

### 3 The Implementation of Monetary Policy

*The Federal Reserve exercises considerable control over the demand for and supply of balances that depository institutions hold at the Reserve Banks. In so doing, it influences the federal funds rate and, ultimately, employment, output, and prices.*

The Federal Reserve implements U.S. monetary policy by affecting conditions in the market for balances that depository institutions hold at the Federal Reserve Banks. The operating objectives or targets that it has used to effect desired conditions in this market have varied over the years. At one time, the FOMC sought to achieve a specific quantity of balances, but now it sets a target for the interest rate at which those balances are traded between depository institutions—the federal funds rate. (See “Operational Approaches over the Years” on page 28.) By conducting open market operations, imposing reserve requirements, permitting depository institutions to hold contractual clearing balances, and extending credit through its discount window facility, the Federal Reserve exercises considerable control over the demand for and supply of Federal Reserve balances and the federal funds rate. Through its control of the federal funds rate, the Federal Reserve is able to foster financial and monetary conditions consistent with its monetary policy objectives.

#### **The Market for Federal Reserve Balances**

The Federal Reserve influences the economy through the market for balances that depository institutions maintain in their accounts at Federal Reserve Banks. Depository institutions make and receive payments on behalf of their customers or themselves in these accounts. The end-of-day balances in these accounts are used to meet reserve and other balance requirements. If a depository institution anticipates that it will end the day with a larger balance than it needs, it can reduce that balance in several ways, depending on how long it expects the surplus to persist. For example, if it expects the surplus to be temporary, the institution can lend excess balances in financing markets, such as the market for repurchase agreements or the market for federal funds.

## Operational Approaches over the Years

The Federal Reserve can try to achieve a desired quantity of balances at the Federal Reserve Banks or a desired price of those balances (the federal funds rate), but it may not be able to achieve both at once. The greater the emphasis on a quantity objective, the more short-run changes in the demand for balances will influence the federal funds rate. Conversely, the greater the emphasis on a funds-rate objective, the more shifts in demand will influence the quantity of balances at the Federal Reserve. Over the years, the Federal Reserve has used variations of both of these operational approaches.

During most of the 1970s, the Federal Reserve targeted the price of Federal Reserve balances. The FOMC would choose a target federal funds rate that it thought would be consistent with its objective for M1 growth over short intervals of time. The funds-rate target would be raised or lowered if M1 growth significantly exceeded or fell short of the desired rate. At times, large rate movements were needed to bring money growth back in line with the target, but the extent of the necessary policy adjustment was not always gauged accurately. Moreover, there appears to have been some reluctance to permit substantial variation in the funds rate. As a result, the FOMC did not have great success in combating the increase in inflationary pressures that resulted from oil-price shocks and excessive money growth over the decade.

By late 1979, the FOMC recognized that a change in tactics was necessary. In October, the Federal Reserve began to target the quantity of reserves—the sum of balances at the Federal Reserve and cash in the vaults of depository institutions that is used to meet reserve requirements—to achieve greater control over M1 and bring down inflation. In particular, the operational objective for open market operations was a specific level of nonborrowed reserves, or total reserves less the quantity of discount window borrowing. A predetermined target path for nonborrowed reserves was based on the FOMC's objectives for M1. If M1 grew faster than the objective, required reserves, which were linked to M1 through the required reserve ratios, would expand more quickly than nonborrowed reserves. With the fixed supply of nonborrowed reserves falling short of demand, banks would bid up the

federal funds rate, sometimes sharply. The rise in short-term interest rates would eventually damp M1 growth, and M1 would be brought back toward its targeted path.

By late 1982, it had become clear that the combination of interest rate deregulation and financial innovation had weakened the historical link between M1 and the economic objectives of monetary policy. The FOMC began to make more discretionary decisions about money market conditions, using a wider array of economic and financial variables to judge the need for adjustments in short-term interest rates. In the day-to-day implementation of open market operations, this change was manifested in a shift of focus from a nonborrowed-reserve target to a borrowed-reserve target. The Federal Reserve routinely supplied fewer nonborrowed reserves than the estimated demand for total reserves, thus forcing depository institutions to meet their remaining need for reserves by borrowing at the discount window. The total amount borrowed was limited, however, even though the discount rate was generally below the federal funds rate, because access to discount window credit was restricted. In particular, depository institutions were required to pursue all other reasonably available sources of funds, including those available in the federal funds market, before credit was granted. During the time it was targeting borrowed reserves, the Federal Reserve influenced the level of the federal funds rate by controlling the extent to which depository institutions had to turn to the discount window. When it wanted to ease monetary policy, it would reduce the borrowed-reserve target and supply more nonborrowed reserves to meet estimated demand. With less pressure to borrow from the discount window, depository institutions would bid less aggressively for balances at the Federal Reserve and the federal funds rate would fall.

Beginning in the mid-1980s, spreading doubts about the financial health of some depository institutions led to an increasing reluctance on the part of many institutions to borrow at the discount window, thus weakening the link between borrowing and the federal funds rate. Consequently, the Federal Reserve increasingly sought to attain a specific level of the federal funds rate rather than a targeted amount of borrowed reserves. In July 1995, the FOMC began to announce its target for the federal funds rate.

In the federal funds market, depository institutions actively trade balances held at the Federal Reserve with each other, usually overnight, on an uncollateralized basis. Institutions with surplus balances in their accounts lend those balances to institutions in need of larger balances. The federal funds rate—the interest rate at which these transactions occur—is an important benchmark in financial markets. Daily fluctuations in the federal funds rate reflect demand and supply conditions in the market for Federal Reserve balances.

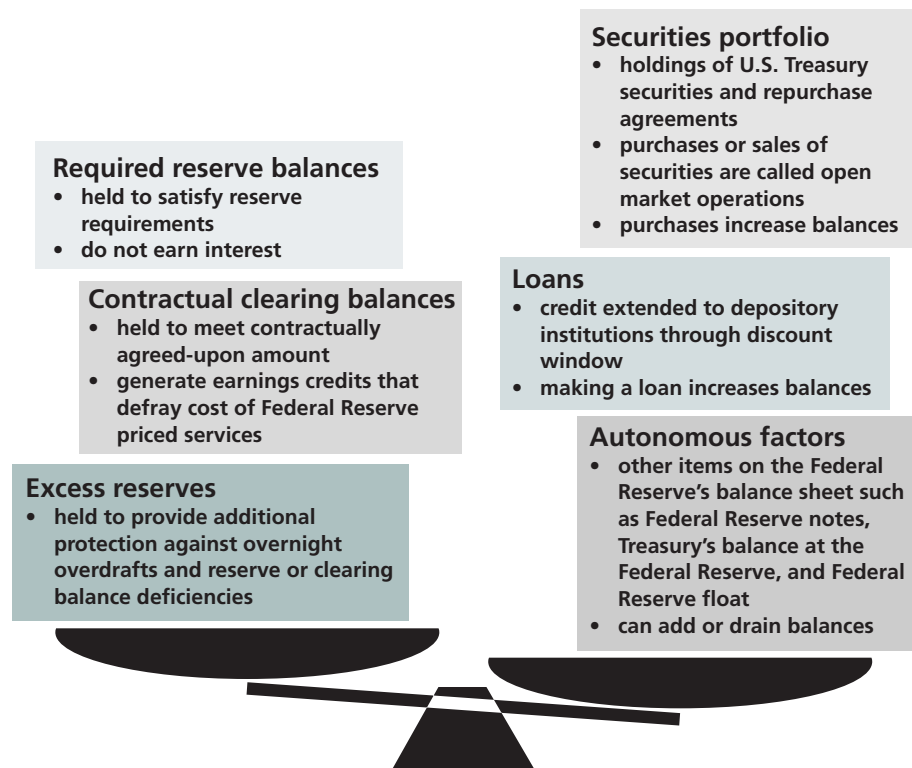
## Demand for Federal Reserve Balances

The demand for Federal Reserve balances has three components: required reserve balances, contractual clearing balances, and excess reserve balances.

### *Required Reserve Balances*

Required reserve balances are balances that a depository institution must hold with the Federal Reserve to satisfy its reserve requirement. Reserve requirements are imposed on all depository institutions—which include commercial banks, savings banks, savings and loan associations, and credit unions—as well as U.S. branches and agencies of foreign banks and other

## The Market for Balances at the Federal Reserve



domestic banking entities that engage in international transactions. Since the early 1990s, reserve requirements have been applied only to transaction deposits, which include demand deposits and interest-bearing accounts that offer unlimited checking privileges. An institution's reserve requirement is a fraction of such deposits; the fraction—the required reserve ratio—is set by the Board of Governors within limits prescribed in the Federal Reserve Act. A depository institution's reserve requirement expands or contracts with the level of its transaction deposits and with the required reserve ratio set by the Board. In practice, the changes in required reserves reflect movements in transaction deposits because the Federal Reserve adjusts the required reserve ratio only infrequently.

A depository institution satisfies its reserve requirement by its holdings of vault cash (currency in its vault) and, if vault cash is insufficient to meet the requirement, by the balance maintained directly with a Federal Reserve Bank or indirectly with a pass-through correspondent bank (which in turn holds the balances in its account at the Federal Reserve). The difference between an institution's reserve requirement and the vault cash used to meet that requirement is called the required reserve balance. If the balance maintained by the depository institution does not satisfy its reserve balance requirement, the deficiency may be subject to a charge.

### ***Contractual Clearing Balances***

Depository institutions use their accounts at Federal Reserve Banks not only to satisfy their reserve balance requirements but also to clear many financial transactions. Given the volume and unpredictability of transactions that clear through their accounts every day, depository institutions seek to hold an end-of-day balance that is high enough to protect against unexpected debits that could leave their accounts overdrawn at the end of the day and against any resulting charges, which could be quite large. If a depository institution finds that targeting an end-of-day balance equal to its required reserve balance provides insufficient protection against overdrafts, it may establish a contractual clearing balance (sometimes referred to as a required clearing balance).

A contractual clearing balance is an amount that a depository institution agrees to hold at its Reserve Bank in addition to any required reserve balance. In return, the depository institution earns implicit interest, in the form of earnings credits, on the balance held to satisfy its contractual clearing balance. It uses these credits to defray the cost of the Federal Reserve services it uses, such as check clearing and wire transfers of funds and securities. If the depository institution fails to satisfy its contractual requirement, the deficiency is subject to a charge.

### *Excess Reserve Balances*

A depository institution may hold balances at its Federal Reserve Bank in addition to those it must hold to meet its reserve balance requirement and its contractual clearing balance; these balances are called excess reserve balances (or excess reserves). In general, a depository institution attempts to keep excess reserve balances at low levels because balances at the Federal Reserve do not earn interest. However, a depository institution may aim to hold some positive excess reserve balances at the end of the day as additional protection against an overnight overdraft in its account or the risk of failing to hold enough balances to satisfy its reserve or clearing balance requirement. This desired cushion of balances can vary considerably from day to day, depending in part on the volume and uncertainty about payments flowing through the institution's account. The daily demand for excess reserve balances is the least-predictable component of the demand for balances. (See table 3.1 for data on required reserve balances, contractual clearing balances, and excess reserve balances.)

*Purchases or sales of securities by the Federal Reserve, whether outright or temporary, are called open market operations.*

Table 3.1

### **Measures of aggregate balances, 2001–2004**

Billions of dollars; annual averages of daily data

Year	Required reserve balances	Contractual clearing balances	Excess reserve balances
2001	7.2	7.0	2.8
2002	8.0	9.7	1.5
2003	10.0	11.0	1.8
2004	11.0	10.4	1.6

### **Supply of Federal Reserve Balances**

The supply of Federal Reserve balances to depository institutions comes from three sources: the Federal Reserve's portfolio of securities and repurchase agreements; loans from the Federal Reserve through its discount window facility; and certain other items on the Federal Reserve's balance sheet known as autonomous factors.

### *Securities Portfolio*

The most important source of balances to depository institutions is the Federal Reserve's portfolio of securities. The Federal Reserve buys and sells securities either on an outright (also called permanent) basis or temporarily in the form of repurchase agreements and reverse repurchase

agreements. Purchases or sales of securities by the Federal Reserve, whether outright or temporary, are called open market operations, and they are the Federal Reserve's principal tool for influencing the supply of balances at the Federal Reserve Banks. Open market operations are conducted to align the supply of balances at the Federal Reserve with the demand for those balances at the target rate set by the FOMC.

Purchasing securities or arranging a repurchase agreement increases the quantity of balances because the Federal Reserve creates balances when it credits the account of the seller's depository institution at the Federal Reserve for the amount of the transaction; there is no corresponding offset in another institution's account. Conversely, selling securities or conducting a reverse repurchase agreement decreases the quantity of Federal Reserve balances because the Federal Reserve extinguishes balances when it debits the account of the purchaser's depository institution at the Federal Reserve; there is no corresponding increase in another institution's account. In contrast, when financial institutions, business firms, or individuals buy or sell securities among themselves, the credit to the account of the seller's depository institution is offset by the debit to the account of the purchaser's depository institution; so existing balances held at the Federal Reserve are redistributed from one depository institution to another without changing the total available.

### ***Discount Window Lending***

The supply of Federal Reserve balances increases when depository institutions borrow from the Federal Reserve's discount window. Access to discount window credit is established by rules set by the Board of Governors, and loans are made at interest rates set by the Reserve Banks and approved by the Board. Depository institutions decide to borrow based on the level of the lending rate and their liquidity needs. Beginning in early 2003, rates for discount window loans have been set above prevailing market rates (see "Major Revision to Discount Window Programs" on page 47). As a result, depository institutions typically will borrow from the discount window in significant volume only when overall market conditions have tightened enough to push the federal funds rate up close to the discount rate. Overall market conditions tend to tighten to such an extent only infrequently, so the volume of balances supplied through the discount window is usually only a small portion of the total supply of Federal Reserve balances. However, at times of market disruptions, such as after the terrorist attacks in 2001, loans extended through the discount window can supply a considerable volume of Federal Reserve balances.

### ***Autonomous Factors***

The supply of balances can vary substantially from day to day because of movements in other items on the Federal Reserve's balance sheet (table

*The supply of Federal Reserve balances increases when depository institutions borrow from the Federal Reserve's discount window.*

3.2). These so-called autonomous factors are generally outside the Federal Reserve’s direct day-to-day control. The most important of these factors are Federal Reserve notes, the Treasury’s balance at the Federal Reserve, and Federal Reserve float.

The largest autonomous factor is Federal Reserve notes. When a depository institution needs currency, it places an order with a Federal Reserve Bank. When the Federal Reserve fills the order, it debits the account of the depository institution at the Federal Reserve, and total Federal Reserve balances decline. The amount of currency demanded tends to grow over time, in part reflecting increases in nominal spending as the economy grows. Consequently, an increasing volume of balances would be extinguished, and the federal funds rate would rise, if the Federal Reserve did not offset the contraction in balances by purchasing securities. Indeed, the expansion of Federal Reserve notes is the primary reason that the Federal Reserve’s holdings of securities grow over time.

Table 3.2

**Consolidated balance sheet of the Federal Reserve Banks, December 31, 2004**

Millions of dollars

Assets		Liabilities	
Securities	717,819	Federal Reserve notes	719,436
Repurchase agreements	33,000	Reverse repurchase agreements	30,783
Loans	43	Balance, U.S. Treasury account	5,912
Float	927	Other liabilities and capital	27,745
All other assets	56,130	Balances, all depository institutions	24,043

Another important factor is the balance in the U.S. Treasury’s account at the Federal Reserve. The Treasury draws on this account to make payments by check or direct deposit for all types of federal spending. When these payments clear, the Treasury’s account is reduced and the account of the depository institution for the person or entity that receives the funds is increased. The Treasury is not a depository institution, so a payment by the Treasury to the public (for example, a Social Security payment) raises the volume of Federal Reserve balances available to depository institutions. Movements in the Treasury’s balance at the Federal Reserve tend to be less predictable following corporate and individual tax dates, especially in the weeks following the April 15 deadline for federal income tax payments.

Federal Reserve float is created when the account of the depository institution presenting a check for payment is credited on a different day than



the account of the depository institution on which the check is drawn is debited. This situation can arise because credit is granted to the presenting depository institution on a preset schedule, whereas the paying institution's account is not debited until the check is presented to it. Float temporarily adds Federal Reserve balances when there is a delay in debiting the paying institution's account because the two depository institutions essentially are credited with the same balances. Float temporarily drains balances when the paying institution's account is debited before the presenting institution receives credit under the schedule. Float tends to be quite high and variable following inclement weather that disrupts the normal check-delivery process.

## Controlling the Federal Funds Rate

The Federal Reserve's conduct of open market operations, its policies related to required reserves and contractual clearing balances, and its lending through the discount window all play important roles in keeping the federal funds rate close to the FOMC's target rate. Open market operations are the most powerful and often-used tool for controlling the funds rate. These operations, which are arranged nearly every business day, are designed to bring the supply of Federal Reserve balances in line with the demand for those balances at the FOMC's target rate. Required reserve balances and contractual clearing balances facilitate the conduct of open market operations by creating a predictable demand for Federal Reserve balances. If, even after an open market operation is arranged, the supply of balances falls short of demand, then discount window lending provides a mechanism for expanding the supply of balances to contain pressures on the funds rate.

*Open market operations are the most powerful and often-used tool for controlling the federal funds rate.*

Reserve balance requirements and contractual clearing balances need to be met only on average over a so-called reserve maintenance period, not each day. This structure gives depository institutions considerable flexibility in managing their end-of-day balances at the Federal Reserve from one day to the next. This flexibility helps smooth fluctuations in the federal funds rate. If a depository institution finds that its balance at the Federal Reserve is unexpectedly high on one day (for instance, because a customer made an unexpected deposit or an expected payment was not made), it does not have to offer to lend the extra balance at very low rates; it can absorb the surplus by choosing to hold lower balances in the remaining days of the maintenance period and still meet its balance requirements. Holding a lower balance on a subsequent day of the period does not necessarily increase the likelihood that the depository institution will incur an overnight overdraft if the sum of its required reserve balance and contractual clearing balance is high relative to its payment needs. This flexibility in managing account balances protects against variations in the

demand for and supply of Federal Reserve balances that would otherwise put pressure on the federal funds rate.

Reserve balance requirements and contractual clearing balances also help create a predictable demand for balances at the Federal Reserve. Without reserve balance requirements or contractual clearing balances, many depository institutions would still hold positive balances at the Federal Reserve to facilitate payments on behalf of themselves or their customers and to avoid having a negative balance in their account at the end of the day. The exact amount of balances that depository institutions want to hold at the Federal Reserve at the end of the day for clearing purposes can vary considerably from day to day, often depending on the volume and uncertainty of the payment flows through their accounts. These demands are very difficult for the Federal Reserve to forecast. When the level of reserve balance requirements, contractual clearing balances, or the sum of the two make it necessary for depository institutions to hold balances above the shifting and unpredictable level needed for clearing purposes, the Federal Reserve can more accurately determine the demand for Federal Reserve balances and, by manipulating the supply of Federal Reserve balances through open market operations, more readily attain the target funds rate.

The remainder of this chapter takes a more detailed look at open market operations, reserve requirements, contractual clearing balances, and the discount window.

## **Open Market Operations**

In theory, the Federal Reserve could conduct open market operations by purchasing or selling any type of asset. In practice, however, most assets cannot be traded readily enough to accommodate open market operations. For open market operations to work effectively, the Federal Reserve must be able to buy and sell quickly, at its own convenience, in whatever volume may be needed to keep the federal funds rate at the target level. These conditions require that the instrument it buys or sells be traded in a broad, highly active market that can accommodate the transactions without distortions or disruptions to the market itself.

The market for U.S. Treasury securities satisfies these conditions. The U.S. Treasury securities market is the broadest and most active of U.S. financial markets. Transactions are handled over the counter, not on an organized exchange. Although most of the trading occurs in New York City, telephone and computer connections link dealers, brokers, and customers—regardless of their location—to form a global market.

## Composition of the Federal Reserve's Portfolio

The overall size of the Federal Reserve's holdings of Treasury securities depends principally on the growth of Federal Reserve notes; however, the amounts and maturities of the individual securities held depends on the FOMC's preferences for liquidity. The Federal Reserve has guidelines that limit its holdings of individual Treasury securities to a percentage of the total amount outstanding. These guidelines are designed to help the Federal Reserve manage the liquidity and average maturity of the System portfolio. The percentage limits under these guidelines are larger for shorter-dated issues than longer-dated ones. Consequently, a sizable share of the Federal Reserve's holdings is held in Treasury securities with remaining maturities of one year or less. This structure provides the Federal Reserve with the ability to alter the composition of its assets quickly when developments warrant. At the end of 2004, the Federal Reserve's holdings of Treasury securities were about evenly weighted between those with maturities of one year or less and those with maturities greater than one year (table 3.3).

Table 3.3

### U.S. Treasury securities held in the Federal Reserve's open market account, December 31, 2004

Billions of dollars

Remaining maturity	U.S. Treasury securities
1 year or less	379.4
More than 1 year to 5 years	208.3
More than 5 years to 10 years	54.4
More than 10 years	75.8
Total	717.8

## The Conduct of Open Market Operations

The Federal Reserve Bank of New York conducts open market operations for the Federal Reserve, under an authorization from the Federal Open Market Committee. The group that carries out the operations is commonly referred to as "the Open Market Trading Desk" or "the Desk." The Desk is permitted by the FOMC's authorization to conduct business with U.S. securities dealers and with foreign official and international institutions that maintain accounts at the Federal Reserve Bank of New York. The dealers with which the Desk transacts business are called primary dealers. The Federal Reserve requires primary dealers to meet the

capital standards of their primary regulators and satisfy other criteria consistent with being a meaningful and creditworthy counterparty. All open market operations transacted with primary dealers are conducted through an auction process.

Each day, the Desk must decide whether to conduct open market operations, and, if so, the types of operations to conduct. It examines forecasts of the daily supply of Federal Reserve balances from autonomous factors and discount window lending. The forecasts, which extend several weeks into the future, assume that the Federal Reserve abstains from open market operations. These forecasts are compared with projections of the demand for balances to determine the need for open market operations. The decision about the types of operations to conduct depends on how long a deficiency or surplus of Federal Reserve balances is expected to last. If staff projections indicate that the demand for balances is likely to exceed the supply of balances by a large amount for a number of weeks or months, the Federal Reserve may make outright purchases of securities or arrange longer-term repurchase agreements to increase supply. Conversely, if the projections suggest that demand is likely to fall short of supply, then the Federal Reserve may sell securities outright or redeem maturing securities to shrink the supply of balances.

Even after accounting for planned outright operations or long-term repurchase agreements, there may still be a short-term need to alter Federal Reserve balances. In these circumstances, the Desk assesses whether the federal funds rate is likely to remain near the FOMC's target rate in light of the estimated imbalance between supply and demand. If the funds rate is likely to move away from the target rate, then the Desk will arrange short-term repurchase agreements, which add balances, or reverse repurchase agreements, which drain balances, to better align the supply of and demand for balances. If the funds rate is likely to remain close to the target, then the Desk will not arrange a short-term operation. Short-term temporary operations are much more common than outright transactions because daily fluctuations in autonomous factors or the demand for excess reserve balances can create a sizable imbalance between the supply of and demand for balances that might cause the federal funds rate to move significantly away from the FOMC's target.

### ***Outright Purchases and Sales***

The Federal Reserve tends to conduct far more outright purchases than outright sales or redemptions of securities primarily because it must offset the drain of balances resulting from the public's increasing demand for Federal Reserve notes (table 3.4). When the Desk decides to buy securities in an outright operation, it first determines how much it wants to buy to address the mismatch between supply and demand. It then divides that

amount into smaller portions and makes a series of purchases in different segments of the maturity spectrum, rather than buying securities across all maturities at once, in order to minimize the impact on market prices.

When the projections indicate a need to drain Federal Reserve balances, the Desk may choose to sell securities or to redeem maturing securities. Sales of securities are extremely rare. By redeeming some maturing securities, rather than exchanging all of them for new issues, the Federal Reserve can reduce the size of its holdings gradually without having to enter the market. Redemptions drain Federal Reserve balances when the Treasury takes funds out of its accounts at depository institutions, transfers those funds to its account at the Federal Reserve, and then pays the Federal Reserve for the maturing issues.

Table 3.4

### Federal Reserve System outright transactions, 2001–2004

Billions of dollars

Transaction	2001	2002	2003	2004
Purchases	68.5	54.2	36.8	50.5
Redemptions	26.9	—	—	—
Total	95.4	54.2	36.8	50.5

Purchases from and sales to foreign official and international customers enable the Federal Reserve to make small adjustments to its portfolio without formally entering the market. These transactions occur at market prices. The size of the buy or sell orders of these customers and the projected need for open market operations determine whether the Desk chooses to arrange these customer transactions directly with the Federal Reserve, in which case they affect Federal Reserve balances, or to act as agent by conducting the transactions in the market, with no effect on balances.

#### *Repurchase Agreements*

The Federal Reserve frequently arranges repurchase agreements to add Federal Reserve balances temporarily (table 3.5). In these transactions, it acquires a security from a primary dealer under an agreement to return the security on a specified date. Most repurchase agreements have an overnight term, although short-term repurchase agreements with maturities of two to thirteen days are also arranged to address shortages in Federal Reserve balances that are expected to extend over several days. Longer-term repurchase agreements are used to address more-persistent needs. The Federal Reserve accepts Treasury, federal agency, and mort-

gage-backed securities guaranteed by federal agencies as collateral for its repurchase agreements.

Table 3.5

**Federal Reserve System temporary transactions, 2001–2004**

Volume in billions of dollars

	2001		2002		2003		2004	
	Num.	Vol.	Num.	Vol.	Num.	Vol.	Num.	Vol.
Repurchase agreements <sup>1</sup>	305	1,497.7	262	1,143.1	288	1,522.9	299	1,876.9
Matched sale–purchase transactions/ Reverse repurchase agreements <sup>2</sup>	10	25.0	7	11.3	10	22.8	2	4.8

1. Includes all types of repurchase agreements.

2. Reverse repurchase agreements after 2003.

***Reverse Repurchase Agreements***

When the Federal Reserve needs to absorb Federal Reserve balances temporarily, it enters into reverse repurchase agreements with primary dealers. These transactions involve selling a Treasury security to a primary dealer under an agreement to receive the security back on a specified date. As in repurchase agreement transactions, these operations are arranged on an auction basis. When the Federal Reserve transfers the collateral (usually a Treasury bill) to the dealer, the account of the dealer’s clearing bank at the Federal Reserve is debited, and total Federal Reserve balances decline. When the transaction unwinds, the account of the dealer’s clearing bank is credited and total balances increase.

Every business day, the Federal Reserve also arranges reverse repurchase agreements with foreign official and international accounts. These institutions have accounts at the Federal Reserve Bank of New York to help manage their U.S. dollar payments and receipts. The Federal Reserve permits these institutions to invest cash balances overnight through these agreements.

**A Typical Day in the Conduct of Open Market Operations**

Each weekday, beginning at around 7:30 a.m., two groups of Federal Reserve staff members, one at the Federal Reserve Bank of New York and one at the Board of Governors in Washington, prepare independent projections of the supply of and demand for Federal Reserve balances.

The manager of the System Open Market Account and the group in New York are linked in a telephone conference call with members of the staff at the Board of Governors and with a Federal Reserve Bank president who is currently a member of the FOMC. Participants in the call discuss staff forecasts for Federal Reserve balances and recent developments in financial markets. They pay special attention to trading conditions in the federal funds market, particularly the level of the federal funds rate in relation to the FOMC's target. In light of this information, they determine a plan for open market operations. The decision is announced to the markets at around 9:30 a.m., at the same time that the Desk solicits offers from dealers. (Typically, longer-term repurchase agreements are arranged earlier in the morning, usually on a specific day of the week.) If an outright operation is also needed, it would typically be executed later in the morning, after the daily operation is complete.

### Securities Lending

The Federal Reserve has a securities lending program designed to provide a secondary and temporary source of securities to the market in order to promote the smooth clearing of Treasury securities. Under this program, securities from the portfolio are offered for loan to primary dealers through an auction process each day at noon. The total amount available for an individual security is a fraction of the Federal Reserve's total holdings, and there are limits on the amount of securities that can be lent to a single dealer. As collateral, the dealer gives the Federal Reserve other securities, not cash; therefore, the Federal Reserve's lending operations do not affect the supply of Federal Reserve balances and are not considered open market operations.

*Reserve requirements play a useful role in the conduct of open market operations by helping to ensure a predictable demand for Federal Reserve balances.*

### Reserve Requirements

Reserve requirements have long been a part of our nation's banking history. Depository institutions maintain a fraction of certain liabilities in reserve in specified assets. The Federal Reserve can adjust reserve requirements by changing required reserve ratios, the liabilities to which the ratios apply, or both. Changes in reserve requirements can have profound effects on the money stock and on the cost to banks of extending credit and are also costly to administer; therefore, reserve requirements are not adjusted frequently. Nonetheless, reserve requirements play a useful role in the conduct of open market operations by helping to ensure a predictable demand for Federal Reserve balances and thus enhancing the Federal Reserve's control over the federal funds rate.

Requiring depository institutions to hold a certain fraction of their deposits in reserve, either as cash in their vaults or as non-interest-bearing

balances at the Federal Reserve, does impose a cost on the private sector. The cost is equal to the amount of forgone interest on these funds—or at least on the portion of these funds that depository institutions hold only because of legal requirements and not to meet their customers’ needs.

The burden of reserve requirements is structured to bear generally less heavily on smaller institutions. At every depository institution, a certain amount of reservable liabilities is exempt from reserve requirements, and a relatively low required reserve ratio is applied to reservable liabilities up to a specific level. The amounts of reservable liabilities exempt from reserve requirements and subject to the low required reserve ratio are adjusted annually to reflect growth in the banking system. Table 3.6 shows the reserve requirement ratios in effect in 2004.

Table 3.6  
**Reserve requirement ratios, 2004**

*The burden of reserve requirements is structured to bear generally less heavily on smaller institutions.*

Category	Reserve requirement
Net transaction accounts	
\$0 to \$6.6 million	0 percent of amount
Over \$6.6 million and up to \$45.4 million	3 percent of amount
Over \$45.4 million	\$1,164,000 plus 10 percent of amount over \$45.4 million
Nonpersonal time deposits	0 percent
Eurocurrency liabilities	0 percent

Changes in reserve requirements can affect the money stock, by altering the volume of deposits that can be supported by a given level of reserves, and bank funding costs. Unless it is accompanied by an increase in the supply of Federal Reserve balances, an increase in reserve requirements (through an increase in the required reserve ratio, for example) reduces excess reserves, induces a contraction in bank credit and deposit levels, and raises interest rates. It also pushes up bank funding costs by increasing the amount of non-interest-bearing assets that must be held in reserve. Conversely, a decrease in reserve requirements, unless accompanied by a reduction in Federal Reserve balances, initially leaves depository institutions with excess reserves, which can encourage an expansion of bank credit and deposit levels and reduce interest rates.

### Recent History of Reserve Requirements

In the 1960s and 1970s, the Federal Reserve actively used reserve requirements as a tool of monetary policy in order to influence the expansion of



money and credit partly by manipulating bank funding costs. As financial innovation spawned new sources of bank funding, the Federal Reserve adapted reserve requirements to these new financial products. It changed required reserve ratios on specific bank liabilities that were most frequently used to fund new lending. Reserve requirements were also imposed on other, newly emerging liabilities that were the functional equivalents of deposits, such as Eurodollar borrowings. At times, it supplemented these actions by placing a marginal reserve requirement on large time deposits—that is, an additional requirement applied only to each new increment of these deposits.

As the 1970s unfolded, it became increasingly apparent that the structure of reserve requirements was becoming outdated. At this time, only banks that were members of the Federal Reserve System were subject to reserve requirements established by the Federal Reserve. The regulatory structure and competitive pressures during a period of high interest rates were putting an increasing burden on member banks. This situation fostered the growth of deposits, especially the newly introduced interest-bearing transaction deposits, at institutions other than member banks and led many banks to leave the Federal Reserve System. Given this situation, policy makers felt that reserve requirements needed to be applied to a broad group of institutions for more effective monetary control—that is, to strengthen the relationship between the amount of reserves supplied by the Federal Reserve and the overall quantity of money in the economy.

*Changes in reserve requirements can affect the money stock and bank funding costs.*

The Monetary Control Act of 1980 (MCA) ended the problem of membership attrition and facilitated monetary control by reforming reserve requirements. Under the act, all depository institutions are subject to reserve requirements set by the Federal Reserve, whether or not they are members of the Federal Reserve System. The Board of Governors may impose reserve requirements solely for the purpose of implementing monetary policy. The required reserve ratio may range from 8 percent to 14 percent on transaction deposits and from 0 percent to 9 percent on nonpersonal time deposits. The Board may also set reserve requirements on the net liabilities owed by depository institutions in the United States to their foreign affiliates or to other foreign banks. The MCA permits the Board, under certain circumstances, to establish supplemental and emergency reserve requirements, but these powers have never been exercised.

Following the passage of the MCA in 1980, reserve requirements were not adjusted for policy purposes for a decade. In December 1990, the required reserve ratio on nonpersonal time deposits was pared from 3 percent to 0 percent, and in April 1992 the 12 percent ratio on transaction deposits was trimmed to 10 percent. These actions were partly motivated by evidence suggesting that some lenders had adopted a more cautious approach to extending credit, which was increasing the cost and restricting the availability of credit to some types of borrowers. By reducing funding costs and thus

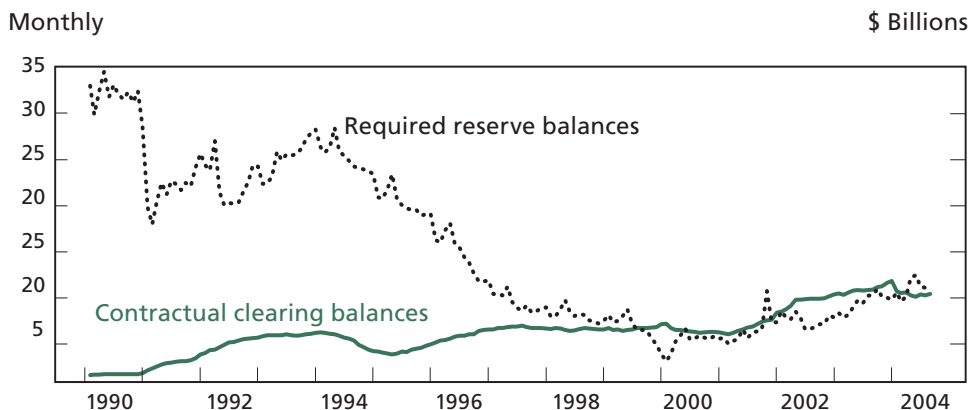
providing depository institutions with easier access to capital markets, the cuts in required reserve ratios put depository institutions in a better position to extend credit.

Although reserve requirement ratios have not been changed since the early 1990s, the level of reserve requirements and required reserve balances has fallen considerably since then because of the widespread implementation of retail sweep programs by depository institutions. Under such a program, a depository institution sweeps amounts above a predetermined level from a depositor’s checking account into a special-purpose money market deposit account created for the depositor. In this way, the depository institution shifts funds from an account that is subject to reserve requirements to one that is not and therefore reduces its reserve requirement. With no change in its vault cash holdings, the depository institution can lower its required reserve balance, on which it earns no interest, and invest the funds formerly held at the Federal Reserve in interest-earning assets.

### Contractual Clearing Balances

Contractual clearing balances, like required reserve balances, help to create a stable, predictable demand for Federal Reserve balances, which assists in the conduct of open market operations. In early 1981, the Federal Reserve Board established a policy that permitted all depository institutions to hold contractual clearing balances at the Federal Reserve Banks. Such balances, which were referred to as required clearing balances at the time, were established following the passage of the MCA to facilitate access to Federal Reserve priced services by depository institutions with zero or low required reserve balances. Use of these arrangements was minimal in the early 1980s because required reserve balances were sufficiently high to facilitate clearing and meet reserve requirements.

Chart 3.1  
Balances at Federal Reserve Banks, 1990–2004



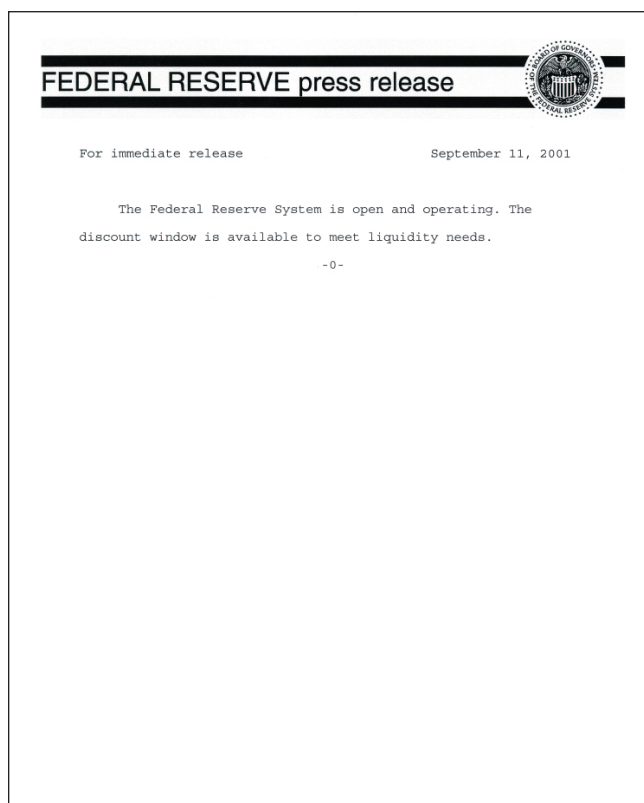
The use of contractual clearing balances rose considerably in the 1990s as required reserve balances dropped in the wake of the cuts in required reserve ratios early in the decade and the widespread implementation of retail sweep programs by depository institutions. The resulting reduction in required reserve balances left some depository institutions with insufficient protection against overnight overdrafts, so they established or expanded their contractual clearing balances. The rise in contractual clearing balances during the 1990s did not match the decline in required reserve balances, however, in part because depository institutions apparently did not need as large a cushion to protect against overnight overdrafts as was once provided by their required reserve balance. In addition, the ability of some depository institutions to expand their contractual clearing balances was limited by the extent to which they use Federal Reserve priced services.

## The Discount Window

The Federal Reserve's lending at the discount window serves two primary functions. It complements open market operations in achieving the target federal funds rate by making Federal Reserve balances available to depository institutions when the supply of balances falls short of demand. It also serves as a backup source of liquidity for individual depository institutions.

Although the volume of discount window borrowing is relatively small, it plays an important role in containing upward pressures on the federal funds rate. If a depository institution faces an unexpectedly

low balance in its account at the Federal Reserve, either because the total supply of balances has fallen short of demand or because it failed to receive an expected transfer of funds from a counterparty, it can borrow at the discount window. This extension of credit increases the supply of Federal



*At times when the normal functioning of financial markets is disrupted, the discount window can become the principal channel for supplying balances to depository institutions.*

Reserve balances and helps to limit any upward pressure on the federal funds rate. At times when the normal functioning of financial markets is disrupted—for example after operational problems, a natural disaster, or a terrorist attack—the discount window can become the principal channel for supplying balances to depository institutions.

The discount window can also, at times, serve as a useful tool for promoting financial stability by providing temporary funding to depository institutions that are having significant financial difficulties. If the institution's sudden collapse were likely to have severe adverse effects on the financial system, an extension of central bank credit could be desirable because it would address the liquidity strains and permit the institution to make a transition to sounder footing. Discount window credit can also be used to facilitate an orderly resolution of a failing institution. An institution obtaining credit in either situation must be monitored appropriately to ensure that it does not take excessive risks in an attempt to return to profitability and that the use of central bank credit would not increase costs to the deposit insurance fund and ultimately the taxpayer.

### Types of Credit

In ordinary circumstances, the Federal Reserve extends discount window credit to depository institutions under the primary, secondary, and seasonal credit programs. The rates charged on loans under each of these programs are established by each Reserve Bank's board of directors every two weeks, subject to review and determination by the Board of Governors. The rates for each of the three lending programs are the same at all Reserve Banks, except occasionally for very brief periods following the Board's action to adopt a requested rate change. The Federal Reserve also has the authority under the Federal Reserve Act to extend credit to entities that are not depository institutions in "unusual and exigent circumstances"; however, such lending has not occurred since the 1930s.

#### *Primary Credit*

Primary credit is available to generally sound depository institutions on a very short-term basis, typically overnight. To assess whether a depository institution is in sound financial condition, its Reserve Bank regularly reviews the institution's condition, using supervisory ratings and data on adequacy of the institution's capital. Depository institutions are not required to seek alternative sources of funds before requesting occasional advances of primary credit, but primary credit is expected to be used as a backup, rather than a regular, source of funding.

The rate on primary credit has typically been set 1 percentage point above the FOMC's target federal funds rate, but the spread can vary depending on circumstances. Because primary credit is the Federal Reserve's main dis-

## Major Revision to Discount Window Programs

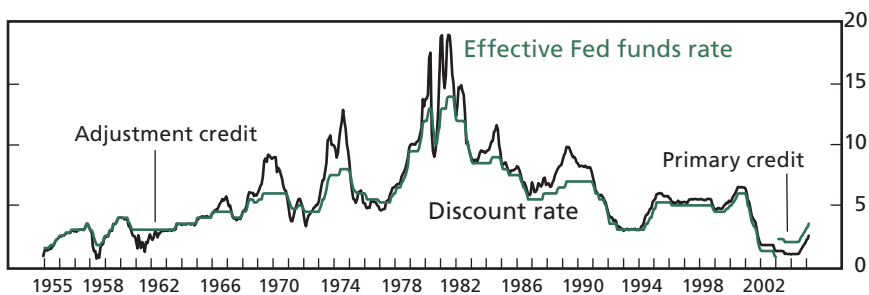
On January 9, 2003, the Federal Reserve significantly revised its discount window lending programs, replacing the previous adjustment and extended credit programs with primary and secondary credit facilities. Adjustment credit had been made available to help depository institutions make short-term balance-sheet adjustments and to provide an alternate source of funds in the event of a shortfall in the supply of Federal Reserve balances. Extended credit, which was intended to accommodate depository institutions' somewhat longer-term liquidity needs resulting from exceptional circumstances, had not been used since 1995.

Adjustment credit was extended at the basic discount rate, which over the previous decade had been 25 to 50 basis points below the usual level of overnight market interest rates. The below-market interest rate on adjustment credit had caused several significant problems. The incentive for depository institutions to exploit the below-market rate meant that borrowing requests necessarily were subject to considerable administration by Reserve Banks. In particular, borrowers were required to seek funds elsewhere before coming to the window. Partly as a result of those requirements, many depository institutions were reluctant to borrow from the discount window, reducing the effectiveness of the discount window in buffering shocks to the money market.

Under the revised lending programs, the above-market rate and the fact that primary credit is restricted to financially sound institutions mean that primary credit can be extended largely without administration, making depository institutions more willing to borrow and so making the discount window a more effective monetary policy tool. The central banks of nearly all industrialized countries have similar lending facilities that extend collateralized credit at an above-market rate with little or no administration.

Chart 3.3

### Effective federal funds rate and discount rate, 1955–2004\*



\* On January 9, 2003, the main discount rate switched from being the rate on adjustment credit to the rate on primary credit.

count window program, the Federal Reserve at times uses the term *discount rate* specifically to mean the primary credit rate.

Reserve Banks ordinarily do not require depository institutions to provide reasons for requesting very short-term primary credit. Borrowers are asked to provide only the minimum information necessary to process a loan, usually the requested amount and term of the loan. If a pattern of borrowing or the nature of a particular borrowing request strongly indicates that a depository institution is not generally sound or is using primary credit as a regular rather than a backup source of funding, a Reserve Bank may seek additional information before deciding whether to extend the loan.

Primary credit may be extended for longer periods of up to a few weeks if a depository institution is in generally sound financial condition and cannot obtain temporary funds in the market at reasonable terms. Large and medium-sized institutions are unlikely to meet this test.

*Depository institutions that have reservable transaction accounts or nonpersonal time deposits may borrow from the discount window.*

### ***Secondary Credit***

Secondary credit is available to depository institutions that are not eligible for primary credit. It is extended on a very short-term basis, typically overnight. Reflecting the less-sound financial condition of borrowers of secondary credit, the rate on secondary credit has typically been 50 basis points above the primary credit rate, although the spread can vary as circumstances warrant. Secondary credit is available to help a depository institution meet backup liquidity needs when its use is consistent with the borrowing institution's timely return to a reliance on market sources of funding or with the orderly resolution of a troubled institution's difficulties. Secondary credit may not be used to fund an expansion of the borrower's assets.

Loans extended under the secondary credit program entail a higher level of Reserve Bank administration and oversight than loans under the primary credit program. A Reserve Bank must have sufficient information about a borrower's financial condition and reasons for borrowing to ensure that an extension of secondary credit would be consistent with the purpose of the facility. Moreover, under the Federal Deposit Insurance Corporation Improvement Act of 1991, extensions of Federal Reserve credit to an FDIC-insured depository institution that has fallen below minimum capital standards are generally limited to 60 days in any 120-day period or, for the most severely undercapitalized, to only five days.

### ***Seasonal Credit***

The Federal Reserve's seasonal credit program is designed to help small depository institutions manage significant seasonal swings in their loans and deposits. Seasonal credit is available to depository institutions that can

demonstrate a clear pattern of recurring swings in funding needs throughout the year—usually institutions in agricultural or tourist areas. Borrowing longer-term funds from the discount window during periods of seasonal need allows institutions to carry fewer liquid assets during the rest of the year and make more funds available for local lending.

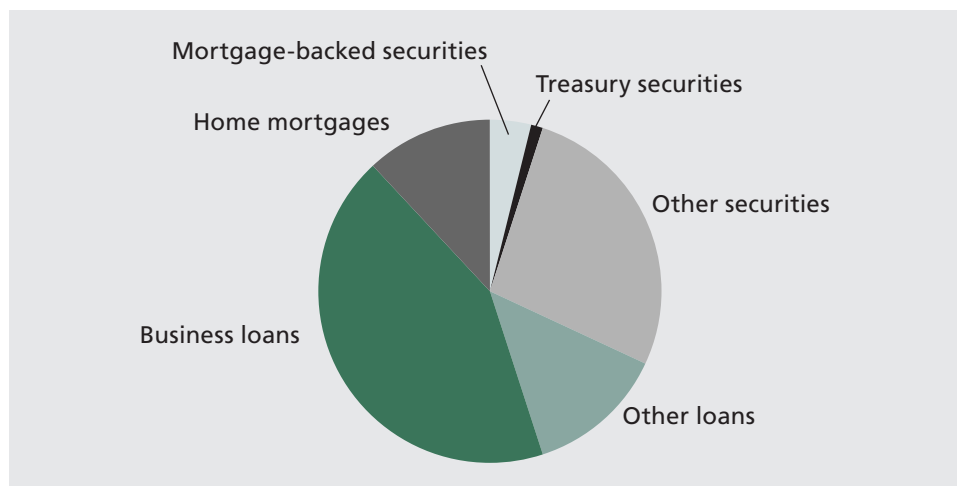
The seasonal credit rate is based on market interest rates. It is set on the first business day of each two-week reserve maintenance period as the average of the effective federal funds rate and the interest rate on three-month certificates of deposit over the previous reserve maintenance period.

### Eligibility to Borrow

By law, depository institutions that have reservable transaction accounts or nonpersonal time deposits may borrow from the discount window. U.S. branches and agencies of foreign banks that are subject to reserve requirements are eligible to borrow under the same general terms and conditions that apply to domestic depository institutions. Banker's banks, corporate credit unions, and certain other banking institutions that are not subject to reserve requirements generally do not have access to the discount window. However, the Board of Governors has determined that those institutions may obtain access to the discount window if they voluntarily maintain required reserve balances.

Chart 3.2

### Collateral value by asset type, December 31, 2004



## Discount Window Collateral

By law, all discount window loans must be secured by collateral to the satisfaction of the lending Reserve Bank. Most loans that are not past due and most investment-grade securities held by depository institutions are acceptable as collateral. Reserve Banks must be able to establish a legal right in the event of default to be first in line to take possession of and, if necessary, sell all collateral that secures discount window loans.

Reserve Banks assign a lendable value to assets accepted as collateral. The lendable value is the maximum loan amount that can be backed by that asset. It is based on market values, if available, or par values—in both cases reduced by a margin. The margin depends on how accurately the asset can be valued, how much its value tends to vary over time, the liquidity of the asset, and the financial condition of the pledging institution.