Chapter 18

Conduct of Monetary Policy: Goals and Targets

PREVIEW

Now that we understand the tools that central banks like the Federal Reserve use to conduct monetary policy, we can proceed to how monetary policy is actually conducted. Understanding the conduct of monetary policy is important, because it not only affects the money supply and interest rates but also has a major influence on the level of economic activity and hence on our well-being.

To explore this subject, we look at the goals that the Fed establishes for monetary policy and its strategies for attaining them. After examining the goals and strategies, we can evaluate the Fed's 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

www.federalreserve.gov/pf/pf.htm

Review what the Federal Reserve reports as its primary purposes and functions.

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 increase 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*, which involves searches by workers and firms to find suitable matchups, 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 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 may take 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.

Another reason that unemployment is not zero when the economy is at full employment is due to what is called *structural unemployment*, a mismatch between job requirements and the skills or availability of local workers. Clearly, this kind of unemployment is undesirable. Nonetheless, it is something that monetary policy can do little about.

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. This level is called the **natural rate of unemployment**.

Although this definition sounds neat and authoritative, 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, policymakers 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 between $4\frac{1}{2}$ and 6%, but even this estimate is subject to a great deal of 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

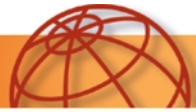
www.economagic.com/
A comprehensive listing of sites that offer a wide variety of economic summary data and graphs.

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 is the stated purpose of so-called supply-side economics policies, which are intended to spur economic growth by providing tax incentives for businesses to invest in facilities and equipment and for taxpayers to save more. There is also an active debate over what role monetary policy can play in boosting growth.

Price Stability

www.bls.gov/cpi/
View current data on the consumer price index.

Over the past few decades, policymakers in the United States have become increasingly aware of the social and economic costs of inflation and more concerned with a stable price level as a goal of economic policy. Indeed, price stability is increasingly viewed as the most important goal for monetary policy. (This view is also evident in Europe—see Box 1.) Price stability is desirable because a rising price level (inflation) creates uncertainty in the economy, and that uncertainty might hamper economic growth. For example, when the overall level of prices is changing, the information conveyed by the prices of goods and services is harder to interpret, which complicates



Box 1: Global

The Growing European Commitment to Price Stability

Not surprisingly, given Germany's experience with hyperinflation in the 1920s, Germans have had the strongest commitment to price stability as the primary goal for monetary policy. Other Europeans 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 was reflected in the December 1991 Treaty of European Union, known as the Maastricht Treaty. This treaty created the European System of Central Banks, which functions 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.

decision making for consumers, businesses, and government. Not only do public opinion surveys indicate that the public is very hostile to inflation, but a growing body of evidence suggests that inflation leads to lower economic growth.[1] The most extreme example of unstable prices is *hyperinflation*, such as Argentina, Brazil, and Russia have experienced in the recent past. Many economists attribute the slower growth that these countries have experienced to their problems with hyperinflation.

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 a child's college education in an inflationary environment. Further, inflation can strain a country's social fabric: Conflict might result, because each group in the society may compete with other groups to make sure that its income keeps up with the rising level of prices.

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 for consumers to decide when to purchase a house and for construction firms to plan how many houses to build. A central bank may also want to reduce upward movements in interest rates for the reasons we discussed in Chapter 14: Upward movements in interest rates generate hostility toward central banks like the Fed and lead to demands that their power be curtailed.

Stability of Financial Markets

As our analysis in Chapter 8 showed, financial crises can interfere with the ability of financial markets to channel funds to people with productive investment opportunities, thereby leading to a sharp contraction in economic activity. The promotion of a more stable financial system in which financial crises are avoided is thus an important goal for a central bank. Indeed, as discussed in Chapter 14, the Federal Reserve System was created in response to the bank panic of 1907 to promote financial stability.

[1]For example, see Stanley Fischer, "The Role of Macroeconomic Factors in Growth," *Journal of Monetary Economics* 32 (1993): 485–512.

The stability of financial markets is also fostered 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 got into serious financial trouble in the 1980s and early 1990s (as we have seen in Chapter 11).

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. 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. In other countries, which are even more dependent on foreign trade, stability in foreign exchange markets takes on even greater importance.

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 (but probably not in the long run). For example, when the economy is expanding and unemployment is falling, both inflation and interest rates may start to rise. If the central bank tries to prevent a rise in interest rates, this might cause the economy to overheat and stimulate inflation. But if a central bank raises interest rates to prevent inflation, in the short run unemployment could rise. The conflict among goals may thus present central banks like the Federal Reserve with some hard choices. We return to the issue of how central banks should choose conflicting goals in later chapters when we examine how monetary policy affects the economy.

Central Bank Strategy: Use of Targets

The central bank'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 central bank 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.

All central banks consequently pursue a different strategy for conducting monetary policy by aiming at variables that lie between its tools and the achievement of its goals. The strategy is as follows: After deciding on its goals for employment and the price level, the central bank 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 central bank's policy tools. Therefore, it chooses another set of variables to aim for, called **operating targets**, or alternatively **instrument 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.)[2]

The central bank 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 track, rather than waiting until it sees the final outcome of its policies on employment and the price level.[3] 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 central bank's strategy works in a similar way. Suppose that the central bank's employment and price-level goals are consistent with a nominal GDP growth rate of 5%. If the central bank 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 $3\frac{1}{2}$% for the monetary base (its operating target), it will carry out open market operations (its tool) to achieve the $3\frac{1}{2}$% growth in the monetary base. After implementing this policy, the central bank 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 central bank 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 central bank may decide to reduce its open market purchases or make open market sales to reduce the M2 growth rate.

One way of thinking about this strategy (illustrated in Figure 1) is that the central bank is using its operating and intermediate targets to direct monetary policy (the space shuttle) 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 central bank 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 central bank

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[2]There is some ambiguity as to whether to call a particular variable an operating target or an intermediate target. The monetary base and the Treasury bill rate are often viewed 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 and a target.

[3]This reasoning for the use of monetary targets has come under attack, 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.

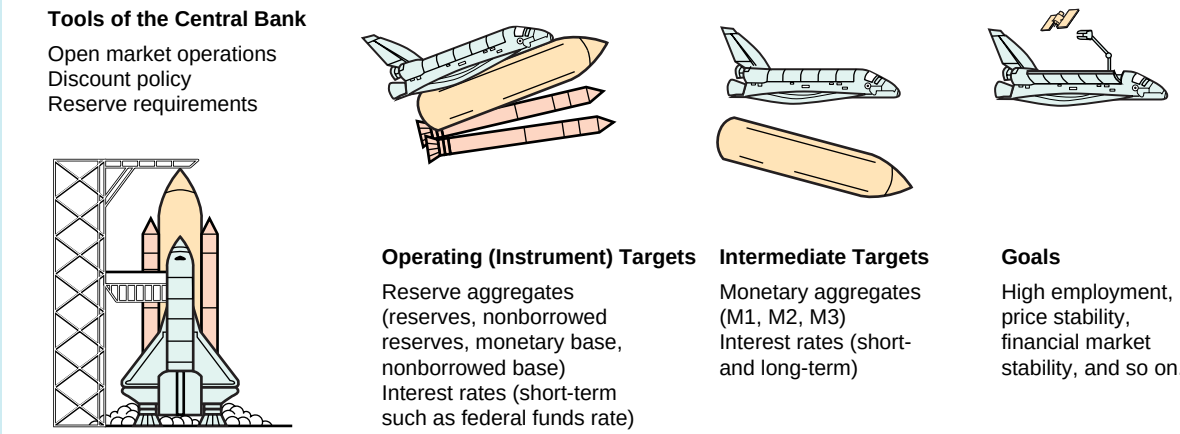


FIGURE 1 Central Bank Strategy

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 space shuttle launches the satellite in the appropriate orbit).

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 central bank 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 central bank choose to pursue both of these targets at the same time? The answer is no. The application of the supply and demand analysis of the money market that we covered in Chapter 5 explains why a central bank 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 central bank 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 could change. If the central bank'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 central bank 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

FIGURE 2 Result of Targeting on the Money Supply
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 $M^{d''}$.

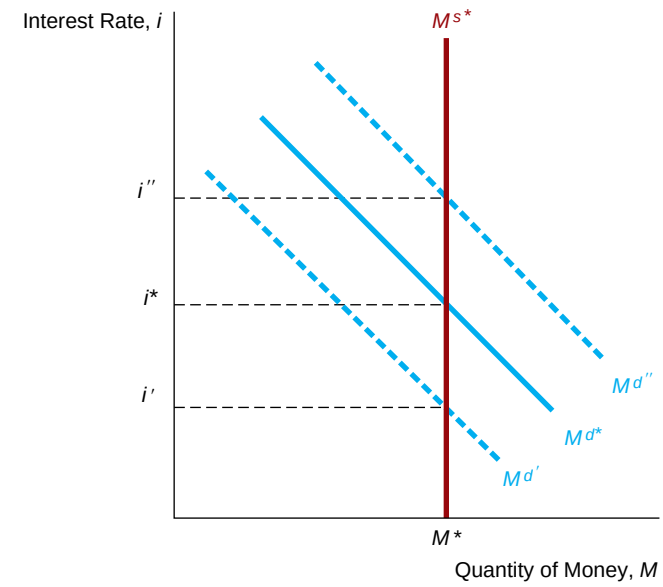
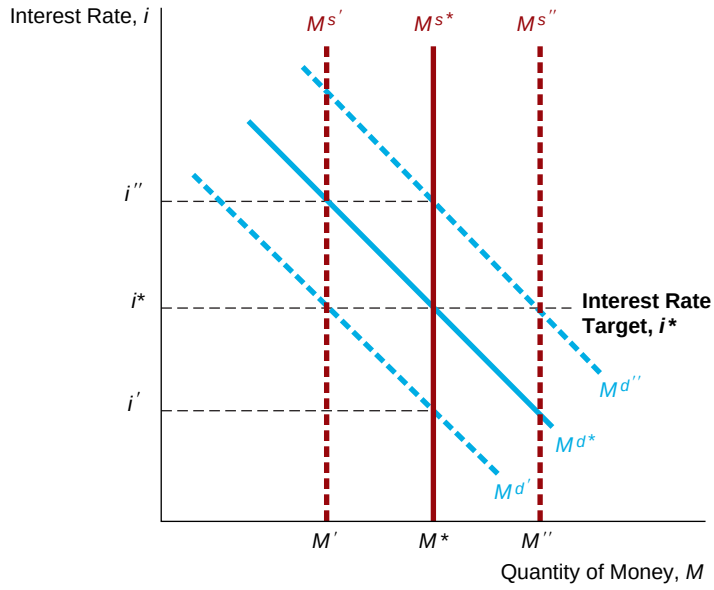


FIGURE 3 Result of Targeting on the Interest Rate
Targeting the interest rate at M^* will lead to fluctuations of the money supply between M' and M'' because of fluctuations in the money demand curve between $M^{d'}$ and $M^{d''}$.



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 central bank 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 central bank 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 central bank would keep interest rates from rising by buying bonds to keep their prices from falling. The central bank will make open market purchases until the money supply rises to $M^{s''}$ and the equilibrium interest rate is i^*. The central bank'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: A central bank 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 a central bank's strategy of using targets suggests three criteria for choosing an intermediate target: It must be measurable, it must be controllable by the central bank, 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 rapidly when policy is off track. What good does it do for the central bank 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 variable like GDP that serves as a goal, 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 central bank'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 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. A central bank must be able to exercise effective control over a variable if it is to function as a useful target. If the central bank cannot control an intermediate target, knowing that it is off track does little good, because the central bank has no way of getting the target back on track. Some economists have suggested that nominal GDP should be used as an intermediate target, but since the central bank has little direct control over nominal GDP, it will not provide much guidance on how the Fed should set its policy tools. A central bank does, however, have a good deal of control over the monetary aggregates and interest rates.

Our discussion of the money supply process and the central bank's policy tools indicates that a central bank 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 a central bank 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, a central bank 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 must have a predictable impact on a goal. If a central bank can accurately and quickly measure the price of tea in China and can completely control its price, what good will it do? The central bank cannot use the price of tea in China to affect unemployment or the price level in its country. 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. The evidence on whether these goals have a closer (more predictable) link with the money supply than with interest rates is discussed in Chapter 26.

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 17. 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 6). However, if the desired intermediate target is a monetary aggregate, our money supply model in Chapters 15 and 16 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: 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 a central bank's goals and the strategies it can use to pursue them cannot tell us how monetary policy is actually conducted. To understand the practical results of the theoretical underpinnings, we have to look at how central banks have actually conducted policy in the past. First we will look at the Federal Reserve'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 U.S. monetary policy may be heading in the future. Once we are done studying the Fed, we will then examine central banks' experiences in other countries.

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 Chapters 15 and 16.

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.[4] 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 low 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 $4\frac{3}{4}$% 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 it made to member banks. After the 1920–1921 recession, the volume of discount loans shrank dramatically, and

[4] Another guiding principle was the maintenance of the gold standard, which we will discuss in Chapter 20.

the Fed was 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 mean raising interest rates to businesses and individuals who had legitimate needs for credit. 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.

The weakness of the economy, particularly in the agricultural sector, led to what Milton Friedman and Anna Schwartz labeled a "contagion of fear" that triggered substantial withdrawals from banks, building to a full-fledged panic in November and December 1930. For the next two years, the Fed sat idly by while one bank panic after another occurred, culminating in the final panic in March 1933, at which point the new president, Franklin Delano Roosevelt, declared a bank holiday. (Why the Fed failed to engage in its lender-of-last-resort role during this period is discussed in Box 2.)

Box 2: Inside the Fed

Bank Panics of 1930–1933: Why Did the Fed Let Them Happen?

The Federal Reserve System was totally passive during the bank panics of the Great Depression period and did not perform its intended role of lender of last resort to prevent them. In retrospect, the Fed's behavior seems quite extraordinary, but hindsight is always clearer than foresight.

The primary reason for the Fed's inaction was that Federal Reserve officials did not understand the negative impact that bank failures could have on the money supply and economic activity. Friedman and Schwartz report that the Federal Reserve officials "tended to regard bank failures as regrettable consequences of bank management or bad banking practices, or as inevitable reactions to prior speculative excesses, or as a consequence but hardly a cause of the financial and economic collapse in process." In addition, bank failures in the early stages of the bank panics "were concentrated among smaller banks and, since the most influential figures in the system were big-city bankers who deplored the existence of smaller banks, their disappearance may have been viewed with complacency."*

Friedman and Schwartz also point out that political infighting may have played an important role in the passivity of the Fed during this period. The Federal Reserve Bank of New York, which until 1928 was the dominant force in the Federal Reserve System, strongly advocated an active program of open market purchases to provide reserves to the banking system during the bank panics. However, other powerful figures in the Federal Reserve System opposed the New York bank's position, and the bank was outvoted. (Friedman and Schwartz's discussion of the politics of the Federal Reserve System during this period makes for fascinating reading, and you might enjoy their highly readable book.)

*Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton, N.J.: Princeton University Press, 1963), p. 358.

The spate of bank panics from 1930 to 1933 were the most severe in U.S. history, and Roosevelt aptly summed up the problem in his statement "The only thing we have to fear is fear itself." By the time the panics were over in March 1933, more than one-third of the commercial banks in the United States had failed.

In Chapter 16, we examined how the bank panics of this period led to a decline in the money supply by over 25%. The resulting unprecedented decline in the money supply during this period is thought by many economists, particularly monetarists, to have been the major contributing factor to the severity of the depression, never equaled before or since.

Reserve Requirements as a Policy Tool

The Thomas Amendment to the Agricultural Adjustment Act of 1933 provided the Federal Reserve's 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 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 lent out and would produce "an uncontrollable expansion of credit in the future."[5]

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: $\frac{3}{8}$% on Treasury bills and $2\frac{1}{2}$% on long-term Treasury bonds. Whenever interest rates rose above these levels and the price of bonds began to fall, the Fed would make open market purchases, thereby bidding up bond prices and driving interest rates down again. The result was a rapid

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

growth in the monetary base and the money supply. The Fed had thus in effect relinquished its control of monetary policy to meet the financing needs of the government.

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 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, and particularly on interest rates.

An important characteristic of this policy procedure was 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* (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 5, a rise in national income ($Y\uparrow$) leads to a rise in market interest rates ($i\uparrow$). With the rise in interest rates, the Fed 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 ($Y\downarrow \Rightarrow M\downarrow$).

A further problem with using interest rates as the primary operating target is that they may encourage an inflationary spiral to get out of control. As we saw in Chapter 5, when inflation and hence expected inflation rises, nominal interest rates rise via the Fisher effect. If the Fed attempted to prevent this increase by purchasing bonds, this would also lead to a rise in the monetary base and the money supply:

$$\pi\uparrow \Rightarrow \pi^e\uparrow \Rightarrow i\uparrow \Rightarrow MB\uparrow \Rightarrow M\uparrow$$

Higher inflation could thus lead to an increase in the money supply, which would increase inflationary pressures further.

By the late 1960s, the rising chorus of criticism of procyclical monetary policy by such prominent monetarist economists such as Milton Friedman, Karl Brunner, and

Allan Meltzer and concerns about inflation 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 4 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 rates 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 M1 growth might be 3% to 6%; for M2, 4% to 7%—while the range for the federal funds rate was a narrow band, say from $7\frac{1}{2}\%$ to $8\frac{1}{4}\%$. 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 M1 was growing too rapidly—the trading desk was instructed to give precedence to the federal funds rate target. In the situation just described, this would mean that although M1 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 output (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: M1 growth greatly exceeded its target, increasing at approximately an 8% rate, while the federal funds rate climbed from $4\frac{1}{2}\%$ to $8\frac{1}{2}\%$. 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 dramatically, 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. The explanation for the Fed's choice of 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 monetary 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. 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 M1 growth target ranges in all three years of the 1979–1982 period.[6] 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 by the Fed 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.[7]

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 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.

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[6]The M1 target ranges and actual growth rates for 1980–1982 were as follows:

Year	*Target 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.*

[7]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.

Interest-rate movements during this period 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. When recovery began in July 1980, inflation remained persistent, still exceeding 10%. 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. The 1981–1982 recession and its large decline in output and high unemployment began to bring inflation down. With 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.

De-emphasis of Monetary Aggregates: October 1982–Early 1990s

www.federalreserve.gov/releases/H3

Historic and current data on the aggregate reserves of depository institutions and the monetary base.

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 de-emphasis of monetary aggregates and the change to a borrowed reserves target led to much smaller fluctuations in the federal funds rate after October 1982 but continued 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 was defended on two grounds. The first was that the rapid pace of financial innovation and deregulation had made the definition and measurement of money very difficult. The second is that there had been a breakdown in the stable relationship between M1 and economic activity (discussed in Chapter 22). These two arguments suggested that a monetary aggregate such as M1 might 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, 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.

Finally, legislation in 2000 amending the Federal Reserve Act dropped the requirement that the Fed report target ranges for monetary aggregates to Congress.

Federal Funds Targeting Again: Early 1990s and Beyond

Having abandoned monetary aggregates as a guide for monetary policy, the Federal Reserve returned to using a federal funds target in the early 1990s. Indeed, from late 1992 until February 1994, a period of a year and a half, the Fed kept the federal funds rate targeted at the constant rate of 3%, a low level last seen in the 1960s. The explanation for this unusual period of keeping the federal funds rate pegged so low for such a long period of time was fear on the part of the Federal Reserve that the credit crunch mentioned in Chapter 9 was putting a drag on the economy (the "headwinds" referred to by Greenspan) that was producing a sluggish recovery from the 1990–1991 recession. Starting in February 1994, after the economy returned to rapid growth, the Fed began a preemptive strike to head off any future inflationary pressures by raising the federal funds rate in steps to 6% by early 1995. The Fed not only has engaged in preemptive strikes against a rise in inflation, but it has acted preemptively against negative shocks to demand. It lowered the federal funds rate in early 1996 to deal with a possible slowing in the economy and took the dramatic step of reducing the federal funds rate by $\frac{3}{4}$ of a percentage point when the collapse of Long Term Capital Management in the fall of 1998 (discussed in Chapter 12) led to concerns about the health of the financial system. With the strong growth of the economy in 1999 and heightened concerns about inflation, the Fed reversed course and began to raise the federal funds rate again. The Fed's timely actions kept the economy on track, helping to produce the longest business cycle expansion in U.S. history. With a weakening economy, in January 2001 (just before the start of the recession in March 2001) the Fed reversed course again and began to reduce sharply the federal funds rate from its height of 6.5% to near 1% eventually.

In February 1994, with the first change in the federal funds rate in a year and a half, the Fed adopted a new policy procedure. Instead of keeping the federal funds target secret, as it had done previously, the Fed now announced any federal funds rate target change. As mentioned in Chapter 14, around 2:15 P.M., after every FOMC meeting, the Fed now announces whether the federal funds rate target has been raised, lowered, or kept the same. This move to greater transparency of Fed policy was followed by another such move, when in February 1999 the Fed indicated that in the future it would announce the direction of bias to where the federal funds rate will head in the future. However, dissatisfaction with the confusion that the bias announcement created for market participants led the Fed to revise its policy, and starting in February 2000, the Fed switched to an announcement of a statement outlining the "balance of risks" in the future, whether toward higher inflation or toward a weaker economy. As a result of these announcements, the outcome of the FOMC meeting is now big news, and the media devote much more attention to FOMC meeting, because announced changes in the federal funds rate feeds into changes in other interest rates that affect consumers and businesses.

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, Chairman 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 will see in Chapter 19, expansionary monetary policy is

Box 3: Global

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 percent on average relative to foreign currencies. At this point, there was growing controversy over the decline in the dollar, and another meeting of 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 subsequent 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. At that time, the United States was not particularly successful in lowering its deficit, and the Germans were reluctant to pursue expansionary policies because of their concerns about inflation.

www.federalreserve.gov/centralbanks.htm
The Federal Reserve provides links to other central bank web pages.

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 3).

International considerations also played a role in the Fed's decision to lower the federal funds rate by $\frac{3}{4}$ of a percentage point in the fall of 1998. Concerns about the potential for a worldwide financial crisis in the wake of the collapse of the Russian financial system at that time and weakness in economies abroad, particularly in Asia, stimulated the Fed to take a dramatic step to calm down markets. International considerations, although not the primary focus of the Federal Reserve, are likely to be a major factor in the conduct of American monetary policy in the future.

The Taylor Rule, NAIRU, and the Phillips Curve

As we have seen, the Federal Reserve currently conducts monetary policy by setting a target for the federal funds rate. But how should this target be chosen?

John Taylor of Stanford University has come up with an answer, his so-called **Taylor rule**. The Taylor rule indicates that the federal (fed) funds rate should be set equal to the inflation rate plus an "equilibrium" real fed funds rate (the real fed funds

rate that is consistent with full employment in the long run) plus a weighted average of two gaps: (1) an inflation gap, current inflation minus a target rate, and (2) an output gap, the percentage deviation of real GDP from an estimate of its potential full employment level.[8] This rule can be written as follows:

$$\text{Federal funds rate target} = \text{inflation rate} + \text{equilibrium real fed funds rate} + 1/2\ (\text{inflation gap}) + 1/2\ (\text{output gap})$$

Taylor has assumed that the equilibrium real fed funds rate is 2% and that an appropriate target for inflation would also be 2%, with equal weights of 1/2 on the inflation and output gaps. For an example of the Taylor rule in practice suppose that the inflation rate were at 3%, leading to a positive inflation gap of 1% (= 3% − 2%), and real GDP was 1% above its potential, resulting in a positive output gap of 1%. Then the Taylor rule suggests that the federal funds rate should be set at 6% [= 3% inflation + 2% equilibrium real fed funds rate + 1/2 (1% inflation gap) + 1/2 (1% output gap)].

The presence of both an inflation gap and an output gap in the Taylor rule might indicate that the Fed should care not only about keeping inflation under control, but also about minimizing business cycle fluctuations of output around its potential. Caring about both inflation and output fluctuations is consistent with many statements by Federal Reserve officials that controlling inflation and stabilizing real output are important concerns of the Fed.

An alternative interpretation of the presence of the output gap in the Taylor rule is that the output gap is an indicator of future inflation as stipulated in **Phillips curve theory**. Phillips curve theory indicates that changes in inflation are influenced by the state of the economy relative to its productive capacity, as well as to other factors. This productive capacity can be measured by potential GDP, which is a function of the natural rate of unemployment, the rate of unemployment consistent with full employment. A related concept is the **NAIRU**, the **nonaccelerating inflation rate of unemployment**, the rate of unemployment at which there is no tendency for inflation to change.[9] Simply put, the theory states that when the unemployment rate is above NAIRU with output below potential, inflation will come down, but if it is below NAIRU with output above potential, inflation will rise. Prior to 1995, the NAIRU was thought to reside around 6%. However, with the decline in unemployment to around the 4% level in the late 1990s, with no increase in inflation and even a slight decrease, some critics have questioned the value of Phillips curve theory. Either they claim that it just doesn't work any more or alternatively believe that there is great uncertainty about the value of NAIRU, which may have fallen to below 5% for reasons that are not absolutely clear. Phillips curve theory is now highly controversial, and many economists believe that it should not be used as a guide for the conduct of monetary policy.

As Figure 4 shows, the Taylor rule does a pretty good job of describing the Fed's setting of the federal funds rate under Chairman Greenspan. It also provides a perspective on the Fed's conduct of monetary policy under Chairmen Burns and Volcker. During the Burns period, from 1970 to 1979, the federal funds rate was consistently

[8]John B. Taylor, "Discretion Versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy* 39 (1993): 195–214. A more intuitive discussion with a historical perspective can be found in John B. Taylor, "A Historical Analysis of Monetary Policy Rules," in *Monetary Policy Rules*, ed. John B. Taylor (Chicago: University of Chicago Press, 1999), pp. 319–341.

[9]There are however subtle differences between the two concepts as is discussed in Arturo Estrella and Frederic S. Mishkin, "The Role of NAIRU in Monetary Policy: Implications of Uncertainty and Model Selection," in *Monetary Policy Rules*, ed. John Taylor (Chicago: University of Chicago Press, 1999): 405–430.

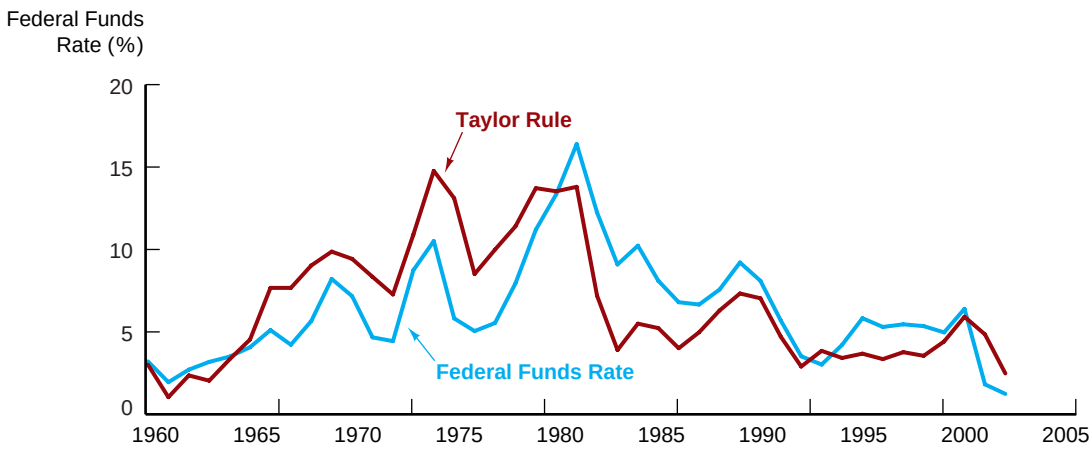

FIGURE 4 The Taylor Rule for the Federal Funds Rate, 1970–2002

Source: Federal Reserve: www.federalreserve.gov/releases and author's calculations.

lower than that indicated by the Taylor rule. This fact helps explain why inflation rose during this period. During the Volcker period, when the Fed was trying to bring inflation down quickly, the funds rate was generally higher than that recommended by the Taylor rule. The closer correspondence between the actual funds rate and the Taylor rule recommendation during the Greenspan era may help explain why the Fed's performance has been so successful in recent years.

Box 4

Fed Watching

As we have seen, the most important player in the determination of the U.S. money supply and interest rates is the Federal Reserve. When the Fed wants to inject reserves into the system, it conducts open market purchases of bonds, which cause bond prices to increase and their interest rates to fall, at least in the short term. If the Fed withdraws reserves from the system, it sells bonds, thereby depressing their price and raising their interest rates. From a longer-run perspective, if the Fed pursues an expansionary monetary policy with high money growth, inflation will rise and, as we saw in Chapter 5, interest rates will rise as well. Contractionary monetary policy is likely to lower inflation in the long run and lead to lower interest rates.

Knowing what actions the Fed might be taking can thus help investors and financial institutions to predict the future course of interest rates with greater accuracy. Because, as we have seen, changes in interest rates have a major impact on investors and financial institutions' profits, they are particularly interested in scrutinizing the Fed's behavior. To assist in this task, financial institutions hire so-called *Fed watchers*, experts on Federal Reserve behavior who may have worked in the Federal Reserve System and so have an insider's view of Federal Reserve operations. A Fed watcher who can accurately predict the course of monetary policy is a very valuable commodity, and successful Fed watchers therefore often earn very high salaries, well into the six-figure range and sometimes even higher.

Summary

1. The six basic goals of monetary policy are 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, a central bank like 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, a central bank 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 reveals that the Fed has switched its operating targets many times, returning to a federal funds rate target in recent years.
5. The Taylor rule indicates that the federal funds rate should be set equal to the inflation rate plus an "equilibrium" real funds rate plus a weighted average of two gaps: (1) an inflation gap, current inflation minus a target rate, and (2) an output gap, the percentage deviation of real GDP from an estimate of its potential full employment level. The output gap in the Taylor rule could represent an indicator of future inflation as stipulated in Phillips curve theory. However, this theory is controversial, because high output relative to potential as measured by low unemployment has not seemed to produce higher inflation in recent years.

Key Terms

instrument target, p. 415
intermediate targets, p. 414
international policy coordination, p. 428
natural rate of unemployment, p. 412
nonaccelerating inflation rate of unemployment (NAIRU), p. 429
operating target, p. 415
Phillips curve theory, p. 429
real bills doctrine, p. 420
Taylor rule, p. 428

Questions and Problems

Questions marked with an asterisk are answered at the end of the book in an appendix, "Answers to Selected 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 your answer.

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 your answer.

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 your answer.

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, 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 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 your answer.

*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?

Web Exercises

1. The Federal Open Market Committee (FOMC) meets about every six weeks to assess the state of the economy and to decide what actions the central bank should take. The minutes of this meeting are released after the next scheduled meeting; however, a brief press release is made available immediately. Find the schedule of minutes and press releases at www.federalreserve.gov/fomc/.
   a. When was the last scheduled meeting of the FOMC? When is the next meeting?
   b. Review the press release from the last meeting. What did the committee decide to do about short-term interest rates?
   c. Review the most recently published meeting minutes. What areas of the economy seemed to be of most concern to the committee members?
2. It is possible to access other central bank web sites to learn about their structure. One example is the European Central bank. Go to www.ecb.int/index.html. On the ECB home page, locate the link to the current exchange rate between the euro and the dollar. It was initially set at 1 to 1. What is it now?