gate demand (spending by consumers and firms). Declining aggregate demand leads to falling output and prices. The effects of monetary policy on the economy that work through changes in real interest rates are called the interest rate channel of monetary policy.

Second, in open economies, a tightening of monetary policy raises the real exchange rate (see Chapter 14). A higher real exchange rate, by making domestic goods more expensive for foreigners and foreign goods cheaper for domestic residents, reduces the demand for the home country’s net exports. All else being equal, this reduced demand for net exports also reduces aggregate demand, depressing output and prices. The effects of monetary policy working through changes in the real exchange rate are called the exchange rate channel.

According to some economists, a tightening of monetary policy also works by reducing both the supply of and demand for credit, a mechanism referred to as the credit channel of monetary policy. Box 15.1 provides a brief description of this potential channel.

Controversy swirls about the relative importance of these different channels of monetary policy. That in turn increases the difficulty that policymakers have in judging how “tight” or “easy” monetary policy is at any particular time. For example, suppose that the Fed observes that real interest rates are currently high but that the dollar has been falling. Is monetary policy tight or not? It’s hard to say, unless we know the relative strengths of the interest rate channel and the exchange rate channel. Similarly, suppose that the real interest rate is low (suggesting an easy monetary policy) but that borrowing and lending have been unusually weak (suggesting a tight monetary policy). Again, the signals are conflicting, and the judgment about whether monetary policy is expansionary or contractionary depends on the relative strength of the different channels.

In discussing the many problems of practical monetary policymaking, we do not mean to suggest that good monetary policy is impossible. Indeed, U.S. monetary policy in the last fifteen years or so has produced quite good results in that both inflation and unemployment have been relatively low and stable. However, this discussion does illustrate why making monetary policy has been called “more an art than a science.”

### 15.3 The Conduct of Monetary Policy: Rules Versus Discretion

How should monetary policy be used? On some aspects of this question, there is broad agreement. Most classicals and Keynesians agree that money is neutral in the long run so that changes in money growth affect inflation but not real variables in the long run. Therefore most would accept that the main long-run goal of monetary policy should be to maintain a low and stable inflation rate. However, there is much less agreement about the effects of monetary policy

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18. As discussed in Chapter 14, actual net exports need not decline following a tightening of monetary policy, because the effect of falling domestic income on import demand may outweigh the real exchange rate effects. However, the higher real exchange rate taken by itself reduces net exports.
BOX 15.1

The Credit Channel of Monetary Policy

According to some economists, besides working through interest rates and exchange rates, monetary policy also affects credit supply and demand. These effects are called the credit channel of monetary policy.*

On the supply side of the credit market, according to this theory, tight monetary policy leads to reduced lending by banks. The reason is that, as we demonstrated earlier in this chapter, a tightening of monetary policy reduces bank reserves and thus the quantity of customer deposits that banks can accept. With fewer deposits on hand, banks have a smaller quantity of funds available to lend. As banks cut back on their lending, the argument goes, borrowers who depend on banks for credit, such as consumers and small firms, are unable to obtain the credit they need to make planned purchases. The resulting decline in spending depresses aggregate demand and thus economic activity.

On the demand side of the credit market, according to proponents of the credit channel, tight monetary policy has the effect of making potential borrowers less "credit-worthy," or less eligible for loans. Consider for example a firm that has a substantial amount of floating-rate debt, or debt whose interest rate is tied to the current interest rate in the market. If a tightening of monetary policy raises interest rates, the firm's interest costs will rise, reducing its profitability. The firm's reduced profitability makes lending to the firm riskier (the firm is more likely to go bankrupt), so the firm has trouble obtaining credit. Alternatively, consider a consumer who wants to use some shares of stock that she owns as collateral for a bank loan. Tighter monetary policy reduces the value of those shares (as financial investors, lured by higher interest rates, switch from stocks to bonds). With reduced collateral, the consumer will be able to borrow less. In either example, the reduction in credit available to the borrower is likely to lead to reduced spending (a shift to the left of the IS curve) and thus a weaker economy.

What is the evidence for the credit channel? On the supply side of the credit market, many economists would argue that the credit channel was powerful in the United States in the 1960s and 1970s but has been less so recently. The reason for this weakening is that the deregulation of the banking sector and elimination of reserve requirements for some types of large deposits have made it easier for banks to maintain their lending, despite a reduction in bank reserves caused by tight money. For example, today (unlike twenty years ago), a bank that loses deposits can replace them by selling certificates of deposit (CDs) to corporations or wealthy individuals. A CD is a large fixed-term debt obligation of the bank, against which no reserves need to be held. As the bank doesn't need to back its CD issuances with reserves, a tightening of monetary policy doesn't affect its ability to raise funds in this way (except, perhaps, by raising the interest rate that the bank must pay).

The evidence that monetary policy affects the demand side of the credit market is stronger. For example, consumer and small firm spending is more sensitive to monetary policy than spending by large firms.† A likely explanation of this finding is that consumers and small firms are financially riskier than large firms to begin with, so when monetary policy tightens they are much more likely to find themselves disqualified for loans. Bankruptcies do increase among small firms and consumers following a tightening of monetary policy, and small firms and consumers also receive less credit after monetary policy tightens, relative to that received by large firms.

The quantitative importance of the credit channel, relative to the other two channels of monetary policy, remains controversial. However, because credit factors appeared to play an important role in the 1990–1991 recession in the United States (see Box 12.2, p. 429), interest in this channel has increased.

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* For a survey of the theory and evidence for the credit channel, see Ben Bernanke and Mark Gertler, “Inside the Black Box: The Credit Channel of Monetary Policy Transmission,” Journal of Economic Perspectives, vol. 9, Fall 1995, pp. 27-48.

and its appropriate use in the short run (Chapters 11 and 12). Most Keynesians believe that monetary policy can and should be used to smooth the business cycle, but most classicals don’t. In this section we revisit the debate about the appropriate use of monetary policy by addressing a long-standing question in macroeconomics: Should monetary policy be conducted according to fixed rules or at the discretion of the central bank?

The use of rules in monetary policy has been advocated primarily by a group of economists called monetarists and by classical macroeconomists. Supporters of rules believe that monetary policy should be essentially automatic. In particular, in its control of the money supply, the central bank should be required to follow a set of simple, prespecified, and publicly announced rules. Many such rules can be imagined. For example, the Fed might be instructed to increase the monetary base by 1% each quarter. An alternative rule, which has been used historically, is to require the central bank to conduct monetary policy to keep the price of gold at a predetermined level (this rule was the essence of the gold standard).

Although the exact form of the rule chosen isn’t crucial, supporters of the rules-based approach emphasize that the monetary rule should be simple; there can’t be dozens of exceptions and conditions. Furthermore, the rule should be stated in terms of variables that the Fed can control directly or nearly directly. Because the Fed can control the monetary base precisely, a prespecified growth rate for the monetary base is acceptable as a rule. But as the Fed’s control over, say, the national unemployment rate is indirect and imperfect, an instruction to the Fed to “keep the unemployment rate at 4%” isn’t acceptable to advocates of a rules-guided monetary policy.

The opposite of the rules approach, which has been supported by most (though not all) Keynesian economists, is called discretion. The idea behind discretion is that the central bank should be free to conduct monetary policy in any way that it believes will advance the ultimate objectives of low and stable inflation, high economic growth, and low unemployment. In particular, the central bank should continuously monitor the economy and, using the advice of economic experts, should change the money supply as needed to best achieve its goals. For example, if inflation is currently low and economic indicators suggest that the economy is slipping into recession, under a strategy of discretion the central bank would be free to increase the money supply to try to stimulate the economy. In contrast, under an approach based on rules the central bank would have to follow its preannounced policy and wouldn’t be free to apply such a stimulus. Because a strategy of discretion involves active responses by the central bank to changes in economic circumstances, such a strategy sometimes is called activist.

From this description of rules and discretion, you may have trouble understanding why many economists advocate the use of rules. After all, why should anyone arbitrarily and unnecessarily tie the hands of the central bank? The idea that giving the central bank the option of responding to changing economic conditions is always better than putting monetary policy in a straitjacket dictated by rules is the essence of the Keynesian case for discretion.

This basic argument for discretion is sound, but a strong case also may be made for rules. Next we discuss the traditional monetarist argument for rules. We then consider a relatively new argument for rules: that the use of rules increases the credibility of the central bank.
The Monetarist Case for Rules

Monetarism emphasizes the importance of monetary factors in the macroeconomy. Although monetarists have included numerous outstanding economists, the dominant figure and leader of the group is Milton Friedman. For many years Friedman has argued that monetary policy should be conducted by rules, and this idea has become an important part of monetarist doctrine.\textsuperscript{19}

Friedman's argument for rules may be broken down into a series of propositions.

Proposition 1. Monetary policy has powerful short-run effects on the real economy. In the longer run, however, changes in the money supply have their primary effect on the price level.

Friedman's research on U.S. monetary history (with Anna Schwartz) provided some of the earliest and best evidence that changes in the money supply can be nonneutral in the short run (Chapter 11). Friedman and other monetarists believe that fluctuations in the money supply historically have been one of the most significant—if not the most significant—sources of business cycle fluctuations. On long-run neutrality Friedman (along with Edmund Phelps) was one of the first to argue that, because prices eventually adjust to changes in the money supply, the effect of money on real variables can only be temporary (Chapter 13).

Proposition 2. Despite the powerful short-run effect of money on the economy, there is little scope for using monetary policy actively to try to smooth business cycles.

Friedman backs this proposition with several points (several of which we discussed in connection with macroeconomic policy more generally in earlier chapters). First, time is needed for the central bank and other agencies to gather and process information about the current state of the economy. These information lags may make it difficult for the central bank to determine whether the economy actually is in a recession and whether a change in policy is appropriate.

Second, there is considerable uncertainty about how much effect a change in the money supply will have on the economy and how long the effect will take to occur (see Fig. 15.7). Friedman has emphasized that there are long and variable lags between monetary policy actions and their economic results. That is, not only does monetary policy take a relatively long time to work, but the amount of time it takes to work is unpredictable and can vary from episode to episode.

Third, wage and price adjustment, although not instantaneous, is fast enough that, by the time the Fed recognizes that the economy is in a recession and increases the money supply, the economy may already be heading out of the recession. If the expansion in the money supply stimulates the economy with a lag of about a year, the stimulus may take effect when output has already recovered and the economy is in a boom. In this case the monetary expansion will cause the economy to overshoot full employment and cause prices to rise. Thus the monetary increase, intended to fight the recession, may actually be destabilizing (causing more variability of output than there would have been otherwise), as well as inflationary.

\textsuperscript{19} Friedman's 1959 book, A Program for Monetary Stability (New York: Fordham University Press) presents a clear early statement of his views.
Proposition 3. Even if there is some scope for using monetary policy to smooth business cycles, the Fed cannot be relied on to do so effectively.

One reason that Friedman doesn’t trust the Fed to manage an activist monetary policy effectively is political. He believes that despite its supposed independence, the Fed is susceptible to short-run political pressures from the President and others in the administration. For example, the Fed might be pressured to stimulate the economy during an election year. If timed reasonably well, an election-year monetary expansion could expand output and employment just before voters go to the polls, with the inflationary effects of the policy not being felt until after the incumbents were safely reelected (see “The Political Environment: Presidential Elections and Macroeconomic Policy,” p. 462).

More fundamentally, though, Friedman’s distrust of the Fed arises from his interpretation of macroeconomic history. From his work with Anna Schwartz, Friedman concludes that for whatever reason—incompetence, shortsightedness, or bad luck—monetary policy historically has been a greater source of economic instability than stability. The primary example cited by Friedman is the 1929–1933 period, when the Fed was unable or unwilling to stop the money supply from falling by one third in the wake of widespread runs on banks. Friedman and Schwartz argued that this monetary contraction was one of the main causes of the Great Depression. Thus Friedman concludes that eliminating monetary policy as a source of instability would substantially improve macroeconomic performance.

How could the Fed be removed as a source of instability? This question leads to Friedman’s policy recommendation, the last proposition.

Proposition 4. The Fed should choose a specific monetary aggregate (such as M1 or M2) and commit itself to making that aggregate grow at a fixed percentage rate, year in and year out.

For Friedman the crucial step in eliminating the Fed as a source of instability is to get it to give up activist, or discretionary, monetary policy and to commit itself—publicly and in advance—to following some rule. Although the exact choice of a rule isn’t critical, Friedman believes that a constant-money-growth rule would be a good choice for two reasons. First, the Fed has considerable influence, though not complete control, over the rate of money growth. Thus if money growth deviated significantly from its target, the Fed couldn’t easily blame the deviation on forces beyond its control. Second, Friedman argues that steady money growth would lead to smaller cyclical fluctuations than the supposedly “countercyclical” monetary policies utilized historically. He concludes that a constant money growth rate would provide a “stable monetary background” that would allow economic growth to proceed without concern about monetary instability.

Friedman doesn’t advocate a sudden shift from discretionary monetary policy to a low, constant rate of money growth. Instead, he envisions a transition period in which the Fed, by gradual preannounced steps, would steadily reduce the growth rate of money. Ultimately, the growth rate of the monetary aggregate selected would be consistent with an inflation rate near zero. Importantly, after the constant growth rate has been attained, the Fed wouldn’t respond to modest economic downturns by increasing money growth but would continue to follow the policy of maintaining a fixed rate of money growth.
growth. However, in some of his writings Friedman appears to leave open the possibility that the monetary rule could be temporarily suspended in the face of major economic crises, such as a depression.

**Rules and Central Bank Credibility**

Much of the monetarist argument for rules rests on pessimism about the competence or political reliability of the Federal Reserve. Economists who are more optimistic about the ability of the government to intervene effectively in the economy (which includes many Keynesians) question the monetarist case for rules. A “policy optimist” could argue as follows:

Monetary policy may have performed badly in the past. However, as time passes, we learn more about the economy and the use of policy gets better. For example, U.S. monetary policy clearly was handled better after World War II than during the Great Depression. Imposing rigid rules just as we are beginning to learn how to use activist policy properly would be foolish. As to the issue of political reliability, that problem affects fiscal policymakers and indeed all our branches of government. We just have to trust in the democratic process to ensure that policymakers will take actions that for the most part are in the best interests of the country.

For policy optimists this reply to the monetarist case for rules seems perfectly satisfactory. During the past two decades, however, a new argument for rules has been developed that applies even if the central bank knows exactly how monetary changes affect the economy and is completely public-spirited. Thus the new argument for rules is a challenge even to policy optimists. It holds that the use of monetary rules can improve the *credibility* of the central bank, or the degree to which the public believes central bank announcements about future policy, and that the credibility of the central bank influences how well monetary policy works.

**Dad, the Kids, and the Game: Credible Threats and Commitment.**

To help explain what credibility is, why it may be enhanced by rules, and why it may be important to monetary policy, let’s look at a simple example drawn from family life. Knowing that Mom will be going to a business meeting, Dad has bought tickets to a baseball game for himself and the two kids, Junior and Sis. Dad likes baseball, as do the kids. Unfortunately, the kids also like to fight with each other. Dad has warned the kids: “Don’t fight. If you do, we just won’t go to the baseball game.” Dad can’t go to the baseball game without both kids because Mom won’t be home, and on such short notice he won’t be able to find a sitter. We are interested in the following questions about the behavior of Dad and the kids: (1) Will the kids fight? and (2) Will Dad take the kids to the baseball game?

Before we analyze this situation, let’s discuss it informally. The kids know that, because Dad wants to go to the game himself, he will be reluctant to impose the punishment he has threatened. That is, Dad’s threat isn’t credible (believable) to the kids. Therefore the kids will fight anyway, assuming that when push comes to shove, Dad won’t be able to bring himself to waste the tickets and they’ll go to the game.

Figure 15.8 illustrates this situation. The two columns of the diagram correspond to the two possible actions that the kids can take: fight and don’t fight.
The two rows correspond to the two actions that Dad can take: *go to game* and *don’t go to game*. Each of the four squares in the diagram thus refers to a possible outcome: Square A corresponds to the outcome *kids fight and Dad takes kids to game*; square B refers to *kids don’t fight and Dad takes kids to game*; and so on.

Dad and the kids each have preferences about the four possible outcomes. Let’s measure preferences in terms of points: The more points someone assigns to an outcome, the more he or she likes it. Dad likes baseball, so let’s assume that he assigns 2 points to going to the game. Also, he assigns 1 point to having the kids not fight. The total number of points Dad assigns to each outcome is shown in each square. Dad’s preferred outcome (worth 3 points) is B, in which the kids don’t fight and they all go to the game. Dad’s worst outcome is C, in which the kids fight and no one goes to the game, an outcome that gets 0 points from Dad.

The kids also like baseball, and they also assign 2 points to going to the game. However, they also like to fight, and they assign 1 point to fighting. The kids’ point totals for each outcome are also shown in each box. The kids’ favorite outcome, worth 3 points, is A (they fight and still get to go to the game). Their least favorite outcome, worth 0 points, is D (no fight and no game).

The sequence of actions is as follows. First, the kids decide whether to fight (after hearing the warning), and then Dad decides whether to take the kids to the game. In terms of Fig. 15.8 the kids get to pick the column (*fight or don’t fight*). After the kids pick the column, Dad gets to pick whether they will be in

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**Figure 15.8**
The game between Dad and the kids

Each square represents a combination of an action by the kids and an action by Dad. The points assigned to each combination of actions (shown in each square) measure how much each set of players likes each outcome. The kids “move” first by picking a column; then Dad “moves” by picking a row. The equilibrium is outcome A, in which the kids fight and still get to go to the game.
the top square (go to game) or the bottom square (don’t go to game). We assume that at each stage both the kids and Dad make the choices that attain their preferred outcome.

The kids reason as follows:

Suppose we pick fight (the left column). That leaves Dad with the choice of A (go to game) or C (don’t go to game). Outcome A is worth 2 points to Dad; C is worth 0 points. So Dad will pick A over C and, if we fight, we still get to go to the game. If we pick don’t fight (the right column), Dad will pick B over D, so we also go to the game in that case. But because we like to fight, and we get to go to the game in either case, we might as well fight.

In terms of Fig. 15.8, the kids know that once they factor in their Dad’s response, they effectively have a choice between A and B. They prefer A to B, so they pick the left column (that is, they fight).

This type of diagram is a standard tool from a branch of mathematics, much used in economics, called game theory. Game theory explores situations (games) in which strategy is used by individuals (players) to achieve their goals, possibly at the expense of the other players. An equilibrium of a game is an outcome that occurs if all players do the best they can for themselves.

In the game here, the “players” are Dad and the kids. The equilibrium of the game is outcome A, in which the kids fight and still go to the game. Outcome A is the equilibrium because the kids recognize that Dad’s threat isn’t credible; he has a strong incentive to back away from his threat when the time comes to carry it out. Indeed, if Dad is smart enough to realize that his threat has no force, he won’t bother to make it in the first place.

Is there some way for Dad to make his threat credible and thereby get the kids to behave? Yes; the key to credibility for Dad is to find some way by which he can commit himself to carrying out the threat. In other words, Dad must convince the kids that, should they fight, he will have no choice but to keep everybody home from the game. Suppose, for example, that Dad gives the game tickets to Mom, with instructions to hide them and not to reveal their whereabouts if the kids fight. Suppose that Mom is indifferent about whether Dad and the kids go to the game and can be counted on to carry out these instructions.

How does Mom’s hiding the tickets affect the equilibrium of the game? Formally, the effect is to cross out square A (kids fight, go to game) as a possible outcome. If the kids fight, going to the game will not be a possible choice for Dad. Thus the kids know that if they choose the left column (fight), Dad will be forced to choose square C (don’t go to game), an outcome that yields 1 point for the kids. On the other hand, if the kids choose the right column (don’t fight), Dad’s preferred choice between his options B and D will be B (go to game). Because the kids prefer B (2 points) to C (1 point), they will pick the right column and not fight. The key conclusion of this analysis is that by committing in advance to carry out his threat, Dad has made his threat credible. If the kids act in their own best interests, Dad achieves the outcome (B) that he likes the best.

**A Game Between the Central Bank and Firms.** We can use game theory to think about the credibility of the central bank. Consider a situation in which the macroeconomy is in general equilibrium so that the IS and LM curves
cross at the FE line (point E in Fig. 15.9a). Initially, suppose that both the money supply and the price level are growing steadily at 10% per year. As M and P are growing at the same rate, the real money supply M/P is constant, and the LM curve, LM1, remains fixed and passes through E. Thus the economy is initially at full employment with the unemployment rate at the natural rate, say, 6%, and the inflation equal to 10% per year.

The central bank (the Fed, let’s say) wants to reduce the inflation rate to zero without increasing the unemployment rate. Suppose that the Fed makes the following announcement to all the firms in the economy:

There’s no reason why we should be suffering from this 10% inflation. Let’s make a deal. If you businesses hold prices, \( \bar{P} \), constant this period, rather than raising them by 10%, we will hold the money supply, M, constant. With M and P both constant, the real money supply, M/P, won’t change and the LM curve won’t shift. Thus the economy will remain at full employment, with an unemployment rate of 6%, but we’ll all be better off with no inflation. However, if you insist on raising prices, we’ll still keep the money supply constant. In this case the real money supply, M/P, will fall by 10%, the LM curve will shift up and to the left to LM2, and we’ll all suffer from both high unemployment and continued inflation (point F).

How will the firms respond to this statement by the Fed? As we show, the Fed’s threat to reduce the real money supply if firms raise prices isn’t credible because the Fed doesn’t want a recession. As a result, the firms will go ahead and raise prices.
The game between the Fed and the firms is analyzed formally in Fig. 15.9(b). The firms’ choices, raise $P$ (by 10%) and don’t raise $P$, correspond to the two columns of the diagram. The Fed’s two choices, raise $M$ (by 10%) and don’t raise $M$ correspond to the two rows. Square A represents the outcome firms raise $P$ and Fed raises $M$; square B represents the outcome firms don’t raise $P$ and Fed raises $M$; and so on.

What happens to the economy in each case? Determining what happens to inflation is easy: In squares A and C, firms raise prices by 10%, so inflation, $\pi$, is 10%; in squares B and D firms don’t raise prices, so $\pi = 0$.

What about unemployment? In square A both money and prices rise by 10%, so $M/P$ is unchanged and the economy remains at full employment (point $E$ in Fig. 15.9a). Similarly, in square D neither $M$ nor $P$ changes, so $M/P$ is unchanged and the economy remains at full employment. Thus in squares A and D the unemployment rate, $u$, remains at the natural rate of 6%. In square C, $P$ rises but $M$ doesn’t. Thus $M/P$ falls, the $LM$ curve shifts up and to the left to $LM^2$, and the economy goes into recession at point $F$ in Fig. 15.9(a), with the unemployment rate increasing to 9%. Finally, in square B, $M$ rises but $P$ doesn’t, so $M/P$ rises and the $LM$ curve shifts down and to the right to $LM^2$. In this case the economy goes into a boom (point $H$ in Fig. 15.9a), and the unemployment rate falls to 3%.

The next step is to determine the points that each player assigns to each outcome. Let’s start with the Fed, which doesn’t like inflation. It assigns 1 point to zero inflation (B and D) and no points to a positive rate of inflation.
(A and C). However, the Fed also doesn’t like unemployment. It assigns 0 points to the natural unemployment rate (A and D), 1 point to unemployment below the natural rate (B), and −1 point to unemployment above the natural rate (C). The total point scores for the Fed are shown in each square. The Fed’s preferred outcome is B, with no inflation and 3% unemployment; its least favorite outcome is C, with 10% inflation and 9% unemployment.

The firms’ profits are maximized on the FE line, that is, when the economy is at full employment. Therefore the firms assign 2 points to the natural unemployment rate (A and D). Firms prefer zero inflation to positive inflation, so they assign 1 point to zero inflation (B and D). Total scores for firms are also shown in each box.

Now let’s find the equilibrium, assuming that firms first decide whether to raise prices and then the Fed decides whether to increase the money supply. The firms reason as follows:

Suppose that we raise prices. This action leaves the Fed the choice between outcomes A and C. The Fed doesn’t want a recession, so it will choose A; that is, it will increase the money supply. If we don’t raise prices, the Fed has a choice of B or D. The Fed prefers B to D because, with no inflation, it prefers unemployment below the natural rate to unemployment at the natural rate. In this case the Fed also will increase the money supply. Therefore, no matter what we do, the Fed will increase the money supply. The Fed’s claim that it will maintain a constant money supply if we raise prices just isn’t credible. If we raise prices we get outcome A, and if we don’t raise prices we get outcome B. We prefer A to B (we’d rather be at full employment than off the FE line and above full employment), so we will raise prices.

The equilibrium of the game is therefore outcome A, in which the firms raise prices and the Fed (failing to carry through on its threat) raises the money supply. Because the Fed’s threat isn’t credible, the firms ignore it. Note that both the Fed and the firms prefer outcome D (full employment and no inflation) to the equilibrium outcome A. Yet because the Fed’s promise to hold the money supply constant isn’t credible, the economy doesn’t attain outcome D.

In contrast, suppose that the Fed could credibly promise not to increase the money supply under any circumstances and that the firms believed this promise. The firms would reason: “If we raise prices, the Fed will pick outcome C (inflation and a recession). If we don’t raise prices, the Fed will pick D (no inflation and no recession). We prefer D to C, so we won’t raise prices.”

The equilibrium in this case would be outcome D, which is preferred by everyone to the no-credibility outcome A. In outcome D disinflation is achieved without increasing unemployment because the central bank is credible.

**Rules, Commitment, and Credibility.** The formal analysis shows why central bank credibility is important. If a central bank is credible, it can reduce money growth and inflation without incurring high unemployment. But how can a central bank achieve credibility?

One possibility is for the central bank to develop a reputation for carrying out its promises. Suppose that in the preceding example firms raise their prices, fully expecting the Fed to increase the money supply. However, the Fed holds the money supply constant, causing a recession. The next time, the firms may take the Fed’s promises more seriously, and the economy may attain outcome
D. Similarly, if Dad crosses up the kids and refuses to take them to the game after they fight, he will improve his reputation for carrying out his threats; the next time, the kids may take him seriously.

The problem with this strategy is that it may involve serious costs while the reputation is being established: The economy suffers a recession while the central bank establishes its reputation; Dad and the kids miss the game while Dad establishes his. Is there some less costly way to achieve credibility?

Advocates of rules suggest that, by forcing the central bank to keep its promises, rules may substitute for reputation in establishing credibility. Suppose that there is an ironclad rule—ideally, enforced by some outside agency—that the Fed must gradually reduce the growth of the money supply. Observing the existence of this rule, the firms might well believe that money supply growth is going to decline no matter what, and painless disinflation (outcome D) can be achieved. Similarly, in the case with Dad and the kids, if there is an unbreakable family rule that fighting suspends all privileges—and Mom is there to help enforce it—Dad’s threat not to go to the game might be more credible. Note that if it increases credibility, a rule improves central bank performance even if the central bank is competent and public-spirited. Hence this reason for monetary policy rules is different from the monetarists’ argument presented earlier.

How do advocates of discretion respond to the credibility argument for rules? Keynesians argue that there may be a trade-off between credibility and flexibility. For a rule to establish credibility, it must be virtually impossible to change—otherwise, no one will believe that the Fed will stick to it. In the extreme, the monetary growth rule would be added as an amendment to the Constitution, which could then be changed only at great cost and with long delays. But if a rule is completely unbreakable, what happens (ask the Keynesians) if some unexpected crisis arises—for example, a new depression? In that case the inability of the Fed to take corrective action—that is, its lack of flexibility—could prove disastrous. Therefore, Keynesians argue, establishing a rule ironclad enough to create credibility for the central bank would, by eliminating policy flexibility, also create unacceptable risks.

The decade of the 1970s, with its combination of high unemployment and high inflation, led many central banks around the world to wonder whether monetary policy could be handled more effectively. Since then, many have experimented with alternative monetary policy strategies in the hope of improving macroeconomic performance. In response to economists’ arguments for the importance of credibility, many of these strategies have involved public announcements by central banks of their goals, accompanied by attempts to convince the public that monetary policymakers were committed to those goals. In this Application we discuss the experience with two such strategies: money-growth targeting and inflation targeting.20

Other Ways to Achieve Central Bank Credibility

Besides announcing targets for money growth or inflation, are there other ways to increase the central bank’s credibility and thus improve the performance of monetary policy? Three possibilities have been suggested: to appoint a “tough” central banker; to change central bankers’ incentives; and to increase the central bank’s independence.

1. Appointing a “tough” central banker. By definition, a credible central bank is one that will be believed by the public when the bank, usually through its chairman, states its intention to reduce money growth and inflation. One way to increase credibility is for the President to appoint a Fed chairman who strongly dislikes inflation and who people believe is willing to accept increased unemployment if necessary to bring inflation down. Thus, when President Jimmy Carter faced a serious inflation problem in 1979, he appointed Paul Volcker—an imposing individual with a strong anti-inflation reputation—to be chairman of the Fed. In appointing a “tough” central banker, Carter hoped to convince the financial markets and the public that he was serious about reducing inflation. Volcker succeeded in getting rid of inflation, but, because unemployment rose significantly in the process, his appointment didn’t completely solve the credibility problem.  

2. Changing central bankers’ incentives. A second way to enhance the central bank’s credibility is to give its leadership strong incentives to be “tough” on inflation (and to ignore any unemployment costs associated with disinflation). If the incentives are strong enough and are publicly known, people may find the central bank’s anti-inflation pronouncements to be credible. An interesting recent example of this approach, mentioned in the preceding Application, is the law passed in New Zealand that sets explicit inflation targets for the central bank and provides for the replacement of the head of the central bank if those targets aren’t met. Inflation has come down significantly in New Zealand, but unemployment has risen. Again, credibility problems haven’t been completely solved.

3. Increasing central bank independence. A third strategy is to increase the independence of the central bank from the other parts of the government—for example, by limiting the legal ability of the executive and legislative branches to interfere in monetary policy decisions. The rationale is that a more independent central bank will be less subject to short-term political pressures to try to expand output and employment (say, before an election) and will be more strongly committed to maintaining a low long-run inflation rate. Because the public will recognize that an independent central bank is less subject to political pressures, announcements made by the central bank should be more credible.

22. The point that appointing a tough central banker may improve central bank credibility was made by Kenneth Rogoff, “The Optimal Degree of Commitment to an Intermediate Monetary Target,” Quarterly Journal of Economics, November 1985, 1169–1189. Keynesians might argue that Volcker was credible but that long-lived stickiness in wages and prices led unemployment to increase in 1981–1982 anyway.

Figure 15.10
Central bank independence and inflation

The figure compares average inflation to an index of central bank independence from the rest of the government (higher values of the index imply that the central bank is more independent) for each of sixteen countries for the period 1955–1988. It shows that countries with more independent central banks have lower average inflation rates.

Source: Alberto Alesina and Lawrence Summers, "Central Bank Independence and Macroeconomic Performance," Journal of Money, Credit and Banking, May 1993, 151–162, Table A1 and Fig. 1a.

Considerable evidence supports the idea that independent central banks are more credible. Figure 15.10, taken from a study by Alberto Alesina of Harvard University and Lawrence Summers24 of the U.S. Treasury, shows the relationship between central bank independence and inflation in sixteen industrialized countries. The vertical axis measures average inflation for each country for the period 1955–1988. The horizontal axis shows an index of central bank independence (based on factors such as the ease with which the government can dismiss the head of the central bank or reverse central bank decisions). Countries with relatively independent central banks, such as Germany, Switzerland, and the United States, clearly have lower long-run inflation rates than countries without independent central banks, such as the United Kingdom, New Zealand,25 Italy, and Spain. A similar figure in the Alesina–Summers study shows that countries with independent central banks don’t have higher long-run rates of unemployment. This evidence supports the idea that increased central bank independence raises credibility and thus lowers the unemployment cost of keeping inflation low.

25. The evaluation of the independence of New Zealand’s central bank preceded the recent reforms in New Zealand’s central banking laws mentioned earlier.