatically in the last twenty years, contributing to explosive growth in mortgage-related market instruments. Traditionally, banks and thrift institutions made long-term fixed-rate loans for the purchase of real estate and financed them mostly with short-maturity deposits. The rising and volatile interest rate patterns of the 1970s made this maturity imbalance costly and encouraged the development of alternative techniques for mortgage finance. One approach was to create variable rate mortgages, which adjusted more or less in line with the depositories' cost of funds. Another was to "securitize" the loans, allowing the depositories to "sell" them. Securitization

of mortgages has come to be the dominant practice in the industry.

GNMA and the FHLMC were created to promote a secondary market in mortgage products. GNMA is a government corporation that functions principally by guaranteeing pass-through securities. These securities pass through to the purchaser the interest earned and principal (which may be prepaid) on pools of government-guaranteed mortgages. The holder of the securities receives a pro rata share of the principal and interest payments earned on the mortgages. The FHLMC buys conventional residential mortgages to foster a secondary market for them; it sells pass-through securities and other bonds to finance its activities. The FHLMC's voting capital stock used to be held solely by the FHLB, but under the terms of the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA), its voting stock has been publicly issued.

The development of mortgage-backed securities meant that the mortgage originators were no longer committed to hold an illiquid asset. Depositories and mortgage bankers could sell the loan to one of the specialized government agencies as long as the loan satisfied certain conditions specified by the agencies to limit credit risk. The agencies created pools of the mortgages and used them to issue the mortgage-backed securities on which they guaranteed the interest and principal payments. Servicers—sometimes the mortgage originator but often specialized institutions—collected interest and principal from the borrowers and passed it to the holders of the securities (less a servicing fee).

Mortgage-backed securities do have a feature that tends to make them more volatile than regular debt issues. While they carry a nominal maturity date based upon the maturities of the underlying mortgages, the effective maturities are considerably shorter and highly uncertain because mortgages are often prepaid. The number of prepayments rises when interest rates fall, which means that what investors thought was a long-term instrument may be paid off rapidly just when falling rates makes reinvestment relatively unattractive. Prices of mortgage-backed securities are consequently much more sensitive to changes in interest rate patterns than are prices of other types of securities, and spreads to Treasuries are variable. Not surprisingly, the market has developed many derivative products to hedge or speculate on interest rate movements.

Mortgage-backed securities are held by a range of large and small investors, with most small investors making purchases through mutual funds.[19] The market is huge; according to FNMA, around $1.7 trillion of securitized mortgages was outstanding in the fourth quarter of 1996.

3. Corporate Debt Instruments

A. Commercial Paper

One of the most rapidly growing sectors of the money market in the last twenty years has been the market for the short-term promissory notes of creditworthy financial and other business enterprises.[20] The smallest denomination for dealer-placed paper is $100,000; blocks of $20 million to $25 million are more common, especially on directly placed paper. Corporate issuers with good credit ratings can often borrow at lower cost in the commercial paper market than from banks. Investors are attracted by the yield premium offered over Treasury issues. To be exempt from registration with the SEC, such notes must mature in 270 days or less and be issued for working capital purposes, such as financing inventories and accounts receivable. The most popular maturities depend somewhat on the rate structure at the time of issuance. Generally, most commercial paper matures between five and forty-five days, with the one-month area being most common.

Commercial paper is sold to money market investors either directly by a firm's own sales force or through a dealer that makes sales on behalf of many borrowers. Direct placement is characteristic of large finance and credit companies, which are often affiliates of automobile and other manufacturers, and of bank holding companies. About 30 to 35 percent of the approximately $779 billion of commercial paper outstanding in the fourth quarter of 1996 was placed directly. The remainder was placed by a small number of dealers with specialized sales forces. Approximately 1,000 companies issue through dealers, including industrial companies, public utilities, bank holding companies, smaller finance companies, foreign banks, and a few foreign government agencies.

Most commercial paper is sold by companies with strong credit ratings. Some small-to-medium-sized firms obtain a letter of credit from a bank—in most instances a foreign bank—that will allow the firm to achieve a good credit rating. The credit rating companies—Standard & Poor's (S&P),

Moody's, and Fitch's—assign numerical ratings to a company's debt after a careful review of the company's balance sheet and operations.[21] In recent years, around 60 percent of all paper sold has carried the top grade (including both A-1+ and A-1 for S&P). Money market mutual funds, which are large purchasers, have been restricted by the SEC since June 1991 to hold no more than 1 percent of assets in lower rated paper.

Commercial paper issuers generally maintain backup liquidity through bank credit lines that will cover the amount of any paper outstanding. Increasingly, backup lines of credit are structured in terms of multiyear revolving agreements in which a bank commits to loan funds to a firm at a floating base rate tied to some predetermined rate such as the prime or LIBOR rate. The spread over the base rate is negotiated at the time of the agreement. The length of the commitment varies, but the trend recently has been toward shorter terms, typically around three years. Compensation for the commitment involves various fees to the bank, generally a certain percentage of the credit line.

Commercial paper is sold at a discount and is redeemed at par at maturity. Dealers generally distribute the paper immediately after receiving it from the issuer and therefore do not hold large amounts in inventory. Dealers will, however, temporarily hold commercial paper when an issuer's needs are pressing. Inventories tend to grow when financing rates are below the return on paper. When financing rates exceed the return, dealers attempt to minimize inventories. Spreads between the rates at which paper is bought and sold are around 10 basis points.

Commercial paper is increasingly being issued in book-entry form. The Depository Trust Company, a New York limited-purpose trust company, has been providing a book-entry system for commercial paper since 1990. To a limited extent, some commercial paper is still issued in physical form. Such paper is lodged by the company with a New York bank, which countersigns and delivers the notes to the commercial paper dealer for payment that same day.

B. Corporate Bonds

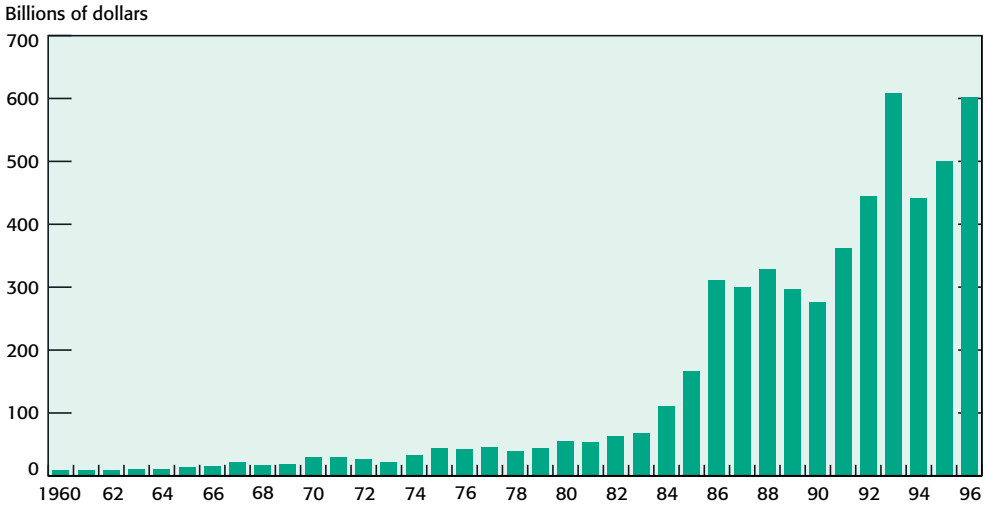
While commercial paper helps satisfy the short-term borrowing needs of many firms, corporate bonds are issued to provide longer term financing. They are often classified by the type of issuing firm: public utility, transportation, industrial, financial, or real estate. Sales by foreign governments in the

U.S. market are treated like corporate debt because they are sold in a similar fashion. Issuance has grown irregularly but rapidly on average; it is sensitive to yields (Chart 3). In the fourth quarter of 1996, $3.1 trillion of corporate debt was outstanding.

Corporate bonds may carry a significant risk of default. The risk for a particular issue depends primarily on the perceived creditworthiness of the issuer but also on how the issue is secured: mortgage bonds are secured by a first lien on property or equipment, collateral bonds by the holding of securities, and debentures by whatever unpledged assets remain at the time of liquidation.[22] Investors may make their own judgments, but generally they rely on the credit ratings assigned by major ratings agencies such as Moody's and S&P. These ratings range from Moody's Aaa (or S&P's AAA) for prime-grade issues down to C for the poorest prospects (or S&P's D for issues actually in default). Issues assigned higher ratings are naturally offered at lower yields.

Corporate bonds have been sold in recent years in maturities ranging from one to a hundred years, although relatively little debt is sold with maturities beyond thirty years. So-called medium-term notes, with maturities of nine months to thirty years, have become increasingly popular in recent years. The majority of the longer maturity issues can be called by the issuer at a prearranged price, typically after an

Chart 3. **Issuance of Investment-Grade Corporate Debt**



Source: Merrill Lynch Government Securities, Inc.

initial period of three to ten years. The issuer will usually call a bond if interest rates have fallen far enough to allow refinancing at lower yields or if the issuer's credit rating has risen significantly since the initial sale. Even if an issue has no call feature, some of it may be retired before the bond reaches its nominal maturity by means of a "sinking fund" provision. The provision requires the issuer to retire gradually a specified portion of the issue each year; in some cases, the provision requires retiring all of the issue by maturity, but in other cases, a single "balloon" payment at the end may be necessary to retire the remaining debt. Sinking fund provisions are characteristic of industrial bonds but are almost never attached to financial issues. Most corporate bonds pay interest semiannually, although a relatively small volume of zero-coupon corporates has been issued as well.

Corporate bonds are usually sold to the public through underwriting syndicates formed by investment banking institutions that have corporate bond divisions. In l989, a Federal Reserve Board ruling gave commercial banks limited authority to underwrite corporate debt through their securities subsidiaries. The firm acting as lead manager recommends the maturities and types of issues believed to be consistent with the issuer's financial needs and tests market appetite through conversations with potential large buyers. Each member of the syndicate will be allocated securities to place with its customers. In some cases, a whole issue may be placed privately with a large investor, generally an insurance company, and never be sold publicly.

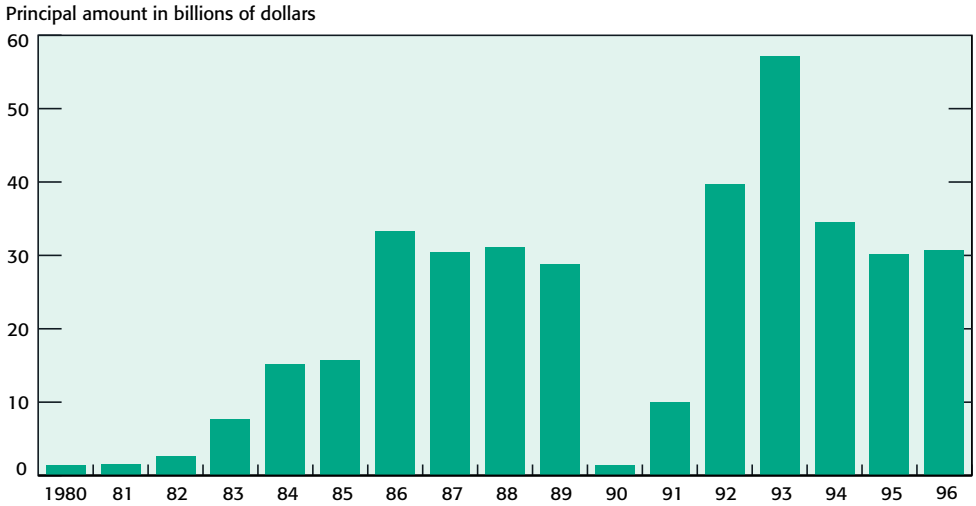
Public offerings must be registered with the SEC, which requires the corporation to report actual and potential obligations that might affect the ability of the corporation to repay the debt. The commission permits "shelf registration," which allows corporate issuers to register their intent to issue debt any time within the upcoming three years without prespecifying issuing dates or amounts (Rule 415). Consequently, issuers can bring the debt to market relatively quickly once the decision is made to offer it. Major purchasers of corporate debt vary over time but generally include insurance companies, pension funds, households, commercial banks, and foreign investors.

Nearly all secondary market trading of corporate bonds takes place in the over-the-counter market, with the residual occurring on organized exchanges such as the New York Stock Exchange. The over-the-counter market is made by securities dealers who trade directly with other dealers and with large

institutional investors. Given the vast number of outstanding corporate issues, the market for most individual issues is illiquid, although the market for particular types of bonds may be fairly broad. Since corporate bonds are less liquid than Treasury securities, the bid-ask spreads quoted by dealers normally exceed those on Treasuries; investment-grade corporate spreads typically range from 1/8 to 1/2 percent, while spreads for lower rated issues are larger. Issues listed on an exchange are more liquid than otherwise similar unlisted issues.

In the 1980s, the market for relatively risky bonds, generally referred to as high yield or junk bonds—carrying Moody's ratings of Ba1 or less and S&P ratings of BB+ or less—grew explosively. Growth was interrupted on several occasions in the face of failures by prominent issuers and a major market maker. After rapid expansion between 1982 and 1986, issuance remained at high levels through the rest of the decade. Then, in 1990, it practically disappeared with the collapse of Drexel Burnham Lambert, previously the largest underwriter and market maker in junk bonds. Issuance rose sharply over the next several years as the economy recovered and other firms became active underwriters. (Chart 4 shows annual issuance.)

Chart 4. **Issuance of Below-Investment-Grade Corporate Debt**

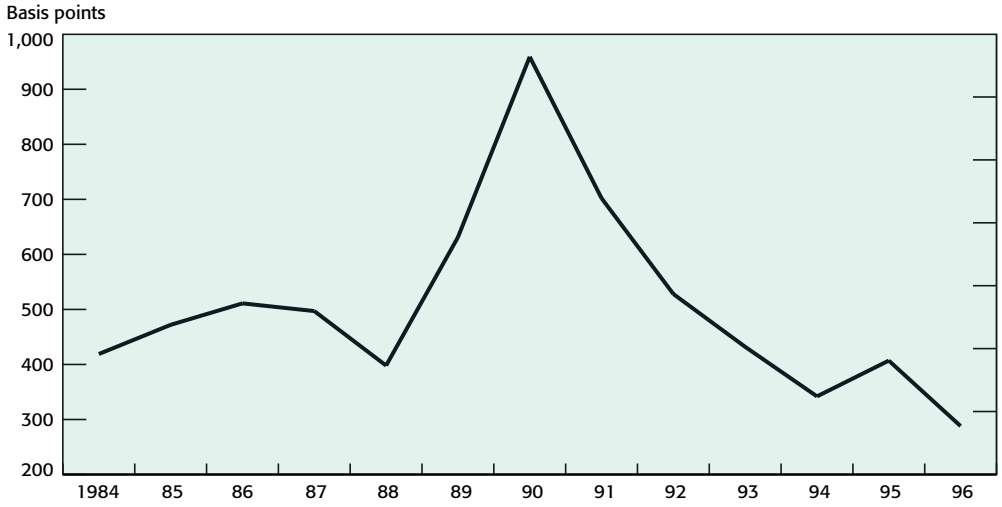


Source: Merrill Lynch Government Securities, Inc.

Issuers saw such debt as an attractive means of financing risky corporate acquisitions; after the acquisition, the corporation would often sell off some assets to fund interest and principal on the debt. To some extent, the expansion of junk bond issuance represented a substitute for private placements of unrated bonds, primarily with insurance companies. (Unrated private placements remain a popular means of finance.) To a greater extent, it represented conversions, from equity finance to debt finance, undertaken at least partly for the tax benefit. In some cases, the company's management bought outstanding common stock, financing the purchase through sales of bonds. In other cases, the conversions were accomplished in a takeover by an outside interest.

Junk bonds have appealed to investors attracted by yields considerably above those on Treasury issues of comparable maturity.[23] The higher yields offered on junk bonds relative to investment-grade issues are intended to compensate for the greater risk of default. The market has had some difficulty determining appropriate yield spreads. Spreads have risen sharply in the face of publicized defaults, then narrowed with the passage of time. Drexel's collapse led to a prolonged period of elevated spreads. Nonetheless, in 1992, spreads had returned to their earlier range (Chart 5).

Chart 5. **Yields on Below-Investment-Grade Bonds versus Treasury Debt**
Spreads of Market-Weighted Yields to Maturity



Source: Merrill Lynch Government Securities, Inc.

Note: Data are year-end figures.

C. Eurobonds

The Eurobond market, centered in London, is an offshore market in intermediate- and long-term debt issues. It serves as a source of capital for multinational corporations and for foreign governments. It developed after the United States instituted the interest equalization tax in 1963 to stem capital outflows inspired by relatively low U.S. interest rates.[24] The tax gave European corporations an incentive to issue dollar-denominated bonds in Europe rather than in New York. Efforts in the 1960s to limit U.S. direct overseas investment prompted U.S. corporations to raise capital for overseas operations in the Euromarkets as well. Moreover, bonds issued by subsidiaries of U.S. corporations chartered outside the United States were exempt from the U.S. withholding tax on interest paid to foreigners. Non-U.S.-dollar Eurobond issues began to be sold in the mid-1960s, soon after the establishment of the Eurodollar bond market.[25]

The Eurobond market was well established when the interest equalization tax was removed in 1974, and it faltered only briefly before resuming its growth. Issuance of foreign currency Eurobonds picked up at times in the 1970s, but it soared after the dollar's exchange value began to decline in 1985. Bonds denominated in European currency units (ECUs) became popular. The liberalization of national markets and the growth of currency swaps added momentum to foreign currency Eurobond issuance. A currency swap allows a U.S. borrower, for example, to issue an Australian dollar bond in the Euromarket and transform the exposure to U.S. dollars. The major foreign currencies, especially the yen, accounted for most of the growth in nondollar Eurobonds, but currency swaps have promoted issuance in several other currencies.

4. Municipal Securities

Municipal securities are issued by state and local governments and by special authorities providing services such as housing, education, transportation facilities, and industrial development. Issues maturing in one year or less are generally referred to as "notes," while longer term obligations are known as "bonds"; the great bulk of funds raised in the municipal market take the form of bond offerings.[26]

Many municipal bonds are exempt from federal income taxes; in addition, for investors residing in the state in which the securities were issued, the bonds are exempt from state and local taxes.

Restrictions on tax-exempt status for private-purpose and industrial development bonds mandated by tax legislation passed in 1986 reduced somewhat the scope of the tax-exempt portion of the market and led to the creation of taxable and partially taxable municipal bonds. Periodic discussions of the possibility of a "flat tax," which would exempt recipients of interest income from taxes regardless of the source, tend to narrow the yield advantage because investors cannot be certain if the tax-exempt feature will have value throughout the life of the security.

Like corporate debt, municipal bonds involve varying degrees of risk. Substantial help in assessing the likelihood of default is offered by Moody's and S&P.[27] These firms base their ratings on their assessment of each issue's security. Generally, municipal bonds can be secured in one of two ways: "revenue" bonds are issued to finance specific projects, and the proceeds of those projects, normally in the form of user fees, are used to service and retire the debt; "general obligation" bonds are backed by the full faith and credit of the issuer, which can use its taxing authority to raise funds to pay interest and principal on the bonds.[28] Some issues are hybrids of the two types, and a sizable proportion of new debt is independently guaranteed by firms specializing in municipal bond insurance.

Investors in municipal bonds were traditionally drawn by the tax-exempt feature. The three major groups of investors have been households (including mutual funds), commercial banks, and property and casualty insurance firms. The 1986 tax reforms resulted in households becoming dominant. Although lower marginal tax rates and the alternative minimum tax reduced the attractiveness of municipal bonds to households, other tax shelters were curtailed as well. The legislation also eliminated the deductibility of carrying costs for commercial banks, a change that greatly diminished the banks' participation. Property and casualty insurers have generally invested in municipal securities when they have had profits to shelter. Thus, their investment has varied considerably from year to year.

New public offerings of municipal bonds may be marketed either by competitive bidding among underwriters or through directly negotiated underwritings. Underwriting is done by investment and commercial banks. Most general obligation issues are competitively offered, while revenue issues may be underwritten through either method. Once distributed, issues trade in a reasonably active secondary market maintained by a group of dealers nationwide. The relative shrinkage in the tax-exempt portion of the market in recent years has encouraged a number of

firms to drop out of municipal bond market-making activities. Because, municipal issues are not listed on formal exchanges, transactions are generally carried out by phone. They are advertised through both the *Bond Buyer*'s "munifacts" teletype system and S&P's *Blue List* publication. Typical bid-ask spreads quoted by dealers for retail investors are about 2 points, while spreads for institutional investors tend to run around 1/2 point or less.