

# Monetary Policy and the Economy

Using the tools of monetary policy, the Federal Reserve can affect the volume of money and credit and their price—interest rates. In this way, it influences employment, output, and the general level of prices.

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*THE FEDERAL RESERVE ACT LAYS OUT* the goals of monetary policy. It specifies that, in conducting monetary policy, the Federal Reserve System and the Federal Open Market Committee should seek “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”

## GOALS OF MONETARY POLICY

Many analysts believe that the central bank should focus primarily on achieving price stability. A stable level of prices appears to be the condition most conducive to maximum sustained output and employment and to moderate long-term interest rates; in such circumstances, the prices of goods, materials, and services are undistorted by inflation and thus can serve as clearer signals and guides for the efficient allocation of resources. Also, a background of stable prices is thought to encourage saving and, indirectly, capital formation because it prevents the erosion of asset values by unanticipated inflation.

However, policymakers must consider the long- and short-term effects of achieving any one goal. For example, in the long run, price stability complements efforts to achieve maximum output and employment; but in the short run, some tension can arise between efforts to reduce inflation and efforts to maximize employment and output. At times, the economy is faced with adverse supply shocks, such as a bad agricultural harvest or a disruption in the supply of oil, which put upward pressure on prices and downward pressure on output and employment. In these circumstances, makers of monetary policy must decide the extent to

which they should focus on defusing price pressures or on cushioning the loss of output and employment. At other times, policymakers may be concerned that the public's expectation of more inflation will get built into decisions about wages and prices, become a self-fulfilling prophecy, and result in temporary losses of output and employment. Countering this threat of inflation with a more restrictive monetary policy could risk small losses of output and employment in the near term but might make it possible to avoid larger losses later should expectations of higher inflation become embedded in the economy.

Beyond influencing the level of prices and the level of output in the near term, the Federal Reserve can contribute to financial stability and better economic performance by limiting the scope of financial disruptions and preventing their spread outside the financial sector. Modern financial systems are highly complex and interdependent and potentially vulnerable to wide-scale systemic disruptions, such as those that can occur during a plunge in stock prices. The Federal Reserve can help to establish for the U.S. banking system and, more broadly, for the financial system a framework that reduces the potential for systemic disruptions. Moreover, if a threatening disturbance develops, the central bank can cushion its effects on financial markets and the economy by providing liquidity through its monetary policy tools.

## MONETARY POLICY AND THE RESERVES MARKET

The initial link between monetary policy and the economy occurs in the market for reserves. The Federal Reserve's policies influence the demand for or supply of reserves at banks and other depository institutions, and through this market, the effects of monetary policy are transmitted to the rest of the economy. Therefore, to understand how monetary policy is related to the economy, one must first understand what the reserves market is and how it works.

### Demand for Reserves

The demand for reserves has two components: required reserves and excess reserves. All depository institutions—commercial banks, saving banks, savings and loan associations, and credit unions—must retain a percentage of certain types of deposits to be

held as reserves. The reserve requirements are set by the Federal Reserve under the Depository Institutions Deregulation and Monetary Control Act of 1980. At the end of 1993, 4,148 member banks, 6,042 nonmember banks, 495 branches and agencies of foreign banks, 61 Edge Act and agreement corporations, and 3,238 thrift institutions were subject to reserve requirements.

Since the early 1990s, reserve requirements have been applied only to transaction deposits (basically, interest-bearing and non-interest-bearing checking accounts). Required reserves are a fraction of such deposits; the fraction—the required reserve ratio—is set by the Board of Governors within limits prescribed by law (see appendix A).

Thus, total required reserves expand or contract with the level of transaction deposits and with the required reserve ratio set by the Board; in practice, however, the required reserve ratio has been adjusted only infrequently. Depository institutions hold required reserves in one of two forms: vault cash (cash on hand at the bank) or, more important for monetary policy, required reserve balances in accounts with the Reserve Bank for their Federal Reserve District.

Depositories use their accounts at Federal Reserve Banks not only to satisfy their reserve requirements but also to clear many finan-

The ultimate targets of monetary policy are specified in law as maximum employment, stable prices, and moderate long-term interest rates.



cial transactions. Given the volume and unpredictability of transactions that clear through their accounts every day, depositories need to maintain a cushion of funds to protect themselves against debits that could leave their accounts overdrawn at the end of the day and subject to penalty. Depositories that find their required reserve balances insufficient to provide such protection may open supplemental accounts for required clearing balances. These additional balances earn interest in the form of credits that can be used to defray the cost of services, such as check-clearing and wire transfers of funds and securities, that the Federal Reserve provides.

Some depository institutions choose to hold reserves even beyond those needed to meet their reserve and clearing requirements. These additional balances, which provide extra protection against overdrafts and deficiencies in required reserves, are called excess reserves; they are the second component of the demand for reserves (a third component if required clearing balances are included). In general, depositories hold few excess reserves because these balances do not earn interest; nonetheless, the demand for these reserves can fluctuate greatly over short periods, complicating the Federal Reserve's task of implementing monetary policy. (See table 2.1 for the average amount of funds in each of these reserve categories in 1993.)

### Supply of Reserves

The Federal Reserve supplies reserves to the banking system in two ways:

- Lending through the Federal Reserve discount window
- Buying government securities (open market operations).

Reserves obtained through the first channel are called borrowed reserves. The Federal Reserve supplies these directly to depository institutions that are eligible to borrow through the discount window. Access to such credit by banks and thrift institutions is established by rules set by the Board of Governors, and loans are made at a rate of interest—the discount rate—set by the Reserve Banks and approved by the Board. The supply of borrowed reserves depends on the initiative of depository institutions to borrow, though it is influenced by the level of the discount rate and by the terms and conditions for access to discount window credit.

In general, banks are expected to come to the discount window to meet liquidity needs only after drawing on all other reasonably available sources of funds, which limits considerably the use of this source of funds. Moreover, many banks fear that their use of discount window credit might become known to private market participants, even though the Federal Reserve treats the identity of such borrowers in a highly confidential manner, and that such borrowing might be viewed as a sign of weakness. As a consequence, the amount of reserves supplied through the discount window is generally a small portion of the total supply of reserves.

The other source of reserve supply is nonborrowed reserves. Although the supply of nonborrowed reserves depends on a variety of factors, many of them outside the day-to-day control of the Federal Reserve, the System can exercise control over this supply through open market operations—the purchase or sale of securities by the Domestic Trading Desk at the Federal Reserve Bank of New York. When the Federal Reserve buys securities in the open market, it creates reserves to pay for them, and the supply of nonborrowed reserves increases. Conversely, when it sells securities, it absorbs reserves in exchange for the securities, and the supply of nonborrowed reserves falls. In other words, the Federal Reserve adjusts the supply of nonborrowed reserves by purchasing or selling securities in the open market, and the purchases are effectively paid for by additions to or subtractions from a depository institution’s reserve balance at the Federal Reserve.

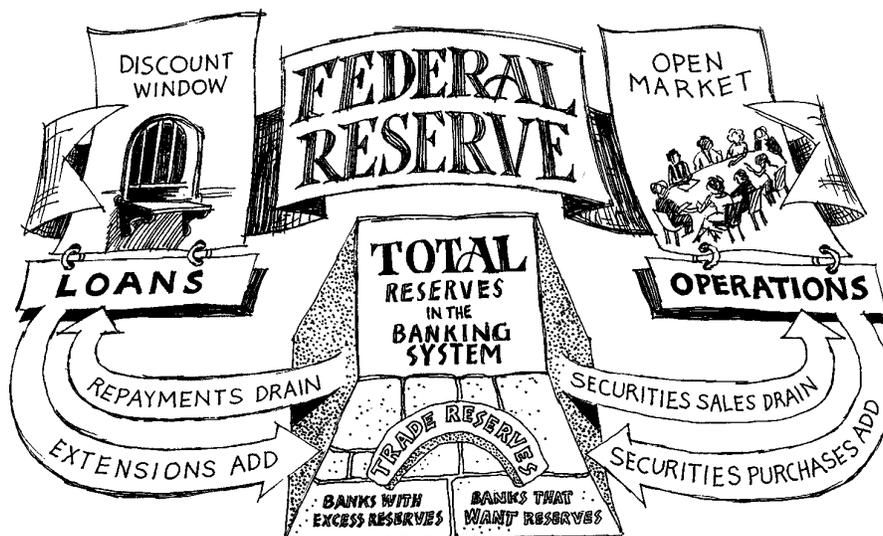
**Table 2.1**  
**Aggregate reserve measures, 1993**  
 Billions of dollars; quarterly averages of daily data

<i>Quarter</i>	<i>Required reserves</i>	<i>Required reserve balances</i>	<i>Applied vault cash</i>	<i>Required clearing balances</i>	<i>Excess reserves</i>
1	53.5	23.8	30.9	6.0	1.2
2	55.6	26.5	30.2	6.0	1.0
3	57.2	26.8	31.4	6.0	1.1
4	60.3	28.9	32.5	6.1	1.1

## Trading of Reserves

Depository institutions actively trade reserves held at the Federal Reserve among themselves, usually overnight. Those with surplus balances in their accounts transfer reserves to those in need of boosting their balances. The benchmark rate of interest charged for the short-term use of these funds is called the federal funds rate. Changes in the federal funds rate reflect the basic supply and demand conditions in the market for reserves.

Equilibrium exists in the reserves market when the demand for required and excess reserves equals the supply of borrowed plus nonborrowed reserves. Should the demand for reserves rise—say, because of a rise in checking account deposits—a disequilibrium will occur, and upward pressure on the federal funds rate will emerge. Equilibrium may be restored by open market operations to supply the added reserves, in which case the federal funds rate will be unchanged. It may also be restored as the supply of reserves increases through greater borrowing from the discount window; in this case, interest rates would tend to rise, and over time the demand for reserves would contract as reserve market pressures are translated, through the actions of banks and their depositors, into lower deposit levels and smaller required reserves. Conversely, should the supply of reserves expand—say,



because the Federal Reserve purchases securities in the open market—the resulting excess supply will put downward pressure on the federal funds rate. A lower federal funds rate will set in motion equilibrating forces through the creation of more deposits and larger required reserves and lessened borrowing from the discount window.

### EFFECTS OF MONETARY POLICY ON THE ECONOMY

As the preceding discussion illustrates, monetary policy works through the market for reserves and involves the federal funds rate. A change in the reserves market will trigger a chain of events that affect other short-term interest rates, foreign exchange rates, long-term interest rates, the amount of money and credit in the economy, and levels of employment, output, and prices. For example, if the Federal Reserve reduces the supply of reserves, the resulting increase in the federal funds rate tends to spread quickly to other short-term market interest rates, such as those on Treasury bills and commercial paper. Because interest rates paid on many deposits in the money stock adjust only slowly, holding balances in money (that is, in a form counted in the money stock) becomes less attractive. As the public pursues higher yields available in the market (for example, on Treasury bills), the money stock declines. Moreover, as bank reserves and deposits shrink, the amount of money available for lending may also decline. Higher costs of borrowing and possible restraints on credit supply will damp growth of both bank credit and broader credit measures.

A change in short-term interest rates will also translate into changes in long-term rates on such financial instruments as home mortgages, corporate bonds, and Treasury bonds, especially if the change in short-term rates is expected to persist. Thus, a rise in short-term rates that is expected to continue will lead to a rise (though typically a smaller one) in long-term rates.

Higher long-term interest rates will reduce the demand for items that are most sensitive to interest cost, such as residential housing, business investment, and durable consumer goods (for example, automobiles and large household appliances). Higher mortgage interest rates depress the demand for housing. Higher corporate bond rates increase the cost of borrowing for businesses and, thus, restrain the demand for additions to plants and equipment;

and tighter supplies of bank credit may constrain the demand for investment goods by those firms particularly dependent on bank loans. Furthermore, higher rates on loans for motor vehicles reduce consumers' demand for cars and light trucks. Beyond these effects, consumption demand is lowered by a reduction in the value of household assets—such as stocks, bonds, and land—that tends to result from higher long-term interest rates.

The implications of changes in interest rates extend beyond domestic money and credit markets. Continuing with the example, when interest rates in the United States move higher in relation to those abroad, holding assets denominated in U.S. dollars becomes more appealing, and the demand for dollars in foreign exchange markets increases. A result is upward pressure on the exchange value of the dollar. With flexible exchange rates (rates that fluctuate as the supply of and demand for national currencies vary), the dollar strengthens, the cost of imported goods to Americans declines, and the price of U.S.-produced goods to people abroad rises. As a consequence, demands for U.S. goods are reduced as Americans are induced to substitute goods from abroad for those produced in the United States and people abroad are induced to buy fewer American goods.

Such changes in the demand for goods and services get translated into changes in total production and prices. Lessened demand resulting from higher interest rates and the stronger dollar tends to reduce production and thereby relieve pressures on resources. In an economy that is overheating, this relief will curb inflation. Production is the first to respond to monetary policy actions; prices and wages respond only later. There is considerable inertia in wages and prices, largely because much of the U.S. economy is characterized by formal and informal contracts that limit changes in prices and wages in the short run and because inflation expectations, which influence how people set wages and prices, tend to be slow to adjust. In other words, because many wages and prices do not adjust promptly to a change in aggregate demand, sales and output slow initially in response to a slowing of aggregate demand. Over a longer period, however, inflation expectations are tempered, contracts are renegotiated, and other adjustments occur. As a consequence, price and wage levels adjust to the slower rate of expansion of aggregate demand, and the economy gravitates toward full employment of resources.

## LIMITATIONS OF MONETARY POLICY

Monetary policy is not the only force affecting output and prices. Indeed, the economy frequently is buffeted by factors affecting aggregate demand for goods and services or aggregate supply. On the demand side, the government influences the economy through changes in tax and spending programs. Such fiscal policy actions receive a lot of public attention and typically can be anticipated well in advance. In fact, their effect on the economy may precede their implementation to the degree that some businesses and households may alter their spending in anticipation of the policy change. Also, forward-looking financial markets may build such fiscal events into the level and structure of interest rates and thus further influence spending decisions before the government action.

Other changes in demand or supply can be totally unpredictable and can influence the economy in unforeseen ways. Examples of such “shocks” on the demand side are changes in households’ propensity to consume and shifts in consumer and business confidence. Monetary policy in time can offset such shocks in private-sector demand but, because of their nature, not as they occur. On the supply side, matters can be even more complicated. Natural disasters, disruptions in the supply of oil, and agricultural losses are examples of adverse supply shocks. Because such events tend to raise prices and reduce output, monetary policy can attempt to counter the losses of output or the higher prices, but cannot completely offset both.

In practice, monetary policymakers do not have up-to-the-minute, reliable information about the state of the economy and prices. Information is limited because of lags in the publication of data and because of later revisions in data. Also, policymakers have a less-than-perfect understanding of the way the economy works, including the knowledge of when and to what extent policy actions will affect aggregate demand. The operation of the economy changes over time, and with it the response of the economy to policy measures. These limitations add to uncertainties in the policy process and make determining the appropriate setting of monetary policy instruments more difficult.

**B**esides monetary policy, the economy is affected by such factors as government fiscal initiatives and unforeseen events.

The central bank will have an easier time reaching its goals if the public understands them and believes the Federal Reserve will take the steps necessary to reach them. For example, a believable anti-inflation policy, implemented through a deceleration of aggregate demand, will more quickly lead the public to expect lower inflation, and such an expectation will itself help bring down inflation. In that case, workers will not feel the need to demand large wage increases to protect themselves against expected price hikes, and businesses will be less aggressive in raising their prices, knowing that doing otherwise would result in losses in sales. In these circumstances, inflation will come down more or less in line with the slowing of aggregate demand, with much less slack emerging in resource markets than if workers and businesses continued to act as if inflation were not going to slow.

## GUIDES FOR MONETARY POLICY

The goals of monetary policy are spelled out in law. But how will the Federal Reserve know whether or not its current operations in the reserves market are consistent with those goals or whether it needs to be more restrictive or more accommodative? The actions taken in the reserves market affect the economy with considerable lags. If the Federal Reserve waits to adjust rates until it sees an undesirable change in employment or prices, it will be too late to achieve its objectives. Consequently, people have suggested that the Federal Reserve pay particularly close attention to guides to policy that are intermediate between operations in the reserves market and effects in the economy. Among those frequently mentioned are monetary and credit aggregates, interest rates, and the foreign exchange value of the dollar. Some suggest that one or the other of these measures be used as an intermediate target—that is, one with a specific formal objective. Others suggest that they be used less formally as indicators of the longer-term effects of monetary policy on the economy, to be judged in conjunction with a variety of other financial and economic information.

### Monetary and Credit Aggregates

The Humphrey–Hawkins Act has something to say about the guides for monetary policy: It specifies that each February the Federal Reserve must announce publicly its objectives for growth

in money and credit and that at midyear it must review its objectives and revise them if appropriate. This provision of the act was based on the presumption of a reasonably stable relation between growth of money and credit, on the one hand, and the goals of monetary policy, on the other—a relation that could be fruitfully exploited in achieving those goals. Control over the money stock, it was thought, could in effect anchor the price level in much the same way that the former gold standard was thought to have anchored the price level.<sup>1</sup>

Nonetheless, the law foresaw that revision might be appropriate should, for example, the relation between the monetary or credit aggregates and the economy—the velocity of money or credit—change unpredictably (see the box for a description of the content of the monetary and credit aggregates).<sup>2</sup> In these circumstances, adherence to the initial objectives for money or credit growth would lead to an undesirable outcome for output or prices. The Federal Reserve is not required to achieve its announced objectives for these financial aggregates, but if it does not, it must explain the reasons to Congress and the public.

The usefulness of the monetary aggregates for indicating the state of the economy and for stabilizing the level of prices has been called into question by frequent departures of their velocities from historical patterns. As can be seen in chart 2.1, the velocity of M2 had until recently been fairly stable over long periods, although it did vary over shorter periods in ways related to the interest-rate cycle. In the early 1990s, the velocity of M2 departed from this pat-

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1. Some economists have argued that, besides serving as a longer-term anchor for the price level, tight control over the money stock will stabilize the economy in the shorter run. To the extent that the relation between the money stock and the economy is very close, an overheating of the economy is associated with stronger demand for money. If the Federal Reserve sticks to a predetermined path for money growth and does not meet that demand, interest rates will rise and will choke off demand and inflationary pressures. Conversely, a weakening of the economy is associated with a decreased demand for money. If the Federal Reserve sticks to a predetermined path for money growth, interest rates will decline and aggregate demand will increase.

Most observers, however, have come to believe that the slippage between the money stock and the economy, at least in the short run, is sufficiently great that efforts to exert tight control over money may lead to less, rather than to more, economic stability.

2. Velocity is the ratio of nominal gross domestic product (GDP) to the money stock (or credit aggregate). If the money stock grows at the same rate as nominal GDP, velocity is steady. If the money stock grows less rapidly than nominal GDP, velocity rises; and if it grows more rapidly, velocity falls.

### The Content of Monetary and Credit Aggregates

The Federal Reserve publishes data on three monetary aggregates. The first, M1, is made up of types of money commonly used for payment, basically currency and checking deposits. The second, M2, includes M1 plus balances that generally are similar to transaction accounts and that, for the most part, can be converted fairly readily to M1 with little or no loss of principal. The M2 measure is thought to be held primarily by households. The third aggregate, M3, includes M2 plus certain accounts that are held by entities other than individuals and are issued by

banks and thrift institutions to augment M2-type balances in meeting credit demands; it also includes balances in money market mutual funds held by institutional investors.

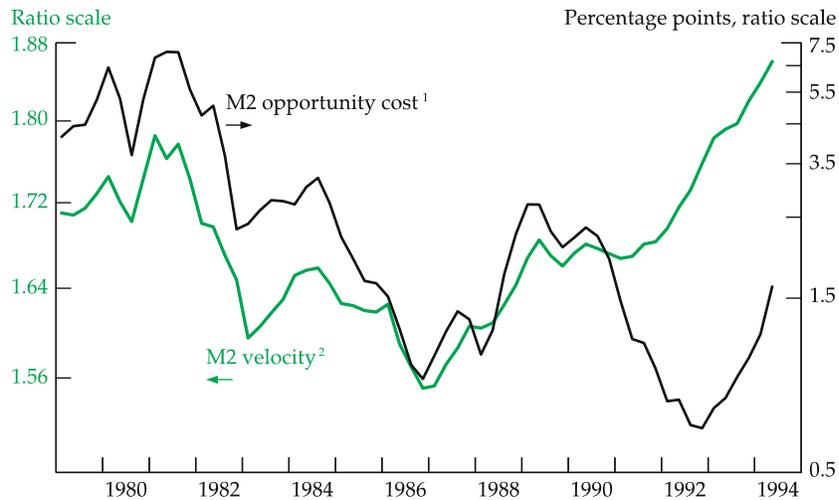
The Federal Reserve publishes a broad measure of credit extended to domestic nonfinancial sectors.

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

<b>M1</b>	<b>M2</b>	<b>M3</b>	<b>Credit extended to (debt owed by)</b>
Currency (and travelers checks)	M1	M2	Federal government
Demand deposits	Savings deposits and money market deposit accounts	Large time deposits	State and local governments
NOW and similar interest-earning checking accounts	Small time deposits <sup>1</sup>	Wholesale-type money market mutual fund balances	Households
	Retail-type money market mutual fund balances	Term (beyond overnight) RPs	Nonfinancial businesses
	Overnight repurchase agreements (RPs)	Term Eurodollars	
	Overnight Eurodollars		

1. Time deposits in amounts of less than \$100,000, excluding balances in IRA and Keogh accounts.

**Chart 2.1**  
**M2 velocity and opportunity cost**



Note. Quarterly data.

1. Two-quarter moving average of the difference between the three-month Treasury bill rate and the average M2 rate.
2. Ratio of nominal GDP to M2.

tern and drifted upward. This upward drift occurred even as market interest rates were moving down, a change that should have added to the attractiveness of deposits in M2 and lowered its velocity. Such departures from historical experience have made forecasting velocity, and thus the rate of monetary growth needed to achieve economic objectives, more difficult.

Many observers believe that the recent unusual monetary behavior is due to the growing variety of new financial assets offered to the public, such as new kinds of mutual funds and mutual fund services, and to changes in the way people manage their financial portfolios. Some analysts expect that rapid financial change will continue and will further undermine the value of the monetary aggregates as guides to policy. Others expect the process to settle down as people complete their shifts of investment-type balances to assets outside M2. In this view, once the shift is fairly complete, M2—perhaps measured somewhat differently—will again behave in a reliable way and can again be used effectively as a guide for monetary policy.

### Short- and Long-term Interest Rates

Interest rates have frequently been proposed as a guide to policy. Surely, some argue, changes in the provision of reserves by the Federal Reserve can influence interest rates, and changes in interest rates affect various spending decisions. Moreover, information on interest rates is available on a real-time basis.

Arguing against giving interest rates a key role in guiding monetary policy is the uncertainty about what level or path of interest rates is consistent with the more basic goals. The appropriate level or path will vary with the stance of fiscal policy, changes in patterns of business and household spending, the productivity of capital, and economic developments abroad. It is difficult not only to gauge the strength of these various forces at any time but also to translate them into an appropriate level of interest rates. Moreover, real interest rates—that is, interest rates net of expected inflation—drive spending decisions. Expected inflation is not readily measured; thus, assessing what the level of real interest rates happens to be is difficult. However, failing to account for inflation expectations can result in misleading signals coming from nominal interest rates. For example, if the public expected more inflation, nominal interest rates would tend to rise, as investors sought protection for the greater loss of purchasing power, and might lead to the belief that monetary policy had become tighter and more disinflationary when, in fact, just the reverse had occurred.

Alternatively, the yield curve—the difference between the interest rate on longer-term securities and the interest rate on short-term instruments—has been proposed. Whereas short-term interest rates are strongly influenced by current reserve provisions of the central bank, longer-term rates are influenced by expectations of future short-term rates and thus by the longer-term effects of monetary policy on inflation and output. For example, a steep positive yield curve (that is, long-term rates far above short-term rates) may be a signal that participants in the bond market believe that monetary policy has become too expansive and thus, without a monetary policy correction, more inflationary. Such a curve would be telling the central bank to provide fewer reserves. Conversely, an inverted yield curve (short-term rates above long-term rates) may be an indication that policy is restrictive, perhaps overly so. However, various other influences, such as uncertainty about the

course of interest rates, affect long-term interest rates. Thus, a steepening of the yield curve may indicate not that the thrust of monetary policy is too expansive, but that market participants have become more uncertain about the outlook for interest rates. In other words, liquidity premiums embodied in long-term interest rates may have risen. More generally, interest rates can vary for a variety of reasons, especially over short periods, and the Federal Reserve must exercise considerable caution in interpreting and reacting to their fluctuations.

### Foreign Exchange Rates

Exchange rate movements are an important channel through which monetary policy affects the economy, and they tend to respond promptly to a change in the provision of reserves and in interest rates. Information on exchange rates, like that on interest rates, is available almost continuously throughout each day.

Interpreting the meaning of movements in foreign exchange rates, however, is not always straightforward. A decline in the foreign exchange value of the dollar, for example, could indicate that monetary policy had become more accommodative, with possible risks of inflation. But foreign exchange rates respond to other influences, such as market assessments of the strength of aggregate demand or developments abroad. For example, a weaker dollar on foreign exchange markets could instead suggest lessened demand for U.S. goods and decreased inflationary pressures. Or a weaker dollar could result from higher interest rates abroad—making assets in those countries more attractive—that could come from strengthening economies or the tightening of monetary policy abroad.

Determining which level of the exchange rate is most consistent with the ultimate goals of policy can be difficult. Selecting the wrong level could lead to a sustained period of deflation and high levels of economic slack or to a greatly overheated economy. Also, reacting in an aggressive way to exchange market pressures could result in the transmission to the United States of certain disturbances from abroad, as the exchange rate could not adjust to cushion them. Consequently, the Federal Reserve does not have specific targets for exchange rates but considers movements in those rates in the context of other available information about financial markets and economies at home and abroad.

## Conclusion

All of the guides to monetary policy discussed above have something to do with the transmission of monetary policy to the economy. As such, they have certain advantages. However, none has shown a consistently close enough relationship with the ultimate goals of monetary policy that it can be relied upon single-mindedly. As a consequence, makers of monetary policy have tended to use a broad range of indicators—those discussed above along with information about the actual performance of output and prices—to judge trends in the economy and to assess the stance of monetary policy.

Such an eclectic approach enables the Federal Reserve to use all available information in conducting policy. This may be especially necessary as market structures and economic processes change in ways that affect the usefulness of any single indicator. However, communicating policy intentions and actions to the public can be more difficult with the eclectic approach than with the approach, for example, of targeting the money stock if the linkage between the money stock and the economy were fairly close and reliable. And, by looking at many variables, which necessarily will give some conflicting signals, the Federal Reserve may delay taking needed action toward restraint or expansion suggested by one or more indicators. As a consequence, more aggressive measures may be needed later if the ultimate goals of policy are to be achieved. ■