The Federal Reserve sets the nation’s monetary policy to promote the objectives of maximum employment, stable prices, and moderate long-term interest rates. The challenge for policymakers is that tensions among the goals can arise in the short run and that information about the economy becomes available only with a lag and may be imperfect.

Goals of Monetary Policy

The goals of monetary policy are spelled out in the Federal Reserve Act, which specifies that the Board of Governors and the Federal Open Market Committee should seek “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.” Stable prices in the long run are a precondition for maximum sustainable output growth and employment as well as moderate long-term interest rates. When prices are stable and believed likely to remain so, the prices of goods, services, materials, and labor are undistorted by inflation and serve as clearer signals and guides to the efficient allocation of resources and thus contribute to higher standards of living. Moreover, stable prices foster saving and capital formation, because when the risk of erosion of asset values resulting from inflation—and the need to guard against such losses—are minimized, households are encouraged to save more and businesses are encouraged to invest more.

Although price stability can help achieve maximum sustainable output growth and employment over the longer run, in the short run some tension can exist between the two goals. Often, a slowing of employment is accompanied by lessened pressures on prices, and moving to counter the weakening of the labor market by easing policy does not have adverse inflationary effects. Sometimes, however, upward pressures on prices are developing as output and employment are softening—especially when an adverse supply shock, such as a spike in energy prices, has occurred. Then, an attempt to restrain inflation pressures would compound the weakness in the economy, or an attempt to reverse employment losses would aggravate inflation. In such circumstances, those responsible for monetary policy face a dilemma and must decide whether to focus on defusing price pressures or on cushioning the loss of employment and output. Adding to the difficulty is the possibility that an expectation of
increasing inflation might get built into decisions about prices and wages, thereby adding to inflation inertia and making it more difficult to achieve price stability.

Beyond influencing the level of prices and the level of output in the near term, the Federal Reserve can contribute to financial stability and better economic performance by acting to contain financial disruptions and preventing their spread outside the financial sector. Modern financial systems are highly complex and interdependent and may be vulnerable to wide-scale systemic disruptions, such as those that can occur during a plunge in stock prices. The Federal Reserve can enhance the financial system’s resilience to such shocks through its regulatory policies toward banking institutions and payment systems. If a threatening disturbance develops, the Federal Reserve can also cushion the impact on financial markets and the economy by aggressively and visibly providing liquidity through open market operations or discount window lending.

**How Monetary Policy Affects the Economy**

The initial link in the chain between monetary policy and the economy is the market for balances held at the Federal Reserve Banks. Depository institutions have accounts at their Reserve Banks, and they actively trade balances held in these accounts in the federal funds market at an interest rate known as the federal funds rate. The Federal Reserve exercises considerable control over the federal funds rate through its influence over the supply of and demand for balances at the Reserve Banks.

The FOMC sets the federal funds rate at a level it believes will foster financial and monetary conditions consistent with achieving its monetary policy objectives, and it adjusts that target in line with evolving economic developments. A change in the federal funds rate, or even a change in expectations about the future level of the federal funds rate, can set off a chain of events that will affect other short-term interest rates, longer-term interest rates, the foreign exchange value of the dollar, and stock prices. In turn, changes in these variables will affect households’ and businesses’ spending decisions, thereby affecting growth in aggregate demand and the economy.

Short-term interest rates, such as those on Treasury bills and commercial paper, are affected not only by the current level of the federal funds rate but also by expectations about the overnight federal funds rate over the duration of the short-term contract. As a result, short-term interest rates could decline if the Federal Reserve surprised market participants with a reduction in the federal funds rate, or if unfolding events convinced participants that the Federal Reserve was going to be holding the federal funds rate lower than had been anticipated. Similarly, short-term inter-
Monetary Policy and the Economy

Interest rates would increase if the Federal Reserve surprised market participants by announcing an increase in the federal funds rate, or if some event prompted market participants to believe that the Federal Reserve was going to be holding the federal funds rate at higher levels than had been anticipated.

It is for these reasons that market participants closely follow data releases and statements by Federal Reserve officials, watching for clues that the economy and prices are on a different trajectory than had been thought, which would have implications for the stance of monetary policy.

Changes in short-term interest rates will influence long-term interest rates, such as those on Treasury notes, corporate bonds, fixed-rate mortgages, and auto and other consumer loans. Long-term rates are affected not only by changes in current short-term rates but also by expectations about short-term rates over the rest of the life of the long-term contract. Generally, economic news or statements by officials will have a greater impact on short-term interest rates than on longer rates because they typically have a bearing on the course of the economy and monetary policy over a shorter period; however, the impact on long rates can also be considerable because the news has clear implications for the expected course of short-term rates over a long period.

Changes in long-term interest rates also affect stock prices, which can have a pronounced effect on household wealth. Investors try to keep their investment returns on stocks in line with the return on bonds, after allowing for the greater riskiness of stocks. For example, if long-term interest rates decline, then, all else being equal, returns on stocks will exceed returns on bonds and encourage investors to purchase stocks and bid up stock prices to the point at which expected risk-adjusted returns on stocks are once again aligned with returns on bonds. Moreover, lower interest rates may convince investors that the economy will be stronger and profits higher in the near future, which should further lift equity prices.

Furthermore, changes in monetary policy affect the exchange value of the dollar on currency markets. For example, if interest rates rise in the United States, yields on dollar assets will look more favorable, which will lead to bidding up of the dollar on foreign exchange markets. The higher dollar will lower the cost of imports to U.S. residents and raise the price of U.S. exports to those living outside the United States. Conversely, lower interest rates in the United States will lead to a decline in the exchange value of the dollar, prompting an increase in the price of imports and a decline in the price of exports.

Changes in the value of financial assets, whether the result of an actual or expected change in monetary policy, will affect a wide range of spending decisions. For example, a drop in interest rates, a lower exchange value of the United States
If the economy slows and employment softens, policy makers will be inclined to ease monetary policy to stimulate aggregate demand.

The Federal Reserve System: Purposes and Functions

If the economy slows and employment softens, policy makers will be inclined to ease monetary policy to stimulate aggregate demand. When growth in aggregate demand is boosted above growth in the economy’s potential to produce, slack in the economy will be absorbed and employment will return to a more sustainable path. In contrast, if the economy is showing signs of overheating and inflation pressures are building, the Federal Reserve will be inclined to counter these pressures by tightening monetary policy—to bring growth in aggregate demand below that of the economy’s potential to produce—for as long as necessary to defuse the inflationary pressures and put the economy on a path to sustainable expansion.

While these policy choices seem reasonably straightforward, monetary policy makers routinely face certain notable uncertainties. First, the actual position of the economy and growth in aggregate demand at any point in time are only partially known, as key information on spending, production, and prices becomes available only with a lag. Therefore, policy makers must rely on estimates of these economic variables when assessing the appropriate course of policy, aware that they could act on the basis of misleading information. Second, exactly how a given adjustment in the federal funds rate will affect growth in aggregate demand—in terms of both the overall magnitude and the timing of its impact—is never certain. Economic models can provide rules of thumb for how the economy will respond, but these rules of thumb are subject to statistical error. Third, the growth in aggregate supply, often called the growth in potential...
output, cannot be measured with certainty. Key here is the growth of the labor force and associated labor input, as well as underlying growth in labor productivity. Growth in labor input typically can be measured with more accuracy than underlying productivity; for some time, growth in labor input has tended to be around the growth in the overall population of 1 percentage point per year. However, underlying productivity growth has varied considerably over recent decades, from approximately 1 percent or so per year to somewhere in the neighborhood of 3 percent or even higher, getting a major boost during the mid- and late 1990s from applications of information technology and advanced management systems. If, for example, productivity growth is 2 percent per year, then growth in aggregate supply would be the sum of this amount and labor input growth of 1 percent—that is, 3 percent per year. In which case, growth in aggregate demand in excess of 3 percent per year would result in a pickup in growth in employment in excess of that of the labor force and a reduction in unemployment. In contrast, growth in aggregate demand below 3 percent would result in a softening of the labor market and, in time, a reduction in inflationary pressures.

Limitations of Monetary Policy

Monetary policy is not the only force acting on output, employment, and prices. Many other factors affect aggregate demand and aggregate supply and, consequently, the economic position of households and businesses. Some of these factors can be anticipated and built into spending and other economic decisions, and some come as a surprise. On the demand side, the government influences the economy through changes in taxes and spending programs, which typically receive a lot of public attention and are therefore anticipated. For example, the effect of a tax cut may precede its actual implementation as businesses and households alter their spending in anticipation of the lower taxes. Also, forward-looking financial markets may build such fiscal events into the level and structure of interest rates, so that a stimulative measure, such as a tax cut, would tend to raise the level of interest rates even before the tax cut becomes effective, which will have a restraining effect on demand and the economy before the fiscal stimulus is actually applied.

Other changes in aggregate demand and supply can be totally unpredictable and influence the economy in unforeseen ways. Examples of such shocks on the demand side are shifts in consumer and business confidence, and changes in the lending posture of commercial banks and other creditors. Lessened confidence regarding the outlook for the economy and labor market or more restrictive lending conditions tend to curb business and household spending. On the supply side, natural disasters, disruptions in the oil market that reduce supply, agricultural losses, and slowdowns in

If the economy is showing signs of overheating and inflation pressures are building, the Federal Reserve will be inclined to counter these pressures by tightening monetary policy.
The statutory goals of maximum employment and stable prices are easier to achieve if the public understands those goals and believes that the Federal Reserve will take effective measures to achieve them.

The Federal Reserve System: Purposes and Functions

Productivity growth are examples of adverse supply shocks. Such shocks tend to raise prices and reduce output. Monetary policy can attempt to counter the loss of output or the higher prices but cannot fully offset both.

In practice, as previously noted, monetary policy makers do not have up-to-the-minute information on the state of the economy and prices. Useful information is limited not only by lags in the construction and availability of key data but also by later revisions, which can alter the picture considerably. Therefore, although monetary policy makers will eventually be able to offset the effects that adverse demand shocks have on the economy, it will be some time before the shock is fully recognized and—given the lag between a policy action and the effect of the action on aggregate demand—an even longer time before it is countered. Add to this the uncertainty about how the economy will respond to an easing or tightening of policy of a given magnitude, and it is not hard to see how the economy and prices can depart from a desired path for a period of time.

The statutory goals of maximum employment and stable prices are easier to achieve if the public understands those goals and believes that the Federal Reserve will take effective measures to achieve them. For example, if the Federal Reserve responds to a negative demand shock to the economy with an aggressive and transparent easing of policy, businesses and consumers may believe that these actions will restore the economy to full employment; consequently, they may be less inclined to pull back on spending because of concern that demand may not be strong enough to warrant new business investment or that their job prospects may not warrant the purchase of big-ticket household goods. Similarly, a credible anti-inflation policy will lead businesses and households to expect less wage and price inflation; workers then will not feel the same need to protect themselves by demanding large wage increases, and businesses will be less aggressive in raising their prices, for fear of losing sales and profits. As a result, inflation will come down more rapidly, in keeping with the policy-related slowing in growth of aggregate demand, and will give rise to less slack in product and resource markets than if workers and businesses continued to act as if inflation were not going to slow.

Guides to Monetary Policy

Although the goals of monetary policy are clearly spelled out in law, the means to achieve those goals are not. Changes in the FOMC’s target federal funds rate take some time to affect the economy and prices, and it is often far from obvious whether a selected level of the federal funds rate will achieve those goals. For this reason, some have suggested that the Federal Reserve pay close attention to guides that are intermediate between its operational target—the federal funds rate—and the economy.
Among those frequently mentioned are monetary aggregates, the level and structure of interest rates, the so-called Taylor rule (discussed on page 23), and foreign exchange rates. Some suggest that one of these guides be selected as an intermediate target—that is, that a specific formal objective be set for the intermediate target and pursued aggressively with the policy instruments. Others suggest that these guides be used more as indicators, to be monitored regularly; in other words, the Federal Reserve could establish a reference path for the intermediate variable that it thought to be consistent with achieving the final goals of monetary policy, and actual outcomes departing appreciably from that path would be seen as suggesting that the economy might be drifting off course and that a policy adjustment might be necessary.

**Monetary Aggregates**

Monetary aggregates have at times been advocated as guides to monetary policy on the grounds that they may have a fairly stable relationship with the economy and can be controlled to a reasonable extent by the central bank, either through control over the supply of balances at the Federal Reserve or the federal funds rate. An increase in the federal funds rate (and other short-term interest rates), for example, will reduce the attractiveness of holding money balances relative to now higher-yielding money market instruments and thereby reduce the amount of money demanded and slow growth of the money stock. There are a few measures of the money stock—ranging from the transactions-dominated M1 to the broader M2 and M3 measures, which include other liquid balances—and these aggregates have different behaviors. (See page 22 for a description of the composition of the monetary aggregates.)

Ordinarily, the rate of money growth sought over time would be equal to the rate of nominal GDP growth implied by the objective for inflation and the objective for growth in real GDP. For example, if the objective for inflation is 1 percent in a given year and the rate of growth in real GDP associated with achieving maximum employment is 3 percent, then the guideline for growth in the money stock would be 4 percent. However, the relation between the growth in money and the growth in nominal GDP, known as “velocity,” can vary, often unpredictably, and this uncertainty can add to difficulties in using monetary aggregates as a guide to policy. Indeed, in the United States and many other countries with advanced financial systems over recent decades, considerable slippage and greater complexity in the relationship between money and GDP have made it more difficult to use monetary aggregates as guides to policy. In addition, the narrow and broader aggregates often give very different signals about the need to adjust policy. Accordingly, monetary aggregates have taken on less importance in policy making over time.
The Components of the Monetary Aggregates

The Federal Reserve publishes data on three monetary aggregates. The first, M1, is made up of types of money commonly used for payment, basically currency and checking deposits. The second, M2, includes M1 plus balances that generally are similar to transaction accounts and that, for the most part, can be converted fairly readily to M1 with little or no loss of principal. The M2 measure is thought to be held primarily by households. The third aggregate, M3, includes M2 plus certain accounts that are held by entities other than individuals and are issued by banks and thrift institutions to augment M2-type balances in meeting credit demands; it also includes balances in money market mutual funds held by institutional investors.

The aggregates have had different roles in monetary policy as their reliability as guides has changed. The following details their principal components:

M1  
Currency (and traveler’s checks)  
Demand deposits  
NOW and similar interest-earning checking accounts

M2  
M1  
Savings deposits and money market deposit accounts  
Small time deposits\(^1\)  
Retail money market mutual fund balances\(^2\)

M3  
M2  
Large time deposits  
Institutional money market mutual fund balances  
Repurchase agreements  
Eurodollars

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1. Time deposits in amounts of less than $100,000, excluding balances in IRA and Keogh accounts at depository institutions.
2. Excludes balances held in IRA and Keogh accounts with money market mutual funds.
Interest Rates

Interest rates have frequently been proposed as a guide to policy, not only because of the role they play in a wide variety of spending decisions but also because information on interest rates is available on a real-time basis. Arguing against giving interest rates the primary role in guiding monetary policy is uncertainty about exactly what level or path of interest rates is consistent with the basic goals of monetary policy. The appropriate level of interest rates will vary with the stance of fiscal policy, changes in the pattern of household and business spending, productivity growth, and economic developments abroad. It can be difficult not only to gauge the strength of these forces but also to translate them into a path for interest rates.

The slope of the yield curve (that is, the difference between the interest rate on longer-term and shorter-term instruments) has also been suggested as a guide to monetary policy. Whereas short-term interest rates are strongly influenced by the current setting of the policy instrument, longer-term interest rates are influenced by expectations of future short-term interest rates and thus by the longer-term effects of monetary policy on inflation and output. For example, a yield curve with a steeply positive slope (that is, longer-term interest rates far above short-term rates) may be a signal that participants in the bond market believe that monetary policy has become too expansive and thus, without a monetary policy correction, more inflationary. Conversely, a yield curve with a downward slope (short-term rates above longer rates) may be an indication that policy is too restrictive, perhaps risking an unwanted loss of output and employment. However, the yield curve is also influenced by other factors, including prospective fiscal policy, developments in foreign exchange markets, and expectations about the future path of monetary policy. Thus, signals from the yield curve must be interpreted carefully.

The Taylor Rule

The “Taylor rule,” named after the prominent economist John Taylor, is another guide to assessing the proper stance of monetary policy. It relates the setting of the federal funds rate to the primary objectives of monetary policy—that is, the extent to which inflation may be departing from something approximating price stability and the extent to which output and employment may be departing from their maximum sustainable levels. For example, one version of the rule calls for the federal funds rate to be set equal to the rate thought to be consistent in the long run with the achievement of full employment and price stability plus a component based on the gap between current inflation and the inflation objective less a component based on the shortfall of actual output from the full-employment level. If inflation is picking up, the Taylor rule prescribes
the amount by which the federal funds rate would need to be raised or, if output and employment are weakening, the amount by which it would need to be lowered. The specific parameters of the formula are set to describe actual monetary policy behavior over a period when policy is thought to have been fairly successful in achieving its basic goals.

Although this guide has appeal, it too has shortcomings. The level of short-term interest rates associated with achieving longer-term goals, a key element in the formula, can vary over time in unpredictable ways. Moreover, the current rate of inflation and position of the economy in relation to full employment are not known because of data lags and difficulties in estimating the full-employment level of output, adding another layer of uncertainty about the appropriate setting of policy.

**Foreign Exchange Rates**

Exchange rate movements are an important channel through which monetary policy affects the economy, and exchange rates tend to respond promptly to a change in the federal funds rate. Moreover, information on exchange rates, like information on interest rates, is available continuously throughout the day.

Interpreting the meaning of movements in exchange rates, however, can be difficult. A decline in the foreign exchange value of the dollar, for example, could indicate that monetary policy has become, or is expected to become, more accommodative, resulting in inflation risks. But exchange rates respond to other influences as well, notably developments abroad; so a weaker dollar on foreign exchange markets could instead reflect higher interest rates abroad, which make other currencies more attractive and have fewer implications for the stance of U.S. monetary policy and the performance of the U.S. economy. Conversely, a strengthening of the dollar on foreign exchange markets could reflect a move to a more restrictive monetary policy in the United States—or expectations of such a move. But it also could reflect expectations of a lower path for interest rates elsewhere or a heightened perception of risk in foreign financial assets relative to U.S. assets.

Some have advocated taking the exchange rate guide a step further and using monetary policy to stabilize the dollar’s value in terms of a particular currency or in terms of a basket of currencies. However, there is a great deal of uncertainty about which level of the exchange rate is most consistent with the basic goals of monetary policy, and selecting the wrong rate could lead to a protracted period of deflation and economic slack or to an overheated economy. Also, attempting to stabilize the exchange rate in the face of a disturbance from abroad would short-circuit the cushioning effect that the associated movement in the exchange rate would have on the U.S. economy.
Conclusion

All of the guides to monetary policy discussed here have something to do with the transmission of monetary policy to the economy. All have certain advantages; however, none has shown so consistently close a relationship with the ultimate goals of monetary policy that it can be relied on alone. Consequently, monetary policy makers have tended to use a broad range of indicators—those mentioned above along with many others, including the actual behavior of output and prices—to judge trends in the economy and to assess the stance of monetary policy.

Such an eclectic approach enables the Federal Reserve and other central banks to use all the available information in conducting monetary policy. This tack may be especially important as market structures and economic processes change in ways that reduce the utility of any single indicator. However, a downside to such an approach is the difficulty it poses in communicating the central bank’s intentions to the public; the lack of a relatively simple set of procedures may make it difficult for the public to understand the actions of the Federal Reserve and to judge whether those actions are consistent with achieving its statutory goals. This downside risk can be mitigated if the central bank develops a track record of achieving favorable policy outcomes when no single guide to policy has proven reliable.
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

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**The Market for Balances at the Federal Reserve**

- **Required reserve balances**
  - held to satisfy reserve requirements
  - do not earn interest

- **Contractual clearing balances**
  - held to meet contractually agreed-upon amount
  - generate earnings credits that defray cost of Federal Reserve priced services

- **Excess reserves**
  - held to provide additional protection against overnight overdrafts and reserve or clearing balance deficiencies

- **Securities portfolio**
  - holdings of U.S. Treasury securities and repurchase agreements
  - purchases or sales of securities are called open market operations
  - purchases increase balances

- **Loans**
  - credit extended to depository institutions through discount window
  - making a loan increases balances

- **Autonomous factors**
  - other items on the Federal Reserve's balance sheet such as Federal Reserve notes, Treasury's balance at the Federal Reserve, and Federal Reserve float
  - can add or drain balances
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 Re-
serve 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 transac-
tions 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 over-
drafts, 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.
The Federal Reserve System: Purposes and Functions

**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.)

**Table 3.1**

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

Billions of dollars; annual averages of daily data

<table>
<thead>
<tr>
<th>Year</th>
<th>Required reserve balances</th>
<th>Contractual clearing balances</th>
<th>Excess reserve balances</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7.2</td>
<td>7.0</td>
<td>2.8</td>
</tr>
<tr>
<td>2002</td>
<td>8.0</td>
<td>9.7</td>
<td>1.5</td>
</tr>
<tr>
<td>2003</td>
<td>10.0</td>
<td>11.0</td>
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</tr>
<tr>
<td>2004</td>
<td>11.0</td>
<td>10.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

**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.
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
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

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

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.

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

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

<table>
<thead>
<tr>
<th>Remaining maturity</th>
<th>U.S. Treasury securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year or less</td>
<td>379.4</td>
</tr>
<tr>
<td>More than 1 year to 5 years</td>
<td>208.3</td>
</tr>
<tr>
<td>More than 5 years to 10 years</td>
<td>54.4</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>75.8</td>
</tr>
<tr>
<td>Total</td>
<td>717.8</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Transaction</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchases</td>
<td>68.5</td>
<td>54.2</td>
<td>36.8</td>
<td>50.5</td>
</tr>
<tr>
<td>Redemptions</td>
<td>26.9</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>95.4</td>
<td>54.2</td>
<td>36.8</td>
<td>50.5</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Num. Vol.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repurchase agreements¹</td>
<td>305</td>
<td>1,497.7</td>
<td>262</td>
<td>1,143.1</td>
</tr>
<tr>
<td>Matched sale-purchase transactions/Reverse repurchase agreements²</td>
<td>10</td>
<td>25.0</td>
<td>7</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>288</td>
<td>1,522.9</td>
<td>299</td>
<td>1,876.9</td>
</tr>
</tbody>
</table>

1. Includes all types of repurchase agreements.

**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**

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Reserve requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net transaction accounts</td>
<td></td>
</tr>
<tr>
<td>$0 to $6.6 million</td>
<td>0 percent of amount</td>
</tr>
<tr>
<td>Over $6.6 million and up to $45.4 million</td>
<td>3 percent of amount</td>
</tr>
<tr>
<td>Over $45.4 million</td>
<td>$1,164,000 plus 10 percent of amount over $45.4 million</td>
</tr>
<tr>
<td>Nonpersonal time deposits</td>
<td>0 percent</td>
</tr>
<tr>
<td>Eurocurrency liabilities</td>
<td>0 percent</td>
</tr>
</tbody>
</table>

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, policymakers 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.

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](chart.png)
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 Reserve balances, thereby allowing the institution to meet its required reserve balance requirements.

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

The Federal Reserve System: Purposes and Functions

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.

**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.
The U.S. economy and the world economy are linked in many ways. Economic developments in this country have a major influence on production, employment, and prices beyond our borders; at the same time, developments abroad significantly affect our economy. The U.S. dollar, which is the currency most used in international transactions, constitutes more than half of other countries’ official foreign exchange reserves. U.S. banks abroad and foreign banks in the United States are important actors in international financial markets.

The activities of the Federal Reserve and the international economy influence each other. Therefore, when deciding on the appropriate monetary policy for achieving basic economic goals, the Board of Governors and the FOMC consider the record of U.S. international transactions, movements in foreign exchange rates, and other international economic developments. And in the area of bank supervision and regulation, innovations in international banking require continual assessments of, and occasional modifications in, the Federal Reserve’s procedures and regulations.

The Federal Reserve formulates policies that shape, and are shaped by, international developments. It also participates directly in international affairs. For example, the Federal Reserve occasionally undertakes foreign exchange transactions aimed at influencing the value of the dollar in relation to foreign currencies, primarily with the goal of stabilizing disorderly market conditions. These transactions are undertaken in close and continuous consultation and cooperation with the U.S. Treasury. The Federal Reserve also works with the Treasury and other government agencies on various aspects of international financial policy. It participates in a number of international organizations and forums and is in almost continuous contact with other central banks on subjects of mutual concern.

International Linkages

The Federal Reserve’s actions to adjust U.S. monetary policy are designed to attain basic objectives for the U.S. economy. But any policy move also influences, and is influenced by, international developments. For example,
U.S. monetary policy actions influence exchange rates. The dollar’s exchange value in terms of other currencies is therefore one of the channels through which U.S. monetary policy affects the U.S. economy. If Federal Reserve actions raised U.S. interest rates, for instance, the foreign exchange value of the dollar generally would rise. An increase in the foreign exchange value of the dollar, in turn, would raise the price in foreign currency of U.S. goods traded on world markets and lower the dollar price of goods imported into the United States. By restraining exports and boosting imports, these developments could lower output and price levels in the U.S. economy. In contrast, an increase in interest rates in a foreign country could raise worldwide demand for assets denominated in that country’s currency and thereby reduce the dollar’s value in terms of that currency. Other things being equal, U.S. output and price levels would tend to increase—just the opposite of what happens when U.S. interest rates rise.

Therefore, when formulating monetary policy, the Board of Governors and the FOMC draw upon information about and analysis of international as well as U.S. domestic influences. Changes in public policies or in economic conditions abroad and movements in international variables that affect the U.S. economy, such as exchange rates, must be factored into the determination of U.S. monetary policy.

Conversely, economic developments in the United States, including U.S. monetary policy actions, have significant effects on growth and inflation in foreign economies. Although the Federal Reserve’s policy objectives are limited to economic outcomes in the United States, it is mutually beneficial for macroeconomic and financial policy makers in the United States and other countries to maintain a continuous dialogue. This dialogue enables the Federal Reserve to better understand and anticipate influences on the U.S. economy that emanate from abroad.

The increasing complexity of global financial markets—combined with ever-increasing linkages between national markets through trade, finance, and direct investment—have led to a proliferation of forums in which policy makers from different countries can meet and discuss topics of mutual interest. One important forum is provided by the Bank for International Settlements (BIS) in Basel, Switzerland. Through the BIS, the Federal Reserve works with representatives of the central banks of other countries on mutual concerns regarding monetary policy, international financial markets, banking supervision and regulation, and payments systems. (The Chairman of the Board of Governors and the president of the Federal Reserve Board of New York represent the U.S. central bank on the board of directors of the BIS.) Representatives of the Federal Reserve also participate in the activities of the International Monetary Fund (IMF) and discuss macroeconomic, financial market, and structural issues with representatives of other industrial countries at the Organisation for Economic
Co-operation and Development (OECD). Following the Asian Financial Crises of 1997 and 1998, the Financial Stability Forum (FSF) was established to enable central banks, finance ministries, and financial regulatory authorities in systemically important economies to work together to address issues related to financial stability. The Federal Reserve also sends delegates to international meetings such as those of the Asia Pacific Economic Cooperation (APEC) Finance Ministers’ Process, the G-7 Finance Ministers and Central Bank Governors, the G-20, and the Governors of Central Banks of the American Continent.

Foreign Currency Operations

The Federal Reserve conducts foreign currency operations—the buying and selling of dollars in exchange for foreign currency—under the direction of the FOMC, acting in close and continuous consultation and cooperation with the U.S. Treasury, which has overall responsibility for U.S. international financial policy. The manager of the System Open Market Account at the Federal Reserve Bank of New York acts as the agent for both the FOMC and the Treasury in carrying out foreign currency operations. Since the late 1970s, the U.S. Treasury and the Federal Reserve have conducted almost all foreign currency operations jointly and equally.

The purpose of Federal Reserve foreign currency operations has evolved in response to changes in the international monetary system. The most important of these changes was the transition in the 1970s from a system of fixed exchange rates—established in 1944 at an international monetary conference held in Bretton Woods, New Hampshire—to a system of flexible (or floating) exchange rates for the dollar in terms of other countries’ currencies. Under the Bretton Woods Agreements, which created the IMF and the International Bank for Reconstruction and Development (known informally as the World Bank), foreign authorities were responsible for intervening in exchange markets to maintain their countries’ exchange rates within 1 percent of their currencies’ parities with the U.S. dollar; direct exchange market intervention by U.S. authorities was extremely limited. Instead, U.S. authorities were obliged to buy and sell dollars against gold to maintain the dollar price of gold near $35 per ounce. After the United States suspended the gold convertibility of the dollar in 1971, a regime of flexible exchange rates emerged; in 1973, under that regime, the United States began to intervene in exchange markets on a more significant scale. In 1978, the regime of flexible exchange rates was codified in an amendment to the IMF’s Articles of Agreement.

Under flexible exchange rates, the main aim of Federal Reserve foreign currency operations has been to counter disorderly conditions in exchange markets through the purchase or sale of foreign currencies (called foreign
Under flexible exchange rates, the main aim of Federal Reserve foreign currency operations has been to counter disorderly conditions in exchange markets.

exchange intervention operations), primarily in the New York market. During some episodes of downward pressure on the foreign exchange value of the dollar, the Federal Reserve has purchased dollars (sold foreign currency) and has thereby absorbed some of the selling pressure on the dollar. Similarly, the Federal Reserve may sell dollars (purchase foreign currency) to counter upward pressure on the dollar’s foreign exchange value. The Federal Reserve Bank of New York also executes transactions in the U.S. foreign exchange market for foreign monetary authorities, using their funds.

In the early 1980s, the United States curtailed its official exchange market operations, although it remained ready to enter the market when necessary to counter disorderly conditions. In 1985, particularly after September, when representatives of the five major industrial countries reached the so-called Plaza Agreement on exchange rates, the United States began to use exchange market intervention as a policy instrument more frequently. Between 1985 and 1995, the Federal Reserve—sometimes in coordination with other central banks—intervened to counter dollar movements that were perceived as excessive. Based on an assessment of past experience with official intervention and a reluctance to let exchange rate issues be seen as a major focus of monetary policy, U.S. authorities have intervened only rarely since 1995.

Sterilization

Intervention operations involving dollars affect the supply of Federal Reserve balances to U.S. depository institutions, unless the Federal Reserve offsets the effect. A purchase of foreign currency by the Federal Reserve increases the supply of balances when the Federal Reserve credits the account of the seller’s depository institution at the Federal Reserve. Conversely, a sale of foreign currency by the Federal Reserve decreases the supply of balances. The Federal Reserve offsets, or “sterilizes,” the effects of intervention on Federal Reserve balances through open market operations; otherwise, the intervention could cause the federal funds rate to move away from the target set by the FOMC.

For example, assume that the Federal Reserve, perhaps in conjunction with Japanese authorities, wants to counter downward pressure on the dollar’s foreign exchange value in relation to the Japanese yen. The Federal Reserve would sell some of its yen-denominated securities for yen on the open market and then trade the yen for dollars in the foreign exchange market, thus reducing the supply of dollar balances at the Federal Reserve. In order to sterilize the effect of intervention on the supply of Federal Reserve balances, the Open Market Desk would then purchase an equal amount of U.S. Treasury securities in the open market (or arrange a repurchase agreement), thereby raising the supply of balances back to
its former level. The net effect of such an intervention is a reduction in dollar-denominated securities in the hands of the public and an increase in yen-denominated securities. The operations have no net effect on the level of yen balances at the Bank of Japan or on the level of dollar balances at the Federal Reserve.

A dollar intervention initiated by a foreign central bank also leaves the supply of balances at the Federal Reserve unaffected, unless the central bank changes the amount it has on deposit at the Federal Reserve. If, for example, the foreign central bank purchases dollars in the foreign exchange market and places them in its account at the Federal Reserve Bank of New York, then the supply of Federal Reserve balances available to U.S. depository institutions decreases because the dollars are transferred from the bank of the seller of dollars to the foreign central bank’s account with the Federal Reserve. However, the Open Market Desk would offset this drain by buying a Treasury security or arranging a repurchase agreement to increase the supply of Federal Reserve balances to U.S. depository institutions. Most dollar purchases by foreign central banks are used to purchase dollar securities directly, and thus they do not need to be countered by U.S. open market operations to leave the supply of dollar balances at the Federal Reserve unchanged.

U.S. Foreign Currency Resources

The main source of foreign currencies used in U.S. intervention operations currently is U.S. holdings of foreign exchange reserves. At the end of June 2004, the United States held foreign currency reserves valued at $40 billion. Of this amount, the Federal Reserve held foreign currency assets of $20 billion, and the Exchange Stabilization Fund of the Treasury held the rest.

The U.S. monetary authorities have also arranged swap facilities with foreign monetary authorities to support foreign currency operations. These facilities, which are also known as reciprocal currency arrangements, provide short-term access to foreign currencies. A swap transaction involves both a spot (immediate delivery) transaction, in which the Federal Reserve transfers dollars to another central bank in exchange for foreign currency, and a simultaneous forward (future delivery) transaction, in which the two central banks agree to reverse the spot transaction, typically no later than three months in the future. The repurchase price incorporates a market rate of return in each currency of the transaction. The original purpose of swap arrangements was to facilitate a central bank’s support of its own currency in case of undesired downward pressure in foreign exchange markets. Drawings on swap arrangements were common in the 1960s but over time declined in frequency as policy authorities came to rely more on foreign exchange reserve balances to finance currency operations.
In years past, the Federal Reserve had standing commitments to swap currencies with the central banks of more than a dozen countries. In the middle of the 1990s, these arrangements totaled more than $30 billion, but they were almost never drawn upon. At the end of 1998, these facilities were allowed to lapse by mutual agreement among the central banks involved, with the exception of arrangements with the central banks of Canada and Mexico (see table 4.1).

Reciprocal currency arrangements can be an important policy tool in times of unusual market disruptions. For example, immediately after the terrorist attacks of September 11, 2001, the Federal Reserve established temporary swap arrangements with the European Central Bank and the Bank of England, as well as a temporary augmentation of the existing arrangement with the Bank of Canada (see table 4.1). The purpose of these arrangements was to enable the foreign central banks to lend dollars to local financial institutions to facilitate the settlement of their dollar obligations and to guard against possible disruptions to the global payments system. The European Central Bank drew $23.5 billion of its swap line; the balance was repaid after three days. The other central banks did not draw on their lines. The temporary arrangements lapsed after thirty days.

Table 4.1
Federal Reserve standing reciprocal currency arrangements, June 30, 2004
Millions of U.S. dollars

<table>
<thead>
<tr>
<th>Institution</th>
<th>Amount of facility</th>
<th>Amount drawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of Canada</td>
<td>2,000</td>
<td>0</td>
</tr>
<tr>
<td>Bank of Mexico</td>
<td>3,000</td>
<td>0</td>
</tr>
<tr>
<td>Temporary reciprocal currency arrangements of September 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European Central Bank</td>
<td>50,000</td>
<td>23,500*</td>
</tr>
<tr>
<td>Bank of England</td>
<td>30,000</td>
<td>0</td>
</tr>
<tr>
<td>Bank of Canada</td>
<td>10,000†</td>
<td>0</td>
</tr>
</tbody>
</table>

† Includes 2,000 from existing arrangement (see upper panel).
International Banking

The Federal Reserve is interested in the international activities of banks, not only because it functions as a bank supervisor but also because such activities are often close substitutes for domestic banking activities and need to be monitored carefully to help interpret U.S. monetary and credit conditions. Moreover, international banking institutions are important vehicles for capital flows into and out of the United States.

Where international banking activities are conducted depends on such factors as the business needs of customers, the scope of operations permitted by a country’s legal and regulatory framework, and tax considerations. The international activities of U.S.-chartered banks include lending to and accepting deposits from foreign customers at the banks’ U.S. offices and engaging in other financial transactions with foreign counterparts. However, the bulk of the international business of U.S.-chartered banks takes place at their branch offices located abroad and at their foreign-incorporated subsidiaries, usually wholly owned. Much of the activity of foreign branches and subsidiaries of U.S. banks has been Eurocurrency business—that is, taking deposits and lending in currencies other than that of the country in which the banking office is located. Increasingly, U.S. banks are also offering a range of sophisticated financial products to residents of other countries and to U.S. firms abroad.

The international role of U.S. banks has a counterpart in foreign bank operations in the United States. U.S. offices of foreign banks actively participate as both borrowers and investors in U.S. domestic money markets and are active in the market for loans to U.S. businesses. (See chapter 5 for a discussion of the Federal Reserve’s supervision and regulation of the international activities of U.S. banks and the U.S. activities of foreign banks.)

International banking by both U.S.-based and foreign banks facilitates the holding of Eurodollar deposits—dollar deposits in banking offices outside the United States—by nonbank U.S. entities. Similarly, Eurodollar loans—dollar loans from banking offices outside the United States—can be an important source of credit for U.S. companies (banks and non-banks). Because they are close substitutes for deposits at domestic banks, Eurodollar deposits of nonbank U.S. entities at foreign branches of U.S. banks are included in the U.S. monetary aggregate M3; Eurodollar deposits of nonbank U.S. entities at all other banking offices in the United Kingdom and Canada are also included in M3. (See page 21 for a discussion of U.S. monetary aggregates.)

1. The term Eurocurrency should not be confused with euro, the common currency of several European Union countries.