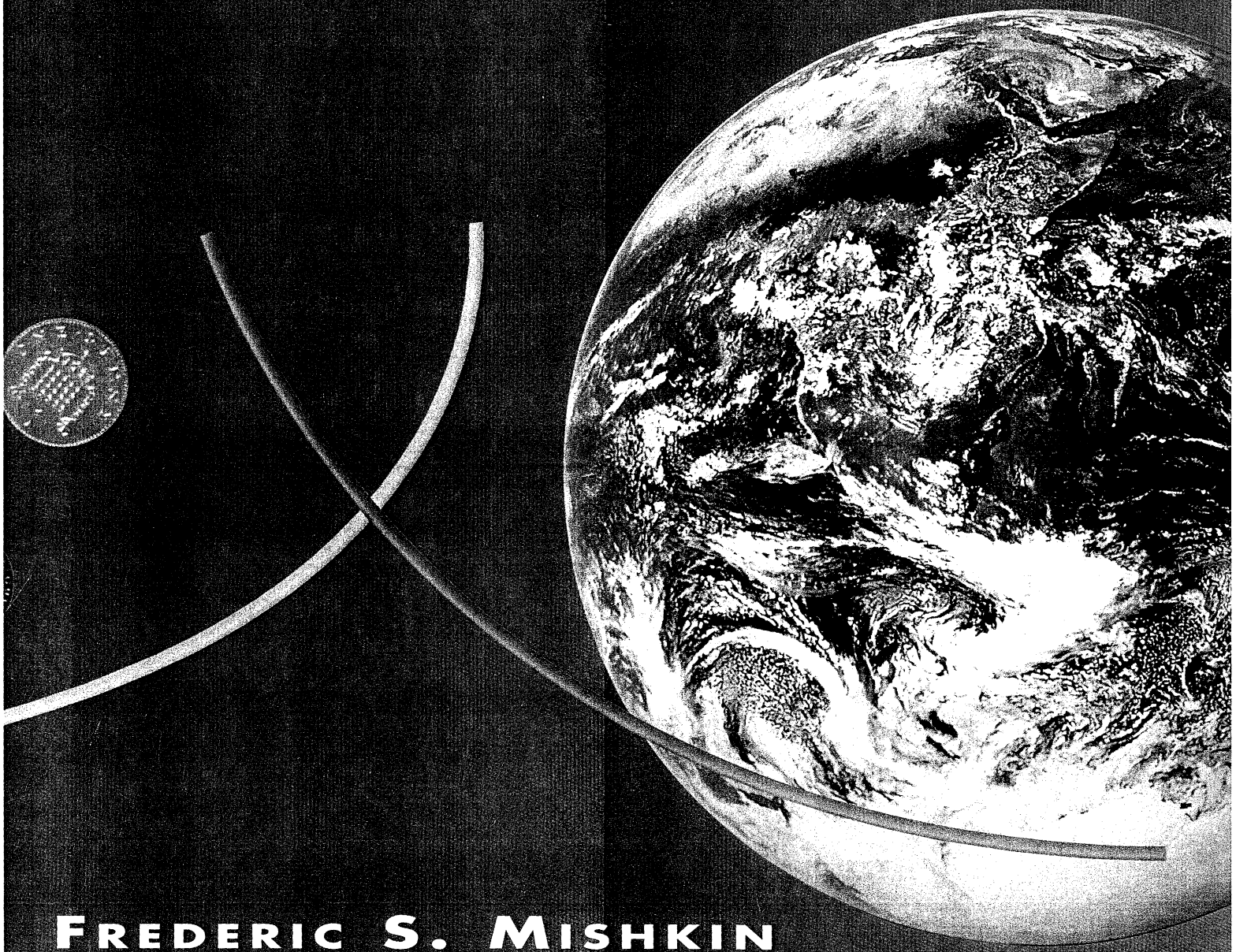
THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS

FOURTH EDITION



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Chapter 21

THE CONDUCT OF MONETARY POLICY: GOALS AND TARGETS

PREVIEW In earlier chapters you have seen how the Fed can use its tools to affect the money supply. Although we have hinted that the conduct (planning and implementation) of monetary policy is an inexact procedure, an examination of the Fed's conduct of monetary policy gives rise to an important question: Given the tools at its disposal, how well can the Fed actually control the money supply?

To explore this subject, we look at the goals the Fed establishes for its monetary policy and its strategies for attaining them. After examining the goals and strategies, we can evaluate the Fed's and other countries' central banks' conduct of monetary policy in the past, with the hope that it will give us some clues to where monetary policy may head in the future.

GOALS OF MONETARY POLICY

Six basic goals are continually mentioned by personnel at the Federal Reserve and other central banks when they discuss the objectives of monetary policy: (1) high employment, (2) economic growth, (3) price stability, (4) interest-rate stability, (5) stability of financial markets, and (6) stability in foreign exchange markets.

High Employment

The Employment Act of 1946 and the Full Employment and Balanced Growth Act of 1978 (more commonly called the Humphrey-Hawkins Act) commit the U.S. government to promoting high employment consistent with a stable price level. High employment is a worthy goal for two main reasons: (1) the alternative situation, high unemployment, causes much human misery, with families suffering financial distress, loss of personal self-respect, and increases in crime (though this last conclusion is highly controversial), and (2) when unemployment is high,

the economy has not only idle workers but also idle resources (closed factories and unused equipment), resulting in a loss of output (lower GDP).

Although it is clear that high employment is desirable, how high should it be? At what point can we say that the economy is at full employment? At first it might seem that full employment is the point at which no worker is out of a job, that is, when unemployment is zero. But this definition ignores the fact that some unemployment, called *frictional unemployment,* is beneficial to the economy. For example, a worker who decides to look for a better job might be unemployed for a while during the job search. Workers often voluntarily decide to leave work temporarily to pursue other activities (raising a family, travel, returning to school), and when they decide to reenter the job market, it again takes some time for them to find the right job. The benefit of having some unemployment is similar to the benefit of having a nonzero vacancy rate in the market for rental apartments. As many of you who have looked for an apartment have discovered, when the vacancy rate in the rental market is too low, you will have a difficult time finding the right apartment.

The goal for high employment should therefore not seek an unemployment level of zero but rather a level above zero consistent with full employment at which the demand for labor equals the supply of labor. Economists call this the **natural rate of unemployment.**

Although this definition sounds neat and authoritative, it isn't because it leaves a troublesome question unanswered: What unemployment rate is consistent with full employment? On the one hand, in some cases, it is obvious that the unemployment rate is too high: The unemployment rate in excess of 20% during the Great Depression, for example, was clearly far too high. In the early 1960s, on the other hand, economists thought that a reasonable goal was 4%, a level that was probably too low because it led to accelerating inflation. Current estimates of the natural rate of unemployment place it around 6%, but even this estimate is subject to uncertainty and disagreement. In addition, it is possible that appropriate government policy, such as the provision of better information about job vacancies or job training programs, might decrease the natural rate of unemployment.

Economic Growth

The goal of steady economic growth is closely related to the high employment goal because businesses are more likely to invest in capital equipment to increase productivity and economic growth when unemployment is low. Conversely, if unemployment is high and factories are idle, it does not pay for a firm to invest in additional plants and equipment. Although the two goals are closely related, policies can be specifically aimed at promoting economic growth by directly encouraging firms to invest or by encouraging people to save, which provides more funds for firms to invest. In fact, this was the stated purpose of Ronald Reagan's supply-side economics policies, which were intended to spur

economic growth by providing tax incentives for businesses to invest in plants and equipment and for taxpayers to save more.

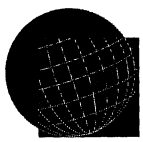
Price Stability

Over the past two decades, American economists have become more aware of the social and economic costs of inflation and more concerned with a stable price level as a goal of economic policy. (The growing commitment to price stability is also evident in Europe; see Box 1.) Price stability is desirable because a rising price level (inflation) creates uncertainty in the economy. For example, the information conveyed by the prices of goods and services is harder to interpret when the overall level of prices is changing, which complicates decision making for consumers, businesses, and government. The most extreme example of unstable prices is hyperinflation, such as Germany experienced in 1921–1923. In the last two years of hyperinflation, Germany's economic activity (as measured by GDP) underwent a sharp slowdown because of the costs imposed by the rising price level.

Inflation also makes it hard to plan for the future. For example, it is more difficult to decide how much funds should be put aside to provide for one's children's college education in an inflationary environment. Further, inflation may strain a country's social fabric: Conflict may result because each group in the society may compete with other groups to make sure that its wages keep up with the rising level of prices.

A Global Perspective

Box 1



THE GROWING EUROPEAN COMMITMENT TO PRICE STABILITY

Not surprisingly, given Germany's experience with hyperinflation, its central bank has the strongest commitment to price stability. In contrast to statutes for the German central bank, the statutes of other central banks in Europe set various objectives for policy, including all the goals outlined here in the text. However, European policymakers have been coming around to the view that the primary objective for a central bank should be price stability. The increased importance of this goal is reflected in the December 1991 Treaty of European Union, known as the Maastricht Treaty, which proposed the creation of the European System of Central Banks, which would function very much like the Federal Reserve System. The statute of the European System of Central Banks sets price stability as the primary objective of this system and indicates that the general economic policies of the European Union are to be supported only if they are not in conflict with price stability.

Interest-Rate Stability

Interest-rate stability is desirable because fluctuations in interest rates can create uncertainty in the economy and make it harder to plan for the future. Fluctuations in interest rates that affect consumers' willingness to buy houses, for example, make it more difficult both for consumers to decide when to purchase a house and for construction firms to plan how many houses to build. The Fed may also want to reduce upward movements in interest rates for the reasons we discussed in Chapter 18: Upward movements in interest rates generate hostility toward the Fed and lead to demands that its power be curtailed.

Stability of Financial Markets

An explicit reason for the creation of the Federal Reserve System was that it could promote a more stable financial system. One way in which the Fed promotes stability is helping prevent financial panics (particularly bank panics) through its role as lender of last resort. The Fed has performed this role many times since the 1970s.

The stability of financial markets is also promoted by interest-rate stability because fluctuations in interest rates create great uncertainty for financial institutions. An increase in interest rates produces large capital losses on long-term bonds and mortgages, losses that can cause the failure of the financial institutions holding them. In recent years, more pronounced interest-rate fluctuations have been a particularly severe problem for savings and loan associations and mutual savings banks, many of which have gotten into serious financial trouble (as we have seen in Chapter 13).

Stability in Foreign Exchange Markets

With the increasing importance of international trade to the U.S. economy, the value of the dollar relative to other currencies has become a major consideration for the Fed. As we saw in Chapter 8, a rise in the value of the dollar makes American industries less competitive with those abroad, and declines in the value of the dollar stimulate inflation in the United States. In addition, preventing large changes in the value of the dollar makes it easier for firms and individuals purchasing or selling goods abroad to plan ahead. Stabilizing extreme movements in the value of the dollar in foreign exchange markets is thus viewed as a worthy goal of monetary policy.

Conflict Among Goals

Although many of the goals mentioned are consistent with each other—high employment with economic growth, interest-rate stability with financial market stability—this is not always the case. The goal of price stability often conflicts with

the goals of interest-rate stability and high employment in the short run. For example, when the economy is expanding and unemployment is falling, both inflation and interest rates may start to rise. If the Fed tries to prevent a rise in interest rates by buying bonds, bidding up their price and thus causing interest rates to fall, the resulting open market purchases will cause the monetary base and the money supply to rise, stimulating inflation. But if the Fed slows down money supply growth to prevent inflation, in the short run both interest rates and unemployment may rise. The conflict among goals may thus present the Fed with some hard choices. We return to the issue of how the Fed should choose between conflicting goals in later chapters when we examine how monetary policy affects the economy.

THE FED'S STRATEGY: USE OF MONETARY TARGETS

The Fed's problem is that it wishes to achieve certain goals such as price stability with high employment, but it does not directly influence the goals. It has a set of tools to employ (open market operations, changes in the discount rate, and changes in reserve requirements) that can affect the goals indirectly after a period of time (typically more than a year). If the Fed waits to see what the price level and employment will be one year later, it will be too late to make any corrections to its policy—mistakes will be irreversible.

The Fed consequently pursues a different strategy for conducting monetary policy by aiming at variables that lie between its tools and the achievement of its goals. The Fed's strategy is as follows: After deciding on its goals for employment and the price level, it chooses a set of variables to aim for, called **intermediate targets,** such as the monetary aggregates ($M1$, $M2$, or $M3$) or interest rates (short- or long-term), which have a direct effect on employment and the price level. However, even these intermediate targets are not directly affected by the Fed's policy tools. Therefore, it chooses another set of variables to aim for, called **operating targets,** such as reserve aggregates (reserves, nonborrowed reserves, monetary base, or nonborrowed base) or interest rates (federal funds rate or Treasury bill rate), which are more responsive to its policy tools. (Recall that nonborrowed reserves are total reserves minus borrowed reserves, which are the amount of discount loans; the nonborrowed base is the monetary base minus borrowed reserves; and the federal funds rate is the interest rate on funds loaned overnight between banks.)[1]

The Fed pursues this strategy because it is easier to hit a goal by aiming at targets than by aiming at the goal directly. Specifically, by using intermediate and operating targets, it can more quickly judge whether its policies are on the right

[1]There is some ambiguity as to whether to call a particular variable an operating target or an intermediate target. Some economists view the monetary base and the Treasury bill rate as possible intermediate targets, even though they may function as operating targets as well. In addition, if the Fed wants to pursue a goal of interest-rate stability, an interest rate can be both a goal variable and a target variable.

track, rather than waiting until it sees the final outcome of its policies on employment and the price level.[2] By analogy, NASA employs the strategy of using targets when it is trying to send a spaceship to the moon. It will check to see whether the spaceship is positioned correctly as it leaves the atmosphere (we can think of this as NASA's "operating target"). If the spaceship is off course at this stage, NASA engineers will adjust its thrust (a policy tool) to get it back on target. NASA may check the position of the spaceship again when it is halfway to the moon (NASA's "intermediate target") and can make further midcourse corrections if necessary.

The Fed's strategy works in a similar way. Suppose that the Fed's employment and price-level goals are consistent with a nominal GDP growth rate of 5%. If the Fed feels that the 5% nominal GDP growth rate will be achieved by a 4% growth rate for *M2* (its intermediate target), which will in turn be achieved by a growth rate of 3½% for the monetary base (its operating target), it will carry out open market operations (its tool) to achieve the 3½% growth in the monetary base. Within days after implementing this policy, the Fed may find that the monetary base is growing too slowly, say, at a 2% rate; then it can correct this too slow growth by increasing the amount of its open market purchases. Somewhat later, the Fed will begin to see how its policy is affecting the growth rate of the money supply. If *M2* is growing too fast, say, at a 7% rate, the Fed may decide to reduce its open market purchases or make open market sales to reduce the *M2* growth rate.

One way of thinking about the Fed's strategy (illustrated in Figure 1) is that it is using its operating and intermediate targets to direct monetary policy (the spaceship) toward the achievement of its goals. After the initial setting of the policy tools (the liftoff), an operating target such as the monetary base, which the Fed can control fairly directly, is used to reset the tools so that monetary policy is channeled toward achieving the intermediate target of a certain rate of money supply growth. Midcourse corrections in the policy tools can be made again when the Fed sees what is happening to its intermediate target, thus directing monetary policy so that it will achieve its goals of high employment and price stability (the spaceship reaches the moon).

CHOOSING THE TARGETS

As we see in Figure 1, there are two different types of target variables: interest rates and aggregates (monetary aggregates and reserve aggregates). In our example, the Fed chose a 4% growth rate for *M2* to achieve a 5% rate of growth for nominal GDP. It could have chosen to lower the interest rate on the three-month Treasury bills to, say, 3% to achieve the same goal. Can the Fed choose to pursue both of these targets at the same time? The answer is no. The application of

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[2]This reasoning for the use of monetary targets has come under fire because information on employment and the price level can be useful in evaluating policy. See Benjamin M. Friedman, "The Inefficiency of Short-Run Monetary Targets for Monetary Policy," *Brookings Papers on Economic Activity* 2 (1977): 292–346.

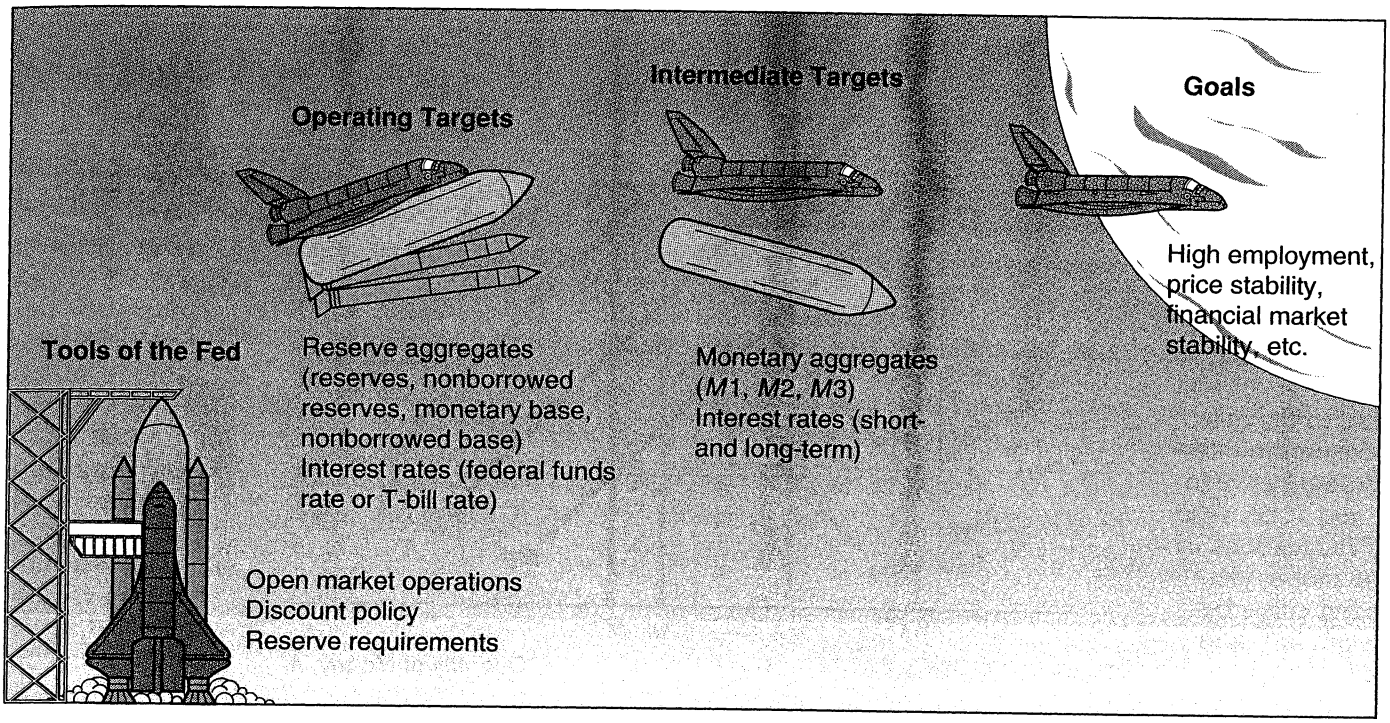

FIGURE 1 Strategy of the Fed

the supply and demand analysis of the money market that we covered in Chapter 6 explains why the Fed must choose one or the other.

Let's first see why a monetary aggregate target involves losing control of the interest rate. Figure 2 contains a supply and demand diagram for the money market. Although the Fed expects the demand curve for money to be at M^{d*}, it fluctuates between $M^{d'}$ and $M^{d''}$ because of unexpected increases or decreases in output or changes in the price level. The money demand curve might also shift unexpectedly because the public's preferences about holding bonds versus money may change. If the Fed's monetary aggregate target of a 4% growth rate in $M2$ results in a money supply of M^*, it expects that the interest rate will be i^*. However, as the figure indicates, the fluctuations in the money demand curve between $M^{d'}$ and $M^{d''}$ will result in an interest rate fluctuating between i' and i''. Pursuing a monetary aggregate target implies that interest rates will fluctuate.

The supply and demand diagram in Figure 3 shows the consequences of an interest rate target set at i^*. Again, the Fed expects the money demand curve to be at M^{d*}, but it fluctuates between $M^{d'}$ and $M^{d''}$ due to unexpected changes in output, the price level, or the public's preferences toward holding money. If the demand curve falls to $M^{d'}$, the interest rate will begin to fall below i^* and the price of bonds will rise. With an interest-rate target, the Fed will prevent the interest rate from falling by selling bonds to drive their price back down and the interest rate back up to its former level. The Fed will make open market sales until the money supply declines to $M^{s'}$, at which point the equilibrium interest rate is again i^*. Conversely, if the demand curve rises to $M^{d''}$ and drives up the interest rate, the Fed would keep interest rates from rising by buying bonds to keep their prices from falling. The Fed will make open market purchases until

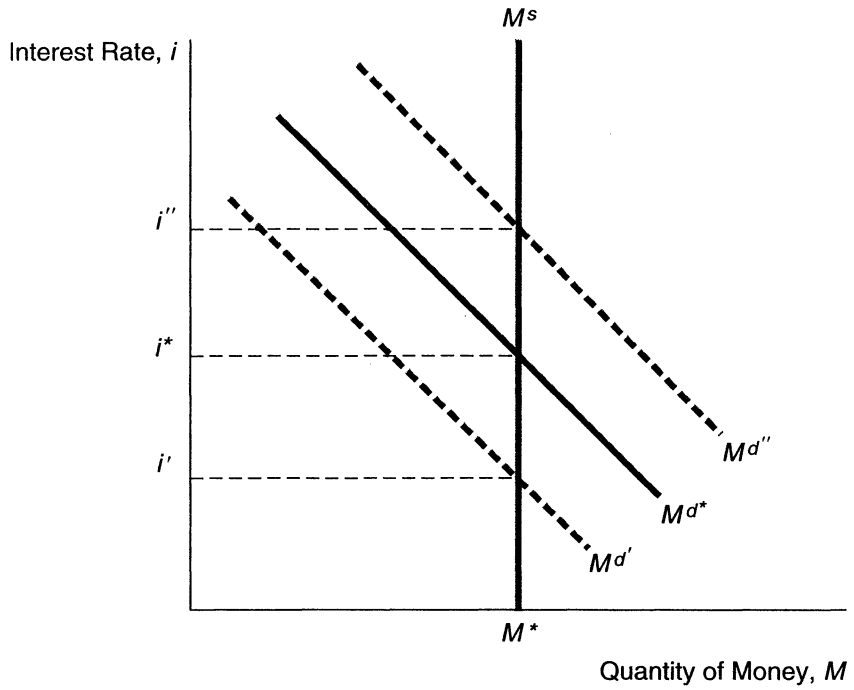

FIGURE 2 Result of Targeting on the Money Supply
The Federal Reserve's targeting on the money supply at M^* will lead to fluctuations in the interest rate between i' and i'' because of fluctuations in the money demand curve between $M^{d'}$ and $M^{d''}$.

the money supply rises to $M^{s''}$ and the equilibrium interest rate is i^*. The Fed's adherence to the interest rate target thus leads to a fluctuating money supply as well as fluctuations in reserve aggregates such as the monetary base.

The conclusion from the supply and demand analysis is that interest-rate and monetary aggregate targets are incompatible: The Fed can hit one or the other but not both. Because a choice between them has to be made, we need to examine what criteria should be used to decide on the target variable.

Criteria for Choosing Intermediate Targets

The rationale behind the Fed's strategy of using targets suggests three criteria for choosing an intermediate target: It must be measurable, it must be controllable by the Fed, and it must have a predictable effect on the goal.

Measurability Quick and accurate measurement of an intermediate target variable is necessary because the intermediate target will be useful only if it signals when policy is off track more rapidly than the goal. What good does it do for the Fed to plan to hit a 4% growth rate for *M2* if it has no way of quickly and accurately measuring *M2*? Data on the monetary aggregates are obtained after a two-week delay, and interest-rate data are available almost immediately. Data on a goal variable like GDP, by contrast, are compiled quarterly and are made available with a month's delay. In addition, the GDP data are less accurate than data on the monetary aggregates or interest rates. On these grounds alone, focusing on interest rates and monetary aggregates as intermediate targets rather than on a goal like GDP can provide clearer signals about the status of the Fed's policy.

At first glance, interest rates seem to be more measurable than monetary aggregates and hence more useful as intermediate targets. Not only are the data on

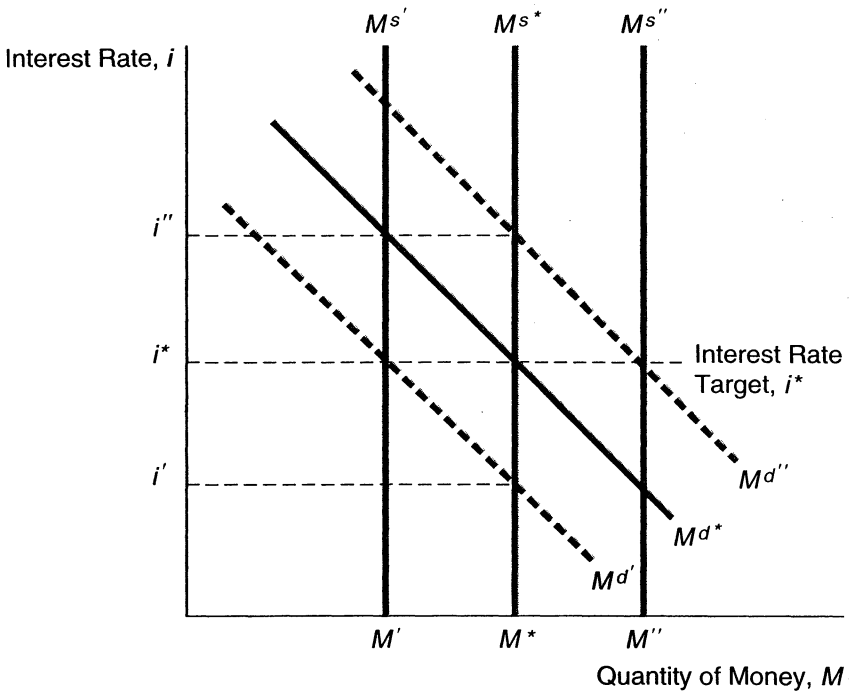

FIGURE 3 Result of Targeting on the Interest Rate
The Federal Reserve's targeting on the interest rate at i^* will lead to fluctuations in the money supply between M' and M'' because of fluctuations in the money demand curve between $M^{d'}$ and $M^{d''}$.

interest rates available more quickly than on monetary aggregates, but they are also measured more precisely and are rarely revised, in contrast to the monetary aggregates, which are subject to a fair amount of revision (as we saw in Chapter 3). However, as we learned in Chapter 4, the interest rate that is quickly and accurately measured, the nominal interest rate, is typically a poor measure of the real cost of borrowing, which indicates with more certainty what will happen to GDP. This real cost of borrowing is more accurately measured by the real interest rate—the interest rate adjusted for expected inflation ($i_r = i - \pi^e$). Unfortunately, the real interest rate is extremely hard to measure because we have no direct way to measure *expected* inflation. Since both interest rate and monetary aggregates have measurability problems, it is not clear whether one should be preferred to the other as an intermediate target.

Controllability The Fed must be able to exercise effective control over a variable if it is to function as a useful target. If the Fed cannot control an intermediate target, knowing that it is off track does little good because the Fed has no way of getting it back on track. Some economists have suggested that nominal GDP should be used as an intermediate target, but since the Fed has little direct control over nominal GDP, it will not provide much guidance on how the Fed should set its policy tools. The Fed does, however, have a good deal of control over the monetary aggregates and interest rates.

Our discussion of the money supply process and the Fed's policy tools indicates that the Fed does have the ability to exercise a powerful effect on the money supply, although its control is not perfect. We have also seen that open market operations can be used to set interest rates by directly affecting the price of bonds. Because the Fed can set interest rates directly whereas it cannot completely control the money supply, it might appear that interest rates dominate the monetary aggregates on the controllability criterion. However, the Fed cannot set *real* interest rates because it does not have control over expectations of inflation.

So again, a clear-cut case cannot be made that interest rates are preferable to monetary aggregates as an intermediate target, or vice versa.

Predictable Effect on Goals The most important characteristic a variable must have to be useful as an intermediate target is that it have a *predictable* impact on a goal. If the Fed can accurately and quickly measure the price of tea in China and can completely control its price, what good will it do? The Fed cannot use the price of tea in China to affect unemployment or the price level in the United States. Because the ability to affect goals is so critical to the usefulness of an intermediate target variable, the linkage of the money supply and interest rates with the goals—output, employment, and the price level—is a matter of much debate in the economics profession. The evidence on whether these goals have a closer (more predictable) link with the money supply than with interest rates is mixed. We discuss the evidence on this issue extensively in Chapter 27.

Criteria for Choosing Operating Targets

The choice of an operating target can be based on the same criteria used to evaluate intermediate targets. Both the federal funds rate and reserve aggregates are measured accurately and are available daily with almost no delay; both are easily controllable using the policy tools that we discussed in Chapter 20. When we look at the third criterion, however, we can think of the intermediate target as the goal for the operating target. An operating target that has a more predictable impact on the most desirable intermediate target is preferred. If the desired intermediate target is an interest rate, the preferred operating target will be an interest-rate variable like the federal funds rate because interest rates are closely tied to each other (as we saw in Chapter 7). However, if the desired intermediate target is a monetary aggregate, our money supply model of Part IV shows that a reserve aggregate operating target such as the monetary base will be preferred. Because there does not seem to be much reason to choose an interest rate over a reserve aggregate on the basis of measurability or controllability, the choice of which operating target is better rests on the choice of the intermediate target (the goal of the operating target).

FED POLICY PROCEDURES: A HISTORICAL PERSPECTIVE

The well-known adage "The road to hell is paved with good intentions" applies as much to the Federal Reserve as it does to human beings. Understanding the Fed's goals and the strategies it can use to pursue its goals cannot tell us *how* monetary policy is actually conducted. To understand the practical results of the theoretical underpinnings, we have to look at the Fed's past policy procedures: its choice of goals, policy tools, operating targets, and intermediate targets. This

historical perspective will not only show us how our central bank carries out its duties but will also help us interpret the Fed's activities and see where monetary policy may be heading in the future.

STUDY GUIDE

The following discussion of the Fed's policy procedures and their effect on the money supply provides a review of the money supply process and how the Fed's policy tools work. If you have trouble understanding how the particular policies described affect the money supply, it might be helpful to review the material in Part IV.

The Early Years: Discount Policy as the Primary Tool

When the Fed was created, changing the discount rate was the primary tool of monetary policy—the Fed had not yet discovered that open market operations were a more powerful tool for influencing the money supply, and the Federal Reserve Act made no provisions for changes in reserve requirements. The guiding principle for the conduct of monetary policy was that as long as loans were being made for "productive" purposes—that is, to support the production of goods and services—providing reserves to the banking system to make these loans would not be inflationary.[3] This theory, now thoroughly discredited, became known as the **real bills doctrine.** In practice, it meant that the Fed would make loans to member commercial banks when they showed up at the discount window with *eligible paper,* loans to facilitate the production and sale of goods and services. (Note that since the 1920s, the Fed has not conducted discount operations in this way.) The Fed's act of making loans to member banks was initially called *rediscounting* because the original bank loans to businesses were made by discounting (loaning less than) the face value of the loan, and the Fed would be discounting them again. (Over time, when the Fed's emphasis on eligible paper diminished, the Fed's loans to banks became known as *discounts* and the interest rate on these loans the *discount rate,* which is the terminology we use today.)

By the end of World War I, the Fed's policy of rediscounting eligible paper and keeping interest rates at low levels to help the Treasury finance the war had led to a raging inflation; in 1919 and 1920, the inflation rate averaged 14%. The Fed decided that it could no longer follow the passive policy prescribed by the real bills doctrine because it was inconsistent with the goal of price stability, and for the first time the Fed accepted the responsibility of playing an active role in influencing the economy. In January 1920, the Fed raised the discount rate from

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[3]Another guiding principle was the maintenance of the gold standard, which we will discuss in Chapter 22.

4¾% to 6%, the largest jump in its history, and eventually raised it further to 7% in June 1920, where it remained for nearly a year. The result of this policy was a sharp decline in the money supply and an especially sharp recession in 1920–1921. Although the blame for this severe recession can clearly be laid at the Fed's doorstep, in one sense the Fed's policy was very successful: After an initial decline in the price level, the inflation rate went to zero, paving the way for the prosperous Roaring Twenties.

Discovery of Open Market Operations

In the early 1920s, a particularly important event occurred: The Fed accidentally discovered open market operations. When the Fed was created, its revenue came exclusively from the interest it received on the discount loans that it made to member banks. After the 1920–1921 recession, the volume of discount loans shrank dramatically, and the Fed was hard pressed for income. It solved this problem by purchasing income-earning securities. In doing so, the Fed noticed that reserves in the banking system grew and there was a multiple expansion of bank loans and deposits. This result is obvious to us now (we studied the multiple deposit creation process in Chapter 15), but to the Fed at that time it was a revelation. A new monetary policy tool was born, and by the end of the 1920s, it was the most important weapon in the Fed's arsenal.

The Great Depression

The stock market boom in 1928 and 1929 created a dilemma for the Fed. It wanted to temper the boom by raising the discount rate, but it was reluctant to do so because that would have meant raising interest rates to businesses and individuals who had legitimate needs for credit. (The Fed did not yet have the authority to set margin requirements as it does today.) Finally, in August 1929, the Fed raised the discount rate, but by then it was too late; the speculative excesses of the market boom had already occurred, and the Fed's action only hastened the stock market crash and pushed the economy into recession. In Chapter 17 we discussed the Fed's many policy blunders from 1930 to 1933, when its failure to perform its role as lender of last resort allowed over a third of the commercial banks in the United States to fail. The resulting unprecedented decline in the money supply during this period is thought by many economists to have been the major contributing factor to the severity of the depression, which has never been equaled before or since.

Reserve Requirements as a Policy Tool

The Thomas Amendment to the Agricultural Adjustment Act of 1933 provided the Board of Governors with emergency power to alter reserve requirements with the approval of the president of the United States. In the Banking Act of

1935, this emergency power was expanded to allow the Fed to alter reserve requirements unilaterally without the president's approval.

The first use of reserve requirements as a tool of monetary control proved that the Federal Reserve was capable of adding to the blunders that it had made during the bank panics of the early 1930s. By the end of 1935, banks had increased their holdings of excess reserves to unprecedented levels, a sensible strategy considering their discovery during the 1930–1933 period that the Fed would not always perform its intended role as lender of last resort. Bankers now understood that they would have to protect themselves against a bank run by holding substantial amounts of excess reserves. The Fed viewed these excess reserves as a nuisance that made it harder to exercise monetary control. Specifically, the Fed worried that these excess reserves might be loaned out and would produce "an uncontrollable expansion of credit in the future."[4]

To improve monetary control, the Fed raised reserve requirements in three steps: August 1936, January 1937, and May 1937. The result of this action was, as we would expect from our money supply model, a slowdown of money growth toward the end of 1936 and an actual decline in 1937. The recession of 1937–1938, which commenced in May 1937, was a severe one and was especially upsetting to the American public because even at its outset, unemployment was intolerably high. So not only does it appear that the Fed was at fault for the severity of the Great Depression contraction in 1929–1933, but to add insult to injury, it appears that it was also responsible for aborting the subsequent recovery. The Fed's disastrous experience with varying its reserve requirements made it far more cautious in the use of this policy tool in the future.

War Finance and the Pegging of Interest Rates: 1942–1951

With the entrance of the United States into World War II in late 1941, government spending skyrocketed, and to finance it, the Treasury issued huge amounts of bonds. The Fed agreed to help the Treasury finance the war cheaply by pegging interest rates at the low levels that had prevailed before the war: ⅜% on Treasury bills and 2½% on long-term Treasury bonds. Whenever interest rates would rise above these levels and the price of bonds would begin to fall, the Fed would make open market purchases, thereby bidding up bond prices and driving interest rates down again. The Fed had thus in effect relinquished its control of monetary policy to meet the financing needs of the government. The result was a substantial monetization of the debt and a rapid growth in the monetary base and the money supply.

When the war ended, the Fed continued to peg interest rates, and because there was little pressure on them to rise, this policy did not result in an explosive growth in the money supply. When the Korean War broke out in 1950, however, interest rates began to climb, and the Fed found that it was again forced to expand the monetary base at a rapid rate. Because inflation began to heat up (the

[4]Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1867–1960*, (Princeton, N.J.: Princeton University Press, 1963), p. 524.

consumer price index rose 8% between 1950 and 1951), the Fed decided that it was time to reassert its control over monetary policy by abandoning the interest-rate peg. An often bitter debate ensued between the Fed and the Treasury, which wanted to keep its interest costs down and so favored a continued pegging of interest rates at low levels. In March 1951, the Fed and the Treasury came to an agreement known as the Accord, in which pegging was abandoned but the Fed promised that it would not allow interest rates to rise precipitously. After Eisenhower's election as president in 1952, the Fed was given complete freedom to pursue its monetary policy objectives.

Targeting Money Market Conditions: The 1950s and 1960s

With its freedom restored, the Federal Reserve, then under the chairmanship of William McChesney Martin, Jr., took the view that monetary policy should be grounded in intuitive judgment based on a feel for the money market. The policy procedure that resulted can be described as one in which the Fed targeted on money market conditions, a vague collection of variables that were supposed to describe supply and demand conditions in the money market. Included among these variables were short-term interest rates and **free reserves** *FR,* equal to excess reserves in the banking system *ER* minus the volume of discount loans *DL:*

$$FR = ER - DL$$

The Fed considered free reserves a particularly good indicator of money market conditions because it thought that they represented the amount of slack in the banking system. The Fed viewed banks as having a first priority in using their excess reserves to repay their discount loans, so only the excess reserves not borrowed from the Fed represented the *free* reserves that could be used to make loans and create deposits. The Fed interpreted an increase in free reserves as an easing of money market conditions and used open market sales to withdraw reserves from the banking system. A fall in free reserves meant a tightening of money market conditions, and the Fed made open market purchases.

An important characteristic of this policy procedure is that it led to more rapid growth in the money supply when the economy was expanding and a slowing of money growth when the economy was in recession. The so-called *procyclical monetary policy* (that is, a positive association of money supply growth with the business cycle) is explained by the following step-by-step reasoning. As we learned in Chapter 6, a rise in national income ($Y\uparrow$) leads to a rise in market interest rates ($i\uparrow$), thus raising the opportunity cost of holding excess reserves and causing excess reserves to decline ($ER\downarrow$). The rise in interest rates also increases the incentives to borrow from the discount window because bank loans become more profitable and so the volume of discount loans will rise ($DL\uparrow$). The decline in excess reserves and the rise in the volume of discount loans then imply that free reserves will fall ($FR\downarrow = ER\downarrow - DL\uparrow$). When the Fed

reacts to the decline in free reserves by making open market purchases, it raises the monetary base ($MB\uparrow$) and hence the money supply ($M\uparrow$). The reasoning outlined can be summarized as follows:

$$Y\uparrow \rightarrow i\uparrow \rightarrow ER\downarrow,\ DL\uparrow \rightarrow FR\downarrow \rightarrow MB\uparrow \rightarrow M\uparrow$$

A business cycle contraction causes the opposite chain of events so that the fall in income leads to a fall in the money supply ($Y\downarrow \rightarrow M\downarrow$). Thus the Fed's use of a free reserves target results in a positive association of money supply movements with national income and hence a procyclical monetary policy.

During this period, many economists, especially Karl Brunner and Allan Meltzer, criticized the Fed's use of free reserves as a target variable because of the procyclical monetary policy that it created. When the money supply grows more rapidly during a business cycle expansion, it can add to inflationary pressures; when it grows more slowly during a recession, it is likely to make the economic contraction worse. Indeed, a stated objective of the Fed during this period was that monetary policy should "lean against the wind": In other words, monetary policy should be anticyclical—contractionary when there is a business cycle expansion and expansionary when there is a business cycle contraction.

The Fed's other primary operating target, short-term interest rates, performed no better as a target variable than free reserves and also led to procyclical monetary policy. If the Fed saw interest rates rising as a result of a rise in income, it would purchase bonds to bid their price up and lower interest rates to their target level. The resulting increase in the monetary base caused the money supply to rise and the business cycle expansion to be accompanied by a faster rate of money growth. In summary,

$$Y\uparrow \rightarrow i\uparrow \rightarrow MB\uparrow \rightarrow M\uparrow$$

In a recession, the opposite sequence of events would occur, and the decline in income would be accompanied by a slower rate of growth in the money supply ($Y\downarrow \rightarrow M\downarrow$).

By the late 1960s, the rising chorus of criticism of procyclical monetary policy finally led the Fed to abandon its focus on money market conditions.

Targeting Monetary Aggregates: The 1970s

In 1970, Arthur Burns was appointed chairman of the Board of Governors, and soon thereafter the Fed stated that it was committing itself to the use of monetary aggregates as intermediate targets. Did monetary policy cease to be procyclical? A glance at Figure 1 in Chapter 1 indicates that monetary policy was as procyclical in the 1970s as in the 1950s and 1960s. What went wrong? Why did the conduct of monetary policy not improve? The answers to these questions lie in the Fed's operating procedures during the period, which suggest that its commitment to targeting monetary aggregates was not very strong.

Every six weeks, the Federal Open Market Committee would set target ranges for the growth rate of various monetary aggregates and would determine what federal funds rate (the interest rate on funds loaned overnight between banks) it thought consistent with these aims. The target ranges for the growth in monetary aggregates were fairly broad—a typical range for *M*1 growth might be 3% to 6%; for *M*2, 4% to 7%—while the range for the federal funds rate was a narrow band, say, from 7½% to 8¼%. The trading desk at the Federal Reserve Bank of New York was then instructed to meet both sets of targets, but as we saw earlier, interest-rate targets and monetary aggregate targets might not be compatible. If the two targets were incompatible, say, the federal funds rate began to climb higher than the top of its target band when *M*1 was growing too rapidly, the trading desk was instructed to give precedence to the federal funds rate target. In the situation we have just described, this would mean that although *M*1 growth was too high, the trading desk would make open market purchases to keep the federal funds rate within its target range.

The Fed was actually using the federal funds rate as its operating target. During the six-week period between FOMC meetings, an unexpected rise in income (which would cause the federal funds rate to hit the top of its target band) would then induce open market purchases and a too rapid growth of the money supply. When the FOMC met again, it would try to bring money supply growth back on track by raising the target range on the federal funds rate. However, if income continued to rise unexpectedly, money growth would overshoot again. This is exactly what occurred from June 1972 to June 1973, when the economy boomed unexpectedly: *M*1 growth greatly exceeded its target, increasing at approximately an 8% rate, while the federal funds rate climbed from 4½% to 8½%. The economy soon became overheated, and inflationary pressures began to mount.

The opposite chain of events occurred at the end of 1974, when the economic contraction was far more severe than anyone had predicted. The federal funds rate fell precipitously from over 12% to 5% and persistently bumped against the bottom of its target range. The trading desk conducted open market sales to keep the federal funds rate from falling, and money growth dropped precipitously, actually turning negative by the beginning of 1975. Clearly, this sharp drop in money growth when the United States was experiencing one of the worst economic contractions of the postwar era was a serious mistake.

Using the federal funds rate as an operating target promoted a procyclical monetary policy despite the Fed's lip service to monetary aggregate targets. If the Federal Reserve really intended to pursue monetary aggregate targets, it seems peculiar that it would have chosen an interest rate for an operating target rather than a reserve aggregate. (However, as the discussion of the conduct of Japanese monetary policy later in this chapter makes clear, more effective monetary control can be achieved even when an interest rate is used as an operating target.) The explanation for why the Fed chose an interest rate as an operating target is that it was still very concerned with achieving interest-rate stability and was reluctant to relinquish control over interest-rate movements. The incompatibility of the Fed's policy procedure with its stated intent of targeting on the mon-

etary aggregates had become very clear by October 1979, when the Fed's policy procedures underwent drastic revision.

New Fed Operating Procedures: October 1979–October 1982

In October 1979, two months after Paul Volcker became chairman of the Board of Governors, the Fed finally deemphasized the federal funds rate as an operating target by widening its target range more than fivefold: A typical range might be from 10% to 15%. The primary operating target became nonborrowed reserves, which the Fed would set after estimating the volume of discount loans the banks would borrow. Figure 4 shows what happened to the federal funds rate and the growth rate of the *M*1 money supply both before and after October 1979. Not surprisingly, the federal funds rate underwent much greater fluctuations after it was deemphasized as an operating target. What is surprising, however, is that the deemphasis of the federal funds target did not result in improved monetary control: After October 1979, the fluctuations in the rate of money supply growth *increased* rather than decreased as would have been expected. In addition, the Fed missed its *M*1 growth target ranges in all three years of the 1979–1982 period.[5] What went wrong?

There are several possible answers to this question. The first is that the economy was exposed to several shocks during this period that made monetary control more difficult: the acceleration of financial innovation and deregulation, which added new categories of deposits such as NOW accounts to the measures of monetary aggregates; the imposition of credit controls from March to July 1980, which restricted the growth of consumer and business loans; and the back-to-back recessions of 1980 and 1981–1982.[6]

A more persuasive explanation for poor monetary control, however, is that controlling the money supply was never really the intent of Volcker's policy shift. Despite Volcker's statements about the need to target monetary aggregates, he was not committed to these targets. Rather, he was far more concerned with using interest-rate movements to wring inflation out of the economy. Volcker's primary reason for changing the Fed's operating procedure was to free his hand

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[5]The *M*1 target ranges and actual growth rates for 1980 through 1982 were as follows:

Year	Range(%)	Actual(%)
1980	4.5–7.0	7.5
1981	6.0–8.5	5.1
1982	2.5–5.5	8.8

Source: Board of Governors of the Federal Reserve System, *Monetary Policy Objectives, 1981–1983.*

[6]Another explanation focuses on the technical difficulties of monetary control when using a nonborrowed reserves operating target under a system of lagged reserve requirements, in which required reserves for a given week are calculated on the basis of the level of deposits two weeks earlier. See David Lindsey, "Nonborrowed Reserve Targeting and Monetary Control," in *Improving Money Stock Control,* ed. Laurence Meyer (Boston: Kluwer-Nijhoff, 1983), pp. 3–41.

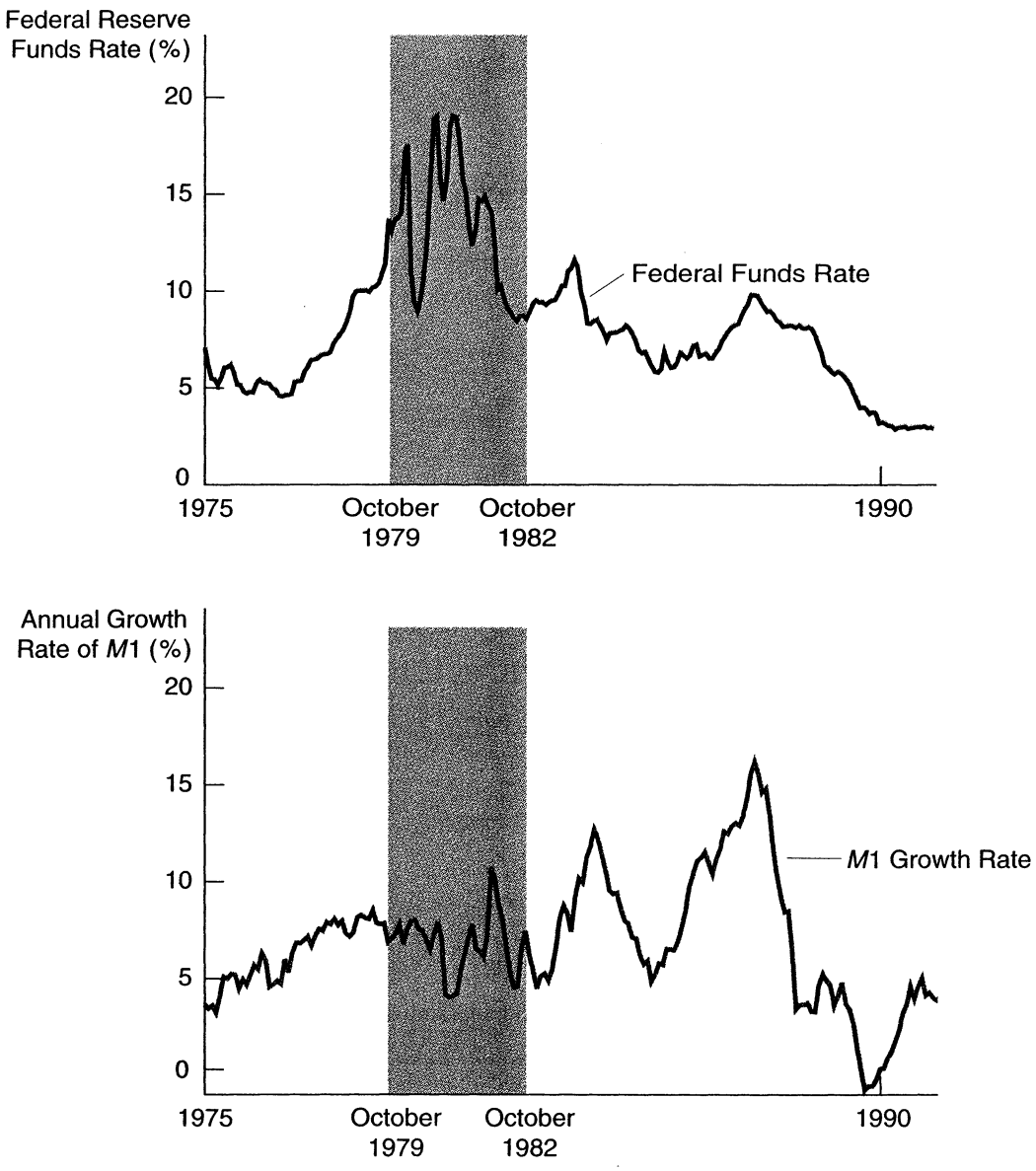


FIGURE 4
Federal Funds Rate and Growth Rate of the Money Supply, Before and After October 1979
Source: Federal Reserve *Bulletin.*

to manipulate interest rates in order to fight inflation. It was necessary to abandon interest-rate targets if Volcker were to be able to raise interest rates sharply when a slowdown in the economy was required to dampen inflation. This view of Volcker's strategy suggests that the Fed's announced attachment to monetary aggregate targets may have been a smokescreen to keep the Fed from being blamed for the high interest rates that would result from the new policy.

The interest-rate movements in Figure 4 support this interpretation of Fed strategy. After the October 1979 announcement, short-term interest rates were driven up by nearly 5%, until in March 1980 they exceeded 15%. With the imposition of credit controls in March 1980 and the rapid decline in real GDP in the second quarter of 1980, the Fed eased up on its policy and allowed interest rates to decline sharply. With the recovery starting in July 1980, inflation remained persistent, still exceeding a 10% rate. Because the inflation fight was not yet won, the Fed tightened the screws again, sending short-term rates above the 15% level for a second time. Finally, the 1981–1982 recession, with its large de-

cline in output and high unemployment, began to bring inflation down. With the inflationary psychology apparently broken, interest rates were allowed to fall.

The Fed's anti-inflation strategy during the October 1979–October 1982 period was neither intended nor likely to produce smooth growth in the monetary aggregates. Indeed, the large fluctuations in interest rates and the business cycle, along with financial innovation, helped generate volatile money growth.

Deemphasis of Monetary Aggregates: October 1982 and Beyond

In October 1982, with inflation in check, the Fed returned, in effect, to a policy of smoothing interest rates. It did this by placing less emphasis on monetary aggregate targets and shifting to borrowed reserves (discount loan borrowings) as an operating target. To see how a borrowed reserves target produces interest rate smoothing, let's consider what happens when the economy expands ($Y\uparrow$) so that interest rates are driven up. The rise in interest rates ($i\uparrow$) increases the incentives for banks to borrow more from the Fed, so borrowed reserves rise ($DL\uparrow$). To prevent the resulting rise in borrowed reserves from exceeding the target level, the Fed must lower interest rates by bidding up the price of bonds through open market purchases. The outcome of targeting on borrowed reserves, then, is that the Fed prevents a rise in interest rates. In doing so, however, the Fed's open market purchases increase the monetary base ($MB\uparrow$) and lead to a rise in the money supply ($M\uparrow$), which produces a positive association of money and national income ($Y\uparrow \rightarrow M\uparrow$). Schematically,

$$Y\uparrow \rightarrow i\uparrow \rightarrow DL\uparrow \rightarrow MB\uparrow \rightarrow M\uparrow$$

A recession causes the opposite chain of events: The borrowed reserves target prevents interest rates from falling and results in a drop in the monetary base, leading to a fall in the money supply ($Y\downarrow \rightarrow M\downarrow$).

The deemphasis of monetary aggregates and the change to a borrowed reserves target are visible in Figure 4, where we see much smaller fluctuations in the federal funds rate after October 1982 but continue to have large fluctuations in money supply growth. Finally, in February 1987, the Fed announced that it would no longer even set $M1$ targets. The abandonment of $M1$ targets has been defended on two grounds. The first is that the rapid pace of financial innovation and deregulation has made the definition and measurement of money very difficult. The second is that there has been a breakdown in the stable relationship between $M1$ and economic activity (discussed in Chapter 23). These two arguments suggest that a monetary aggregate such as $M1$ may no longer be a reliable guide for monetary policy. As a result, the Fed switched its focus to the broader monetary aggregate $M2$, which it felt had a more stable relationship with economic activity. However, in the early 1990s, this relationship also broke down, and in July 1993, the Board of Governors' chairman, Alan Greenspan, testified in Congress that the Fed would no longer use any monetary targets, including $M2$, as a guide for conducting monetary policy.

The Fed's continuing deemphasis of monetary aggregates suggests that the Fed has returned to interest-smoothing operating procedures that, as we have seen, are likely to produce procyclical money supply growth in the future.

International Considerations

The increasing importance of international trade to the American economy has brought international considerations to the forefront of Federal Reserve policymaking in recent years. By 1985, the strength of the dollar had contributed to a deterioration in American competitiveness with foreign businesses. In public pronouncements, Volcker and other Fed officials made it clear that the dollar was at too high a value and needed to come down. Because, as we saw in Chapter 8, expansionary monetary policy is one way to lower the value of the dollar, it is no surprise that the Fed engineered an acceleration in the growth rates of the monetary aggregates in 1985 and 1986 and that the value of the dollar declined. By 1987, policymakers at the Fed agreed that the dollar had fallen sufficiently, and sure enough, monetary growth in the United States slowed. These monetary policy actions by the Fed were encouraged by the process of **international policy coordination** (agreements among countries to enact policies cooperatively) that led to the Plaza Agreement in 1985 and the Louvre Accord in 1987 (see Box 2). International considerations are likely to be a major factor in the conduct of American monetary policy in the future.

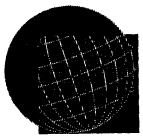
HOW WELL CAN THE FED CONTROL THE MONEY SUPPLY?

Our examination of the historical record of the Fed's conduct of monetary policy comes to the conclusion that the Fed has not been able to exercise effective control over the money supply. Does this mean that the Fed cannot control the money supply? Some economists, particularly those at the Fed, contend that the Fed's failure to control the money supply in the past implies that this objective is unachievable. Our analysis of the money supply process since Chapter 15 gives some credence to this position because we have seen that several factors outside of the Fed's control affect both the monetary base and money multiplier. Empirical evidence, however, supports a strong link between the monetary base, which is easily controlled through open market operations, and the money supply, suggesting that over longer time periods—six months to a year—the money supply can be controlled quite accurately.

Many economists contend that the Fed's failure to control the money supply in the past has occurred because, despite Fed statements to the contrary, the Fed really did not want to control it. Specifically, the Fed was not willing to commit

A Global Perspective

Box 2



INTERNATIONAL POLICY COORDINATION: THE PLAZA AGREEMENT AND THE LOUVRE ACCORD

By 1985, the decrease in the competitiveness of American corporations as a result of the strong dollar was raising strong sentiment in Congress for restricting imports. This protectionist threat to the international trading system stimulated finance ministers and the heads of central banks from the Group of Five (G-5) industrial countries—the United States, the United Kingdom, France, West Germany, and Japan—to reach an agreement at New York's Plaza Hotel in September 1985 to bring down the value of the dollar. From September 1985 until the beginning of 1987, the value of the dollar did indeed undergo a substantial decline, falling by 35% on average relative to foreign currencies. At this point, there was growing controversy over the decline in the dollar, and another meeting of the economic policymakers from the G-5 countries plus Canada took place in February 1987 at the Louvre Museum in Paris. There the policymakers agreed that exchange rates should be stabilized around the levels currently prevailing. Although the value of the dollar did continue to fluctuate relative to foreign currencies after the Louvre Accord, its downward trend had been checked as intended.

Because exchange rate movements were pretty much in line with the Plaza Agreement and the Louvre Accord, these attempts at international policy coordination have been considered successful. However, other aspects of the agreements were not adhered to by all signatories. For example, West German and Japanese policymakers agreed that their countries should pursue more expansionary policies by increasing government spending and cutting taxes, and the United States agreed to try to bring down its budget deficit. The United States has not been particularly successful in lowering its deficit, and the Germans have been reluctant to pursue expansionary policies because of their concerns about inflation.

itself to policy procedures that would ensure better control.[7] They suggest that the Fed could obtain far better control if it were willing to do two things: tie the discount rate to a market interest rate to decrease unwanted fluctuations in the volume of discount loans and focus less on stabilizing interest rates and more on control of the monetary base and the money supply. There is some evidence that policy procedures incorporating these suggestions could result in greatly improved control of the money supply over even shorter time periods (such as

[7]One possible reason is that such policy procedures would make the Fed more accountable for its actions, something that the theory of bureaucratic behavior suggests the Fed may want to avoid.

three months).[8] However, given the recent breakdown of a stable relationship between monetary aggregates and economic activity, there are doubts as to whether tighter control of the money supply is desirable.

THE CONDUCT OF MONETARY POLICY IN FIVE OTHER COUNTRIES

To understand how well a central bank can control the money supply, it is worth examining how monetary policy has been conducted in other countries besides the United States. Here we look at the conduct of monetary policy in recent decades in five other countries: the United Kingdom, Canada, Germany, Switzerland, and Japan.[9]

United Kindgom

As in the United States, the British introduced monetary targeting in late 1973 in response to mounting concerns about inflation. The Bank of England used a broader monetary target than the Fed did in the United States, *M*3, but did not pursue it seriously, resulting in greater volatility of British monetary aggregates than American ones. After inflation accelerated in the late 1970s, Prime Minister Margaret Thatcher in 1980 introduced the Medium-Term Financial Strategy, which proposed a gradual deceleration of *M*3 growth. Unfortunately, the *M*3 targets ran into problems similar to those of the *M*1 targets in the United States: They were not reliable indicators of the tightness of monetary policy. Subsequent to 1983, arguing that financial innovation was wreaking havoc with the relationship between *M*3 and income, the Bank of England began to deemphasize *M*3 in favor of a narrower monetary aggregate, *M*0 (the monetary base). The target for *M*3 was temporarily suspended in October 1985 and was completely dropped in 1987, leaving *M*0 as the only monetary aggregate targeted. Since 1984, target ranges for the growth in *M*0 have been reduced over time, and actual *M*0 growth has fallen within or close to the target ranges.

Canada

The Canadian experience with monetary policy closely parallels that of the United States. This is not surprising given the strong ties between the two economies and the fact that the value of the Canadian dollar has been closely linked to the U.S dollar.

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[8] See, for example, James Johannes and Robert Rasche, "Predicting the Money Multiplier," *Journal of Monetary Economics* 5 (1979): 301–325.

[9] The discussion here is based on Ben Bernanke and Frederic S. Mishkin, "Central Bank Behavior and the Strategy of Monetary Policy: Observations from Six Industrialized Countries," in *NBER Macroeconomics Annual, 1992,* ed. O. Blanchard and S. Fischer (Cambridge: MIT Press, 1992), pp. 183–228.

In response to the rise in inflation in the early 1970s, the Bank of Canada introduced a program of "monetary gradualism," under which *M*1 growth would be controlled within a gradually falling target range. Monetary gradualism was no more successful in Canada than the initial attempts at monetary targeting in the United States and the United Kingdom. By 1978, only three years after monetary targeting had begun, the Bank of Canada began to distance itself from this strategy out of concern for the exchange rate. Because of the conflict with exchange rate goals, as well as the uncertainty about *M*1 as a reliable guide to monetary policy, the *M*1 targets were abandoned in November 1982. In a dramatic reversal of the subsequent ad hoc monetary strategy, in January 1988, John Crow, the governor (head) of the Bank of Canada, announced that the Bank of Canada would subsequently pursue an objective of price stability. The Bank and the Ministry of Finance have jointly announced a series of declining inflation targets in which *M*2 would be used as the guide to policy, along with an index of monetary conditions based on interest rates and exchange rates.

Germany

Germany's central bank, the Bundesbank, also responded to rising inflation in the early 1970s by adopting monetary targets in 1975. The monetary aggregate chosen was a narrow one known as *central bank money,* the sum of currency in circulation and bank deposits weighted by the 1974 required reserve ratios. The Bundesbank has allowed growth outside of its target ranges for periods of two to three years, and overshoots of its targets have subsequently been reversed. The primary reason for allowing deviations from its targets has been exchange rate considerations, which have been important to international agreements such as the European Exchange Rate Mechanism, the Plaza Agreement, and the Louvre Accord. In 1988, the Bundesbank switched targets from central bank money to *M*3. German monetary policy using monetary targeting has been quite successful in maintaining a low and stable inflation rate.

The reunification of Germany in 1990 created some difficult problems for monetary policy. The Bundesbank has been torn between trying to restrain the inflationary pressures created by reunification and keeping its exchange rate in line with those in other European countries. These strains contributed to an exchange rate crisis in Europe in September 1992, which will be discussed further in Chapter 22.

Switzerland

The Swiss National Bank, the central bank, began to announce monetary targets, with *M*1 as the targeted aggregate, at the end of 1974. The Swiss approach has been unusual in two ways: Targets are expressed as precise values rather than ranges, and the monetary base serves as the operating target. (Interest rates have been the operating target for the other countries discussed here, except for brief periods such as 1979–1982 in the United States.) The approach to hitting targets

has been similar to that followed by Germany, with deviations to deal with exchange rate considerations reversed at a later date. Beginning in 1980, the Swiss National Bank switched to *M0*, the monetary base, as its targeted aggregate, thus using it as both its operating and intermediate target. In recent years, the relationship between the monetary aggregates and inflation have become quite unstable in Switzerland, leading the Swiss National Bank to deemphasize monetary targeting.

Japan

The increase in oil prices in late 1973 was a major shock for Japan, which experienced a huge jump in the inflation rate to greater than 20% in 1974—a surge facilitated by money growth in 1973 in excess of 20%. The Bank of Japan, like the other central banks discussed here, began to pay more attention to money growth rates. In 1978, the Bank of Japan began to announce "forecasts" at the beginning of each quarter for *M2 + CDs*. Although the Bank of Japan was not officially committed to monetary targeting, after 1978 monetary policy appeared to be more money-focused. For example, after the second oil price shock in 1979, the Bank of Japan quickly reduced *M2 + CDs* growth, rather than allowing it to shoot up as occurred after the first oil shock. The Bank of Japan conducted monetary policy with operating procedures that are similar in many ways to those that the Federal Reserve has used in the United States. The Bank of Japan uses the interest rate in the Japanese interbank market (which has a function similar to that of the federal funds market in the United States) as its daily operating target, just as the Fed has done.

The Bank of Japan's monetary policy performance during the 1978–1987 period was much better than the Fed's. Money growth in Japan slowed gradually, beginning in the mid-1970s, and was much less variable than in the United States. The outcome was a more rapid braking of inflation and an average inflation rate that was lower in Japan. These excellent results on inflation were achieved with lower variability in real output in Japan than in the United States. The success of Japanese monetary policy in the 1978–1987 period using an interest rate as an operating target, in contrast to the lack of success in the 1970–1979 period in the United States when the Fed used a similar operating procedure, suggests that using an interest rate as an operating target is not necessarily a barrier to successful monetary policy. More important might be a commitment to a low inflation rate, something that was true for the Bank of Japan in this period.

In parallel with the United States, financial innovation and deregulation in Japan began to reduce the usefulness of the *M2 + CDs* monetary aggregate as an indicator of monetary policy. Because of concerns about the appreciation of the yen, the Bank of Japan significantly increased the rate of money growth from 1987 to 1989. Many observers blame speculation in Japanese land and stock

prices (the so-called *bubble economy*) on the increase in money growth, and to reduce this speculation, the Bank of Japan switched to a tighter monetary policy aimed at slower money growth. The aftermath has been a substantial decline in land and stock prices and the end of the bubble economy.

SUMMARY

1. There are six basic goals of monetary policy: high employment, economic growth, price stability, interest-rate stability, stability of financial markets, and stability in foreign exchange markets.
2. By using intermediate and operating targets, the Fed can more quickly judge whether its policies are on the right track and make midcourse corrections, rather than waiting to see the final outcome of its policies on such goals as employment and the price level. The Fed's policy tools directly affect its operating targets, which in turn affect the intermediate targets, which in turn affect the goals.
3. Because interest-rate and monetary aggregate targets are incompatible, the Fed must choose between them on the basis of three criteria: measurability, controllability, and the ability to affect goal variables predictably. Unfortunately, these criteria do not establish an overwhelming case for one set of targets over another.
4. The historical record of the Fed's conduct of monetary policy suggests that the Fed has not been able to exercise effective control over the money supply.
5. Some economists contend that the historical record indicates that the Fed cannot control the money supply, while other economists contend the Fed could obtain better control over the money supply if it wanted to. Empirical evidence supports a strong link between open market operations and the money supply, suggesting that over longer time periods, such as six months to a year, the money supply can be controlled quite effectively.
6. In response to the rise in inflation in the early 1970s, central banks around the world began to target monetary aggregates.

KEY TERMS

natural rate of unemployment
intermediate targets
operating targets
real bills doctrine
free reserves
international policy coordination

QUESTIONS AND PROBLEMS

*1. "Unemployment is a bad thing, and the government should make every effort to eliminate it." Do you agree or disagree? Explain.
2. Classify each of the following as either an operating target or an intermediate target, and explain why.
   (a) The three-month Treasury bill rate
   (b) The monetary base
   (c) M2
*3. "If the demand for money did not fluctuate, the Fed could pursue both a money supply target and an interest-rate target at the same time." Is this statement true, false, or uncertain? Explain.
4. If the Fed has an interest-rate target, why will an increase in money demand lead to a rise in the money supply?
*5. What procedures can the Fed use to control the three-month Treasury bill rate? Why does control

of this interest rate imply that the Fed will lose control of the money supply?

6. Compare the monetary base to *M2* on the grounds of controllability and measurability. Which do you prefer as an intermediate target? Why?

*7. "Interest rates can be measured more accurately and more quickly than the money supply. Hence an interest rate is preferred over the money supply as an intermediate target." Do you agree or disagree? Explain.

8. Explain why the rise in the discount rate in 1920 led to a sharp decline in the money supply.

*9. How did the Fed's failure to perform its role as the lender of last resort contribute to the decline of the money supply in the 1930–1933 period?

10. Excess reserves are frequently called *idle reserves,* suggesting that they are not useful. Does the episode of the rise in reserve requirements in 1936–1937 bear out this view?

*11. "When the economy enters a recession, either a free reserves target or an interest-rate target will lead to a slower rate of growth for the money supply." Explain why this statement is true. What does it say about the use of free reserves or interest rates as targets?

12. "The failure of the Fed to control the money supply in the 1970s and 1980s suggests that the Fed is not able to control the money supply." Do you agree or disagree? Explain.

*13. Which is more likely to produce smaller fluctuations in the federal funds rate, a nonborrowed reserves target or a borrowed reserves target? Why?

14. How can bank behavior and the Fed's behavior cause money supply growth to be procyclical (rising in booms and falling in recessions)?

*15. Why might the Fed say that it wants to control the money supply but in reality not be serious about doing so?