

Chapter
21

The Influence of Monetary and Fiscal Policy on Aggregate Demand

Chapter Outline

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Chapter Recap

Chapter Introduction



Imagine that you are a member of the Federal Open Market Committee, the group at the Federal Reserve that sets monetary policy. You observe that the president and Congress have agreed to raise taxes. How should the Fed respond to this change in fiscal policy? Should it expand the money supply, contract the money supply, or leave the money supply the same?

To answer this question, you need to consider the impact of monetary and fiscal policy on the economy. In the preceding chapter, we used the model of aggregate demand and aggregate supply to explain short-run economic fluctuations. We saw that shifts in the aggregate-demand curve or the aggregate-supply curve cause fluctuations in the economy's overall output of goods and services and its overall level of prices. As we noted in the previous chapter, monetary and fiscal policy can each influence aggregate demand. Thus, a change in one of these policies can lead to short-run fluctuations in output and prices. Policymakers will want to anticipate this effect and, perhaps, adjust the other policy in response.

In this chapter, we examine in more detail how the government's policy tools influence the position of the aggregate-demand curve. These tools include monetary policy (the supply of money set by the central bank) and fiscal policy (the levels of government spending and taxation set by the president and Congress). We have previously discussed the long-run effects of these policies. In Chapters 12 and 13, we saw how fiscal policy affects saving, investment, and long-run economic growth. In Chapters 16 and 17, we saw how monetary policy influences the price level in the long run. We now see how these policy tools can shift the aggregate-demand curve and, in doing so, affect macroeconomic variables in the short run.

As we have already learned, many factors influence aggregate demand besides monetary and fiscal policy. In particular, desired spending by households and firms determines the overall demand for goods and services. When desired spending changes, aggregate demand shifts. If policymakers do not respond, such shifts in aggregate demand cause short-run fluctuations in output and employment. As a result, monetary and fiscal policymakers sometimes use the policy levers at their disposal to try to offset these shifts in aggregate demand and thereby stabilize the economy. Here we discuss the theory behind these policy actions and some of the difficulties that arise in using this theory in practice.

21-1 How Monetary Policy Influences Aggregate Demand

Money Market and Aggregate Demand

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The aggregate-demand curve shows the total quantity of goods and services demanded in the economy for any price level. The preceding chapter discussed three reasons the aggregate-demand curve slopes downward:

- *The wealth effect:* A lower price level raises the real value of households' money holdings, which are part of their wealth. Higher real wealth stimulates consumer spending and thus increases the quantity of goods and services demanded.
- *The interest-rate effect:* A lower price level reduces the amount of money people want to hold. As people try to lend out their excess money holdings, the interest rate falls. The lower interest rate stimulates investment spending and thus increases the quantity of goods and services demanded.
- *The exchange-rate effect:* When a lower price level reduces the interest rate, investors move some of their funds overseas in search of higher returns. This movement of funds causes the real value of the domestic currency to fall in the market for foreign-currency exchange. Domestic goods become less expensive relative to foreign goods. This change in the real exchange rate stimulates spending on net exports and thus increases the quantity of goods and services demanded.

These three effects occur simultaneously to increase the quantity of goods and services demanded when the price level falls and to decrease it when the price level rises.

Although all three effects work together to explain the downward slope of the aggregate-demand curve, they are not of equal importance. Because money holdings are a small part of household wealth, the wealth effect is the least important of the three. In addition, because exports and imports represent only a small fraction of U.S. GDP, the exchange-rate effect is not large for the U.S. economy. (This effect is more important for smaller countries, which typically export and import a higher fraction of their GDP.) *For the U.S. economy, the most important reason for the downward slope of the aggregate-demand curve is the interest-rate effect.*

To better understand aggregate demand, we now examine the short-run determination of interest rates in more detail. Here we develop the **theory of liquidity preference**. This theory of interest-rate determination will help explain the downward slope of the aggregate-demand curve, as well as how monetary and fiscal policy can shift this curve. By shedding new light on aggregate demand, the theory of liquidity preference expands our understanding of what causes short-run economic fluctuations and what policymakers can potentially do about them.

21-1a The Theory of Liquidity Preference

In his classic book *The General Theory of Employment, Interest, and Money*, John Maynard Keynes proposed the theory of liquidity preference to explain the factors that determine an economy's interest rate. The theory is, in essence, an application of supply and demand. According to Keynes, the interest rate adjusts to balance the supply of and demand for money.

You may recall that economists distinguish between two interest rates: The *nominal interest rate* is the interest rate as usually reported, and the *real interest rate* is the interest rate corrected for the effects of inflation. When there is no inflation, the two rates are the same. But when borrowers and lenders expect prices to rise over the course of the loan, they agree to a nominal interest rate that exceeds the real interest rate by the expected rate of inflation. The higher nominal interest rate compensates for the fact that they expect the loan to be repaid in less valuable dollars.

Which interest rate are we now trying to explain with the theory of liquidity preference? The answer is both. In the analysis that follows, we hold constant the expected rate of inflation. This assumption is reasonable for studying the economy in the short run, because expected inflation is typically stable over short periods of time. In this case, nominal and real interest rates differ by a constant. When the nominal interest rate rises or falls, the real interest rate that people expect to earn rises or falls as well. For the rest of this chapter, when we refer to changes in the interest rate, you should envision the real and nominal interest rates moving in the same direction.

Let's now develop the theory of liquidity preference by considering the supply and demand for money and how each depends on the interest rate.

Money Supply

The first piece of the theory of liquidity preference is the supply of money. As we first discussed in Chapter 16, the money supply in the U.S. economy is controlled by the Federal Reserve. The Fed alters the money supply primarily by changing the quantity of reserves in the banking system through the purchase and sale of government bonds in open-market operations. When the Fed buys government bonds, the dollars it pays for the bonds are typically deposited in banks, and these dollars are added to bank reserves. When the Fed sells government bonds, the dollars it receives for the bonds are withdrawn from the banking system, and bank reserves fall. These changes in bank reserves, in turn, lead to changes in banks' ability to make loans and create money. Thus, by buying and selling bonds in open-market operations, the Fed alters the quantity of money in the economy.

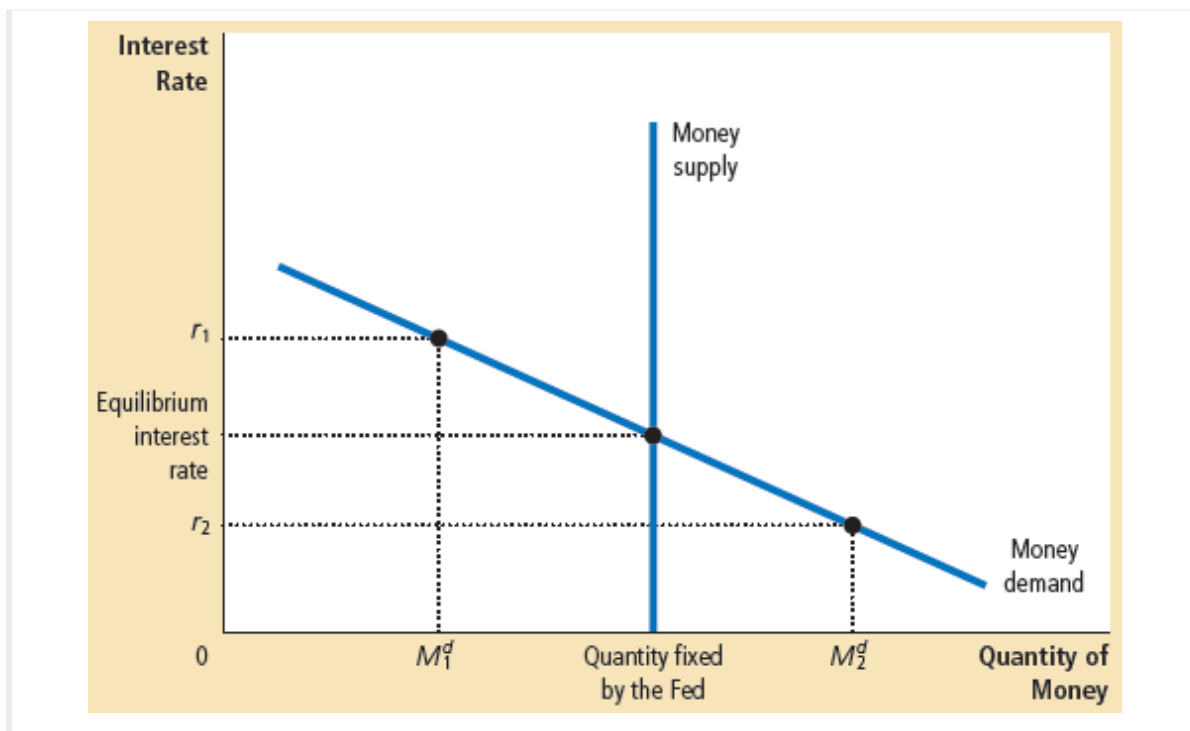
In addition to open-market operations, the Fed can influence the money supply using a variety of other tools. One option is for the Fed to change how much it lends to banks. For example, a decrease in the discount rate (the interest rate at which banks can borrow reserves from the Fed) encourages more bank borrowing, which increases bank reserves and thereby the money supply. Conversely, an increase in the discount rate discourages bank borrowing, which decreases bank reserves and the money supply. The Fed also alters the money supply by changing reserve requirements (the amount of reserves banks must hold against deposits) and by changing the interest rate it pays banks on the reserves they are holding.

These details of monetary control are important for the implementation of Fed policy, but they are not crucial for the analysis in this chapter. Our goal here is to examine how changes in the money supply affect the aggregate demand for goods and services. For this purpose, we can ignore the details of how Fed policy is implemented and assume that the Fed controls the money supply directly. In other words, the quantity of money supplied in the economy is fixed at whatever level the Fed decides to set it.

Because the quantity of money supplied is fixed by Fed policy, it does not depend on other economic variables. In particular, it does not depend on the interest rate. Once the Fed has made its policy decision, the quantity of money supplied is the same, regardless of the prevailing interest rate. We represent a fixed money supply with a vertical supply curve, as in Figure 1.

Figure 1. Equilibrium in the Money Market

According to the theory of liquidity preference, the interest rate adjusts to bring the quantity of money supplied and the quantity of money demanded into balance. If the interest rate is above the equilibrium level (such as at r_1), the quantity of money people want to hold (M_1^d) is less than the quantity the Fed has created, and this surplus of money puts downward pressure on the interest rate. Conversely, if the interest rate is below the equilibrium level (such as at r_2), the quantity of money people want to hold (M_2^d) is greater than the quantity the Fed has created, and this shortage of money puts upward pressure on the interest rate. Thus, the forces of supply and demand in the market for money push the interest rate toward the equilibrium interest rate, at which people are content holding the quantity of money the Fed has created.



Money Demand

The second piece of the theory of liquidity preference is the demand for money. As a starting point for understanding money demand, recall that any asset's *liquidity* refers to the ease with which that asset can be converted into the economy's medium of exchange. Because money is the economy's medium of exchange, it is by definition the most liquid asset available. The liquidity of money explains the demand for it: People choose to hold money instead of other assets that offer higher rates of return because money can be used to buy goods and services.

Although many factors determine the quantity of money demanded, the one emphasized by the theory of liquidity preference is the interest rate. The reason is that the interest rate is the opportunity cost of holding money. That is, when you hold wealth as cash in your wallet, instead of as an interest-bearing bond, you lose the interest you could have earned. An increase in the interest rate raises the cost of holding money and, as a result, reduces the quantity of money demanded. A decrease in the interest rate reduces the cost of holding money and raises the quantity demanded. Thus, as shown in Figure 1, the money-demand curve slopes downward.

Equilibrium in the Money Market

According to the theory of liquidity preference, the interest rate adjusts to balance the supply and demand for money. There is one interest rate, called the *equilibrium interest rate*, at which the quantity of money demanded exactly balances the quantity of money supplied. If the interest rate is at any other level, people will try to adjust their portfolios of assets and, as a result, drive the interest rate toward the equilibrium.

For example, suppose that the interest rate is above the equilibrium level, such as r_1 in Figure 1. In this case, the quantity of money that people want to hold, M_1^d , is less than the quantity of money that the Fed has supplied. Those people who are holding the surplus of money will try to get rid of it by buying interest-bearing bonds or by depositing it in an interest-bearing bank account. Because bond issuers and banks prefer to pay lower interest rates, they respond to this surplus of money by lowering the interest rates they offer. As the interest rate falls, people become more willing to hold money until, at the equilibrium interest rate, people are happy to hold exactly the amount of money the Fed has supplied.

Conversely, at interest rates below the equilibrium level, such as r_2 in Figure 1, the quantity of money that people want to hold, M_2^d , is greater than the quantity of money that the Fed has supplied. As a result, people try to increase their holdings of money by reducing their holdings of bonds and other interest-bearing assets. As people cut back on their holdings of bonds, bond issuers find that they have to offer higher interest rates to attract buyers. Thus, the interest rate rises and approaches the equilibrium level.

Having seen how the theory of liquidity preference explains the economy's equilibrium interest rate, we now consider the theory's implications for the aggregate demand for goods and services. As a warm-up exercise, let's begin by using the theory to reexamine a topic we already understand—the interest-rate effect and the downward slope of the aggregate-demand curve. In particular, suppose that the overall level of prices in the economy rises. What happens to the interest rate that balances the supply and demand for money, and how does that change affect the quantity of goods and services demanded?

FYI: Interest Rates in the Long Run and the Short Run

In an earlier chapter, we said that the interest rate adjusts to balance the supply of loanable funds (national saving) and the demand for loanable funds (desired investment). Here we just said that the interest rate adjusts to balance the supply of and demand for money. Can we reconcile these two theories?

To answer this question, we need to focus on three macroeconomic variables: the economy's output of goods and services, the interest rate, and the price level. According to the classical macroeconomic theory we developed earlier in the book, these variables are determined as follows:

1. *Output* is determined by the supplies of capital and labor and the available production technology for turning capital and labor into output. (We call this the natural rate of output.)
2. For any given level of output, the *interest rate* adjusts to balance the supply and demand for loanable funds.
3. Given output and the interest rate, the *price level* adjusts to balance the supply and demand for money. Changes in the supply of money lead to proportionate changes in the price level.

These are three of the essential propositions of classical economic theory. Most economists believe that these propositions do a good job of describing how the economy works *in the long run*.

Yet these propositions do not hold in the short run. As we discussed in the preceding chapter, many prices are slow to adjust to changes in the money supply; this fact is reflected in a short-run aggregate-supply curve that is upward sloping rather than vertical. As a result, *in the short run*, the overall price level cannot, by itself, move to balance the supply of and demand for money. This stickiness of the price level requires the interest rate to move to bring the money market into equilibrium. These changes in the interest rate, in turn, affect the aggregate demand for goods and services. As aggregate demand fluctuates, the economy's output of goods and services moves away from the level determined by factor supplies and technology.

To think about the operation of the economy in the short run (day to day, week to week, month to month, or quarter to quarter), it is best to keep in mind the following logic:

1. The *price level* is stuck at some level (based on previously formed expectations) and, in the short run, is relatively unresponsive to changing economic conditions.
2. For any given (stuck) price level, the *interest rate* adjusts to balance the supply of and demand for money.
3. The interest rate that balances the money market influences the quantity of goods and services demanded and thus the level of *output*.

Notice that this precisely reverses the order of analysis used to study the economy in the long run.

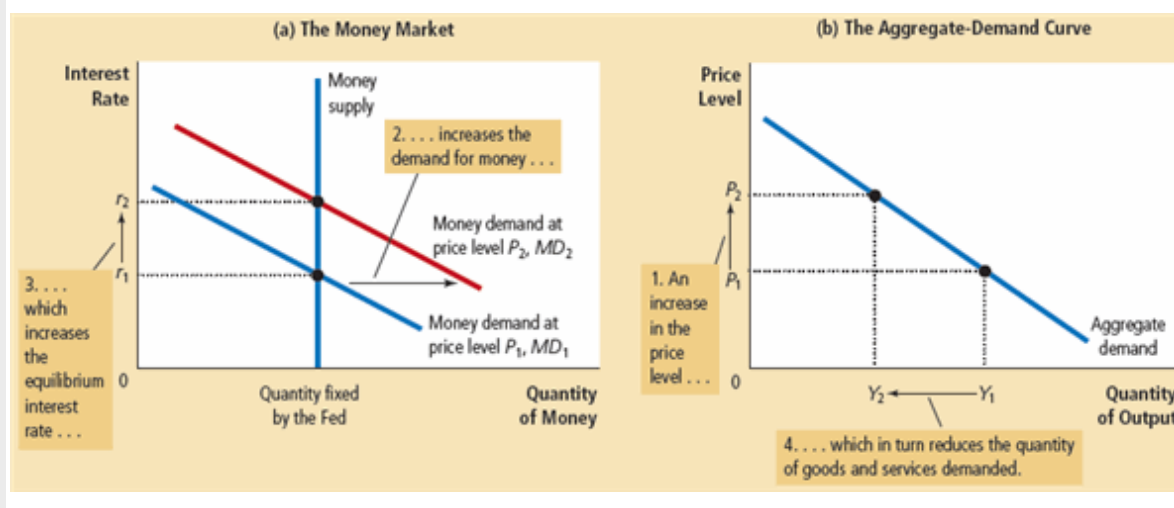
The two different theories of the interest rate are useful for different purposes. When thinking about the long-run determinants of interest rates, it is best to keep in mind the loanable-funds theory, which highlights the importance of an economy's saving propensities and investment opportunities. By contrast, when thinking about the short-run determinants of interest rates, it is best to keep in mind the liquidity-preference theory, which highlights the importance of monetary policy.

As we discussed in Chapter 17, the price level is one determinant of the quantity of money demanded. At higher prices, more money is exchanged every time a good or service is sold. As a result, people will choose to hold a larger quantity of money. That is, a higher price level

increases the quantity of money demanded for any given interest rate. Thus, an increase in the price level from P_1 to P_2 shifts the money-demand curve to the right from MD_1 to MD_2 , as shown in panel (a) of Figure 2.

Figure 2. The Money Market and the Slope of the Aggregate-Demand Curve

An increase in the price level from P_1 to P_2 shifts the money-demand curve to the right, as in panel (a). This increase in money demand causes the interest rate to rise from r_1 to r_2 . Because the interest rate is the cost of borrowing, the increase in the interest rate reduces the quantity of goods and services demanded from Y_1 to Y_2 . This negative relationship between the price level and quantity demanded is represented with a downward-sloping aggregate-demand curve, as in panel (b).



Notice how this shift in money demand affects the equilibrium in the money market. For a fixed money supply, the interest rate must rise to balance money supply and money demand. Because the higher price level has increased the amount of money people want to hold, it has shifted the money demand curve to the right. Yet the quantity of money supplied is unchanged, so the interest rate must rise from r_1 to r_2 to discourage the additional demand.

This increase in the interest rate has ramifications not only for the money market but also for the quantity of goods and services demanded, as shown in panel (b). At a higher interest rate, the cost of borrowing and the return to saving are greater. Fewer households choose to borrow to buy a new house, and those who do buy smaller houses, so the demand for residential investment falls. Fewer firms choose to borrow to build new factories and buy new equipment, so business investment falls. Thus, when the price level rises from P_1 to P_2 , increasing money demand from MD_1 to MD_2 and raising the interest rate from r_1 to r_2 , the quantity of goods and services demanded falls from Y_1 to Y_2 .

This analysis of the interest-rate effect can be summarized in three steps: (1) A higher price level raises money demand. (2) Higher money demand leads to a higher interest rate. (3) A higher interest rate reduces the quantity of goods and services demanded. The same logic works in reverse: A lower price level reduces money demand, which leads to a lower interest rate, and this in turn increases the quantity of goods and services demanded. The result of this analysis is a negative relationship between the price level and the quantity of goods and services demanded, as illustrated by a downward-sloping aggregate-demand curve.

21-1c Changes in the Money Supply

So far, we have used the theory of liquidity preference to explain more fully how the total quantity of goods and services demanded in the economy changes as the price level changes. That is, we have examined movements along a downward-sloping aggregate-demand curve. The theory also sheds light, however, on some of the other events that alter the quantity of goods and services demanded. Whenever the quantity of goods and services demanded changes *for any given price level*, the aggregate-demand curve shifts.

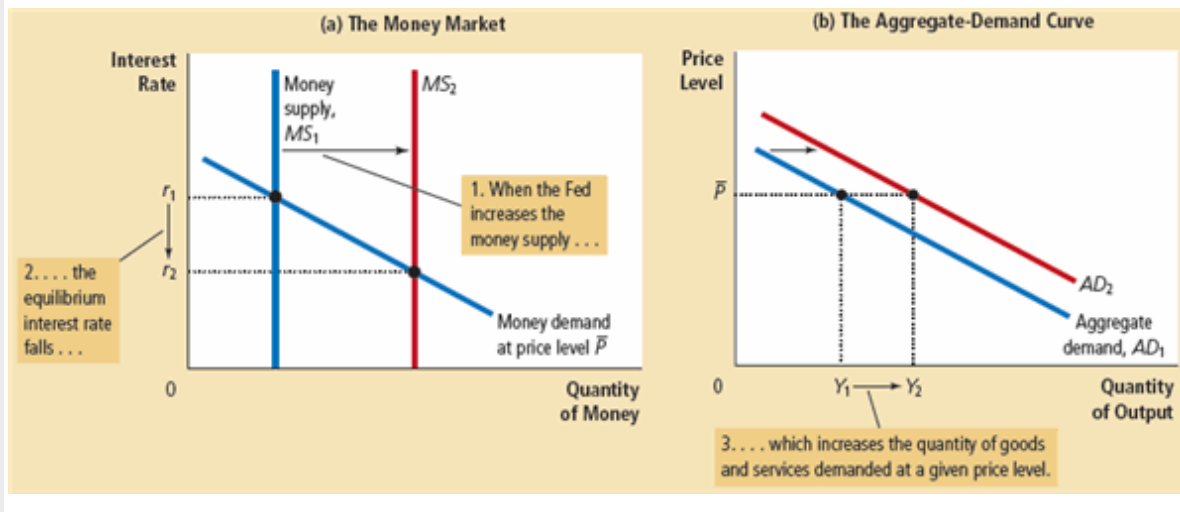
One important variable that shifts the aggregate-demand curve is monetary policy. To see how monetary policy affects the economy in the short run, suppose that the Fed increases the money supply by buying government bonds in open-market operations. (Why the Fed might do this will become clear later, after we understand the effects of such a move.) Let's consider how this monetary injection influences the equilibrium interest rate for a given price level. This will tell us what the injection does to the position of the aggregate-demand curve.

As panel (a) of Figure 3 shows, an increase in the money supply shifts the money-supply curve to the right from MS_1 to MS_2 . Because the

money-demand curve has not changed, the interest rate falls from r_1 to r_2 to balance money supply and money demand. That is, the interest rate must fall to induce people to hold the additional money the Fed has created, restoring equilibrium in the money market.

Figure 3. A Monetary Injection

In panel (a), an increase in the money supply from MS_1 to MS_2 reduces the equilibrium interest rate from r_1 to r_2 . Because the interest rate is the cost of borrowing, the fall in the interest rate raises the quantity of goods and services demanded at a given price level from Y_1 to Y_2 . Thus, in panel (b), the aggregate-demand curve shifts to the right from AD_1 to AD_2 .



Once again, the interest rate influences the quantity of goods and services demanded, as shown in panel (b) of Figure 3. The lower interest rate reduces the cost of borrowing and the return to saving. Households buy more and larger houses, stimulating the demand for residential investment. Firms spend more on new factories and new equipment, stimulating business investment. As a result, the quantity of goods and services demanded at a given price level, \bar{P} , rises from Y_1 to Y_2 . Of course, there is nothing special about \bar{P} : The monetary injection raises the quantity of goods and services demanded at every price level. Thus, the entire aggregate-demand curve shifts to the right.

To sum up: *When the Fed increases the money supply, it lowers the interest rate and increases the quantity of goods and services demanded for any given price level, shifting the aggregate-demand curve to the right. Conversely, when the Fed contracts the money supply, it raises the interest rate and reduces the quantity of goods and services demanded for any given price level, shifting the aggregate-demand curve to the left.*

21-1d The Role of Interest-Rate Targets in Fed Policy

How does the Federal Reserve affect the economy? Our discussion here and earlier in the book has treated the money supply as the Fed's policy instrument. When the Fed buys government bonds in open-market operations, it increases the money supply and expands aggregate demand. When the Fed sells government bonds in open-market operations, it decreases the money supply and contracts aggregate demand.

Discussions of Fed policy often treat the interest rate, rather than the money supply, as the Fed's policy instrument. Indeed, in recent years, the Federal Reserve has conducted policy by setting a target for the *federal funds rate*—the interest rate that banks charge one another for short-term loans. This target is reevaluated every six weeks at meetings of the Federal Open Market Committee (FOMC). The FOMC has chosen to set a target for the federal funds rate, rather than for the money supply, as it has done at times in the past.

There are several related reasons for the Fed's decision to use the federal funds rate as its target. One is that the money supply is hard to measure with sufficient precision. Another is that money demand fluctuates over time. For any given money supply, fluctuations in money demand would lead to fluctuations in interest rates, aggregate demand, and output. By contrast, when the Fed announces a target for the federal funds rate, it essentially accommodates the day-to-day shifts in money demand by adjusting the money supply accordingly.

The Fed's decision to target an interest rate does not fundamentally alter our analysis of monetary policy. The theory of liquidity preference illustrates an important principle: *Monetary policy can be described either in terms of the money supply or in terms of the interest rate.* When the FOMC sets a target for the federal funds rate of, say, 6 percent, the Fed's bond traders are told: "Conduct whatever open-market operations are necessary to ensure that the equilibrium interest rate equals 6 percent." In other words, when the Fed sets a target for the interest rate, it commits itself to adjusting the money supply to make the equilibrium in the money market hit that target.

As a result, changes in monetary policy can be viewed either in terms of changing the interest rate target or in terms of changing the money supply. When you read in the newspaper that "the Fed has lowered the federal funds rate from 6 to 5 percent," you should understand that this occurs only because the Fed's bond traders are doing what it takes to make it happen. To lower the federal funds rate, the Fed's bond traders buy government bonds, and this purchase increases the money supply and lowers the equilibrium interest rate (just as in Figure 3). Similarly, when the FOMC raises the target for the federal funds rate, the bond traders sell government bonds, and this sale decreases the money supply and raises the equilibrium interest rate.

FYI: The Zero Lower Bound

As we have just seen, monetary policy works through interest rates. This conclusion raises a question: What if the Fed's target interest rate has fallen as far as it can? In the recession of 2008 and 2009, the federal funds rate fell to about zero. What, if anything, can monetary policy do then to stimulate the economy?

Some economists describe this situation as a *liquidity trap*. According to the theory of liquidity preference, expansionary monetary policy works by reducing interest rates and stimulating investment spending. But if interest rates have already fallen almost to zero, then perhaps monetary policy is no longer effective. Nominal interest rates cannot fall below zero: Rather than making a loan at a negative nominal interest rate, a person would just hold cash. In this environment, expansionary monetary policy raises the supply of money, making the public's asset portfolio more liquid, but because interest rates can't fall any further, the extra liquidity might not have any effect. Aggregate demand, production, and employment may be "trapped" at low levels.

Other economists are skeptical about the relevance of liquidity traps and believe that a central bank continues to have tools to expand the economy, even after its interest rate target hits its lower bound of zero. One possibility is that the central bank could raise inflation expectations by committing itself to future monetary expansion. Even if nominal interest rates cannot fall any further, higher expected inflation can lower real interest rates by making them negative, which would stimulate investment spending.

A second possibility is that the central bank could conduct expansionary open-market operations with a larger variety of financial instruments than it normally uses. For example, it could buy mortgages and corporate debt and thereby lower the interest rates on these kinds of loans. The Federal Reserve actively pursued this last option during the downturn of 2008 and 2009.

Some economists have suggested that the possibility of hitting the zero lower bound for interest rates justifies setting the target rate of inflation well above zero. Under zero inflation, the real interest rate, like the nominal interest, can never fall below zero. But if the normal rate of inflation is, say, 4 percent, then the central bank can easily push the real interest rate to negative 4 percent by lowering the nominal interest rate toward zero. Thus, moderate inflation gives monetary policymakers more room to stimulate the economy when needed, reducing the risk of hitting up against the zero lower bound and having the economy fall into a liquidity trap.

The lessons from this analysis are simple: *Changes in monetary policy aimed at expanding aggregate demand can be described either as increasing the money supply or as lowering the interest rate. Changes in monetary policy aimed at contracting aggregate demand can be described either as decreasing the money supply or as raising the interest rate.*

Case Study: Why the Fed Watches the Stock Market (and Vice Versa)

"The stock market has predicted nine out of the past five recessions." So quipped Paul Samuelson, the famed economist (and textbook author). Samuelson was surely right that the stock market is highly volatile and can give wrong signals about the economy. But fluctuations in stock prices are often a sign of broader economic developments. The economic boom of the 1990s, for example, appeared not only in rapid GDP growth and falling unemployment but also in rising stock prices, which increased about fourfold during this decade. Similarly, the deep recession of 2008 and 2009 was reflected in falling stock prices: From November 2007 to March 2009, the stock market lost about half its value.

How should the Fed respond to stock-market fluctuations? The Fed has no reason to care about stock prices in themselves, but it does have the job of monitoring and responding to developments in the overall economy, and the stock market is a piece of that puzzle. When the stock market booms, households become wealthier, and this increased wealth stimulates consumer spending. In addition, a rise in stock prices makes it more attractive for firms to sell new shares of stock, and this stimulates investment spending. For both reasons, a booming stock market expands the aggregate demand for goods and services.

As we discuss more fully later in the chapter, one of the Fed's goals is to stabilize aggregate demand, because greater stability in aggregate demand means greater stability in output and the price level. To promote stability, the Fed might respond to a stock-market boom by keeping the money supply lower and interest rates higher than it otherwise would. The contractionary effects of higher interest rates would offset the expansionary effects of higher stock prices. In fact, this analysis does describe Fed behavior: Real interest rates were kept high by historical standards during the stock-market boom of the late 1990s.

The opposite occurs when the stock market falls. Spending on consumption and investment tends to decline, depressing aggregate demand and pushing the economy toward recession. To stabilize aggregate demand, the Fed would increase the money supply and lower interest rates. And indeed, that is what it typically does. For example, on October 19, 1987, the stock market fell by 22.6 percent—one of the biggest one-day drops in history. The Fed responded to the market crash by increasing the money supply and lowering interest rates. The federal funds rate fell from 7.7 percent at the beginning of October to 6.6 percent at the end of the month. In part because of the Fed's quick action, the economy avoided a recession. Similarly, as we discussed in a case study in the preceding chapter, the Fed also reduced interest rates during the economic downturn and stock market decline of 2008 and 2009, but this time monetary policy was not sufficient to avert a deep recession.

While the Fed keeps an eye on the stock market, stock-market participants also keep an eye on the Fed. Because the Fed can influence interest rates and economic activity, it can alter the value of stocks. For example, when the Fed raises interest rates by reducing the money supply, it makes owning stocks less attractive for two reasons. First, a higher interest rate means that bonds, the alternative to stocks, are earning a higher return. Second, the Fed's tightening of monetary policy reduces the demand for goods and services, which reduces profits. As a result, stock prices often fall when the Fed raises interest rates.

QUICK QUIZ

Use the theory of liquidity preference to explain how a decrease in the money supply affects the equilibrium interest rate. How does this change in monetary policy affect the aggregate-demand curve?

21-2 How Fiscal Policy Influences Aggregate Demand

The government can influence the behavior of the economy not only with monetary policy but also with fiscal policy. **Fiscal policy** refers to the government's choices regarding the overall level of government purchases and taxes. Earlier in the book, we examined how fiscal policy influences saving, investment, and growth in the long run. In the short run, however, the primary effect of fiscal policy is on the aggregate demand for goods and services.

21-2a Changes in Government Purchases

When policymakers change the money supply or the level of taxes, they shift the aggregate-demand curve indirectly by influencing the spending decisions of firms or households. By contrast, when the government alters its own purchases of goods and services, it shifts the aggregate-demand curve directly.

Suppose, for instance, that the U.S. Department of Defense places a \$20 billion order for new fighter planes with Boeing, the large aircraft manufacturer. This order raises the demand for the output produced by Boeing, which induces the company to hire more workers and increase production. Because Boeing is part of the economy, the increase in the demand for Boeing planes means an increase in the total quantity of goods and services demanded at each price level. As a result, the aggregate-demand curve shifts to the right.

By how much does this \$20 billion order from the government shift the aggregate-demand curve? At first, one might guess that the aggregate-demand curve shifts to the right by exactly \$20 billion. It turns out, however, that this is not the case. There are two macroeconomic effects that cause the size of the shift in aggregate demand to differ from the change in government purchases. The first—the multiplier effect—suggests the shift in aggregate demand could be *larger* than \$20 billion. The second—the crowding-out effect—suggests the shift in aggregate demand could be *smaller* than \$20 billion. We now discuss each of these effects in turn.

21-2b The Multiplier Effect

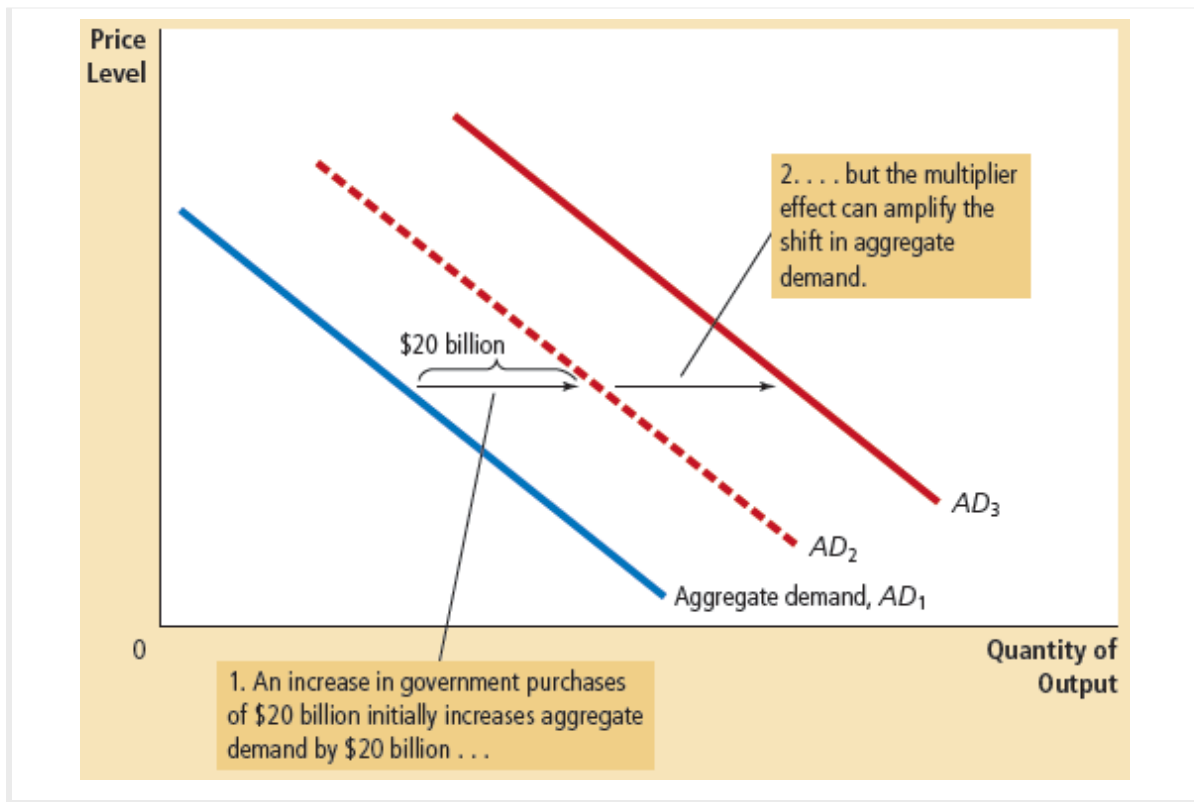
When the government buys \$20 billion of goods from Boeing, that purchase has repercussions. The immediate impact of the higher demand from the government is to raise employment and profits at Boeing. Then, as the workers see higher earnings and the firm owners see higher profits, they respond to this increase in income by raising their own spending on consumer goods. As a result, the government purchase from Boeing raises the demand for the products of many other firms in the economy. Because each dollar spent by the government can raise the aggregate demand for goods and services by more than a dollar, government purchases are said to have a **multiplier effect** on aggregate demand.

This multiplier effect continues even after this first round. When consumer spending rises, the firms that produce these consumer goods hire more people and experience higher profits. Higher earnings and profits stimulate consumer spending once again and so on. Thus, there is positive feedback as higher demand leads to higher income, which in turn leads to even higher demand. Once all these effects are added together, the total impact on the quantity of goods and services demanded can be much larger than the initial impulse from higher government spending.

Figure 4 illustrates the multiplier effect. The increase in government purchases of \$20 billion initially shifts the aggregate-demand curve to the right from AD_1 to AD_2 by exactly \$20 billion. But when consumers respond by increasing their spending, the aggregate-demand curve shifts still further to AD_3 .

Figure 4. The Multiplier Effect

An increase in government purchases of \$20 billion can shift the aggregate-demand curve to the right by more than \$20 billion. This multiplier effect arises because increases in aggregate income stimulate additional spending by consumers.



This multiplier effect arising from the response of consumer spending can be strengthened by the response of investment to higher levels of demand. For instance, Boeing might respond to the higher demand for planes by deciding to buy more equipment or build another plant. In this case, higher government demand spurs higher demand for investment goods. This positive feedback from demand to investment is sometimes called the *investment accelerator*.

21-2c A Formula for the Spending Multiplier

Some simple algebra permits us to derive a formula for the size of the multiplier effect that arises when an increase in government purchases induces increases in consumer spending. An important number in this formula is the *marginal propensity to consume* (MPC)—the fraction of extra income that a household consumes rather than saves. For example, suppose that the marginal propensity to consume is $\frac{3}{4}$. This means that for every extra dollar that a household earns, the household spends \$0.75 ($\frac{3}{4}$ of the dollar) and saves \$0.25. With an MPC of $\frac{3}{4}$, when the workers and owners of Boeing earn \$20 billion from the government contract, they increase their consumer spending by $\frac{3}{4} \times \$20$ billion, or \$15 billion.

To gauge the impact on aggregate demand of a change in government purchases, we follow the effects step by step. The process begins when the government spends \$20 billion, which implies that national income (earnings and profits) also rises by this amount. This increase in income in turn raises consumer spending by $MPC \times \$20$ billion, which in turn raises the income for the workers and owners of the firms that produce the consumption goods. This second increase in income again raises consumer spending, this time by $MPC \times (MPC \times \$20 \text{ billion})$. These feedback effects go on and on.

To find the total impact on the demand for goods and services, we add up all these effects:

Change in government purchases =	\$20 billion
First change in consumption =	$MPC \times \$20 \text{ billion}$
Second change in consumption =	$MPC^2 \times \$20 \text{ billion}$
Third change in consumption =	$MPC^3 \times \$20 \text{ billion}$
•	•
•	•
•	•
<hr style="width: 50%; margin: 10px auto;"/>	
Total change in demand	
$= (1 + MPC + MPC^2 + MPC^3 + \dots) \times \$20 \text{ billion}.$	

Here "..." represents an infinite number of similar terms. Thus, we can write the multiplier as follows:

$$\text{Multiplier} = 1 + MPC + MPC^2 + MPC^3 + \dots$$

This multiplier tells us the demand for goods and services that each dollar of government purchases generates.

To simplify this equation for the multiplier, recall from math class that this expression is an infinite geometric series. For x between -1 and $+1$,

$$1 + x + x^2 + x^3 + \dots = 1/(1 - x).$$

In our case, $x = MPC$. Thus,

$$\text{Multiplier} = 1/(1 - MPC).$$

For example, if MPC is $\frac{3}{4}$, the multiplier is $1/(1 - \frac{3}{4})$, which is 4. In this case, the \$20 billion of government spending generates \$80 billion of demand for goods and services.

This formula for the multiplier shows an important conclusion: The size of the multiplier depends on the marginal propensity to consume. While an MPC of $\frac{3}{4}$ leads to a multiplier of 4, an MPC of $\frac{1}{2}$ leads to a multiplier of only 2. Thus, a larger MPC means a larger multiplier. To see why this is true, remember that the multiplier arises because higher income induces greater spending on consumption. With a larger MPC , consumption responds more to a change in income, and so the multiplier is larger.

21-2d Other Applications of the Multiplier Effect

Because of the multiplier effect, a dollar of government purchases can generate more than a dollar of aggregate demand. The logic of the multiplier effect, however, is not restricted to changes in government purchases. Instead, it applies to any event that alters spending on any component of GDP—consumption, investment, government purchases, or net exports.

For example, suppose that a recession overseas reduces the demand for U.S. net exports by \$10 billion. This reduced spending on U.S. goods and services depresses U.S. national income, which reduces spending by U.S. consumers. If the marginal propensity to consume is $\frac{3}{4}$ and the multiplier is 4, then the \$10 billion fall in net exports means a \$40 billion contraction in aggregate demand.

As another example, suppose that a stock-market boom increases households' wealth and stimulates their spending on goods and services by \$20 billion. This extra consumer spending increases national income, which in turn generates even more consumer spending. If the marginal propensity to consume is $\frac{3}{4}$ and the multiplier is 4, then the initial impulse of \$20 billion in consumer spending translates into an \$80 billion increase in aggregate demand.

The multiplier is an important concept in macroeconomics because it shows how the economy can amplify the impact of changes in spending. A small initial change in consumption, investment, government purchases, or net exports can end up having a large effect on aggregate demand and, therefore, the economy's production of goods and services.

21-2e The Crowding-Out Effect

The multiplier effect seems to suggest that when the government buys \$20 billion of planes from Boeing, the resulting expansion in aggregate demand is necessarily larger than \$20 billion. Yet another effect works in the opposite direction. While an increase in government purchases stimulates the aggregate demand for goods and services, it also causes the interest rate to rise, which reduces investment spending and puts downward pressure on aggregate demand. The reduction in aggregate demand that results when a fiscal expansion raises the interest rate is called the **crowding-out effect**.

To see why crowding out occurs, let's consider what happens in the money market when the government buys planes from Boeing. As we have discussed, this increase in demand raises the incomes of the workers and owners of this firm (and because of the multiplier effect, of other firms as well). As incomes rise, households plan to buy more goods and services and, as a result, choose to hold more of their wealth in liquid form. That is, the increase in income caused by the fiscal expansion raises the demand for money.

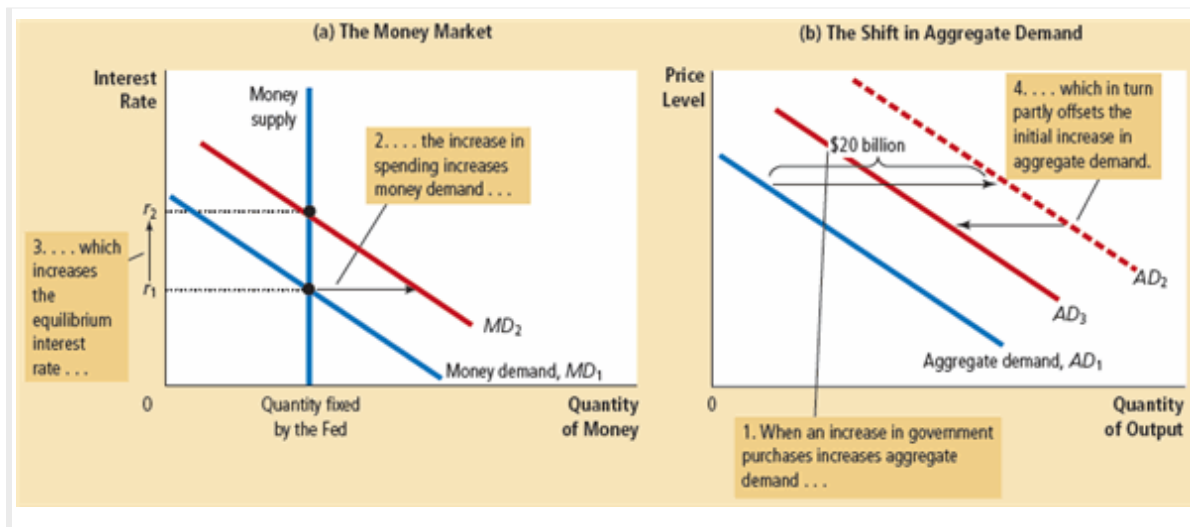
The effect of the increase in money demand is shown in panel (a) of Figure 5. Because the Fed has not changed the money supply, the vertical supply curve remains the same. When the higher level of income shifts the money-demand curve to the right from MD_1 to MD_2 , the interest rate must rise from r_1 to r_2 to keep supply and demand in balance.

Crowding Out

[Click to View Larger](#)

Figure 5. The Crowding-Out Effect

Panel (a) shows the money market. When the government increases its purchases of goods and services, the resulting increase in income raises the demand for money from MD_1 to MD_2 , and this causes the equilibrium interest rate to rise from r_1 to r_2 . Panel (b) shows the effects on aggregate demand. The initial impact of the increase in government purchases shifts the aggregate-demand curve from AD_1 to AD_2 . Yet because the interest rate is the cost of borrowing, the increase in the interest rate tends to reduce the quantity of goods and services demanded, particularly for investment goods. This crowding out of investment partially offsets the impact of the fiscal expansion on aggregate demand. In the end, the aggregate-demand curve shifts only to AD_3 .



The increase in the interest rate, in turn, reduces the quantity of goods and services demanded. In particular, because borrowing is more expensive, the demand for residential and business investment goods declines. That is, as the increase in government purchases increases the demand for goods and services, it may also crowd out investment. This crowding-out effect partially offsets the impact of government purchases on aggregate demand, as illustrated in panel (b) of Figure 5. The increase in government purchases initially shifts the aggregate-demand curve from AD_1 to AD_2 , but once crowding out takes place, the aggregate-demand curve drops back to AD_3 .

To sum up: *When the government increases its purchases by \$20 billion, the aggregate demand for goods and services could rise by more or less than \$20 billion depending on the sizes of the multiplier and crowding-out effects.* The multiplier effect by itself makes the shift in aggregate demand greater than \$20 billion. The crowding-out effect pushes the aggregate-demand curve in the opposite direction and, if large enough, could result in an aggregate-demand shift of less than \$20 billion.

21-2f Changes in Taxes

BBC Video: Bush's Tax Cut

The other important instrument of fiscal policy, besides the level of government purchases, is the level of taxation. When the government cuts personal income taxes, for instance, it increases households' take-home pay. Households will save some of this additional income, but they will also spend some of it on consumer goods. Because it increases consumer spending, the tax cut shifts the aggregate-demand curve to the right. Similarly, a tax increase depresses consumer spending and shifts the aggregate-demand curve to the left.

The size of the shift in aggregate demand resulting from a tax change is also affected by the multiplier and crowding-out effects. When the government cuts taxes and stimulates consumer spending, earnings and profits rise, which further stimulates consumer spending. This is the multiplier effect. At the same time, higher income leads to higher money demand, which tends to raise interest rates. Higher interest rates make borrowing more costly, which reduces investment spending. This is the crowding-out effect. Depending on the size of the multiplier and

crowding-out effects, the shift in aggregate demand could be larger or smaller than the tax change that causes it.

In addition to the multiplier and crowding-out effects, there is another important determinant of the size of the shift in aggregate demand that results from a tax change: households' perceptions about whether the tax change is permanent or temporary. For example, suppose that the government announces a tax cut of \$1,000 per household. In deciding how much of this \$1,000 to spend, households must ask themselves how long this extra income will last. If households expect the tax cut to be permanent, they will view it as adding substantially to their financial resources and, therefore, increase their spending by a large amount. In this case, the tax cut will have a large impact on aggregate demand. By contrast, if households expect the tax change to be temporary, they will view it as adding only slightly to their financial resources and, therefore, will increase their spending by only a small amount. In this case, the tax cut will have a small impact on aggregate demand.

An extreme example of a temporary tax cut was the one announced in 1992. In that year, President George H. W. Bush faced a lingering recession and an upcoming reelection campaign. He responded to these circumstances by announcing a reduction in the amount of income tax that the federal government was withholding from workers' paychecks. Because legislated income tax rates did not change, however, every dollar of reduced withholding in 1992 meant an extra dollar of taxes due on April 15, 1993, when income tax returns for 1992 were to be filed. Thus, this "tax cut" actually represented only a short-term loan from the government. Not surprisingly, the impact of the policy on consumer spending and aggregate demand was relatively small.

FYI: How Fiscal Policy Might Affect Aggregate Supply

So far, our discussion of fiscal policy has stressed how changes in government purchases and changes in taxes influence the quantity of goods and services demanded. Most economists believe that the short-run macroeconomic effects of fiscal policy work primarily through aggregate demand. Yet fiscal policy can potentially influence the quantity of goods and services supplied as well.

For instance, consider the effects of tax changes on aggregate supply. One of the *Ten Principles of Economics* in Chapter 1 is that people respond to incentives. When government policymakers cut tax rates, workers get to keep more of each dollar they earn, so they have a greater incentive to work and produce goods and services. If they respond to this incentive, the quantity of goods and services supplied will be greater at each price level, and the aggregate-supply curve will shift to the right.

Some economists, called *supply-siders*, have argued that the influence of tax cuts on aggregate supply is large. According to some supply-siders, the influence is so large that a cut in tax rates will stimulate enough additional production and income that tax revenue will actually increase. This is certainly a theoretical possibility, but most economists do not consider it the normal case. While the supply-side effects of taxes are important to consider, they are usually not large enough to cause tax revenue to rise when tax rates fall.

Like changes in taxes, changes in government purchases can also potentially affect aggregate supply. Suppose, for instance, that the government increases expenditure on a form of government-provided capital, such as roads. Roads are used by private businesses to make deliveries to their customers; an increase in the quantity of roads increases these businesses' productivity. Hence, when the government spends more on roads, it increases the quantity of goods and services supplied at any given price level and, thus, shifts the aggregate-supply curve to the right. This effect on aggregate supply is probably more important in the long run than in the short run, however, because it would take some time for the government to build the new roads and put them into use.

QUICK QUIZ

Suppose that the government reduces spending on highway construction by \$10 billion. Which way does the aggregate-demand curve shift? Explain why the shift might be larger than \$10 billion. Explain why the shift might be smaller than \$10 billion.

21-3 Using Policy to Stabilize the Economy

Ask the Author: If it's better to have higher output and lower unemployment, then why doesn't the government use monetary and fiscal policy to expand aggregate demand as much as possible?

We have seen how monetary and fiscal policy can affect the economy's aggregate demand for goods and services. These theoretical insights raise some important policy questions: Should policymakers use these instruments to control aggregate demand and stabilize the economy? If so, when? If not, why not?

21-3a The Case for Active Stabilization Policy

Let's return to the question that began this chapter: When the president and Congress raise taxes, how should the Federal Reserve respond? As we have seen, the level of taxation is one determinant of the position of the aggregate-demand curve. When the government raises taxes, aggregate demand will fall, depressing production and employment in the short run. If the Federal Reserve wants to prevent this adverse effect of the fiscal policy, it can expand aggregate demand by increasing the money supply. A monetary expansion would reduce interest rates, stimulate investment spending, and expand aggregate demand. If monetary policy responds appropriately, the combined changes in monetary and fiscal policy could leave the aggregate demand for goods and services unaffected.

This analysis is exactly the sort followed by members of the Federal Open Market Committee. They know that monetary policy is an important determinant of aggregate demand. They also know that there are other important determinants as well, including fiscal policy set by the president and Congress. As a result, the Fed's Open Market Committee watches the debates over fiscal policy with a keen eye.

This response of monetary policy to the change in fiscal policy is an example of a more general phenomenon: the use of policy instruments to stabilize aggregate demand and, as a result, production and employment. Economic stabilization has been an explicit goal of U.S. policy since the Employment Act of 1946. This act states that "it is the continuing policy and responsibility of the federal government to . . . promote full employment and production." In essence, the government has chosen to hold itself accountable for short-run macroeconomic performance.

The Employment Act has two implications. The first, more modest, implication is that the government should avoid being a cause of economic fluctuations. Thus, most economists advise against large and sudden changes in monetary and fiscal policy, for such changes are likely to cause fluctuations in aggregate demand. Moreover, when large changes do occur, it is important that monetary and fiscal policymakers be aware of and respond to each others' actions.

The second, more ambitious, implication of the Employment Act is that the government should respond to changes in the private economy to stabilize aggregate demand. The act was passed not long after the publication of Keynes's *The General Theory of Employment, Interest, and Money*, which has been one of the most influential books ever written about economics. In it, Keynes emphasized the key role of aggregate demand in explaining short-run economic fluctuations. Keynes claimed that the government should actively stimulate aggregate demand when aggregate demand appeared insufficient to maintain production at its full-employment level.

Keynes (and his many followers) argued that aggregate demand fluctuates because of largely irrational waves of pessimism and optimism. He used the term "animal spirits" to refer to these arbitrary changes in attitude. When pessimism reigns, households reduce consumption spending, and firms reduce investment spending. The result is reduced aggregate demand, lower production, and higher unemployment. Conversely, when optimism reigns, households and firms increase spending. The result is higher aggregate demand, higher production, and

inflationary pressure. Notice that these changes in attitude are, to some extent, self-fulfilling.

In principle, the government can adjust its monetary and fiscal policy in response to these waves of optimism and pessimism and, thereby, stabilize the economy. For example, when people are excessively pessimistic, the Fed can expand the money supply to lower interest rates and expand aggregate demand. When they are excessively optimistic, it can contract the money supply to raise interest rates and dampen aggregate demand. Former Fed Chairman William McChesney Martin described this view of monetary policy very simply: "The Federal Reserve's job is to take away the punch bowl just as the party gets going."

Case Study: Keynesians in the White House

When a reporter in 1961 asked President John F. Kennedy why he advocated a tax cut, Kennedy replied, "To stimulate the economy. Don't you remember your Economics 101?" Kennedy's policy was, in fact, based on the analysis of fiscal policy we have developed in this chapter. His goal was to enact a tax cut, which would raise consumer spending, expand aggregate demand, and increase the economy's production and employment.

In choosing this policy, Kennedy was relying on his team of economic advisers. This team included such prominent economists as James Tobin and Robert Solow, who later would win Nobel Prizes for their contributions to economics. As students in the 1940s, these economists had closely studied John Maynard Keynes's *General Theory*, which then was only a few years old. When the Kennedy advisers proposed cutting taxes, they were putting Keynes's ideas into action.

Although tax changes can have a potent influence on aggregate demand, they have other effects as well. In particular, by changing the incentives that people face, taxes can alter the aggregate supply of goods and services. Part of the Kennedy proposal was an investment tax credit, which gives a tax break to firms that invest in new capital. Higher investment would not only stimulate aggregate demand immediately but also increase the economy's productive capacity over time. Thus, the short-run goal of increasing production through higher aggregate demand was coupled with a long-run goal of increasing production through higher aggregate supply. And indeed, when the tax cut Kennedy proposed was finally enacted in 1964, it helped usher in a period of robust economic growth.

Since the 1964 tax cut, policymakers have from time to time used fiscal policy as a tool for controlling aggregate demand. For example, when President Barack Obama moved into the Oval Office in 2009, he faced an economy in the midst of a recession. One of his first policy initiatives was a stimulus bill that included substantial increases in government spending. The accompanying In the News box discusses some of the debate over this policy initiative.

In the News: How Large Is the Fiscal Policy Multiplier?

In the global economic downturn of 2008 and 2009, governments around the world turned to fiscal policy to prop up aggregate demand.

Much Ado about Multipliers

It is the biggest peacetime fiscal expansion in history. Across the globe countries have countered the recession by cutting taxes and by boosting government spending. The G20 group of economies, whose leaders meet this week in Pittsburgh, have introduced stimulus packages worth an average of 2% of GDP this year and 1.6% of GDP in 2010. Co-ordinated action on this scale might suggest a consensus about the effects of fiscal stimulus. But economists are in fact deeply divided about how well, or indeed whether, such stimulus works.

The debate hinges on the scale of the "fiscal multiplier." This measure, first formalised in 1931 by Richard Kahn, a student of John Maynard Keynes, captures how effectively tax cuts or increases in government spending stimulate output. A multiplier of one means that a \$1 billion increase in government spending will increase a country's GDP by \$1 billion.

The size of the multiplier is bound to vary according to economic conditions. For an economy operating at full capacity, the fiscal multiplier

should be zero. Since there are no spare resources, any increase in government demand would just replace spending elsewhere. But in a recession, when workers and factories lie idle, a fiscal boost can increase overall demand. And if the initial stimulus triggers a cascade of expenditure among consumers and businesses, the multiplier can be well above one.

The multiplier is also likely to vary according to the type of fiscal action. Government spending on building a bridge may have a bigger multiplier than a tax cut if consumers save a portion of their tax windfall. A tax cut targeted at poorer people may have a bigger impact on spending than one for the affluent, since poorer folk tend to spend a higher share of their income.

Crucially, the overall size of the fiscal multiplier also depends on how people react to higher government borrowing. If the government's actions bolster confidence and revive animal spirits, the multiplier could rise as demand goes up and private investment is "crowded in." But if interest rates climb in response to government borrowing then some private investment that would otherwise have occurred could get "crowded out." And if consumers expect higher future taxes in order to finance new government borrowing, they could spend less today. All that would reduce the fiscal multiplier, potentially to below zero.

Different assumptions about the impact of higher government borrowing on interest rates and private spending explain wild variations in the estimates of multipliers from today's stimulus spending. Economists in the Obama administration, who assume that the federal funds rate stays constant for a four-year period, expect a multiplier of 1.6 for government purchases and 1.0 for tax cuts from America's fiscal stimulus. An alternative assessment by John Cogan, Tobias Cwik, John Taylor and Volker Wieland uses models in which interest rates and taxes rise more quickly in response to higher public borrowing. Their multipliers are much smaller. They think America's stimulus will boost GDP by only one-sixth as much as the Obama team expects.

When forward-looking models disagree so dramatically, careful analysis of previous fiscal stimuli ought to help settle the debate. Unfortunately, it is extremely tricky to isolate the impact of changes in fiscal policy. One approach is to use microeconomic case studies to examine consumer behaviour in response to specific tax rebates and cuts. These studies, largely based on tax changes in America, find that permanent cuts have a bigger impact on consumer spending than temporary ones and that consumers who find it hard to borrow, such as those close to their credit-card limit, tend to spend more of their tax windfall. But case studies do not measure the overall impact of tax cuts or spending increases on output.

An alternative approach is to try to tease out the statistical impact of changes in government spending or tax cuts on GDP. The difficulty here is to isolate the effects of fiscal-stimulus measures from the rises in social-security spending and falls in tax revenues that naturally accompany recessions. This empirical approach has narrowed the range of estimates in some areas. It has also yielded interesting cross-country comparisons. Multipliers are bigger in closed economies than open ones (because less of the stimulus leaks abroad via imports). They have traditionally been bigger in rich countries than emerging ones (where investors tend to take fright more quickly, pushing interest rates up). But overall economists find as big a range of multipliers from empirical estimates as they do from theoretical models.

To add to the confusion, the post-war experiences from which statistical analyses are drawn differ in vital respects from the current situation. Most of the evidence on multipliers for government spending is based on military outlays, but today's stimulus packages are heavily focused on infrastructure. Interest rates in many rich countries are now close to zero, which may increase the potency of, as well as the need for, fiscal stimulus. Because of the financial crisis relatively more people face borrowing constraints, which would increase the effectiveness of a tax cut. At the same time, highly indebted consumers may now be keen to cut their borrowing, leading to a lower multiplier. And investors today have more reason to be worried about rich countries' fiscal positions than those of emerging markets.

Add all this together and the truth is that economists are flying blind. They can make relative judgments with some confidence. Temporary tax cuts pack less punch than permanent ones, for instance. Fiscal multipliers will probably be lower in heavily indebted economies than in prudent ones. But policymakers looking for precise estimates are deluding themselves.

Economist, September 24, 2009.

21-3b The Case against Active Stabilization Policy

Some economists argue that the government should avoid active use of monetary and fiscal policy to try to stabilize the economy. They claim that these policy instruments should be set to achieve long-run goals, such as rapid economic growth and low inflation, and that the economy should be left to deal with short-run fluctuations on its own. These economists may admit that monetary and fiscal policy can stabilize the economy in theory, but they doubt whether it can do so in practice.

The primary argument against active monetary and fiscal policy is that these policies affect the economy with a long lag. As we have seen, monetary policy works by changing interest rates, which in turn influence investment spending. But many firms make investment plans far in advance. Thus, most economists believe that it takes at least six months for changes in monetary policy to have much effect on output and employment. Moreover, once these effects occur, they can last for several years. Critics of stabilization policy argue that because of this lag, the Fed should not try to fine-tune the economy. They claim that the Fed often reacts too late to changing economic conditions and, as a result, ends up being a cause of rather than a cure for economic fluctuations. These critics advocate a passive monetary policy, such as slow and steady growth in the money supply.

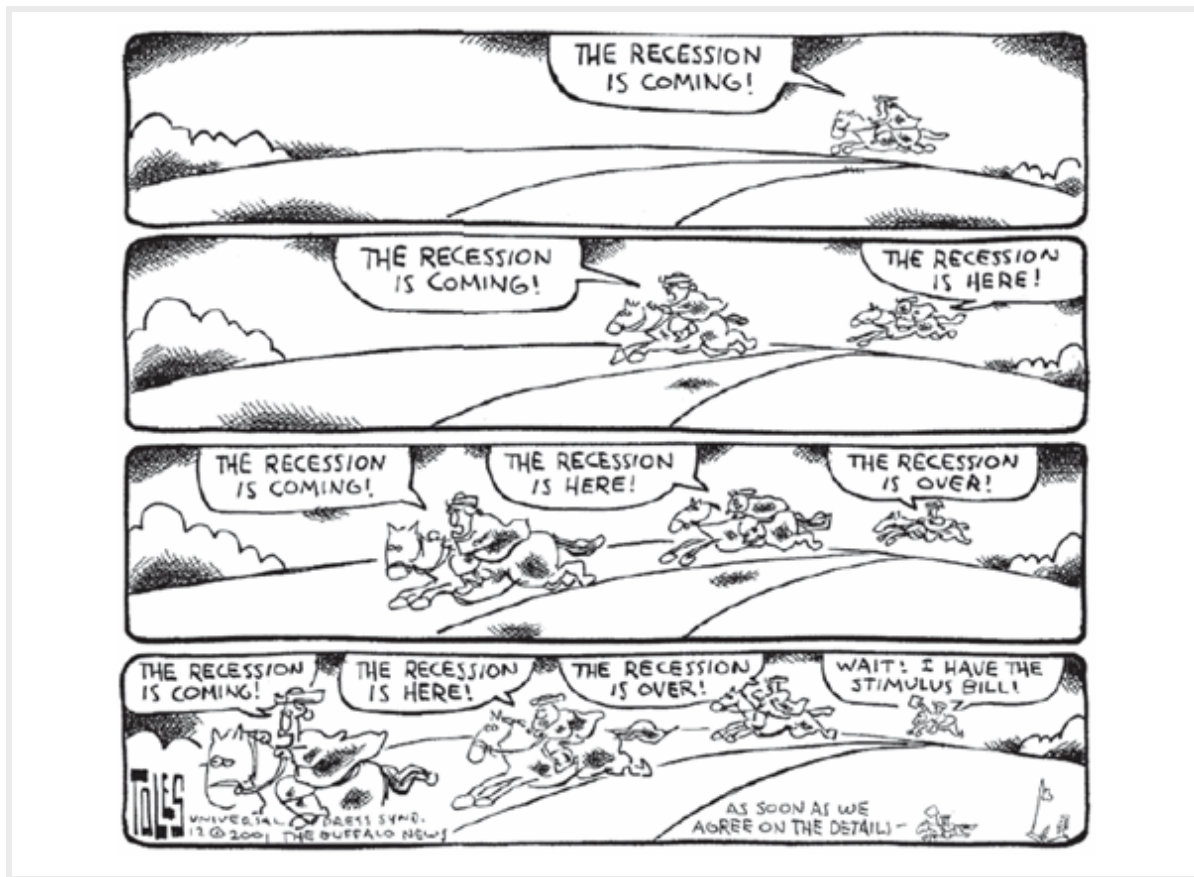
Fiscal policy also works with a lag, but unlike the lag in monetary policy, the lag in fiscal policy is largely attributable to the political process. In the United States, most changes in government spending and taxes must go through congressional committees in both the House and the Senate, be passed by both legislative bodies, and then be signed by the president. Completing this process can take months or, in some cases, years. By the time the change in fiscal policy is passed and ready to implement, the condition of the economy may well have changed.

These lags in monetary and fiscal policy are a problem in part because economic forecasting is so imprecise. If forecasters could accurately predict the condition of the economy a year in advance, then monetary and fiscal policymakers could look ahead when making policy decisions. In this case, policymakers could stabilize the economy despite the lags they face. In practice, however, major recessions and depressions arrive without much advance warning. The best policymakers can do at any time is to respond to economic changes as they occur.

21-3c Automatic Stabilizers

All economists—both advocates and critics of stabilization policy—agree that the lags in implementation render policy less useful as a tool for short-run stabilization. The economy would be more stable, therefore, if policymakers could find a way to avoid some of these lags. In fact, they have. **Automatic stabilizers** are changes in fiscal policy that stimulate aggregate demand when the economy goes into a recession without policymakers having to take any deliberate action.

The most important automatic stabilizer is the tax system. When the economy goes into a recession, the amount of taxes collected by the government falls automatically because almost all taxes are closely tied to economic activity. The personal income tax depends on households' incomes, the payroll tax depends on workers' earnings, and the corporate income tax depends on firms' profits. Because incomes, earnings, and profits all fall in a recession, the government's tax revenue falls as well. This automatic tax cut stimulates aggregate demand and, thereby, reduces the magnitude of economic fluctuations.



Government spending also acts as an automatic stabilizer. In particular, when the economy goes into a recession and workers are laid off, more people apply for unemployment insurance benefits, welfare benefits, and other forms of income support. This automatic increase in government spending stimulates aggregate demand at exactly the time when aggregate demand is insufficient to maintain full employment. Indeed, when the unemployment insurance system was first enacted in the 1930s, economists who advocated this policy did so in part because of its power as an automatic stabilizer.

The automatic stabilizers in the U.S. economy are not sufficiently strong to prevent recessions completely. Nonetheless, without these automatic stabilizers, output and employment would probably be more volatile than they are. For this reason, many economists oppose a constitutional amendment that would require the federal government always to run a balanced budget, as some politicians have proposed. When the economy goes into a recession, taxes fall, government spending rises, and the government's budget moves toward deficit. If the government faced a strict balanced-budget rule, it would be forced to look for ways to raise taxes or cut spending in a recession. In other words, a strict balanced-budget rule would eliminate the automatic stabilizers inherent in our current system of taxes and government spending.

QUICK QUIZ

Suppose a wave of negative "animal spirits" overruns the economy, and people become pessimistic about the future. What happens to aggregate demand? If the Fed wants to stabilize aggregate demand, how should it alter the money supply? If it does this, what happens to the interest rate? Why might the Fed choose not to respond in this way?

In the News: Offbeat Indicators

Because monetary and fiscal policy work with long lags, policymakers are constantly searching for clues about where the economy is heading. This article, written as the 2001 recession was just ending, describes some unusual ways economists monitor macroeconomic conditions.

Economic Numbers Befuddle Even the Best

By George Hager

Economists pore over scores of numbers every week, trying to sense when the recession is over. But quirky indicators and gut instinct might be almost as helpful—maybe even more so.

Is your dentist busy? Dentists say people put off appointments when times turn tough, then reschedule when the economy improves.

How far away do you have to park when you go to the mall? Fewer shoppers equal more parking spaces.

If you drive to work, has your commute time gotten shorter or longer?

Good Times



Economist Michael Evans says a colleague with a pipeline into the garbage business swears by his own homegrown Chicago Trash index. Collections plunged after the Sept. 11 terror attacks, rebounded in October but then fell off again in mid-November. "Trash is a pretty good indicator of what people are buying," says Evans, an economist with Evans Carrol & Associates. "They've got to throw out the wrappings." . . .

What's actually happening is often clear only in hindsight. That's one reason the National Bureau of Economic Research waited until November to declare that a recession began last March—and why it took them until December 1992 to declare that the last recession had ended more than a year earlier, in March 1991.

"The data can fail you," says Allen Sinai, chief economist for Decision Economics. Sinai cautions that if numbers appear to be going up (or down), it's best to wait to see what happens over two or three months before drawing a conclusion—something hairtrigger financial markets routinely don't do.

"We have lots of false predictions of recoveries by (stock) markets that don't happen," he says.

Like a lot of economists, Sinai leavens the numbers with informal observations. These days, he's paying particular attention to what business executives say at meetings and cocktail parties because their mood—and their plans for investing and hiring—are key to a comeback.

Bad Times



Even the Federal Reserve, whose more than 200 economists monitor about every piece of the economy that can be measured, make room for anecdotes. Two weeks before every policy meeting, the Fed publishes its "beige book," a survey based on off-the-record conversations between officials at the Fed's 12 regional banks and local businesses.

The reports are peppered with quotes from unnamed business people ("Everybody's decided to go shopping again," someone told the Richmond Fed Bank last month) and the occasional odd detail that reveals just how far down the Fed inquisitors sometimes drill. Last March, the Dallas Fed Bank reported "healthy sales of singing gorillas" for Valentine's Day.

USA Today, December 26, 2001.

21-4 Conclusion

Before policymakers make any change in policy, they need to consider all the effects of their decisions. Earlier in the book, we examined classical models of the economy, which describe the long-run effects of monetary and fiscal policy. There we saw how fiscal policy influences saving, investment, and long-run growth and how monetary policy influences the price level and the inflation rate.

In this chapter, we examined the short-run effects of monetary and fiscal policy. We saw how these policy instruments can change the aggregate demand for goods and services and alter the economy's production and employment in the short run. When Congress reduces government spending to balance the budget, it needs to consider both the long-run effects on saving and growth and the short-run effects on aggregate demand and employment. When the Fed reduces the growth rate of the money supply, it must take into account the long-run effect on inflation as well as the short-run effect on production. In all parts of government, policymakers must keep in mind both long-run and short-run goals.

Chapter Recap: Summary

- In developing a theory of short-run economic fluctuations, Keynes proposed the theory of liquidity preference to explain the determinants of the interest rate. According to this theory, the interest rate adjusts to balance the supply and demand for money.
- An increase in the price level raises money demand and increases the interest rate that brings the money market into equilibrium. Because the interest rate represents the cost of borrowing, a higher interest rate reduces investment and, thereby, the quantity of goods and services demanded. The downward-sloping aggregate-demand curve expresses this negative relationship between the price level and the quantity demanded.
- Policymakers can influence aggregate demand with monetary policy. An increase in the money supply reduces the equilibrium interest rate for any given price level. Because a lower interest rate stimulates investment spending, the aggregate-demand curve shifts to the right. Conversely, a decrease in the money supply raises the equilibrium interest rate for any given price level and shifts the aggregate-demand curve to the left.
- Policymakers can also influence aggregate demand with fiscal policy. An increase in government purchases or a cut in taxes shifts the aggregate-demand curve to the right. A decrease in government purchases or an increase in taxes shifts the aggregate-demand curve to the left.
- When the government alters spending or taxes, the resulting shift in aggregate demand can be larger or smaller than the fiscal change. The multiplier effect tends to amplify the effects of fiscal policy on aggregate demand. The crowding-out effect tends to dampen the effects of fiscal policy on aggregate demand.
- Because monetary and fiscal policy can influence aggregate demand, the government sometimes uses these policy instruments in an attempt to stabilize the economy. Economists disagree about how active the government should be in this effort. According to advocates of active stabilization policy, changes in attitudes by households and firms shift aggregate demand; if the government does not respond, the result is undesirable and unnecessary fluctuations in output and employment. According to critics of active stabilization policy, monetary and fiscal policy work with such long lags that attempts at stabilizing the economy often end up being destabilizing.

Ask the Instructor: Why are some rates of interest so much higher than others?

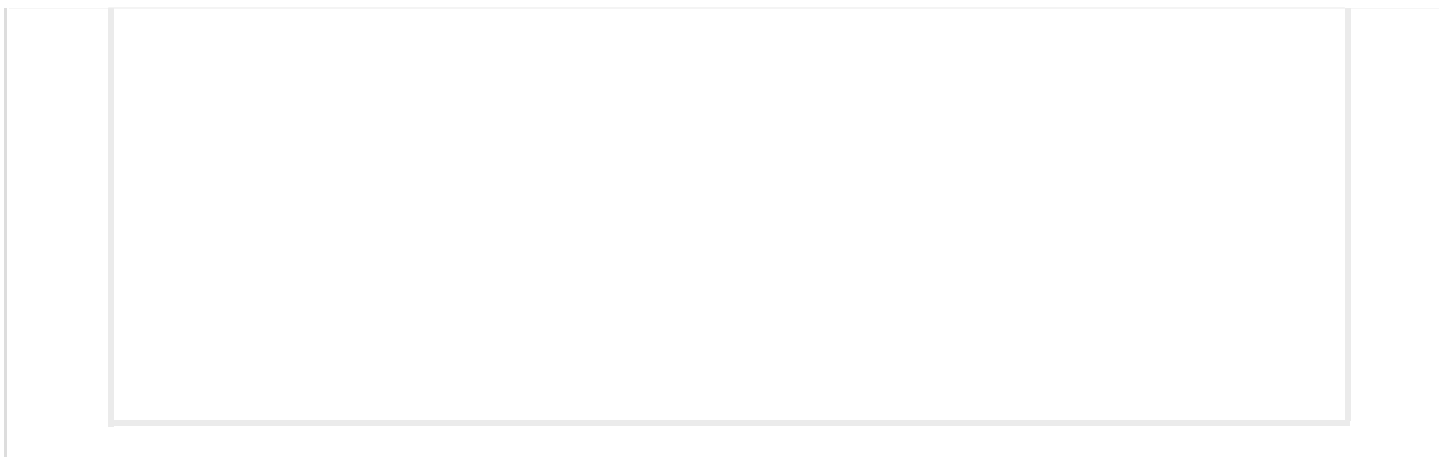
Ask the Instructor: Does the multiplier work in both directions?

Ask the Instructor: What is fiscal policy, and what is it supposed to accomplish?

Ask the Instructor: What is crowding out?

Ask the Instructor: What is the common sense explanation for the simple spending multiplier?

Ask the Instructor: Can we count on fiscal and monetary policy to smooth out the business cycle?



Chapter Recap: Questions for Review

1. What is the theory of liquidity preference? How does it help explain the downward slope of the aggregate-demand curve?
2. Use the theory of liquidity preference to explain how a decrease in the money supply affects the aggregate-demand curve.
3. The government spends \$3 billion to buy police cars. Explain why aggregate demand might increase by more than \$3 billion. Explain why aggregate demand might increase by less than \$3 billion.
4. Suppose that survey measures of consumer confidence indicate a wave of pessimism is sweeping the country. If policymakers do nothing, what will happen to aggregate demand? What should the Fed do if it wants to stabilize aggregate demand? If the Fed does nothing, what might Congress do to stabilize aggregate demand?
5. Give an example of a government policy that acts as an automatic stabilizer. Explain why the policy has this effect.

Chapter Recap: Problems and Applications

1. Explain how each of the following developments would affect the supply of money, the demand for money, and the interest rate. Illustrate your answers with diagrams.
 - a. The Fed's bond traders buy bonds in open-market operations.
 - b. An increase in credit-card availability reduces the cash people hold.
 - c. The Federal Reserve reduces banks' reserve requirements.
 - d. Households decide to hold more money to use for holiday shopping.
 - e. A wave of optimism boosts business investment and expands aggregate demand.
2. The Federal Reserve expands the money supply by 5 percent.
 - a. Use the theory of liquidity preference to illustrate in a graph the impact of this policy on the interest rate.
 - b. Use the model of aggregate demand and aggregate supply to illustrate the impact of this change in the interest rate on output and the price level in the short run.
 - c. When the economy makes the transition from its short-run equilibrium to its long-run equilibrium, what will happen to the price level?
 - d. How will this change in the price level affect the demand for money and the equilibrium interest rate?
 - e. Is this analysis consistent with the proposition that money has real effects in the short run but is neutral in the long run?
3. Suppose a computer virus disables the nation's automatic teller machines, making withdrawals from bank accounts less convenient. As a result, people want to keep more cash on hand, increasing the demand for money.
 - a. Assume the Fed does not change the money supply. According to the theory of liquidity preference, what happens to the interest rate? What happens to aggregate demand?
 - b. If instead the Fed wants to stabilize aggregate demand, how should it change the money supply?
 - c. If it wants to accomplish this change in the money supply using open-market operations, what should it do?
4. Consider two policies—a tax cut that will last for only one year and a tax cut that is expected to be permanent. Which policy will stimulate greater spending by consumers? Which policy will have the greater impact on aggregate demand? Explain.
5. The economy is in a recession with high unemployment and low output.
 - a. Draw a graph of aggregate demand and aggregate supply to illustrate the current situation. Be sure to include the aggregate-demand curve, the short-run aggregate-supply curve, and the long-run aggregate-supply curve.
 - b. Identify an open-market operation that would restore the economy to its natural rate.
 - c. Draw a graph of the money market to illustrate the effect of this open-market operation. Show the resulting change in the interest rate.
 - d. Draw a graph similar to the one in part (a) to show the effect of the open-market operation on output and the price level. Explain in words why the policy has the effect that you have shown in the graph.
6. In the early 1980s, new legislation allowed banks to pay interest on checking deposits, which they could not do previously.
 - a. If we define money to include checking deposits, what effect did this legislation have on money demand? Explain.
 - b. If the Federal Reserve had maintained a constant money supply in the face of this change, what would have happened to the interest rate? What would have happened to aggregate demand and aggregate output?

- c. If the Federal Reserve had maintained a constant market interest rate (the interest rate on nonmonetary assets) in the face of this change, what change in the money supply would have been necessary? What would have happened to aggregate demand and aggregate output?
7. Suppose economists observe that an increase in government spending of \$10 billion raises the total demand for goods and services by \$30 billion.
- If these economists ignore the possibility of crowding out, what would they estimate the marginal propensity to consume (MPC) to be?
 - Now suppose the economists allow for crowding out. Would their new estimate of the MPC be larger or smaller than their initial one?
8. Suppose the government reduces taxes by \$20 billion, that there is no crowding out, and that the marginal propensity to consume is $\frac{3}{4}$.
- What is the initial effect of the tax reduction on aggregate demand?
 - What additional effects follow this initial effect? What is the total effect of the tax cut on aggregate demand?
 - How does the total effect of this \$20 billion tax cut compare to the total effect of a \$20 billion increase in government purchases? Why?
 - Based on your answer to part (c), can you think of a way in which the government can increase aggregate demand without changing the government's budget deficit?
9. An economy is operating with output \$400 billion below its natural rate, and fiscal policy makers want to close this recessionary gap. The central bank agrees to adjust the money supply to hold the interest rate constant, so there is no crowding out. The marginal propensity to consume is $\frac{4}{5}$, and the price level is completely fixed in the short run. In what direction and by how much would government spending need to change to close the recessionary gap? Explain your thinking.
10. Suppose government spending increases. Would the effect on aggregate demand be larger if the Federal Reserve held the money supply constant in response or if the Fed were committed to maintaining a fixed interest rate? Explain.
11. In which of the following circumstances is expansionary fiscal policy more likely to lead to a short-run increase in investment? Explain.
- When the investment accelerator is large or when it is small?
 - When the interest sensitivity of investment is large or when it is small?
12. For various reasons, fiscal policy changes automatically when output and employment fluctuate.
- Explain why tax revenue changes when the economy goes into a recession.
 - Explain why government spending changes when the economy goes into a recession.
 - If the government were to operate under a strict balanced-budget rule, what would it have to do in a recession? Would that make the recession more or less severe?
13. Some members of Congress have proposed a law that would make price stability the sole goal of monetary policy. Suppose such a law were passed.
- How would the Fed respond to an event that contracted aggregate demand?
 - How would the Fed respond to an event that caused an adverse shift in short-run aggregate supply?

In each case, is there another monetary policy that would lead to greater stability in output?

For further information on topics in this chapter, additional problems, applications, examples, online quizzes, and more, please visit our website at www.cengage.com/economics/mankiw (<http://www.cengage.com/economics/mankiw>).

Chapter Recap: Key Terms

- automatic stabilizers

changes in fiscal policy that stimulate aggregate demand when the economy goes into a recession without policymakers having to take any deliberate action

- crowding-out effect

the offset in aggregate demand that results when expansionary fiscal policy raises the interest rate and thereby reduces investment spending

- fiscal policy

the setting of the level of government spending and taxation by government policymakers

- multiplier effect

the additional shifts in aggregate demand that result when expansionary fiscal policy increases income and thereby increases consumer spending

- theory of liquidity preference

Keynes's theory that the interest rate adjusts to bring money supply and money demand into balance