

# Understanding Open Market Operations

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## Foreword

The Federal Reserve Bank of New York is responsible for day-to-day implementation of the nation's monetary policy. It is primarily through open market operations—purchases or sales of U.S. Government securities in the open market in order to add or drain reserves from the banking system—that the Federal Reserve influences money and financial market conditions that, in turn, affect output, jobs and prices.

This edition of **Understanding Open Market Operations** seeks to explain the challenges in formulating and implementing U.S. monetary policy in today's highly competitive financial environment. The book highlights the broad and complex set of considerations that are involved in daily decisions for open market operations and details the steps taken to implement policy.

Michael Akbar Akhtar, vice president of the Federal Reserve Bank of New York, leads the reader—whether a student, market professional or an interested member of the public—through various facets of monetary policy decision-making, and offers a general perspective on the transmission of policy effects throughout the economy.

**Understanding Open Market Operations** provides a nontechnical review of how monetary policy is formulated and executed. Ideally, it will stimulate readers to learn more about the subject as well as enhance appreciation of the challenges and uncertainties confronting monetary policymakers.

William J. McDonough  
*President*

## Acknowledgment

Much has changed in U.S. financial markets and institutions since 1985, when the last edition of **Open Market Operations**, written by Paul Meek, was published. The formulation and implementation of monetary policy also have undergone some noteworthy changes over the years. Consequently, the current edition is a substantially new book rather than simply an update of the earlier work. Even so, I have made considerable use of materials from Paul Meek's book and have followed its structure where possible.

I owe a special debt of gratitude to the Open Market Desk staff at the Federal Reserve Bank of New York: to Peter Fisher for allowing me to observe the daily operations over an extended period of time; to Spence Hilton, Sandy Krieger, Ann-Marie Meulendyke and John

Partlan for extensive comments on drafts; and to all of the Desk staff for graciously and patiently answering my questions.

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M. A. Akhtar



# Introduction

As the nation's central bank, the Federal Reserve System is responsible for formulating and implementing monetary policy. The formulation of monetary policy involves developing a plan aimed at pursuing the goals of stable prices, full employment and, more generally, a stable financial environment for the economy. In implementing that plan, the Federal Reserve uses the tools of monetary policy to induce changes in interest rates, and the amount of money and credit in the economy. Through these financial variables, monetary policy actions influence, albeit with considerable time lags, the levels of spending, output, employment and prices.

The formulation of monetary policy has undergone significant shifts over the years. In the early 1980s, for example, the Federal Reserve placed special emphasis on objectives for the monetary aggregates as policy guides for indicating the state of the economy and for stabilizing the price level. Since that time, however, ongoing and far-reaching changes in the financial system have reduced the usefulness of the monetary aggregates as policy guides. As a consequence, monetary policy

plans must be based on a much broader array of indicators. Today, the monetary aggregates still play a useful role in judging the appropriateness of financial conditions and in making monetary policy plans, but their role is quite similar to that of many other financial and nonfinancial indicators of the economy.

To a considerable extent, changes in policy formulation have been accompanied by corresponding changes in the implementation approach. In the early 1980s, monetary policy was implemented by targeting a quantity of bank reserves that was based on numerical objectives for the monetary aggregates. As the Federal Reserve reduced its reliance on the monetary aggregates and conditioned its policy decisions on a wide range of indicators, the implementation strategy shifted toward a focus on reserve and money market conditions consistent with broader policy goals, rather than on achieving a particular quantity of reserves.

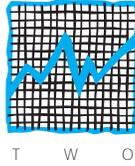
No one approach to implementing monetary policy can be expected to prove satisfactory under all economic and financial circumstances. The actual

approach has been adapted from time to time in light of different considerations, such as the need to combat inflation and the desire to deal with uncertainties stemming from structural changes in the financial system. Thus, it is fair to say that the current implementation approach is likely to continue to evolve in response to changing circumstances.

Regardless of the particular approach, implementing monetary policy involves adjustments in the supply of bank reserves, relative to the reserve demand, in order to achieve and maintain desired money and financial market conditions. Among the policy instruments used by the Federal Reserve, none is more important for adjusting bank reserves than open market oper-

ations, which add or drain reserves through purchases or sales of securities in the open market. Indeed, open market operations are, by far, the most powerful and flexible tool of monetary policy.

Focusing on open market operations, this book offers a detailed description of how monetary policy is implemented. By tracing the economic and financial conditions that influence the actual decision-making process, it attempts to provide a sense of the uncertainties and challenges involved in conducting day-to-day operations. The book also reviews the monetary policy formulation process, and offers a broad perspective on the linkages between monetary policy and the economy.



# Monetary Policy and the Economy

## Policy Formulation

The basic link between monetary policy and the economy is through the market for bank reserves, more commonly known as the federal funds market. In that market, banks and other depository institutions trade their non-interest-bearing reserve balances held at the Federal Reserve with each other, usually on an overnight basis. On any given day, depository institutions that are below their desired reserve positions borrow from others that are above their desired reserve positions. The benchmark interest rate charged for the short-term use of these funds is called the federal funds rate. The Federal Reserve's monetary policy actions have an immediate effect on the supply of or demand for reserves and the federal funds rate, initiating a chain of reactions that transmit the policy effects to the rest of the economy.

The Federal Reserve can change reserves market conditions by using three main instruments: reserve requirements, the discount rate and open market operations. The Board of Governors of the Federal Reserve System (hereafter frequently referred to as the Board)

sets reserve requirements, under which depository institutions must hold a fraction of their deposits as reserves. At present, as described in the next chapter, these reserve requirements apply only to checkable or transactions deposits, which include demand deposits and interest-bearing accounts that offer unlimited checking privileges. Directors of the Reserve Banks set the discount rate and initiate changes in it, subject to review and determination by the Board of Governors. The Reserve Banks administer discount window lending to depository institutions, making short-term loans.

The Federal Open Market Committee (FOMC) directs the primary and, by far, the most flexible and actively used instrument of monetary policy—open market operations—to effect changes in reserves. The Chairman of the Board of Governors presides over FOMC meetings, currently eight per year, in which the Chairman, the six other governors, and the 12 Reserve Bank presidents assess the economic outlook and plan monetary policy actions. The voting members of the FOMC include the seven members of the Board of

Governors, the president of the Federal Reserve Bank of New York—designated, by tradition, as the vice chairman of the FOMC—and four other Reserve Bank presidents who serve in annual rotation. There is sometimes discussion as well at the FOMC meetings of reserve requirements and the discount rate, although these tools are outside the FOMC's jurisdiction.

Under the Federal Reserve Act as amended by the Full Employment and Balanced Growth Act of 1978 (the Humphrey-Hawkins Act), the Federal Reserve and the FOMC are charged with the job of seeking "to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates." The Humphrey-Hawkins Act requires that, in the pursuit of these goals, the Federal Reserve and the FOMC establish annual objectives for growth in money and credit, taking account of past and prospective economic developments. This provision of the Act assumes that the economy and the growth of money and credit have a reasonably stable relationship that can be exploited toward achieving policy goals. The law recognizes, however, that changing economic conditions may necessitate revisions to, or deviations from, monetary growth plans.

Since about 1980, far-reaching changes in the financial system have caused considerable instability in

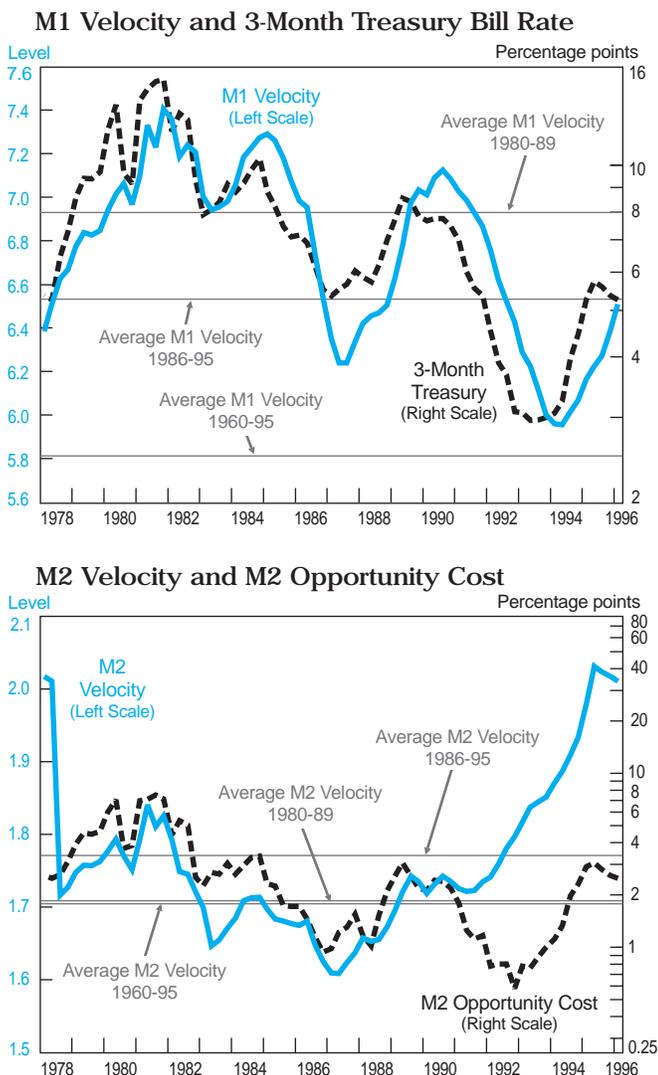
the relationship of money and credit to the economy. In particular, monetary velocities—ratios of nominal GDP (gross domestic product) to various monetary aggregates—have shown frequent and marked departures from their historical patterns, making the monetary aggregates unreliable as indicators of economic activity and as guides for stabilizing prices. Velocities of M1 (currency, checkable deposits and travelers checks of non-bank issuers) and M2 (M1 plus saving and small time deposits and retail-type money market mutual fund balances) have fluctuated widely in recent years, and their average values over the last five to ten years have been much different from their long-run averages (Figure 2-1). For example, until the late 1980s, M2 velocity had been relatively stable over longer periods, while its short-run movements were positively correlated to interest rate changes. In the early 1990s, however, M2 velocity departed from its historical pattern and drifted upward even as interest rates were declining.

Some observers believe that ongoing, rapid financial changes will continue to cause instability in the financial linkages of the economy, undermining the usefulness of money and credit aggregates as guides for policy. Others expect the financial innovation process to settle down, leading to a restoration, at least to some

*The Federal Reserve's monetary policy actions have an immediate effect on the supply of or demand for reserves and the federal funds rate.*

Figure 2-1

## Monetary Velocities and Interest Rates



Notes: (1) Quarterly observations.

(2) Velocities are ratios of nominal GDP to M1 or M2.

(3) M2 opportunity cost is the difference between the 3-month Treasury bill rate and the average rate paid on M2 components.

extent, of the usefulness of money and credit as policy guides. Whatever the future outcome of these controversies, the Federal Reserve has been obliged, for some time now, to reduce its reliance on numerical targets for money and credit in formulating monetary policy. In recent years, the FOMC has used a wide range of financial and nonfinancial indicators in judging economic trends and the appropriateness of monetary and financial conditions, and in making monetary policy plans. In effect, under this eclectic approach, the FOMC's strategy for changing bank reserve levels aims at inducing broad financial conditions that it believes to be consistent with final policy goals.

In making monetary policy plans, the Federal Reserve and the FOMC are involved in a complex, dynamic process in which monetary policy is only one of many forces affecting employment, output and prices. The government's budgetary policies influence the economy through changes in tax and spending programs. Shifts in business and consumer confidence and a variety of other market forces also affect saving and spending plans of businesses and households. Changes in expectations about economic prospects and policies, through their effects on interest rates and financial conditions, can have significant influence on the outcomes for jobs, output and prices. Natural disasters and commodity price shocks can cause significant disruptions in output supply and the economy. Shifts in international

trade rules and regulations and in economic policies abroad can lower or raise the contribution of the external sector to the U.S. economy.

The FOMC also must estimate when, and to what extent, its own policy actions will affect money, credit, interest rates, business developments and prices. Since the state of knowledge about the way the economy works is quite imperfect, policymakers' understanding of the effects of various influences, including the effect of monetary policy, is far from certain. Moreover, the working of the economy changes over time, leading to changes in its response to policy and nonpolicy factors. On top of all these difficulties, policymakers do not have up-to-the-minute, reliable information about the economy, because of lags in the collection and publication of data. Even preliminary published data are frequently subject to significant errors that become evident in subsequent revisions.

In all of this, there is no escape from forecasting and from using judgment to deal with the uncertainties of data and the policy process. Indeed, monetary policy formulation is not a simple technical matter; it is clearly an art in that it greatly depends on experience, expertise and judgment.

### **Operational Approaches**

Determining the appropriate reserve market conditions—that is, the desired degree of monetary policy

restraint—also is very complicated. In choosing an operating strategy, the FOMC attempts to achieve a desired degree of monetary policy restraint, ease or tightness, by focusing on the reserve supply relative to demand, and the associated level of the federal funds rate. The Domestic Open Market Desk at the Federal Reserve Bank of New York can come reasonably close to meeting short-term objectives for nonborrowed reserves—supply of reserves excluding discount window borrowing. The contemplated reserve levels are based, of course, on the FOMC's desire to induce short-run monetary and financial conditions that will help to achieve policy goals for the economy.

In principle, the FOMC can aim for direct control of the quantity of reserves by not accommodating observed fluctuations in the demand for reserves. However, this will result in free movements in the federal funds rate. Alternatively, the FOMC can control the federal funds rate by adjusting the supply of reserves to meet all changes in the demand for reserves; this will allow the quantity of reserves to vary freely. Over the years, the actual approach has been adapted to changing circumstances. Sometimes the emphasis has been on controlling the quantity of reserves; other times, the federal funds rate.

While the FOMC generally has not aimed at precise control of the quantity of reserves, the operating strategy from October 1979 to late 1982 was closely

consistent with this approach. Concerned over rapidly accelerating inflation in the late 1970s, the Committee sought changes in its operating procedures in order to control money stock growth more effectively. In October 1979, the Committee began targeting nonborrowed reserves, allowing the federal funds rate to fluctuate freely within a wide and flexible range. Under this approach, the targeted path for nonborrowed reserves was based on the FOMC's growth objectives for M1—currency, checkable deposits and travelers checks of nonbank issuers. M1 growth in excess of the Committee's objectives would cause the depository institutions' demand for reserves to outstrip the nonborrowed reserves target, putting upward pressures on the funds rate and other short-term rates. The rise in interest rates, in turn, would reduce the growth in checkable deposits and other low-yielding instruments, bringing money stock growth back toward the Committee's objectives.

The reserve targeting procedure from 1979 to 1982 gradually came to provide assurance to financial markets and the public at large that the Federal Reserve would not underwrite a continuation of high and accelerating inflation. Reinforcing this procedure's built-in effects on money market conditions were judgmental changes in nonborrowed reserve objectives and in the discount

rate. Monetary policy contributed importantly to lowering the inflation rate sharply, albeit not without a significant increase in interest rate volatility and a period of marked decline in output.

The historical relationship between M1 and the economy broke down in the early 1980s, leading the FOMC to de-emphasize its control of M1 during 1982. In late 1982, the Committee abandoned the formal reserve targeting procedure and moved toward accommodating

short-run fluctuations in the demand for reserves, while limiting their effects on the federal funds rate. Subsequently, ongoing deregulation and financial innovation precluded a return to the use of numerical objectives for M1 and the nonborrowed reserve targeting procedure.

As a consequence, since 1982, the Federal Reserve's operating procedures have focused on achieving a particular degree of tightness or ease in reserve market conditions rather than on the quantity of reserves. Specifically, the FOMC expresses its operating directives in terms of a desired degree of reserve pressure—that is, the costs and other conditions for the availability of reserves to the banking system—which is associated with an average level of the federal funds rate. The approach for evaluating the degree of reserve pressure, however, has

*Monetary policy formulation is not a simple technical matter; it is clearly an art in that it greatly depends on experience, expertise and judgment.*

changed over time. As discussed in detail in Chapter 5, discount window borrowing targets were used as the main factor for assessing reserve availability conditions during 1983-87, but they have not played a significant role through much of the subsequent period.

Under the current approach, the FOMC uses the federal funds rate as the principal guide for evaluating reserve availability conditions and indicates a desired level of the federal funds rate. This judgmental approach involves estimating the demand for and supply of reserves, and accommodating all significant changes in the demand for reserves through adjustments in the supply of nonborrowed reserves. It allows for only modest day-to-day variations in the funds rate around the level intended by the Committee.

### **Financial Markets**

The money market—which includes the federal funds market—provides the natural point of contact between the Federal Reserve and the financial system. The money market is a term used for wholesale markets in short-term credit or IOUs, comprising debt instruments maturing within one year. The market is international in scope and helps in economizing on the use of cash or money. Borrowers who are the issuers of short-term IOUs—generally, the U.S. Treasury, banks, business corporations and finance companies—can bridge differences in the timing of receipts and payments or can defer long-term

borrowing to a more propitious time. The market allows the lenders—businesses, households or governmental units—to offset uneven flows of funds by allowing them to invest in short-term interest-earning assets that can be readily converted into cash with little risk of loss. They can also time their purchases of bonds and stocks to their particular views of long-term interest rates and stock prices.

The main instruments of the money market are federal funds, Treasury bills, repurchase agreements (RPs), Eurodollar deposits, certificates of deposits (CDs), bankers acceptances, commercial paper, municipal notes and federal agency short-term securities (see Figure 2-2 for definitions of instruments). The stock-in-trade of the market includes a large portion of the U.S. Treasury debt and federal agency securities. The daily dollar volume in this market is very large, several times that of the most active trading days on the New York Stock Exchange.

Banks are at the center of the money market, with their customer deposits and their own reserve balances at the Federal Reserve serving as the core element in the flow of funds. Large banks borrow and lend huge sums of money, on a daily basis, through the federal funds market. They are also particularly active in the markets for RPs, Eurodollars and bankers acceptances. Many banks act as dealers in money market securities, while many others offer short-term investment services.

Like other financial institutions, banks invest in short-term instruments such as Treasury bills and commercial paper. Banks also supply much of the short-term credit that allows nonbank dealers in money market paper to buy and hold an inventory.

Changes in borrowing and lending in the money market are reflected more or less continuously in the demand for nonborrowed reserves relative to the available supply, with immediate consequences for the federal funds rate. Thus, if the Federal Reserve increases the reserve supply relative to demand—i.e. eases reserve market conditions—the funds rate will fall quickly, and

vice versa. Sustained movements of the federal funds rate are transmitted almost fully to yields on Treasury bills, commercial paper and other money market instruments.

The transmission of monetary policy actions to capital markets—markets for Government securities and corporate bonds and stocks with maturities exceeding one year—and the foreign exchange market is more complex and less predictable. Insurance companies, pension funds and other investors in capital market instruments seek rates of return that will compensate them, not only for expected future inflation, but also for

*Figure 2-2*

## **Glossary: Common Money Market Instruments**

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### **Federal Funds**

Non-interest-bearing deposits held by banks and other depository institutions at the Federal Reserve; these are immediately available funds that institutions borrow or lend, usually on an overnight basis.

### **Treasury Bills**

Short-term debt obligations of the U.S. Treasury that are issued to mature in 3 to 12 months.

### **Repurchase Agreements**

Short-term loans—normally for less than two weeks and frequently for one day—arranged by selling securities to an investor with an agreement to repurchase them at a fixed price on a fixed date.

### **Eurodollar Deposits**

Dollar deposits in a U.S. bank branch or a foreign bank located outside the United States.

### **Certificate of Deposit**

A time deposit with a specific maturity date shown on a certificate; large-denomination certificates of deposits can be sold before maturity.

### **Bankers' Acceptances**

A draft or bill of exchange accepted by a bank to guarantee payment of the bill.

### **Commercial Paper**

An unsecured promissory note with a fixed maturity of one to 270 days; usually it is sold at a discount from face value.

### **Municipal Notes**

Short-term notes issued by municipalities in anticipation of tax receipts or other revenues.

### **Federal Agency Short-Term Securities**

Short-term securities issued by federally sponsored agencies such as the Farm Credit System, the Federal Home Loan Bank and the Federal National Mortgage Association.

uncertainty and forgone real return. In making investment decisions, such investors take into account recent experience with inflation and inflation expectations, as well as numerous other factors, including the federal budget deficit, long-term prospects for the economy, expectations about short-term interest rates and the credibility of monetary policy. These same considerations are also important in the transmission of monetary policy to the foreign exchange market.

Given the wide variety of influences on capital markets, long-term interest rates do not respond one-for-one to changes in the federal funds rate. In general, sustained changes in the federal funds rate (and other money market rates) lead to significant, but usually smaller, changes in long rates. Such interest rate changes also may tend to strengthen or weaken the dollar against other currencies, other things remaining the same. For example, a rise in U.S. interest rates relative to interest rates abroad will tend to make dollar assets more attractive to hold, increasing the foreign exchange value of the dollar as long as U.S. inflation trends and other forces are not working to offset the upward pressures on the dollar.

### **Economic Effects of Monetary Policy**

By causing changes in interest rates, financial markets and the dollar exchange rate, monetary policy actions have important effects on output, employment and prices.

These effects work through many different channels, affecting demand and economic activity in various sectors of the economy. Figure 2-3 shows the main contours of the transmission of monetary policy to the economy (see Box for a brief description of the transmission channels).

### *Private Spending and Output*

Changes in the cost and availability of credit, reflecting changes in interest rates and credit supply conditions, are the most important sources of monetary policy effects on the economy. Higher interest rates tend to reduce demand and output in interest-sensitive sectors: higher corporate bond rates increase borrowing costs, restraining the demand for additional plant and equipment; higher mortgage rates depress the demand for housing; higher auto and consumer loan rates reduce purchases of cars and other consumer durables. Other (non-rate) restrictive provisions of loan agreements and lower supplies of credit also restrain the demand for investment goods and consumer durables, especially by those businesses and households particularly dependent on bank credit.

Consumption demand also is affected by changes in the value of household assets such as stocks and bonds. In general, asset values are inversely related to movements of interest rates—higher interest rates tend to reduce the value of household assets, other things remaining the same.



## Monetary Policy Influence on the Economy

Figure 2-3 indicates that monetary policy actions influence output, employment and prices through a number of complex channels. These channels involve a variety of forces in financial markets that cause changes in (1) the cost and availability of funds to businesses and households, (2) the value of household assets or net worth, and (3) the foreign exchange value of the dollar with direct consequences for import/export prices. All these changes, in due course, affect economic activity and prices in various sectors of the economy.

When the Federal Reserve tightens monetary policy—for example, by draining bank reserves through open market sales of Government securities—the federal funds rate and other short-term interest rates rise more or less immediately, reflecting the reduced supply of bank reserves in the market. Sustained increases in short-term interest rates lead to lower growth of deposits and money as well as higher long-term interest rates. Higher interest rates raise the cost of funds, and, over time, have adverse consequences for business investment demand, home buying and consumer spending on durable goods, other things remaining the same. This is the conventional money or interest rate channel of monetary policy influence on the economy.

A firming of monetary policy also may reduce the supply of bank loans through higher funding costs for banks or through increases in the perceived risk-

ness of bank loans. Similarly, non-bank sources of credit to the private sector may become more scarce because of higher lending risks (actual or perceived) associated with tighter monetary conditions. The reduced availability—as distinct from costs—of loans may have negative effects on aggregate demand and output. This is the so-called “credit channel” that may operate alongside the interest rate channel.

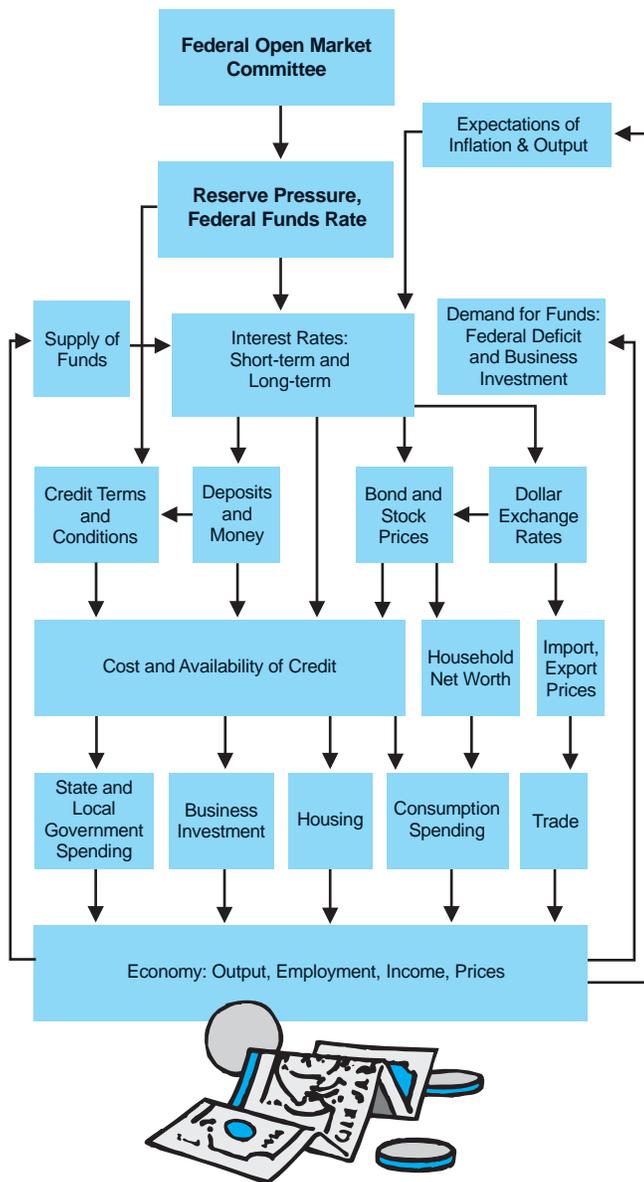
Higher interest rates and lower monetary growth also may influence economic activity through the “wealth channel” by lowering actual or expected asset values. For example, rising interest rates generally tend to lower bond and stock prices, reducing household net worth and weakening business balance sheets. As a consequence, business and household spending may suffer.

Finally, a monetary policy tightening affects economic activity by raising the foreign exchange value of the dollar—the exchange rate channel. By making U.S. imports cheaper and by increasing the cost of U.S. exports to foreigners, the appreciation of the dollar reduces the demand for U.S. goods, and, therefore, has adverse consequences for the trade balance and output. On the positive side, lower import prices help in improving the U.S. inflation performance.

Needless to say, all these effects work in the opposite direction when the Federal Reserve eases monetary policy.

Figure 2-3

## The Transmission of Monetary Policy



The outlook for the economy and expectations of households and businesses play a central role in the magnitude and timing of monetary policy effects on the economy. Households' own experience with the cyclical rise and fall in interest rates may affect their actions. A sustained sharp rise in interest rates, for example, may suggest more uncertain prospects for employment and incomes, resulting in greater household caution toward spending on consumer goods and house purchases. Conversely, a significant fall in interest rates during a period of weak economic activity may encourage greater consumer spending by increasing the value of household assets. Lower mortgage rates, together with greater availability of mortgage credit, also may stimulate the demand for housing.

Businesses plan their inventories and additions to productive capacity (i.e. capital spending) to meet future customer demands and their own sales expectations. Since internal resources—retained earnings and depreciation allowances—do not provide all of their cash requirements, businesses often are obliged to use the credit markets to finance capital spending and inventories.

During business cycle expansion, the business sector's need for external financing rises rapidly, as firms accumulate inventories to ensure that sales will not be lost because of shortages. At the same time, businesses attempt to finance additions to capacity. Greater business demand for funds tends to bid up interest rates in

financial markets, but higher rates do not pose serious problems for businesses so long as sales are growing and the economy is expanding at a rapid pace. In this environment, monetary policy tightening will dampen capital spending and inventory building only slowly, if the strong outlook for business sales and the economy persists. Eventually, however, higher interest costs and reduced credit availability contribute to a tempering of the optimistic outlook, leading to weaker business sales, unwanted accumulation of inventories and lower output.

With lower capital spending, business credit demands fall during periods of business slowdown, putting downward pressure on market interest rates. Actual and expected easing of monetary policy work in the same direction, accelerating the speed of decline in rates and increasing credit availability to businesses. These conditions gradually build up expectations of stronger demand and economic activity, setting the stage for an end to the inventory runoff. Eventually, production levels needed to meet current sales are restored.

#### *Government Sector*

Monetary policy has only a modest direct effect on capital spending by state and local governments. Rising

interest rates tend to trim or postpone some state and local government capital spending projects, as private investors bid away financial resources from other users. Conversely, a fall in interest rates tends to make some state and local Government projects viable.

In contrast, the discretionary spending and revenue decisions of the federal Government are largely immune to monetary restraint or ease. The U.S. Treasury

*Monetary policy has significant effects on employment and output in the short run, but in the long run, it affects primarily prices.*

is, in fact, a major independent force in financial markets, competing with other borrowers. To some extent, federal credit demands tend to run counter to private credit demands: they rise during recessions, when tax receipts go down and cyclically induced Government spendings go up; they fall during expansions, reflecting favorable effects on tax receipts and cyclical

Government spendings. Since the early 1980s, however, federal credit demands have tended to remain very high, even in good times, because of a sharp rise in structural deficits. Recent Government budget initiatives may reverse this trend by reducing future structural deficits.

#### *External Sector*

U.S. monetary policy exercises significant effects on the economy through the external sector. For example, the appreciation of the dollar associated with higher interest

rates reduces the demand for U.S. goods by lowering the cost of imports to Americans and increasing the cost of U.S. exports to foreigners. With Americans substituting cheaper imports for domestically produced goods and people abroad buying fewer American goods, U.S. production suffers and the trade balance worsens.

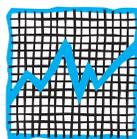
Other countries have to weigh the benefits and costs of changes in exchange rates resulting from U.S. monetary policy changes for their own economies. A country may welcome the stimulus from the depreciation of its currency—the appreciation of the dollar—if its economy is facing considerable slack and inflation is not a serious problem. On the other hand, if a country is experiencing significant inflationary pressures at home, it may attempt to offset the depreciation of its currency by tightening monetary policy. Of course, the feedback on U.S. exports and trade depends, not only on changes in foreign and U.S. monetary policies, but also on the pace of economic growth here and abroad.

### *Inflation*

The drop in demand and output induced by tighter monetary policy tends to relieve pressures on economic resources. Such relief is necessary to curb inflation in an overheating economy. By contrast, in a depressed econ-

omy, monetary ease helps increase employment of labor and other economic resources by generating higher demand and output. Monetary policy has significant effects on employment and output in the short run, but in the long run, it affects primarily prices. To sustain non-inflationary economic growth over time, therefore, the Federal Reserve must aim at maintaining price stability or low inflation. Indeed, price stability is necessary, though not sufficient, to maximize the long-run growth potential of an economy.

Monetary restraint or ease affects the economy with considerable time lags that differ among sectors and, perhaps more importantly, between demand/output and prices. Normally, sales and production respond to monetary policy changes more quickly than do wages and prices. The economy is characterized by many formal and informal contracts and other rigidities that limit changes in prices and wages in the short run. In addition, inflation expectations, which influence decisions to set wages and prices, tend to adjust rather slowly. Over a longer period, however, monetary policy changes are transmitted more fully to wages and prices as adjustment of inflation expectations is completed and contracts are renegotiated.



T H R E E

## Monetary Stresses and Reserve Management

As background for understanding the monetary policy implementation process, this chapter, first offers a brief description of the institutional setting under which depository institutions hold and manage their reserves. It then reviews a variety of influences on supply and demand conditions for reserves. The review emphasizes the role of market factors in absorbing and supplying reserves and its implications for open market operations.

### Depository Institutions' Reserve Positions

All depository institutions in the United States, as in many other countries, are subject to reserve requirements on their customers' deposits. Commercial banks and thrift institutions—mutual savings banks, savings and loan associations and credit unions—whose checkable deposits exceed a certain size are required to maintain cash reserves equal to a specified fraction of those deposits (Figure 3-1). As of end-1995, commercial banks held about 86 percent of checkable deposits, and thrift institutions the remaining 14 percent.

The bulk of the commercial bank share of

checkable deposits is accounted for by member banks of the Federal Reserve System. About 4,000 commercial banks were members of the System at the end of 1995. These included just over 2,900 federally chartered national banks—which are required to be members—and about 1,050 state-chartered banks. Approximately 6,000 state-chartered banks were not members at end-1995. But they and all other depository institutions have access to the Federal Reserve System's lending facilities on equal terms with members, just as they are subject to reserve requirements.

Reserve requirements are structured to bear less heavily on smaller depository institutions. At all depository institutions, checkable deposits up to certain levels—adjusted annually to reflect growth in the banking system—either are exempted or carry relatively low requirements.

Depository institutions hold required reserves either as cash in their own vaults or as deposits at their District Federal Reserve Bank. To provide banks and thrifts with flexibility in meeting their requirements, the

Federal Reserve allows them to hold an average amount of reserves over two-week reserve maintenance periods ending on alternate Wednesdays, rather than a specific amount on each day. Large banks apply all of their vault cash toward meeting requirements, since their required reserves exceed their vault cash. But many small banks and thrift institutions hold more vault cash than their required reserves because they need more cash to meet customer demands than they do to meet reserve requirements.

In contrast, over 3,000 depository institutions in early 1996 had less vault cash than their required reserves, obliging them to hold balances at Reserve Banks. These so-called bound institutions accounted for roughly three-quarters of total checkable deposits.

#### *Coping With Reserve Pressures*

In managing their reserve positions, depository institutions attempt to balance two opposing considerations. As profit-seeking enterprises, they try to keep their reserves, which produce no income, close to the required minimum. Yet they also must avoid reserve deficiencies, which carry a penalty charge on the deficiency at a rate that is 2 percentage points above the discount rate. In addition, if a depository institution frequently fails to meet requirements, its senior management is given a warning that continued failure would put the institution under scrutiny. To clear their ongoing financial transactions through the Federal Reserve and to maintain a cushion of funds in order to avoid penalty charges, many depository institutions arrange with their Reserve Banks to maintain supplementary accounts for required clearing balances. These additional balances effectively earn interest in the form of credits that can be used to pay for Federal Reserve services, such as check-clearing and wire transfers of funds and securities.

Managing the reserve position of a depository institution is a difficult job. The institution's reserve posi-

Figure 3-1

### **Required Reserves on Checking Deposits in 1996\***

Dollar Amount of Deposits	Reserve Ratio**	Other Provisions
Up to \$4.3 million	0 percent	Depository institutions hold an average amount of reserves over a two-week maintenance period; they are allowed to carry forward for one maintenance period any excess or deficiency of up to four percent of their requirements; reserve deficiencies beyond the carry-forward amount are assessed a penalty equal to two percentage points above the discount rate.
\$4.3 million to \$52 million	3 percent	
Above \$52 million	10 percent	

\* Time deposits and other bank liabilities are not subject to reserve requirements at present.

\*\* Fraction of deposits held as required reserves.

tion is affected by virtually all of its transactions—whether carried out for its customers or on its own account. A bank or thrift institution, for example, loses reserves when it pays out cash or transfers funds by wire on behalf of its customers. Customer checks to pay out-of-town bills funnel back through its Federal Reserve Bank and are charged against its reserve or clearing account; customer checks to pay in-town bills also drain reserves, on a net basis, as accounts among banks are settled. A bank may also lose reserves when it advances loans or buys securities. On the other hand, a bank gains reserves from deposits of customer checks and currency, sales of securities and numerous other transactions. At the end of each day, after the close of wire transfers of funds and securities, a bank's reserve position reflects the net of reserve losses and gains resulting from all of its transactions.

*A bank's reserve position reflects the net of reserve losses and gains resulting from all of its transactions.*

A depository institution facing a reserve deficiency has several options. It can try to borrow reserves for one or more days from another depository institution. It can sell liquid, or readily marketable assets, such as Government securities, pulling in funds from the buyer's bank. It can bid for funds in the money market, such as large certificates of deposits (CDs) or Eurodollars. Using Government securities or other acceptable collateral, a depository institution also can—as a last resort—borrow

from its District Reserve Bank at the prevailing discount rate to compensate for unforeseen reserve losses.

### **The Open Market Desk and Reserve Supply**

While an individual institution can meet its reserve shortages by purchasing or borrowing reserves from other banks or thrift institutions, depository institutions cannot expand aggregate reserves (except by borrowing at the

discount window); they can merely pass

around the existing reserves.

Reserve shortages or surpluses of depository institutions are reflected in the overall reserve supply and demand in the federal funds market.

When depository institutions, collectively, seek more reserves than are available in the market, they bid up the federal funds rate. As the funds rate

rises, more banks and thrift institutions

are induced to borrow at the discount window, bringing reserve supply back into line with reserve demand. Thus, within a given reserve maintenance period, the banking system as a whole has no practical alternative to borrowing more reserves from the Federal Reserve if aggregate reserve demand exceeds the total supply of non-borrowed reserves.

Open market operations allow the Open Market Desk at the Federal Reserve Bank of New York to adjust

the volume of nonborrowed reserves in the system before depository institutions turn to borrowing from the discount window. Open market operations involve the buying and selling of Government securities in the open, or secondary, market by the Federal Reserve—a purchase adds to nonborrowed reserves, while a sale reduces them (see Chapter 5 for details). In this way, the Federal Reserve can offset swings in reserves caused by changes in the public's demand for cash and numerous other factors, sheltering the funds rate from the effects of potential reserve changes. Alternately, the Federal Reserve can choose not to offset, or even to reinforce, movements in nonborrowed reserves, inducing changes in the funds rate.

By managing the supply of nonborrowed reserves in relation to the demand for them, the Federal Reserve can adjust the cost and availability of reserves to induce changes in the federal funds rate. When the Open Market Desk adds more reserves than depository institutions collectively demand, the funds rate declines. Over time, higher reserves and a lower federal funds rate stimulate the expansion of money and credit in the economy, other things remaining the same. Conversely, when the Desk holds back on reserves relative to demand, the funds rate rises and the growth of money and credit tends to go down.

While open market operations allow the Federal Reserve to exert control over the supply of nonborrowed

reserves, many factors outside the Federal Reserve's control influence that supply. Among the most important such factors are changes in currency holdings of the public, the Treasury's cash balances at the Federal Reserve, short-term credit to banks resulting from the Federal Reserve's national check clearing arrangements and foreign central bank transactions. As discussed in Chapter 5, the Federal Reserve forecasts daily these and other factors affecting reserves to assess the need for open market operations. Here, we briefly sketch the general implications of these factors for reserve movements and open market operations.

#### *Currency in Circulation*

Depository institutions obtain currency from the Federal Reserve Banks to replenish actual or anticipated cash withdrawals by customers, and they pay for it through debits of their reserve accounts at the Fed. Over time, currency demand is the largest single factor requiring reserve injections, because it has a strong growth trend which reflects, primarily, the growth trend of the economy. However, currency movements display significant short-run variations. Such variations may result from many sources, including cyclical developments in the economy or changes in foreign demand for U.S. currency, which usually expands in times of political and economic uncertainty abroad. Indeed, in recent years, foreign demand for U.S. dollars, especially from high-

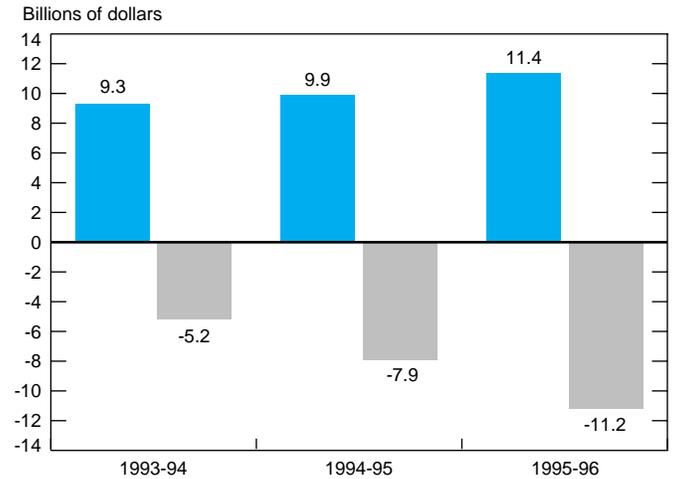
inflation economies of Eastern Europe and other regions, has contributed significantly to the growth of U.S. currency in circulation.

Normally, seasonal swings in the public's currency holdings are the dominant source of short-run currency variations. Some of these swings represent intramonthly patterns reflecting such routine transactions as payments of salaries and social security benefits. Others result from the effects of somewhat longer seasonal cycles on business activity during the year. For example, currency in circulation rises substantially during the winter holiday shopping season, from early November to year-end, and much of this bulge reverses in the following month (Figure 3-2).

Most short-term variations in currency movements are reasonably predictable, since they follow recurrent seasonal patterns (Figure 3-3). The Federal Reserve, through its open market operations, attempts to offset recurrent contractions and expansions in reserves associated with seasonal swings in currency. If the Federal Reserve did not do so, depository institutions as a group would be obliged to adjust their reserve positions by lowering or raising their investments and short-term loans. Such actions would cause significant fluctuations in the federal funds rate and other short rates, and could lead to serious market disturbances. Indeed, one of the original reasons for creating the Federal Reserve System was to avoid the undesirable effects of seasonal

Figure 3-2

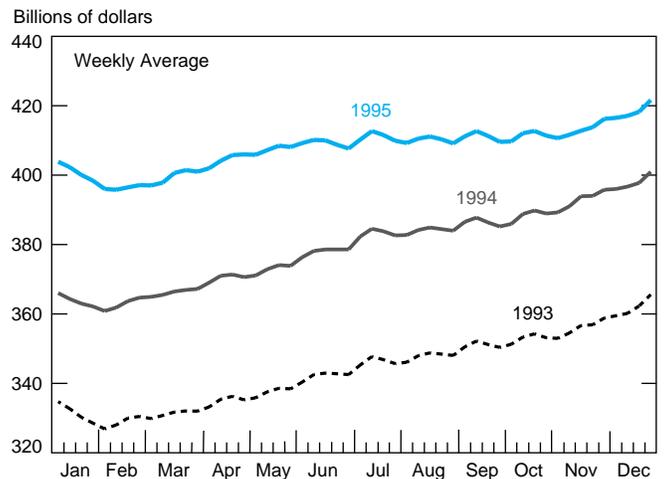
### Changes in Currency Demand: Winter Holiday Shopping Season\*



\* For each period, the first bar represents the cumulative increase over the seven-week period from mid-November to the beginning of January, while the second bar reports the cumulative decrease over the four-week period from early January to end-January.

Figure 3-3

### Currency in Circulation



swings in the public's currency holdings. Before the establishment of the Federal Reserve in 1913, financial strains from seasonal increases in currency demands were quite common and became so severe on a few occasions that they touched off financial panics, causing bankruptcies and recessions in business activity.

### *Treasury Balances*

The U.S. Treasury maintains its working balances at the Federal Reserve for making and receiving payments; increases in these balances absorb reserves since they involve the transfer of funds from the public and depository institutions to the Federal Reserve, while decreases in these balances supply reserves to banks and thrifts. The Treasury attempts to keep its balances reasonably stable, generally around \$5 billion, so as not to complicate the Fed's job of managing reserves. It places additional cash in Treasury tax and loan note option (TT&L) accounts at depository institutions that have agreed to accept them; these accounts serve as collection points for tax receipts. Each depository institution limits the amount of TT&L account balances because it must pay interest on those balances and must hold collateral against them. When balances exceed the limit, the excess is transferred to the Federal Reserve.

*One of the original reasons for creating the Federal Reserve System was to avoid the undesirable effects of seasonal swings in the public's currency holdings.*

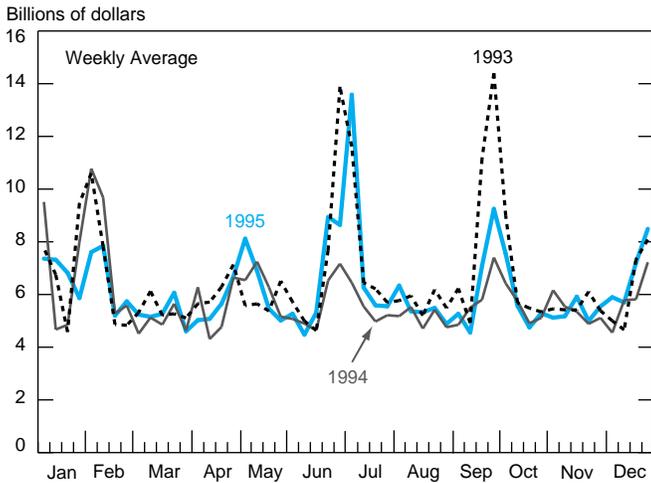
The Treasury can transfer funds into or out of the TT&L accounts on a daily basis to keep its Federal Reserve balances close to the target level. It can make a "call" before 11 a.m. on the larger depository institutions to transfer funds to the Fed on the same day, or the following day. It can make a "direct investment" to move funds from the Fed to the TT&L accounts.

Because of the difficulties in predicting the timing and size of the myriad receipts and expenditures of the federal Government, daily estimates of Treasury balances at the Fed are subject to sizable errors. It is not unusual for the balance to be \$1 billion or so higher or lower than expected. Most of the time such errors have only a modest effect on the average level of reserves over the two-week maintenance period, since the Treasury can take action the next day to bring the balance back to the desired level.

However, a more serious reserve management problem arises when Treasury tax receipts are particularly heavy—for example, following some of the major tax dates in January, April, June and September (Figure 3-4). In this case, Treasury balances accumulate in excess of the combined aggregate limits on the TT&L accounts set by depository institutions, lifting balances at the Federal Reserve and draining reserves from the

Figure 3-4

### Treasury Balances at the Fed



banking system. At times, the excess in Treasury balances may last for up to two weeks before they drop below the aggregate capacity of the TT&L accounts. Accordingly, on those occasions, the Open Market Desk has to offset reserve drains by injecting large amounts of reserves.

#### Federal Reserve Float

Households and businesses make a significant portion of their payments by writing checks on their accounts at depository institutions. The Federal Reserve's national check clearing system facilitates the movement of these checks around the country. The Reserve Banks credit a bank's reserve account at the Fed for checks

deposited—presented for collection—by the bank and debit its account for checks drawn on it and presented by other banks. When a presenting bank's reserve account is credited before a corresponding debit is made to the account of the bank on which the check is drawn, two banks have credit simultaneously for the same reserves, creating reserve float. This float arises because Reserve Banks credit checks presented for collection, under a preset schedule, to a bank's reserve account within a maximum of two business days, while it sometimes takes more than two days to process those checks and collect funds from the banks on which they are drawn.

Since 1983, the Fed has actively discouraged float by charging the banks explicitly for the float they receive. As a result, float has declined dramatically in recent years. Float also has become more predictable because of increased information flows about delivery and processing of checks. Most of the time, therefore, changes in float are not a significant consideration for open market operations.

Still, however, float can vary widely on a weekly or even monthly basis (Figure 3-5), and occasionally, it shows large increases when normal check delivery is interrupted, for example, due to bad weather. On these occasions, the Open Market Desk may be obliged to engage in significant operations to offset the effects of large swings in float on the supply of nonborrowed reserves.

### Foreign Central Bank Transactions

Many foreign central banks and official international institutions maintain working and short-term investment balances at the Federal Reserve to execute their dollar-denominated transactions. Drawing down of these balances increases the reserves of depository institutions receiving payments. Moving funds from depository institutions into these balances drains reserves of the banking system. At times, unexpected transfers into and out of foreign central bank accounts can result in significant increases or decreases in reserves, requiring sizable off-setting open market operations.

### Deposit Flows and Reserve Demand

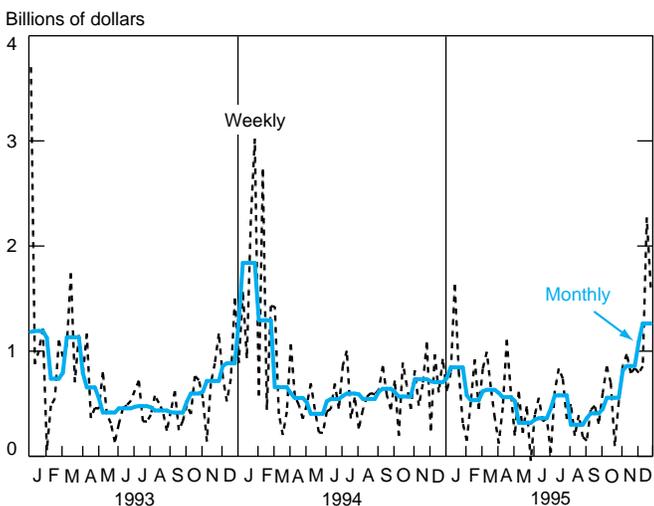
Open market operations are required, not only to offset seasonal and other short-lived influences on the supply of nonborrowed reserves, but also to deal with changes in depository institutions' demand for reserves. Specifically, in managing the supply of nonborrowed reserves, the Open Market Desk must make adjustments for changes in the demand for those reserves so as to create money market conditions that are consistent with the desired monetary policy objectives. Open market operations, therefore, have both defensive and dynamic aspects.

Depository institutions' demand for reserves has two components: required reserves and excess reserves above requirements. Since banks and thrifts attempt to keep their reserves—which yield no income—close to the required minimum, aggregate excess reserves in the system are quite small. In 1995, for example, excess reserves averaged only about \$1 billion, less than 2 percent of total reserves.

Required reserves are based on checkable deposits, which serve as the principal means of payment for transactions in the economy. Over time, the public's demand for checkable deposits is related to the growth of the economy and developments in other modes of payments—such as cash, direct debit of accounts and electronic transfers—that may encourage or discourage the use of checks for making payments. But, in the short

Figure 3-5

### Weekly and Monthly Average Float, 1993-1995 (Including As-Of Adjustments)



run, the demand for checkable deposits can be highly variable, leading to large increases or decreases in required reserves.

Short-run variability of checkable deposits results in part from the influence of cyclical and other short-term developments in business activity; these developments go hand-in-hand with short-run changes in interest rates and affect credit flows and the holdings of various income-producing assets—such as bonds, stocks and time/saving deposits—relative to currency and demand deposits that yield no income. But it also reflects a variety of recurring influences, including tax payment cycles, regular payroll disbursements and seasonal movements in demands for credit and deposits. For example, businesses and households normally keep checkable deposits at minimum levels because such deposits pay low interest rates, if any at all. However, they shift out of higher-yielding short-term investments into checkable deposits when tax, payroll or other significant payments are due. Around major tax payment dates, for instance, checkable deposits at banks and thrifts increase substantially, enabling businesses and households to make their tax payments to the U.S. Treasury. Required reserves increase correspondingly on a temporary basis, and decline a few days later when the funds are trans-

*In the short run, the demand for checkable deposits can be highly variable, leading to large increases or decreases in required reserves.*

ferred to the TT&L balances, which are not subject to reserve requirements.

#### *Bank Decisions and Monetary Policy*

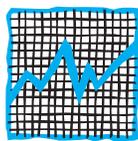
Seasonal adjustments and related procedures can be applied to sort out recurrent patterns of deposit movements. But whether short-term monetary developments are consistent with the Federal Reserve's expectations and policy goals also will depend on how the underlying deposit flows and the corresponding reserve demands evolve in response to ongoing economic and financial trends in the economy. The actual behavior of deposits and credit in the economy reflects the interaction of depository institutions, their customers—businesses and households—and the Federal Reserve. The lending and funding decisions of banks and thrifts are influenced by current and prospective customer demands, the outlook for the economy and perceptions about monetary policy. Within this context, lenders must assess the loan demand they are likely to face and possible growth of their own deposits.

For example, if a bank is facing rising loan demand at a time when the outlook for economic growth is strong, it may expect the Federal Reserve to tighten

monetary policy, putting upward pressures on interest rates. In that case, if the bank's own deposit growth is insufficient to meet its loan demand, it may fund loan demand by issuing domestic CDs or by borrowing in the Eurodollar market at prevailing interest rates, rather than risk having to roll over overnight borrowings at higher rates. On the other hand, if the bank expects its own deposit growth to outrun its loan demand, it may attempt to lend more to creditworthy customers, while buying additional securities. A turn in the outlook toward a sluggish economy would accelerate such activities.

Bank decisions affect money and credit conditions, as do developments in numerous other financial and nonfinancial indicators. The Federal Open Market Committee (FOMC), as described in the next chapter, considers all these indicators in determining the course of monetary policy and in assessing the need for changes in it. The Domestic Open Market Desk at the

Federal Reserve Bank of New York, which is responsible for implementing the FOMC's decisions on a day-to-day basis, focuses on achieving and maintaining the FOMC's desired degree of reserve pressure and the associated federal funds rate (see Chapter 5 for details). The Manager of the Desk and Federal Reserve staffs in New York and at the Board of Governors in Washington, D.C., track reserve supply and demand conditions at banks and thrift institutions, movements of various short and long interest rates and deposit flows into and out of M1 and broader monetary aggregates. They also watch closely the responses of financial and foreign exchange markets to developments in monetary policy, inflation expectations and the economy more generally. All this information helps in assessing whether money and financial conditions in the economy are developing in line with those contemplated by the FOMC.



F O U R

## Decisions of the Federal Open Market Committee

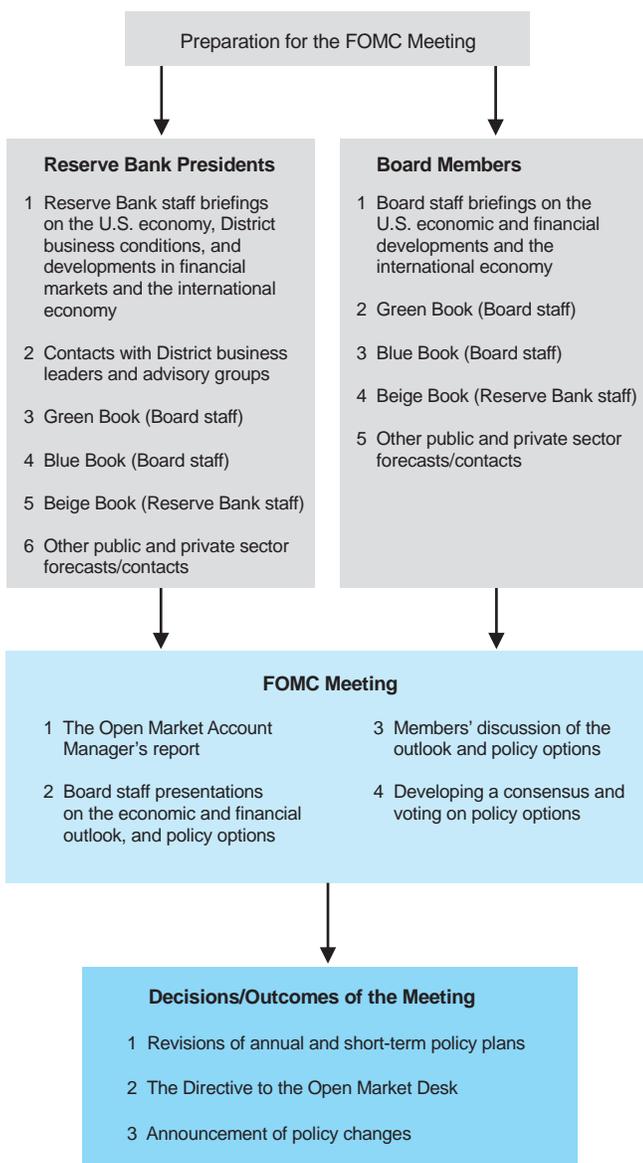
The decision-making process for U.S. monetary policy centers on the FOMC's annual policy objectives and semi-annual reports to Congress. Each year, in February, the Chairman of the FOMC, who is also the Chairman of the Board of Governors, reports to the Congress on the FOMC's expectations about the performance of the economy and its monetary policy plans for the current calendar year. The report is based on a comprehensive review of the economic and financial situation. It reviews a wide range of indicators for determining the course of monetary policy and includes specific annual growth ranges for money and debt aggregates, consistent with expectations for inflation and growth of employment and output. In July, after further consideration by the FOMC, the Chairman reports any revisions to the plans for the current year, along with preliminary plans for the following year.

In late January or early February, Board members and Reserve Bank presidents assemble in Washington, D.C., for the first FOMC meeting of the year. At present, they participate in seven other similar meet-

ings, roughly six weeks apart, during the course of a year. Each participant considers a variety of information sources on the economic and financial situation to prepare for the FOMC meeting. (Figure 4-1 provides a schematic description of the FOMC deliberations.) All of them carefully examine the Board staff's Green Book forecasts of the economy and the relevant policy and other assumptions underlying those forecasts. These forecasts draw on large, complex models that are based on historical relationships among major sectors, but the projections presented are essentially judgmental. Participants also are familiar with many other private and public sector forecasts of the national economy as well as with Reserve Bank staff's Beige Book commentaries on regional economic conditions. The Reserve Bank presidents have considered their own staff forecasts for the national economy, and also have carefully reviewed the economic situation in their particular regions. Both Board members and Reserve Bank presidents also have looked at various monetary policy options presented in the Board staff's Blue Book.

Figure 4-1

## The FOMC Deliberations



At FOMC meetings, before the Committee begins the discussion of the economic outlook and monetary policy, the Manager of the System Open Market Account reports on (1) foreign exchange market developments, along with any System open market transactions in foreign currencies since the last FOMC meeting, and (2) domestic financial market developments and System open market transactions in Government securities and federal agency obligations during the preceding intermeeting period.

### Annual Policy Plans

The discussion of the economic outlook and monetary policy is usually quite detailed, but it is particularly comprehensive at the first meeting of the year, since that meeting precedes the Chairman's testimony to Congress on annual monetary policy plans. The outlook review begins with the Board staff's presentation on how the U.S. economy and its trade and other external account balances are likely to evolve over the current and following years. The presentation covers a wide range of key economic variables and usually provides a comparison of the Board staff's forecasts for output, employment and prices with those of the Administration. The Board staff also presents an analysis of recent monetary and financial developments, and growth ranges for money and credit aggregates from the fourth quarter of the year just ended to the fourth quarter of the current year that

would be consistent with the Committee's broad policy goals. Estimates of appropriate monetary growth ranges involve considerable judgment about the future evolution of monetary velocities—ratios of nominal GDP (gross domestic product) to monetary aggregates—while taking into account their recent behavior and past business cycle experience.

In considering monetary policy options, policymakers discuss a wide range of issues. They usually consider the likelihood that economic growth or inflation will turn out to be higher or lower than the most likely outcomes in the staff forecasts. The discussion brings out the range of participants' views and concerns about prospects for the economy. Policymakers may differ on the economic outlook for a variety of reasons: different expectations about the spending and saving behavior of businesses and households; different views on the workings of labor and product markets; different regional perspectives; different perceptions of the impact of monetary policy on key sectors of the economy.

Mindful of potential instability in monetary velocities, policymakers consider alternative monetary growth ranges and the consistency of each with desirable outcomes for economic performance. In considering alternatives, policymakers also are keenly aware of the difficulties of specifying the relationship between monetary growth ranges and the Open Market Desk operations in reserves. Thus, even if all participants agreed that a par-

ticular outcome for the economy is both attainable and desirable, they may differ significantly on the monetary growth ranges and on the reserve market conditions needed to achieve those policy goals.

Given such wide-ranging issues, it is obviously a challenge for FOMC members to find a common ground on many aspects of monetary policy. Yet, the Chairman attempts to forge a reasonable consensus on the background considerations; efforts to build a consensus are helped by the fact that there is a collegial desire to be as united as possible in approaching policy decisions. Even after agreement, however, FOMC members may hold different expectations about future inflation and economic performance.

Against this background, and in keeping with the requirements of the Humphrey-Hawkins Act, the FOMC establishes annual monetary growth ranges. At present, growth ranges are specified, on a fourth-quarter-to-fourth-quarter basis, for the broader monetary aggregates, M2 and M3. (M2 consists of M1—currency, checkable deposits and travelers checks of nonbank issuers—plus savings and small time deposits, and retail-type money market mutual fund balances, while M3 is made up of M2 plus large time deposits, institution-only money market mutual funds, repurchase agreements and Eurodollars.) The Committee expects these monetary growth ranges to be consistent with achieving its broader policy goals for inflation and economic

growth. The Committee also sets an annual monitoring range for the growth of aggregate debt of all nonfinancial sectors.

While the FOMC continues to set annual monetary growth ranges, it has not found them to be reliable guides for monetary policy over the past several years. The Committee evaluates the behavior of the monetary aggregates in conjunction with progress on meeting its broader policy goals, movements of monetary velocities and other developments in the economy and financial markets. Nevertheless, annual monetary growth ranges play a useful role in policy deliberations and in communicating monetary policy intentions.

### Short-Term Policy Directives

Concerning the implementation of short-term policy actions, at each of the eight FOMC meetings during the year, participants review monetary policy operations since the last meeting, discuss the economic and financial outlook and consider the implementation of policy over the intermeeting period ahead.

In formulating policy strategy for the near term, the Committee reviews various options presented by the Board staff in the Blue Book. Typically, each option specifies a level of the federal funds rate. Also included is an assessment of the expected evolution of financial condi-

tions and possible monetary growth rates over the near term that are consistent with each option.

Individual policymakers, including the Chairman, indicate which option seems most appropriate to them, given their views on the economic outlook and the Committee's long-run policy objectives. After extensive discussion, the Chairman usually is able to present an option with appropriate specifications that commands widespread support among members. He also may outline the conditions under which the policy might be modified between meetings, i.e., before the

next formal meeting. At times, further discussion may result in modifications of the option presented by the Chairman. Finally, the vote on policy is taken by the 12 voting members.

At the conclusion of the meeting, the Committee issues the domestic policy directive to the Federal Reserve Bank of New York. If there is a change in the FOMC's stance on monetary policy, it is announced to the public shortly after the meeting, on the same day. The announcement gives the new intended average level of the federal funds rate, along with a brief rationale for the change in policy stance.

The directive provides instructions to the Open Market Desk on the FOMC's desired degree of pressure on reserve positions until the next FOMC meeting,

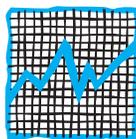
*While the FOMC continues to set annual monetary growth ranges, it has not found them to be reliable guides for monetary policy over the past several years.*

against the background of short-run developments in the economy and financial markets. This degree of reserve pressure is associated with the intended average level of the federal funds rate during the intermeeting period; greater reserve pressure implies a higher level of the funds rate, while smaller reserve pressure means a lower level of the funds rate. The directive also offers guidance

on the FOMC's inclination to move policy before the next meeting, and includes the Committee's qualitative expectation about the implications of the contemplated reserve conditions for short-run growth in the monetary aggregates.<sup>1</sup> In its implementation of policy for the immediate future, the Committee seeks to remain consistent with its general long-run policy objectives.

<sup>1</sup> A summary of the FOMC meeting, along with the directive, is released to the public shortly after the next FOMC meeting. A complete transcript of the record is made available to the public about five years later.





F I V E

## Implementing Monetary Policy—I

The domestic policy directive, discussed above, guides the Open Market Desk's daily operations in the market for reserves to achieve and maintain the FOMC's intended average level of the federal funds rate. For example, if the federal funds rate is persistently above the intended level, the Desk must expand the supply of reserves to restore the appropriate reserve market conditions, thereby bringing down the funds rate to the intended level. But knowing how much reserves to add requires, among other things, information about the levels of reserve supply and demand in the market, and the expected level of reserves that would be consistent with maintaining the intended federal funds rate. In other words, to conduct its open market operations, the Desk needs not only daily estimates of reserve supply but also a reserve target, or a reserve path, that is based on the FOMC's intended level of the federal funds rate over the relevant time horizon.

To implement policy, therefore, the Manager of the Open Market Account must translate the FOMC's directive into operating objectives. To this end, Federal

Reserve staffs in New York and at the Board in Washington, D.C. develop reserve objectives consistent with the directive's instructions. Based on detailed forecasts of the demand for reserves and the anticipated level of discount window borrowing, they create a nonborrowed reserve (NBR) path, or objective, for each two-week reserve maintenance period. This path is updated continuously during the period as projections of the demand for reserves are revised. The nonborrowed reserve objectives, together with estimates of the supply of nonborrowed reserves, serve as the core elements for judging reserve conditions and for conducting day-to-day open market operations.

### **Nonborrowed Reserve Objectives**

The starting point for constructing the NBR objective is the projection of required reserves. Required reserves are based on checkable deposits held by depository institutions over the two weeks ending on the Monday two days prior to the end of the reserve maintenance period. This means that through much of the period

required reserves for the current maintenance period are not known and must be estimated. Staffs at the Federal Reserve Bank of New York and at the Board of Governors project required reserves for the current and two succeeding maintenance periods, using estimates of the underlying deposit trends, seasonal and technical factors, and the average required reserve ratios for small and large depository institutions. This process of projecting required reserves considers, among other things, recent trends in various checkable deposits as well as the effects of interest rates and other developments in the economy on the public's demand for those deposits.

Required reserve projections for the current maintenance period are marked by considerable uncertainty. Daily reports of deposits from large banks and weekly reports from a sample of other institutions help in revising projections of required reserves during the two-week period. But even on the last day of the period, the Desk faces some uncertainty regarding required reserves because of the lags in reporting and verifying deposit data.

The next step in developing the NBR objectives is to obtain estimates of total reserve demand by adding projections of required reserves to estimates of excess reserves—amount of reserves in excess of requirements.

*To conduct its open market operations, the Desk needs not only daily estimates of reserve supply but also a reserve target, or a reserve path.*

Since banks attempt to keep their reserves, which yield no income, close to the required minimum, the demand for aggregate excess reserves does not show significant changes from one reserve maintenance period to another. The staff generally uses a “normal” allowance for excess reserves. But the staff does keep track of actual and expected variations from the normal level of excess

reserves during the period, and adjusts its estimates of the demand for total reserves when excess reserves are expected to be significantly different from the normal level.

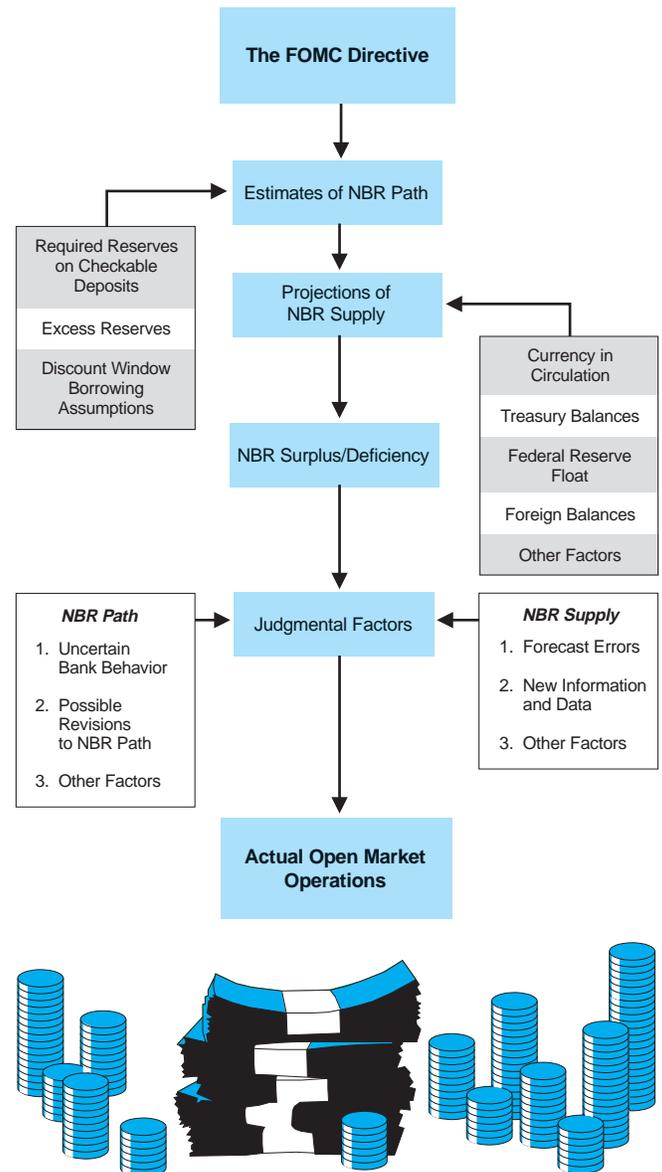
In the final step, the amount of borrowed reserves (i.e., seasonal and adjustment borrowings from the discount window) anticipated to be associated with the FOMC's intended average level of the funds rate, given the discount rate, is subtracted from estimates of total reserve demand. This step creates tentative NBR objectives for the current and two succeeding maintenance periods. The staff routinely revises the NBR objectives during the period as incoming data produce changes in estimates of required or excess reserves. The allowance for borrowing from the discount window also may be adjusted during the period if actual borrowing deviates from its assumed relationship with the federal funds and discount rates.

## The Manager's Task

In seeking to attain the FOMC's desired degree of pressure on reserve positions and the associated average level of the federal funds rate, the Manager aims at bringing the actual level of nonborrowed reserves into line with the NBR objective over the current two-week reserve maintenance period. (Figure 5-1 outlines the main steps in the decision-making process for day-to-day open market operations.) This involves comparing the objective with projections of the supply of NBR made each business day to see whether the Open Market Desk needs to add or drain reserves. At the operational level, the gap between the objective and the estimated supply of NBR measures the approximate extent to which open market operations will be needed over the period to maintain the desired reserve conditions.

Projections of the supply of NBR require a close examination of the behavior of various factors affecting reserves. Of those factors, the Federal Reserve System's portfolio of Treasury and federal agency securities supply by far the bulk of nonborrowed reserves; by changing the size of this portfolio through open market operations, the Desk can adjust the supply of NBR. However, as discussed in Chapter 3, many factors outside the control of the Federal Reserve drain or add reserves and are subject to substantial short-run variations. Each business day, the staff responsible for conducting open market operations receives two sets of estimates of the factors

Figure 5-1  
Daily Decisions for Open Market Operations



affecting the supply of NBR, one from the New York staff and the other from the Board staff in Washington, D.C. These projections form the basis for comparison with the NBR objective; in judging the need for day-to-day open market operations, the Desk normally assigns equal weights to the two sets of estimates.

Working out daily plans for adding or draining reserves to achieve the nonborrowed reserve objective may sound a bit mechanical. But, in fact, it is not. Decisions are made in an environment of uncertain bank reserve behavior marked by continuous changes in the outlook for reserves. The forecasts are subject to wide margins of error, and change on a daily basis in response to incoming data. Every day, as new information flows in, the projection staffs learn how various reserve demand and supply components turned out the day before and what new developments may affect them in the immediate future. The resulting revisions to the objective and the estimated supply of nonborrowed reserves underscore the uncertainty in determining the size of open market operations needed to maintain the desired reserve conditions.

Reserve levels have increased significantly over time, reflecting the long-term trend growth of currency demand. But short-term variability in reserve supplies and demands caused by factors outside the Fed's control generally dominates the longer term growth trend for reserves. While the predictability of recurrent seasonal

patterns helps in managing short-term variations in reserve supply and demand, the difficulties of forecasting the reserve effects of seasonal variations in numerous factors remain a significant source of operational uncertainty.

All this calls for considerable judgment in working out plans for open market operations. In considering reserve estimates, the Manager and the Desk staff must weigh the various factors affecting reserve supplies and demands and the duration of such effects. They also must allow for possible revisions to the estimates. The decision for daily operations attempts to balance the action indicated by the reserve estimates against the wide margin of projection error and against other possible considerations bearing on reserve market conditions, including recent and prospective trading ranges for the federal funds rate.

In implementing the directive, the Desk's primary focus is to keep federal funds trading centered, on average, on the FOMC's intended rate level. To do so, the Desk aims at achieving the NBR objective on average over the reserve maintenance period, but its actions also take account of the day-to-day pattern of reserve shortages or excesses as well as current market conditions. The size and nature of actual operations on any given day are almost always determined in the context of possible actions both for the maintenance period as a whole and for the days immediately ahead. The Manager

and the Desk staff also must consider whether reserve shortages or excesses are expected to be short-lived or likely to persist over several future periods. Accordingly, a decision must be made whether to add or drain reserves on a temporary or permanent basis.

To get a more concrete sense of the day-to-day implementation of monetary policy, we will focus on open market operations in the context of the changing reserve outlook and related conditions during the two-week maintenance period ending April 26, 1995. But, first, it may be useful to provide a brief description of the tools of open market operations.

### **Tools of Open Market Operations**

Open market operations by the Federal Reserve involve the buying and selling of Government securities in the secondary market in which previously issued securities are traded. When the Fed buys securities from a dealer, it pays by crediting the reserve account of the dealer's bank at a Federal Reserve Bank; in effect, the Fed pays for its purchase by writing a check on itself. Since this transaction involves no offsetting changes in reserves at other depository institutions, the rise in the reserves of the dealer's bank increases the aggregate volume of reserves in the monetary system. When the Fed sells securities to

a dealer, the reserve consequence is exactly the opposite—the payment by the dealer reduces reserves of the dealer's bank and of the monetary system.

The Federal Reserve normally conducts its open market operations in the U.S. Treasury securities market, which is the broadest and most active of U.S. financial markets, with overall trading at present averaging more than \$150 billion a day.<sup>1</sup> The breadth and depth of this market—as evident in its capacity to accommodate all types of transactions without distortions and disruptions—are essential for the effectiveness of open market operations. These characteristics of the Government securities market enable the Desk to buy and sell quickly, at its own convenience, and in any amount that may be required to keep the supply of nonborrowed reserves in line with policy objectives.

The Open Market Desk uses two general approaches to add or drain reserves through changes in the System's portfolio of securities. When significant reserve shortages or excesses are expected to persist for a relatively long period, the Desk may make outright purchases or sales (and redemptions) of securities that permanently affect the size of the Federal Reserve System's portfolio and the supply of reserves. The Desk generally conducts outright transactions in the market

<sup>1</sup> This dollar amount excludes financing transactions by primary dealers, and refers to purchases and sales of U.S. Treasury securities, including inter-dealer trades.

only a limited number of times each year, to accommodate long-term reserve needs. In recent years, because of expanded currency issuance and the associated long-term increases in reserve demand, outright purchases have been much more common than sales or deliberate redemptions, and have resulted in a considerable enlargement of the System's portfolio of securities.

Aside from the long-term upward trend, most of the time reserve surpluses or deficiencies are expected to be short-lived, either because seasonal and other technical factors are expected to be reversed or offset, or because the outlook for reserves is uncertain. In these cases, the Desk undertakes transactions that only temporarily affect the supply of reserves. As described below, the Desk uses repurchase agreements to add reserves and matched-sale purchase transactions to drain reserves on a temporary basis. Such temporary transactions are designed to minimize fluctuations in the overall supply of reserves, and they are used routinely and much more frequently than are outright transactions.

#### *Outright Purchases and Sales*

Normally the Desk conducts outright transactions in the market through auctions in which dealers are requested to submit bids to buy securities from the Federal Reserve

or offers to sell securities of a particular type and maturity, generally either Treasury bills—short-term discount securities with a maximum maturity of one year—or Treasury coupon securities—currently debt instruments with maximum maturities of two to about thirty years. In considering propositions on any given security, the Desk selects bids with the highest prices (lowest yields) for its sales, and offers with the lowest prices (highest yields) for its purchases. Typically the outright operations are arranged for delivery of the securities within the next day or two. The timing of outright transactions is driven primarily by the expected persistence of excesses or deficiencies in reserves; the exact timing of such operations also considers market conditions, as the Federal Reserve attempts to avoid rapidly rising or falling markets, and other possible events that may add to market volatility or impede price movements.

In late 1995, the Desk adjusted its method for outright operations in Treasury coupon issues. Instead of a single, large transaction aimed at the entire range of the yield curve, the Desk began using a series of smaller operations, focusing on segments of the yield curve. The change was designed to speed the turn-around time on outright operations, and had no policy significance.

*In implementing the directive, the Desk's primary focus is to keep federal funds trading centered, on average, on the FOMC's intended rate level.*

The Desk also may conduct outright transactions in Treasury securities directly with foreign official accounts on any day when those accounts are buying or selling securities that match the Desk's needs. These customer trades allow the Desk to add or drain relatively modest amounts of reserves in a timely manner.

Usually, the Federal Reserve replaces maturing securities in its portfolio by rolling them over at Treasury auctions so as to avoid unwanted reserve drains.<sup>2</sup> Occasionally, however, if the Desk wants to reduce reserve levels, it redeems a modest portion of maturing securities from the Federal Reserve System's holdings. The Desk generally keeps redemptions modest in size to avoid complicating the Treasury's debt management plans. Redemptions have the same effect on reserves as outright sales. When the Desk redeems a security, the Treasury pays the Fed by drawing down its account; this leaves fewer reserves in the banking system as the Treasury transfers funds from TT&L accounts into the Fed account to maintain the normal target level of around \$5 billion.

#### *Repurchase Agreements (RPs)*

The Desk uses short-term RPs with dealers to add reserves on a temporary basis. Under the RP arrangement, the Desk buys securities from dealers who agree

to repurchase them at a specified price on a specified date. The added reserves are extinguished automatically when the RPs mature. It is much more convenient for the Fed to inject large amounts of reserves on a temporary basis through RPs—or System RPs as they are usually called—than through outright purchases. RPs allow the Desk to respond quickly when reserves fall short of desired levels and they can smooth the pattern of reserves for the maintenance period by meeting needs for particular days. Moreover, transaction costs for RPs are very low, and acceptable collateral is broadly based to include Treasury bills, notes and bonds and certain federal agency securities held by both dealers and their customers.

The Desk can conduct RPs on an overnight basis or on a term basis. While the Desk is authorized to arrange term RPs for up to 15 days, most term RPs are arranged to mature within seven days. The distribution of RP transactions among dealers is determined by auction in which dealers bid for a dollar amount of RPs at a specified interest rate. With all the offers arranged in descending order of interest rates, the Desk accepts offers that carry the highest rates up to the desired dollar amount.

The Desk also has arranged customer-related RPs with dealers on behalf of foreign official accounts, generally to meet relatively modest reserve needs. These

<sup>2</sup> The Federal Reserve is prohibited by law from adding to its net position by direct purchases of securities from the Treasury—that is, the Federal Reserve has no authority for direct lending to the Treasury. As a consequence, at most the Desk's acquisition at Treasury auctions can equal maturing holdings.

customer RPs—as distinguished from System RPs described above—have been arranged to mature on the next business day, with their volume being limited by the total funds available from foreign accounts for investment. In December 1996, the Desk announced that it is likely to use customer-related RPs much less frequently in the future than it has in the past.

#### *Matched Sale-Purchase Transactions (MSPs)*

The Desk arranges MSPs with dealers to drain reserves on a temporary basis. In an MSP, the Fed makes a contract for immediate sale of securities to a dealer and a simultaneous matching contract to buy them back from the dealer on a specified date. The initial sale drains reserves and the subsequent purchase reverses the drain. MSPs are typically arranged for one to seven days. They work just like the reverse of RPs in terms of their effects, and offer a convenient mechanism for responding quickly to temporary excesses in reserves and for smoothing fluctuations in the supply of reserves.

In arranging an MSP, the Desk selects a Treasury bill in which the System has ample holdings and invites dealers to specify interest rates at which they are willing to purchase the bills for same-day delivery and to sell them back for delivery on a particular subsequent date. The Desk accepts the most favorable propositions (lowest rates) up to the desired amount of reserves it wants to withdraw from the monetary system.

#### **Reserve Conditions and Open Market Operations**

Figure 5-2 outlines the basic data bearing on the Manager's task on Monday, April 17, 1995, the third business day of the reserve maintenance period. Required reserves were estimated at a daily average level of \$58.3 billion for the two-week period ending April 26. Given the discount window borrowing allowance of \$100 million and assuming normal excess reserves at \$1 billion, the NBR objective was set at \$59.2 billion ( $\$58.3\text{b.} + \$1\text{b.} - \$0.1\text{b.} = \$59.2\text{b.}$ ). The New York staff projection for the supply of NBR was \$54.6 billion a day, indicating a need for the Desk to add about \$4.6 billion of reserves on average per day for the two-week period. (A similar Board staff forecast indicated a reserve need of about \$4.7 billion.) Tentative NBR objectives and supply projections for the two subsequent maintenance periods, shown in the figure, also suggested significant reserve needs. Note that, at this early stage, the reserve projections for the two subsequent maintenance periods were considerably more uncertain than those for the current period.

Seasonal increases were expected in required reserves and currency during the maintenance period then in progress, contributing to large reserve shortages. Corporate and individual nonwithheld Federal income taxes were due that Monday, and were expected to yield heavy, though uncertain, inflows to the Treasury balance at the Fed for several days.

On that Monday, the monetary system faced large projected reserve deficiencies for the day and for several days thereafter (bottom part of Figure 5-2). Banks had experienced moderate reserve deficiencies on the previous Friday when there had been no intervention by the Desk, as the securities markets were closed for the Good Friday holiday. On Monday morning, excess reserves for the period-to-date were running negative, and banks had significant cumulative reserve deficiencies, in part because the Treasury balance had turned out to be higher than expected over the weekend.

Confronted with large reserve deficiencies for the day, banks had bid up the federal funds rate to the

6 1/8 - 6 3/16 range that Monday morning, somewhat above the FOMC's intended 6 percent level. Other short-term interest rates also experienced modest upward pressures. The firmness in the money market likely reflected the reserve pressures stemming from federal tax payment flows.

Against this background, the Desk supplied about \$7.7 billion in reserves by arranging three-day System RPs on that Monday; as explained above, System RPs offer a very convenient mechanism for injecting large amounts of temporary reserves. This operation lifted the two-week average reserve level by about \$1.65 billion ( $\$7.7\text{b.} \times 3 \div 14 = \$1.65\text{b.}$ ). The Desk paid

Figure 5-2

### Estimates of NBR Supplies and Objectives on Monday, April 17, 1995

Millions of Dollars

Two Week Reserve Period Ending	Path Assumptions			NBR Path (4)=(1)+(2)-(3)	NBR Projected Supply (5)	Open Market Operation to Hit Path (6)
	Required Reserves (1)	Excess Reserves (2)	Borrowing (3)			
April 26	58,347	1,000	100	59,247	54,649	4,598
		-594e	114e			
May 10	56,870	1,000	100	57,770	55,023	2,747
May 24	56,102	1,000	100	57,002	51,654	5,348

### Projected Daily Reserve Surplus/Deficiency\*

Monday (4/17)	Tuesday (4/18)	Wednesday (4/19)	Thursday (4/20)	Friday (4/21)
-6,925	-5,925	-7,464	-5,974	-3,659

\* Surplus/Deficiency is equal to NBR supply *minus* required reserves on a two-week basis.

e Estimate for the period through the previous day.

the dealers by giving immediate credits to their banks' reserve accounts, thereby supplying an equivalent amount of reserves to the financial system. In the absence of such a large temporary reserve injection, the funds rate most likely would have come under additional upward pressures, moving further above the Committee's intended level as banks would have struggled to keep on track toward meeting their reserve requirements and avoid ending the day with reserve shortages.

Within the context of uncertain reserve estimates, the Desk's decision was based partly on the sizable estimated average need to add reserves over the maintenance period, and partly on the even larger anticipated needs for that Monday and the immediate days ahead. Accordingly, the addition to reserves was intended to smooth the reserve situation for that day, but also to influence the profile of reserve supplies and demands over the coming days and the whole maintenance period.

#### *Managing Reserve Conditions*

Open market operations from one day to the next are closely related. In its daily actions, the Desk responds to market factors affecting reserve supplies and demands, but also takes into account the implications of its own

immediate past operations. With uncertain reserve estimates and possible projection errors, the Desk faces considerable risk that it might add or drain more reserves on any given day than may be warranted, causing the federal funds rate to move away from the desired level. To minimize this risk, the Manager responds cautiously to projections of large uncertain reserve shortfalls or excesses. Nonetheless, at times, the Desk does add or

drain reserves that are shown, by subsequent data, to be out of line with reserve needs. Usually, the consequences of any such actions can be remedied quickly, since revised information and operations of the previous day are routinely factored into the daily reserve picture. Late in the maintenance period, however, it can be difficult to offset large revisions.

To look more closely at the continuity and dynamics of the Desk's operations, let us follow the main developments in the reserve outlook and open market operations after Monday, April 17 through the end of the maintenance period. Over the next two days, the reserve estimates continued to indicate a large deficiency for the period, though considerably smaller than it appeared in Monday's estimates. However, these reserve estimates were subject to greater-than-normal uncertainty because unexpected changes in the pattern

*The Desk faces considerable risk that it might add or drain more reserves on any given day than may be warranted, causing the federal funds rate to move away from the desired level.*

of incoming tax receipts were making the Treasury balance particularly hard to estimate. Meanwhile, on both days, federal funds traded comfortably close to the Committee's intended level of 6 percent. With the three-day System RPs from Monday still on the books, the daily pattern of reserves indicated no significant reserve deficiencies on either of the two days. In this setting of considerable uncertainty about the reserve need for the period and little immediate pressure on the federal funds rate, the Desk added only about \$1.5 billion in overnight reserves through customer-related RPs—which are quite suitable for dealing with modest reserve deficiencies on an overnight basis—on Tuesday and took no action to affect reserves on Wednesday.

Difficulties in estimating tax receipts and Treasury balances continued to cause problems for reserve projections, but those difficulties seemed to diminish somewhat in the latter part of the week. On Thursday and Friday, the reserve estimates were somewhat less uncertain and still showed large needs to add reserves for the period; on Thursday, the estimated average reserve need for the period was about \$3.8 billion, indicating a daily average add need of about \$7.6 billion ( $\$3.8\text{b.} \times 14 \div 7 = \$7.6\text{b.}$ ) for the remaining seven days of the maintenance period. Banks had only modest amounts of excess reserves to date on both days. In view of the continuing large estimated reserve shortfall for the period, the Desk supplied over \$5 billion of

reserves on Thursday through four-day System RPs, and another \$2.3 billion on Friday through six-day System RPs. By using these relatively longer duration RPs, the Desk injected reserves on the day of the operation as well as on each of the remaining days of the period. On both Thursday and Friday, federal funds, presumably cushioned by open market operations, traded comfortably close to the FOMC's intended rate level.

By the second Monday, April 24, two days before the end of the period, the cumulative effect of the various open market operations (RPs), together with some partially offsetting revisions to required reserves and market factors, had lowered the estimated remaining reserve needs significantly. Figure 5-3 shows projections of the NBR objectives and supplies on that Monday; these numbers are comparable to those in Figure 5-2. With upwardly revised required reserves, the NBR objective for the current period was now estimated to be about \$220 million higher than it had been on the previous Monday. And the average need to add reserves for the period had dropped to \$1.2 billion from \$4.6 billion on the previous Monday. Still, with only three days remaining in the period, this amount represented a significant reserve shortage, and implied an average need to add reserves of about \$5.6 billion ( $\$1.2\text{b.} \times 14 \div 3$ ) for each remaining day. Projected reserve deficiencies on Monday and the next two days were also considerable (bottom part of the figure), but did not appear to be a

cause for immediate concern since banks had comfortable levels of working balances for supporting payment transactions at the Fed on Monday, and had ended the previous business day with significant amounts of excess reserves.

No unusual pressures seemed evident in the money market on that Monday, with federal funds trading at or very near the intended 6 percent level. In this environment, taking account of possible uncertainty in reserve estimates two days before the end of the reserve maintenance period, the Desk supplied about \$4 billion in reserves through 3-day System RPs, meeting about 70 percent of the estimated remaining daily need of

about \$5.6 billion.

The money market changed little between Monday and Tuesday, with federal funds continuing to trade at or near the desired level. Meanwhile, the NBR path was again revised upward by about \$330 million due to higher estimates of required reserves. With the upwardly revised NBR objective, Tuesday's reserve supply estimates indicated that the Desk would need to supply significant amounts of reserves on the last two days of the period. Because the Desk was somewhat uncertain about the banks' demand for excess reserves, it opted to meet most, but not all, of the remaining estimated need by injecting reserves of about \$3 billion

Figure 5-3

### Estimates of NBR Supplies and Objectives on Monday, April 24, 1995

Millions of Dollars

Two Week Reserve Period Ending	Path Assumptions			NBR Path (4)=(1)+(2)-(3)	NBR Projected Supply (5)	Open Market Operation to Hit Path (6)
	Required Reserves (1)	Excess Reserves (2)	Borrowing (3)			
April 26	58,567	1,000	100	59,467	58,272	1,195
		637e	143e			
May 10	56,765	1,000	100	57,665	53,367	4,298
May 24	55,839	1,000	100	56,739	50,145	6,594

### Projected Daily Reserve Surplus/Deficiency\*

Monday (4/24)	Tuesday (4/25)	Wednesday (4/26)
-2,062	-3,969	-3,866

\* Surplus/Deficiency is equal to NBR supply *minus* required reserves on a two-week basis.

e Estimate for the period through the previous day.

through customer-related RPs on Tuesday and another \$5.4 billion through overnight System RPs on Wednesday; the excess reserves were allowed to be modestly lower relative to the original expected level. On the final day of the period, the funds rate traded firmly before the Desk entered the market, and experienced only modest upward pressures in the afternoon as banks sought to meet their remaining reserve needs.

Overall, the results for the maintenance period ending April 26, 1995 were generally consistent with the operating objectives established at the beginning of the period to implement the FOMC's directive. The federal funds rate averaged 6.03 percent for the period, essentially the same as the FOMC's intended level of 6 percent. Nonborrowed reserves ended the period about \$160 million below the formal path set toward the end of the period, although the path itself underwent relatively significant revisions over the period.

The Desk met large reserve needs for the period through a series of temporary operations, mostly System RPs. Even though significant reserve needs were projected to persist beyond the maintenance period, the Desk did not add reserves through outright purchases of securities. It had bought sizeable amounts of Treasury coupon securities in the previous maintenance period and did contemplate further outright purchases. But the needs beyond the tax processing period were not sufficiently certain to lead it to act.

## **Recent Changes in the Conduct of Open Market Operations**

Figure 5-4 offers a brief overview of changes in operating procedures since the early 1980s. Throughout the period since 1982, the FOMC's operational strategy has continued to focus on the costs and other conditions for reserve availability to depository institutions. But the actual operating procedures have changed somewhat over time, and the approach for evaluating reserve availability conditions is different today from what it was in the mid-1980s.

From 1983 through early October 1987, borrowed reserves were used as the principal guide for assessing reserve conditions. Specifically, the degree of reserve pressure sought by the Committee was estimated to be associated with an intended level of adjustment plus seasonal borrowing at the discount window. The mechanism depended on the banks being reluctant to borrow from the discount window to a reasonably predictable degree. Thus, the more the banks were forced to satisfy their reserve demand by discount window borrowing, the higher they would bid the federal funds rate relative to a given discount rate. The reluctance to borrow arose from Federal Reserve guidelines limiting access to the window.

In implementing this approach, the Desk used nonborrowed reserves to satisfy most of the demand for reserves, with the balance to be met at the discount window—a balance that was effectively equal to the

intended level of borrowed reserves. At a given discount rate, the borrowed reserve approach resulted in a reasonably close relationship between discount window borrowing and the federal funds rate, although the relationship was less than precise.

To be sure, the borrowed reserve procedure was implemented in a way so as not to lose control over the federal funds rate. In its day-to-day operations, the Desk considered not just the assumed level of discount win-

dow borrowing, but also the degree of uncertainty surrounding the reserve estimates, as well as other signals about reserve market conditions, including movements of the funds rate. And, occasionally, the funds rate was given the dominant position in assessing the reserve pressures.

On average, however, the FOMC and the Desk used the intended level of discount window borrowing as the main factor for evaluating reserve availability condi-

Figure 5-4

### Changes in Operating Procedures, 1979-1996

Period	Operating Procedures		Implications	
	Key Elements	NBR Path	Federal Funds Rate	Other
1979-82	Target for NBR quantity	Based on the FOMC's desired money growth	High levels of volatility; automatic movements in the funds rate over a wide and flexible range	No significant accommodation of short-run fluctuations in reserves demand; operations could signal policy shifts
1983-87	Degree of reserve pressure; targets for borrowed reserves	Consistent with the FOMC's intended levels of discount window borrowing and the funds rate	Modest amount of volatility within and between maintenance periods	Partial accommodation of short-run fluctuations in reserves demand; operations could signal policy shifts
1989-93	Degree of reserve pressure; assumed initial borrowing allowance	Consistent with the FOMC's intended federal funds rate	Limited variations within maintenance periods around the intended level	Nearly complete accommodation of short-run fluctuations in reserves demand; operations could signal policy shifts
1994-96	Degree of reserve pressure and associated federal funds rate target; new policy disclosure procedures	Consistent with the FOMC's intended federal funds rate	Limited variations within maintenance periods around the intended level	Nearly complete accommodation of short-run fluctuations in reserves demand; operations do not signal policy shifts

Note: NBR = nonborrowed reserves

tions during 1983-87, with short-run market expectations being allowed to play a relatively modest role in determining the funds rate. In this setting, the funds rate had considerable leeway to fluctuate without changes in the desired policy stance. Through much of the 1983-87 period, it was not unusual for the average effective federal funds rate to vary by 20 to 40 basis points even between those maintenance periods in which the FOMC had not sought to change the degree of reserve pressures.

After the October 1987 plunge in stock prices, the FOMC temporarily abandoned the borrowed reserve approach and relied heavily on an intended level of the funds rate to assure adequate liquidity and to calm financial markets. In 1988, the FOMC returned to the borrowing approach for a while, but found that the relationship between borrowed reserves and the federal funds rate had become more uncertain and less reliable, largely because the reluctance of banks to borrow from the discount window was increasing, and no longer predictable. This greater reluctance was associated, not with any changes in Federal Reserve rules, but instead with the public's identification of borrowing at the window with the possibility that a bank was suffering financial difficulties. The relationship between borrowing and the funds rate continued to deteriorate over the next two years, as the average level of borrowing fell steadily but unpredictably. In fact, by 1989, it was no longer possible to estimate a meaningful range of the federal funds rate

consistent with a particular allowance for discount window borrowing. As a consequence, the FOMC and the Desk were obliged to place less weight on an intended level of discount window borrowing in implementing monetary policy. The deviations of borrowing from its assumed level were routinely accepted as long as they were consistent with maintaining the money market conditions expected by the FOMC.

The operating procedures begun in the late 1980s have been used throughout the subsequent period. While the FOMC continues to express its policy stance in the directive in terms of the degree of pressure on reserve positions, the federal funds rate is now the principal guide for evaluating reserve availability conditions, and has therefore become the day-to-day policy objective for open market operations. The Desk still utilizes an anticipated level of discount window borrowing in constructing the NBR path, but it compensates for deviations from that anticipated level by modifying the NBR reserve objective, formally or informally, so as to maintain the Committee's intended funds rate. On average, changes in the demand for reserves during the maintenance period are now more fully accommodated by adjusting the supply of nonborrowed reserves than was the case in the 1983-87 period. As a result, the average level of the funds rate during the period is more closely associated with the intended degree of reserve pressures than before. The funds rate does fluctuate

during the maintenance period, but its average value from one period to the next remains essentially the same as long as there is no change in the intended stance of monetary policy.

#### *New Disclosure Procedures*

Another, more recent, development that has affected the conduct of open market operations considerably was the FOMC's change in procedures, initiated in early 1994 and formalized in early 1995, for disclosing monetary policy decisions immediately after they are made. Until the end of 1993, the Committee's policy decisions were announced with a five-to-eight week lag, through the release of its minutes, which contain the domestic policy directive. However, any changes in the stance of monetary policy were quickly communicated to financial markets through open market operations as the Desk implemented the policy directive. Under the new procedures, which are now standard, changes in the FOMC's stance on monetary policy, including any intermeeting changes, are announced on the day they are made. The FOMC continues to release its directive for each meeting with a delay, on the Friday after the next meeting.

Before the recent disclosure procedures for policy decisions went into effect, market participants closely

watched the Desk's operations to detect policy signals. The use of open market operations to signal policy changes created, at times, considerable complications for the Desk, especially when the funds rate and the reserve estimates gave conflicting signals. Just as importantly, the Desk also faced considerable risks that its day-to-day technical or defensive operations would be viewed as indicators of policy moves. Such risks were heightened during periods when market participants expected shifts in policy.

The recent disclosure procedures have essentially freed the Desk from the risk that its normal technical or defensive operations would be misinterpreted as policy moves. Open market operations no longer convey any new information about changes in the stance of monetary policy. In implementing the directive, the Desk carries out a policy that is already known to financial markets and the public at large, and is no longer concerned about using a particular type of operation to signal a change in policy. Of course, market participants speculate, just as they always did, about possible future policy moves, especially in the period immediately leading up to the FOMC meetings. But, in general, they no longer closely watch day-to-day open market operations to detect policy signals.



## Implementing Monetary Policy—II

### Primary Dealers

The Federal Reserve implements monetary policy through the purchases and sales of U.S. Government securities in the secondary market, in which previously issued securities are traded. Its private sector business counterparties, known as primary dealers, are able to handle large orders efficiently, quickly, and safely. In recent years, the number of primary dealers has ranged between 37 and 46.

To minimize the credit, delivery and settlement risks associated with its transactions, the Federal Reserve has developed criteria for selecting trading counterparties for its open market operations. Primary dealers must be either commercial banking organizations subject to official supervision by U.S. federal bank supervisors or brokers/dealers registered with the Securities and Exchange Commission. They must meet the minimum capital standards of their primary regulators, and also must have certain minimum amounts of capital.

All primary dealers are expected to engage in

substantial trading with the Desk, provide the Desk with market information and analysis that may be useful for formulation and implementation of monetary policy and participate meaningfully in Treasury auctions. If a dealer fails to meet these standards, the Desk has the authority to discontinue its trading relationship with that dealer.

The Desk arranges its open market transactions—RPs, MSPs, and outright purchases and sales—with primary dealers through an automated processing system. For RPs and MSPs, an electronic announcement is sent to primary dealers and, typically, they are asked to respond within 10 to 15 minutes. The Desk notifies all dealers of the propositions accepted and rejected, usually within about 5 minutes of the closing time for the response, again using its automated processing system.

The Desk does not have a fixed time for its outright purchase and sale operations. It times its outright transactions during the day when market participants are not preoccupied with other developments, because these transactions can be somewhat more time con-

suming than RPs and MSPs. But recent changes in the method of outright coupon operations involving a series of smaller transactions, as described earlier, have significantly reduced the turnaround time on operations.

As part of its business relationship, the Desk maintains extensive contacts with all primary dealers. Over the course of each day, traders at the Desk talk to most dealers, using direct telephone lines, about the activity in the securities markets and the financing of their securities positions. Each afternoon, one or more members of the Desk staff hold brief meetings, usually arranged over the telephone, with representatives of two primary dealers. Over a four-week period, the Desk staff has the opportunity to talk to representatives of all primary dealers. Discussions at these meetings cover a broad array of topics; many topics are common to all dealers, while others vary depending on the dealers' business interests.

Ongoing contacts with primary dealers inform the Desk staff about the wide-ranging forces at work in financial markets: changing demands of the dealers' customers in the securities markets and their interest in particular types of securities; the economic and interest rate outlook that various dealers are presenting to their clients; financing of the dealers' securities positions; special developments influencing reserve conditions; the dealers' expectations about Treasury financing in the period ahead, and potential customer interest in coming financ-

ing; the strength of business loan demand at banks associated with primary dealers, and any issuance of wholesale market instruments to fund lending at those banks.

### **Informing the FOMC**

The Manager and the Desk staff keep the FOMC fully informed about evolving reserve market conditions and their daily plans for open market operations, as well as about the feedback on policy from financial markets. The Desk's main channels for communicating with the FOMC are (1) a daily conference call, (2) two daily reports, (3) a weekly report on financial market developments and a biweekly report on open market operations for each maintenance period, (4) an intermeeting period report on operations and financial market developments prepared for each FOMC meeting, (5) the Manager's reports at the regular FOMC meetings, and (6) an annual report on monetary policy operations; some consideration is now being given to replacing this annual report with quarterly or semi-annual reports. In addition, the Manager and the Director of the Division of Monetary Affairs at the Board make sure that the Chairman is fully informed at all times about significant developments relating to open market operations and financial markets. When appropriate, the Manager, the Director and the Chairman discuss unfolding events that may have important implications for the Committee's directive or its implementation.

### *The Conference Call*

Each business day, at present about 10:20 a.m., the Manager and several other Desk staff members gather in an office near the trading room at the Federal Reserve Bank of New York to participate in a telephone conference call. The call links the Manager and other New York staff with the Director of the Division of Monetary Affairs and other staff members at the Board, and with one of the four Reserve Bank Presidents outside of New York currently voting on the FOMC. The call, which usually lasts about 15 minutes, offers the Desk's review of reserve conditions and financial market developments, and the Manager's plan for open market operations. It also enables the Desk to consult, on a daily basis, with one of the Committee members concerning the implementation of the directive. Desk staff members report on financial market developments and the reserve outlook. At times, other participants may make brief comments on special aspects of economic and financial market developments that may be of interest on a particular day. The financial market review includes price and rate movements in the U.S. Government securities markets and the main influences on market movements. Mention is made of the effects of any data releases and other events on activity in the securities markets. Desk staff members describe

*Ongoing contacts with primary dealers inform the Desk staff about the wide-ranging forces at work in financial markets.*

the situation in the federal funds market, providing the latest information on rates and on the reserve needs and the funding activity of major banks. They also note key developments in the foreign exchange markets.

The Desk staff review of the reserve outlook presents the estimated reserve needs, and explains revisions to the outlook from the previous day. Finally, the proposed "program" for open market operations is read and the Reserve Bank President is asked for comments. Normally the president will concur with the Manager's plan, but occasionally may ask questions about the plan or other possible options. Formal presentations are concise and leave room for conference participants to ask questions and make other brief comments. Also, the Director of the Division of Monetary Affairs at the Board may occasionally use the call to provide the latest information on developments in monetary aggregates.

### *Daily Reports*

A summary of the conference call, put together by the Board staff, is delivered to each Board member shortly after the call and immediately transmitted to each Reserve Bank president. After the securities markets are effectively closed around 5:00 p.m., the Desk staff

sends, electronically, a summary of the day's developments in the financial markets to Reserve Bank presidents and Monetary Affairs staff at the Board in Washington, D.C.

#### *Weekly and Biweekly Reports*

Every Friday, the Desk staff sends a weekly report to the FOMC on developments in the domestic securities and foreign exchange markets. Every other Friday, the weekly report contains a comprehensive review of open market operations for the maintenance period ended on the preceding Wednesday. The biweekly portion of the report describes the conduct of operations and the reserve market conditions over the maintenance period, and includes the latest information on monetary aggregates.

Prior to each FOMC meeting, the Desk staff submits a background report to the FOMC on open market operations and financial market developments in the latest intermeeting period. A brief description of reserve operations also appears in the Blue Book, prepared by the Board staff, in advance of the FOMC meeting. At the regular FOMC meetings, the Manager's presentation also covers operations and market developments during the intermeeting period. Finally, in the first quarter of the year, the Desk staff prepares an

annual report on monetary policy implementation and financial market developments for the preceding year. A modified version of this report is published in the annual report of the Federal Reserve Bank of New York.

#### **A Day at the Open Market Desk**

The working day at the Desk begins soon after 8:00 a.m., although one person is usually in the trading room about an hour earlier to contact people from overseas

markets where U.S. Government securities are traded. The early part of the day is occupied with information-gathering activities and meetings that help the Manager and other Desk staff prepare the daily plan for open market operations. Traders track early trading and related developments in U.S. financial markets. They talk to dealers about their expectations for business activity in the securities markets

and to the large money center banks about their funding plans in the federal funds market. Other staff members collect information on economic and financial developments by looking at headlines from news services and reading information screens. Such information includes, among other things, economic data releases, comments of various analysts on recent economic and monetary developments, trading of U.S. Government securities in

*The Manager and the Desk staff keep the FOMC fully informed about evolving reserve market conditions and their daily plans for open market operations.*

Asia and Europe, and reports of any event that might influence early trading in U.S. financial and foreign exchange markets.

### *The Treasury Call*

Each weekday morning, at present about 10:00 a.m., several Desk staff members, including staff from the Desk's reserve projections unit, gather in an office near the trading room for a telephone conference with representatives of the Treasury. Before the call, the assembled group quickly looks at preliminary estimates of nonborrowed reserves and its components over the maintenance period and in the days immediately ahead. When the estimates of the New York Fed and Treasury staffs suggest that the Treasury balance is likely to move away from the desired levels on the current and upcoming days, the Treasury staff will, if possible, take action to bring it back into line by transferring funds to or from depository institutions.

After the Treasury call, which usually lasts only a few minutes, the senior Desk staff begin a discussion of the plan of action for the day. The starting point of the discussion is the estimated need to add or drain reserves for the maintenance period, but as described in Chapter 5, the range of issues involved is quite broad; some of the subjects are similar from one day to the next, while others differ with circumstances. As they move toward a decision on the plan for the day, the Manager and Desk

staff call the Director of the Division of Monetary Affairs to get a reading of the Board staff's assessment of the reserve situation and to provide a preliminary indication of what sort of operation is being contemplated.

While work on the day's action plan is still in progress, the reserve forecasters deliver tables containing the revised estimates of the New York Fed staff as well as those of the Federal Reserve Board staff. If these estimates are significantly different from the preliminary estimates, the action plan may need to be modified. As the discussion reaches a conclusion, one of the participants writes a program of action for the day. The program reviews the reserve situation, the trading in the federal funds market that morning and other factors that have influenced the proposed action.

As described earlier, the proposed program for open market operations is read during the daily three-way conference call that links the Desk staff, the Board staff and a Reserve Bank president. If the action plan of the day involves temporary transactions, RPs or MSPs, they are carried out immediately after the conference call. The Desk staff normally completes its operations within a few minutes. Once the transactions are executed, including receipt of collateral, the reserve accounts of the dealers' banks are credited or debited accordingly, altering the supply of nonborrowed reserves in the monetary system.

Over the remainder of the day, the trading room

continues to monitor rates and prices in the securities markets, trading in the federal funds market, and other financial market developments. In addition, each afternoon, the Desk staff holds brief telephone conferences with representatives of two primary dealers as part of its ongoing efforts to gather information on the wide-ranging forces at work in financial markets. On a regular basis, Desk staff members visit with market participants

and dealers at their offices in New York City to learn about markets and dealer operations; these visits frequently take place in the afternoons. Toward the end of the day, as mentioned earlier, the Desk staff sends, electronically, a summary of the day's financial market developments to the Board staff and Reserve Bank presidents.