Twelve

SHORT-RUN ECONOMIC FLUCTUATIONS
Economic activity fluctuates from year to year. In most years, the production of goods and services rises. Because of increases in the labor force, increases in the capital stock, and advances in technological knowledge, the economy can produce more and more over time. This growth allows everyone to enjoy a higher standard of living. On average over the past 50 years, the production of the U.S. economy as measured by real GDP has grown by about 3 percent per year.

In some years, however, this normal growth does not occur. Firms find themselves unable to sell all of the goods and services they have to offer, so they cut back on production. Workers are laid off, unemployment rises, and factories are left idle. With the economy producing fewer goods and services, real GDP and other measures of income fall. Such a period of falling incomes and rising
unemployment is called a **recession** if it is relatively mild and a **depression** if it is more severe.

What causes short-run fluctuations in economic activity? What, if anything, can public policy do to prevent periods of falling incomes and rising unemployment? When recessions and depressions occur, how can policymakers reduce their length and severity? These are the questions that we take up in this and the next two chapters.

The variables that we study in the coming chapters are largely those we have already seen. They include GDP, unemployment, interest rates, exchange rates, and the price level. Also familiar are the policy instruments of government spending, taxes, and the money supply. What differs in the next few chapters is the time horizon of our analysis. Our focus in the previous seven chapters has been on the behavior of the economy in the long run. Our focus now is on the economy’s short-run fluctuations around its long-run trend.

Although there remains some debate among economists about how to analyze short-run fluctuations, most economists use the *model of aggregate demand and aggregate supply*. Learning how to use this model for analyzing the short-run effects of various events and policies is the primary task ahead. This chapter introduces the model’s two key pieces—the aggregate-demand curve and the aggregate-supply curve. After getting a sense of the overall structure of the model in this chapter, we examine the pieces of the model in more detail in the next two chapters.

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**THREE KEY FACTS ABOUT ECONOMIC FLUCTUATIONS**

Short-run fluctuations in economic activity occur in all countries and in all times throughout history. As a starting point for understanding these year-to-year fluctuations, let’s discuss some of their most important properties.

**FACT 1: ECONOMIC FLUCTUATIONS ARE IRREGULAR AND UNPREDICTABLE**

Fluctuations in the economy are often called *the business cycle*. As this term suggests, economic fluctuations correspond to changes in business conditions. When real GDP grows rapidly, business is good. Firms find that customers are plentiful and that profits are growing. On the other hand, when real GDP falls, businesses have trouble. In recessions, most firms experience declining sales and profits.

The term *business cycle* is somewhat misleading, however, because it seems to suggest that economic fluctuations follow a regular, predictable pattern. In fact, economic fluctuations are not at all regular, and they are almost impossible to predict with much accuracy. Panel (a) of Figure 31-1 shows the real GDP of the U.S. economy since 1965. The shaded areas represent times of recession. As the figure shows, recessions do not come at regular intervals. Sometimes recessions are close...
A Look at Short-Run Economic Fluctuations. This figure shows real GDP in panel (a), investment spending in panel (b), and unemployment in panel (c) for the U.S. economy using quarterly data since 1965. Recessions are shown as the shaded areas. Notice that real GDP and investment spending decline during recessions, while unemployment rises.

Source: U.S. Department of Commerce; U.S. Department of Labor.
together, such as the recessions of 1980 and 1982. Sometimes the economy goes many years without a recession.

**FACT 2: MOST MACROECONOMIC QUANTITIES FLUCTUATE TOGETHER**

Real GDP is the variable that is most commonly used to monitor short-run changes in the economy because it is the most comprehensive measure of economic activity. Real GDP measures the value of all final goods and services produced within a given period of time. It also measures the total income (adjusted for inflation) of everyone in the economy.

It turns out, however, that for monitoring short-run fluctuations, it does not really matter which measure of economic activity one looks at. Most macroeconomic variables that measure some type of income, spending, or production fluctuate closely together. When real GDP falls in a recession, so do personal income, corporate profits, consumer spending, investment spending, industrial production, retail sales, home sales, auto sales, and so on. Because recessions are economy-wide phenomena, they show up in many sources of macroeconomic data.

Although many macroeconomic variables fluctuate together, they fluctuate by different amounts. In particular, as panel (b) of Figure 31-1 shows, investment spending varies greatly over the business cycle. Even though investment averages about one-seventh of GDP, declines in investment account for about two-thirds of the declines in GDP during recessions. In other words, when economic conditions deteriorate, much of the decline is attributable to reductions in spending on new factories, housing, and inventories.
FACT 3: AS OUTPUT FALLS, UNEMPLOYMENT RISES

Changes in the economy’s output of goods and services are strongly correlated with changes in the economy’s utilization of its labor force. In other words, when real GDP declines, the rate of unemployment rises. This fact is hardly surprising: When firms choose to produce a smaller quantity of goods and services, they lay off workers, expanding the pool of unemployed.

Panel (c) of Figure 31-1 shows the unemployment rate in the U.S. economy since 1965. Once again, recessions are shown as the shaded areas in the figure. The figure shows clearly the impact of recessions on unemployment. In each of the recessions, the unemployment rate rises substantially. When the recession ends and real GDP starts to expand, the unemployment rate gradually declines. The unemployment rate never approaches zero; instead, it fluctuates around its natural rate of about 5 percent.

**QUICK QUIZ:** List and discuss three key facts about economic fluctuations.

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EXPLAINING SHORT-RUN ECONOMIC FLUCTUATIONS

Describing the regular patterns that economies experience as they fluctuate over time is easy. Explaining what causes these fluctuations is more difficult. Indeed, compared to the topics we have studied in previous chapters, the theory of economic fluctuations remains controversial. In this and the next two chapters, we develop the model that most economists use to explain short-run fluctuations in economic activity.

HOW THE SHORT RUN DIFFERS FROM THE LONG RUN

In previous chapters we developed theories to explain what determines most important macroeconomic variables in the long run. Chapter 24 explained the level and growth of productivity and real GDP. Chapter 25 explained how the real interest rate adjusts to balance saving and investment. Chapter 26 explained why there is always some unemployment in the economy. Chapters 27 and 28 explained the monetary system and how changes in the money supply affect the price level, the inflation rate, and the nominal interest rate. Chapters 29 and 30 extended this analysis to open economies in order to explain the trade balance and the exchange rate.

All of this previous analysis was based on two related ideas—the classical dichotomy and monetary neutrality. Recall that the classical dichotomy is the separation of variables into real variables (those that measure quantities or relative prices) and nominal variables (those measured in terms of money). According to classical macroeconomic theory, changes in the money supply affect nominal variables but not real variables. As a result of this monetary neutrality, Chapters 24, 25,
and 26 were able to examine the determinants of real variables (real GDP, the real interest rate, and unemployment) without introducing nominal variables (the money supply and the price level).

Do these assumptions of classical macroeconomic theory apply to the world in which we live? The answer to this question is of central importance to understanding how the economy works: Most economists believe that classical theory describes the world in the long run but not in the short run. Beyond a period of several years, changes in the money supply affect prices and other nominal variables but do not affect real GDP, unemployment, or other real variables. When studying year-to-year changes in the economy, however, the assumption of monetary neutrality is no longer appropriate. Most economists believe that, in the short run, real and nominal variables are highly intertwined. In particular, changes in the money supply can temporarily push output away from its long-run trend.

To understand the economy in the short run, therefore, we need a new model. To build this new model, we rely on many of the tools we have developed in previous chapters, but we have to abandon the classical dichotomy and the neutrality of money.

THE BASIC MODEL OF ECONOMIC FLUCTUATIONS

Our model of short-run economic fluctuations focuses on the behavior of two variables. The first variable is the economy’s output of goods and services, as measured by real GDP. The second variable is the overall price level, as measured by the CPI or the GDP deflator. Notice that output is a real variable, whereas the price level is a nominal variable. Hence, by focusing on the relationship between these two variables, we are highlighting the breakdown of the classical dichotomy.

We analyze fluctuations in the economy as a whole with the model of aggregate demand and aggregate supply, which is illustrated in Figure 31-2. On the vertical axis is the overall price level in the economy. On the horizontal axis is the overall quantity of goods and services. The aggregate-demand curve shows the quantity of goods and services that households, firms, and the government want to buy at each price level. The aggregate-supply curve shows the quantity of goods and services that firms produce and sell at each price level. According to this model, the price level and the quantity of output adjust to bring aggregate demand and aggregate supply into balance.

It may be tempting to view the model of aggregate demand and aggregate supply as nothing more than a large version of the model of market demand and market supply, which we introduced in Chapter 4. Yet in fact this model is quite different. When we consider demand and supply in a particular market—ice cream, for instance—the behavior of buyers and sellers depends on the ability of resources to move from one market to another. When the price of ice cream rises, the quantity demanded falls because buyers will use their incomes to buy products other than ice cream. Similarly, a higher price of ice cream raises the quantity supplied because firms that produce ice cream can increase production by hiring workers away from other parts of the economy. This microeconomic substitution from one market to another is impossible when we are analyzing the economy as a whole. After all, the quantity that our model is trying to explain—real GDP—measures the total quantity produced in all of the economy’s markets. To understand why the aggregate-demand curve is downward sloping and why the
aggregate-supply curve is upward sloping, we need a *macroeconomic* theory. Developing such a theory is our next task.

**QUICK QUIZ:** How does the economy’s behavior in the short run differ from its behavior in the long run? ♦ Draw the model of aggregate demand and aggregate supply. What variables are on the two axes?

**THE AGGREGATE-DEMAND CURVE**

The aggregate-demand curve tells us the quantity of all goods and services demanded in the economy at any given price level. As Figure 31-3 illustrates, the aggregate-demand curve is downward sloping. This means that, other things equal, a fall in the economy’s overall level of prices (from, say, $P_1$ to $P_2$) tends to raise the quantity of goods and services demanded (from $Y_1$ to $Y_2$).

**WHY THE AGGREGATE-DEMAND CURVE SLOPES DOWNWARD**

Why does a fall in the price level raise the quantity of goods and services demanded? To answer this question, it is useful to recall that GDP (which we denote as $Y$) is the sum of consumption ($C$), investment ($I$), government purchases ($G$), and net exports ($NX$):
Each of these four components contributes to the aggregate demand for goods and services. For now, we assume that government spending is fixed by policy. The other three components of spending—consumption, investment, and net exports—depend on economic conditions and, in particular, on the price level. To understand the downward slope of the aggregate-demand curve, therefore, we must examine how the price level affects the quantity of goods and services demanded for consumption, investment, and net exports.

**The Price Level and Consumption: The Wealth Effect**  Consider the money that you hold in your wallet and your bank account. The nominal value of this money is fixed, but its real value is not. When prices fall, these dollars are more valuable because they can be used to buy more goods and services. Thus, a decrease in the price level makes consumers feel more wealthy, which in turn encourages them to spend more. The increase in consumer spending means a larger quantity of goods and services demanded.

**The Price Level and Investment: The Interest-Rate Effect**  As we discussed in Chapter 28, the price level is one determinant of the quantity of money demanded. The lower the price level, the less money households need to hold to buy the goods and services they want. When the price level falls, therefore, households try to reduce their holdings of money by lending some of it out. For instance, a household might use its excess money to buy interest-bearing bonds. Or it might deposit its excess money in an interest-bearing savings account, and the bank would use these funds to make more loans. In either case, as households try to convert some of their money into interest-bearing assets, they drive down the quantity of goods and services demanded.

\[ Y = C + I + G + NX. \]
interest rates. Lower interest rates, in turn, encourage borrowing by firms that want to invest in new plants and equipment and by households who want to invest in new housing. Thus, a lower price level reduces the interest rate, encourages greater spending on investment goods, and thereby increases the quantity of goods and services demanded.

**The Price Level and Net Exports: The Exchange-Rate Effect** As we have just discussed, a lower price level in the United States lowers the U.S. interest rate. In response, some U.S. investors will seek higher returns by investing abroad. For instance, as the interest rate on U.S. government bonds falls, a mutual fund might sell U.S. government bonds in order to buy German government bonds. As the mutual fund tries to move assets overseas, it increases the supply of dollars in the market for foreign-currency exchange. The increased supply of dollars causes the dollar to depreciate relative to other currencies. Because each dollar buys fewer units of foreign currencies, foreign goods become more expensive relative to domestic goods. This change in the real exchange rate (the relative price of domestic and foreign goods) increases U.S. exports of goods and services and decreases U.S. imports of goods and services. Net exports, which equal exports minus imports, also increase. Thus, when a fall in the U.S. price level causes U.S. interest rates to fall, the real exchange rate depreciates, and this depreciation stimulates U.S. net exports and thereby increases the quantity of goods and services demanded.

**Summary** There are, therefore, three distinct but related reasons why a fall in the price level increases the quantity of goods and services demanded: (1) Consumers feel wealthier, which stimulates the demand for consumption goods. (2) Interest rates fall, which stimulates the demand for investment goods. (3) The exchange rate depreciates, which stimulates the demand for net exports. For all three reasons, the aggregate-demand curve slopes downward.

It is important to keep in mind that the aggregate-demand curve (like all demand curves) is drawn holding “other things equal.” In particular, our three explanations of the downward-sloping aggregate-demand curve assume that the money supply is fixed. That is, we have been considering how a change in the price level affects the demand for goods and services, holding the amount of money in the economy constant. As we will see, a change in the quantity of money shifts the aggregate-demand curve. At this point, just keep in mind that the aggregate-demand curve is drawn for a given quantity of money.

**WHY THE AGGREGATE-DEMAND CURVE MIGHT SHIFT**

The downward slope of the aggregate-demand curve shows that a fall in the price level raises the overall quantity of goods and services demanded. Many other factors, however, affect the quantity of goods and services demanded at a given price level. When one of these other factors changes, the aggregate-demand curve shifts.

Let’s consider some examples of events that shift aggregate demand. We can categorize them according to which component of spending is most directly affected.

**Shifts Arising from Consumption** Suppose Americans suddenly become more concerned about saving for retirement and, as a result, reduce their current consumption. Because the quantity of goods and services demanded at
any price level is lower, the aggregate-demand curve shifts to the left. Conversely, imagine that a stock market boom makes people feel wealthy and less concerned about saving. The resulting increase in consumer spending means a greater quantity of goods and services demanded at any given price level, so the aggregate-demand curve shifts to the right.

Thus, any event that changes how much people want to consume at a given price level shifts the aggregate-demand curve. One policy variable that has this effect is the level of taxation. When the government cuts taxes, it encourages people to spend more, so the aggregate-demand curve shifts to the right. When the government raises taxes, people cut back on their spending, and the aggregate-demand curve shifts to the left.

Shifting Arising from Investment Any event that changes how much firms want to invest at a given price level also shifts the aggregate-demand curve. For instance, imagine that the computer industry introduces a faster line of computers, and many firms decide to invest in new computer systems. Because the quantity of goods and services demanded at any price level is higher, the aggregate-demand curve shifts to the right. Conversely, if firms become pessimistic about future business conditions, they may cut back on investment spending, shifting the aggregate-demand curve to the left.

Tax policy can also influence aggregate demand through investment. As we saw in Chapter 25, an investment tax credit (a tax rebate tied to a firm’s investment spending) increases the quantity of investment goods that firms demand at any given interest rate. It therefore shifts the aggregate-demand curve to the right. The repeal of an investment tax credit reduces investment and shifts the aggregate-demand curve to the left.

Another policy variable that can influence investment and aggregate demand is the money supply. As we discuss more fully in the next chapter, an increase in the money supply lowers the interest rate in the short run. This makes borrowing less costly, which stimulates investment spending and thereby shifts the aggregate-demand curve to the right. Conversely, a decrease in the money supply raises the interest rate, discourages investment spending, and thereby shifts the aggregate-demand curve to the left. Many economists believe that throughout U.S. history changes in monetary policy have been an important source of shifts in aggregate demand.

Shifting Arising from Government Purchases The most direct way that policymakers shift the aggregate-demand curve is through government purchases. For example, suppose Congress decides to reduce purchases of new weapons systems. Because the quantity of goods and services demanded at any price level is lower, the aggregate-demand curve shifts to the left. Conversely, if state governments start building more highways, the result is a greater quantity of goods and services demanded at any price level, so the aggregate-demand curve shifts to the right.

Shifting Arising from Net Exports Any event that changes net exports for a given price level also shifts aggregate demand. For instance, when Europe experiences a recession, it buys fewer goods from the United States. This reduces U.S. net exports and shifts the aggregate-demand curve for the U.S. economy to
the left. When Europe recovers from its recession, it starts buying U.S. goods again, shifting the aggregate-demand curve to the right.

Net exports sometimes change because of movements in the exchange rate. Suppose, for instance, that international speculators bid up the value of the U.S. dollar in the market for foreign-currency exchange. This appreciation of the dollar would make U.S. goods more expensive compared to foreign goods, which would depress net exports and shift the aggregate-demand curve to the left. Conversely, a depreciation of the dollar stimulates net exports and shifts the aggregate-demand curve to the right.

**Summary**  In the next chapter we analyze the aggregate-demand curve in more detail. There we examine more precisely how the tools of monetary and fiscal policy can shift aggregate demand and whether policymakers should use these tools for that purpose. At this point, however, you should have some idea about why the aggregate-demand curve slopes downward and what kinds of events and policies can shift this curve. Table 31-1 summarizes what we have learned so far.

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**Table 31-1**

**THE AGGREGATE-DEMAND CURVE: SUMMARY**

<table>
<thead>
<tr>
<th>WHY DOES THE AGGREGATE-DEMAND CURVE SLOPE DOWNWARD?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>The Wealth Effect:</em> A lower price level increases real wealth, which encourages spending on consumption.</td>
</tr>
<tr>
<td>2. <em>The Interest-Rate Effect:</em> A lower price level reduces the interest rate, which encourages spending on investment.</td>
</tr>
<tr>
<td>3. <em>The Exchange-Rate Effect:</em> A lower price level causes the real exchange rate to depreciate, which encourages spending on net exports.</td>
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<table>
<thead>
<tr>
<th>WHY MIGHT THE AGGREGATE-DEMAND CURVE SHIFT?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>Shifts Arising from Consumption:</em> An event that makes consumers spend more at a given price level (a tax cut, a stock market boom) shifts the aggregate-demand curve to the right. An event that makes consumers spend less at a given price level (a tax hike, a stock market decline) shifts the aggregate-demand curve to the left.</td>
</tr>
<tr>
<td>2. <em>Shifts Arising from Investment:</em> An event that makes firms invest more at a given price level (optimism about the future, a fall in interest rates due to an increase in the money supply) shifts the aggregate-demand curve to the right. An event that makes firms invest less at a given price level (pessimism about the future, a rise in interest rates due to a decrease in the money supply) shifts the aggregate-demand curve to the left.</td>
</tr>
<tr>
<td>3. <em>Shifts Arising from Government Purchases:</em> An increase in government purchases of goods and services (greater spending on defense or highway construction) shifts the aggregate-demand curve to the right. A decrease in government purchases on goods and services (a cutback in defense or highway spending) shifts the aggregate-demand curve to the left.</td>
</tr>
<tr>
<td>4. <em>Shifts Arising from Net Exports:</em> An event that raises spending on net exports at a given price level (a boom overseas, an exchange-rate depreciation) shifts the aggregate-demand curve to the right. An event that reduces spending on net exports at a given price level (a recession overseas, an exchange-rate appreciation) shifts the aggregate-demand curve to the left.</td>
</tr>
</tbody>
</table>
QUICK QUIZ: Explain the three reasons why the aggregate-demand curve slopes downward. Give an example of an event that would shift the aggregate-demand curve. Which way would this event shift the curve?

THE AGGREGATE-SUPPLY CURVE

The aggregate-supply curve tells us the total quantity of goods and services that firms produce and sell at any given price level. Unlike the aggregate-demand curve, which is always downward sloping, the aggregate-supply curve shows a relationship that depends crucially on the time horizon being examined. In the long run, the aggregate-supply curve is vertical, whereas in the short run, the aggregate-supply curve is upward sloping. To understand short-run economic fluctuations, and how the short-run behavior of the economy deviates from its long-run behavior, we need to examine both the long-run aggregate-supply curve and the short-run aggregate-supply curve.

WHY THE AGGREGATE-SUPPLY CURVE IS VERTICAL IN THE LONG RUN

What determines the quantity of goods and services supplied in the long run? We implicitly answered this question earlier in the book when we analyzed the process of economic growth. In the long run, an economy's production of goods and services (its real GDP) depends on its supplies of labor, capital, and natural resources and on the available technology used to turn these factors of production into goods and services. Because the price level does not affect these long-run determinants of real GDP, the long-run aggregate-supply curve is vertical, as in Figure 31-4. In other words, in the long run, the economy’s labor, capital, natural resources, and technology determine the total quantity of goods and services supplied, and this quantity supplied is the same regardless of what the price level happens to be.

The vertical long-run aggregate-supply curve is, in essence, just an application of the classical dichotomy and monetary neutrality. As we have already discussed, classical macroeconomic theory is based on the assumption that real variables do not depend on nominal variables. The long-run aggregate-supply curve is consistent with this idea because it implies that the quantity of output (a real variable) does not depend on the level of prices (a nominal variable). As noted earlier, most economists believe that this principle works well when studying the economy over a period of many years, but not when studying year-to-year changes. Thus, the aggregate-supply curve is vertical only in the long run.

One might wonder why supply curves for specific goods and services can be upward sloping if the long-run aggregate-supply curve is vertical. The reason is that the supply of specific goods and services depends on relative prices—the prices of those goods and services compared to other prices in the economy. For example, when the price of ice cream rises, suppliers of ice cream increase their production, taking labor, milk, chocolate, and other inputs away from the production of other goods, such as frozen yogurt. By contrast, the economy’s overall production of
goods and services is limited by its labor, capital, natural resources, and technology. Thus, when all prices in the economy rise together, there is no change in the overall quantity of goods and services supplied.

**WHY THE LONG-RUN AGGREGATE-SUPPLY CURVE MIGHT SHIFT**

The position of the long-run aggregate-supply curve shows the quantity of goods and services predicted by classical macroeconomic theory. This level of production is sometimes called *potential output* or *full-employment output*. To be more accurate, we call it the *natural rate of output* because it shows what the economy produces when unemployment is at its natural, or normal, rate. The natural rate of output is the level of production toward which the economy gravitates in the long run.

Any change in the economy that alters the natural rate of output shifts the long-run aggregate-supply curve. Because output in the classical model depends on labor, capital, natural resources, and technological knowledge, we can categorize shifts in the long-run aggregate-supply curve as arising from these sources.

**Shifts Arising from Labor** Imagine that an economy experiences an increase in immigration from abroad. Because there would be a greater number of workers, the quantity of goods and services supplied would increase. As a result, the long-run aggregate-supply curve would shift to the right. Conversely, if many workers left the economy to go abroad, the long-run aggregate-supply curve would shift to the left.

The position of the long-run aggregate-supply curve also depends on the natural rate of unemployment, so any change in the natural rate of unemployment shifts the long-run aggregate-supply curve. For example, if Congress were to raise
the minimum wage substantially, the natural rate of unemployment would rise, and the economy would produce a smaller quantity of goods and services. As a result, the long-run aggregate-supply curve would shift to the left. Conversely, if a reform of the unemployment insurance system were to encourage unemployed workers to search harder for new jobs, the natural rate of unemployment would fall, and the long-run aggregate-supply curve would shift to the right.

**Shifts Arising from Capital**  An increase in the economy’s capital stock increases productivity and, thereby, the quantity of goods and services supplied. As a result, the long-run aggregate-supply curve shifts to the right. Conversely, a decrease in the economy’s capital stock decreases productivity and the quantity of goods and services supplied, shifting the long-run aggregate-supply curve to the left.

Notice that the same logic applies regardless of whether we are discussing physical capital or human capital. An increase either in the number of machines or in the number of college degrees will raise the economy’s ability to produce goods and services. Thus, either would shift the long-run aggregate-supply curve to the right.

**Shifts Arising from Natural Resources**  An economy’s production depends on its natural resources, including its land, minerals, and weather. A discovery of a new mineral deposit shifts the long-run aggregate-supply curve to the right. A change in weather patterns that makes farming more difficult shifts the long-run aggregate-supply curve to the left.

In many countries, important natural resources are imported from abroad. A change in the availability of these resources can also shift the aggregate-supply curve. As we discuss later in this chapter, events occurring in the world oil market have historically been an important source of shifts in aggregate supply.

**Shifts Arising from Technological Knowledge**  Perhaps the most important reason that the economy today produces more than it did a generation ago is that our technological knowledge has advanced. The invention of the computer, for instance, has allowed us to produce more goods and services from any given amounts of labor, capital, and natural resources. As a result, it has shifted the long-run aggregate-supply curve to the right.

Although not literally technological, there are many other events that act like changes in technology. As Chapter 9 explains, opening up international trade has effects similar to inventing new production processes, so it also shifts the long-run aggregate-supply curve to the right. Conversely, if the government passed new regulations preventing firms from using some production methods, perhaps because they were too dangerous for workers, the result would be a leftward shift in the long-run aggregate-supply curve.

**Summary**  The long-run aggregate-supply curve reflects the classical model of the economy we developed in previous chapters. Any policy or event that raised real GDP in previous chapters can now be viewed as increasing the quantity of goods and services supplied and shifting the long-run aggregate-supply curve to the right. Any policy or event that lowered real GDP in previous chapters can now
be viewed as decreasing the quantity of goods and services supplied and shifting the long-run aggregate-supply curve to the left.

A NEW WAY TO DEPICT LONG-RUN GROWTH AND INFLATION

Having introduced the economy’s aggregate-demand curve and the long-run aggregate-supply curve, we now have a new way to describe the economy’s long-run trends. Figure 31-5 illustrates the changes that occur in the economy from decade to decade. Notice that both curves are shifting. Although there are many forces that govern the economy in the long run and can in principle cause such shifts, the two most important in practice are technology and monetary policy. Technological progress enhances the economy’s ability to produce goods and services, and this continually shifts the long-run aggregate-supply curve to the right. At the same time, because the Fed increases the money supply over time, the aggregate-demand curve also shifts to the right. As the figure illustrates, the result is trend growth in output (as shown by increasing \( Y \)) and continuing inflation (as shown by increasing \( P \)). This is just another way of representing the classical analysis of growth and inflation we conducted in Chapters 24 and 28.

The purpose of developing the model of aggregate demand and aggregate supply, however, is not to dress our long-run conclusions in new clothing. Instead,
it is to provide a framework for short-run analysis, as we will see in a moment. As we develop the short-run model, we keep the analysis simple by not showing the continuing growth and inflation depicted in Figure 31-5. But always remember that long-run trends provide the background for short-run fluctuations. *Short-run fluctuations in output and the price level should be viewed as deviations from the continuing long-run trends.*

**WHY THE AGGREGATE-SUPPLY CURVE SLOPES UPWARD IN THE SHORT RUN**

We now come to the key difference between the economy in the short run and in the long run: the behavior of aggregate supply. As we have already discussed, the long-run aggregate-supply curve is vertical. By contrast, in the short run, the aggregate-supply curve is upward sloping, as shown in Figure 31-6. That is, over a period of a year or two, an increase in the overall level of prices in the economy tends to raise the quantity of goods and services supplied, and a decrease in the level of prices tends to reduce the quantity of goods and services supplied.

What causes this positive relationship between the price level and output? Macroeconomists have proposed three theories for the upward slope of the short-run aggregate-supply curve. In each theory, a specific market imperfection causes the supply side of the economy to behave differently in the short run than it does in the long run. Although each of the following theories will differ in detail, they share a common theme: The quantity of output supplied deviates from its long-run, or “natural,” level when the price level deviates from the price level that people expected. When the price level rises above the expected level, output rises above its natural rate, and when the price level falls below the expected level, output falls below its natural rate.

![Figure 31-6](image-url)

**Figure 31-6**

**The Short-Run Aggregate-Supply Curve.** In the short run, a fall in the price level from \( P_1 \) to \( P_2 \) reduces the quantity of output supplied from \( Y_1 \) to \( Y_2 \). This positive relationship could be due to misperceptions, sticky wages, or sticky prices. Over time, perceptions, wages, and prices adjust, so this positive relationship is only temporary.
**The Misperceptions Theory**  One approach to the short-run aggregate-supply curve is the misperceptions theory. According to this theory, changes in the overall price level can temporarily mislead suppliers about what is happening in the individual markets in which they sell their output. As a result of these short-run misperceptions, suppliers respond to changes in the level of prices, and this response leads to an upward-sloping aggregate-supply curve.

To see how this might work, suppose the overall price level falls below the level that people expected. When suppliers see the prices of their products fall, they may mistakenly believe that their relative prices have fallen. For example, wheat farmers may notice a fall in the price of wheat before they notice a fall in the prices of the many items they buy as consumers. They may infer from this observation that the reward to producing wheat is temporarily low, and they may respond by reducing the quantity of wheat they supply. Similarly, workers may notice a fall in their nominal wages before they notice a fall in the prices of the goods they buy. They may infer that the reward to working is temporarily low and respond by reducing the quantity of labor they supply. In both cases, a lower price level causes misperceptions about relative prices, and these misperceptions induce suppliers to respond to the lower price level by decreasing the quantity of goods and services supplied.

**The Sticky-Wage Theory**  A second explanation of the upward slope of the short-run aggregate-supply curve is the sticky-wage theory. According to this theory, the short-run aggregate-supply curve slopes upward because nominal wages are slow to adjust, or are “sticky,” in the short run. To some extent, the slow adjustment of nominal wages is attributable to long-term contracts between workers and firms that fix nominal wages, sometimes for as long as three years. In addition, this slow adjustment may be attributable to social norms and notions of fairness that influence wage setting and that change only slowly over time.

To see what sticky nominal wages mean for aggregate supply, imagine that a firm has agreed in advance to pay its workers a certain nominal wage based on what it expected the price level to be. If the price level $P$ falls below the level that was expected and the nominal wage remains stuck at $W$, then the real wage $W/P$ rises above the level the firm planned to pay. Because wages are a large part of a firm’s production costs, a higher real wage means that the firm’s real costs have risen. The firm responds to these higher costs by hiring less labor and producing a smaller quantity of goods and services. In other words, because wages do not adjust immediately to the price level, a lower price level makes employment and production less profitable, which induces firms to reduce the quantity of goods and services supplied.

**The Sticky-Price Theory**  Recently, some economists have advocated a third approach to the short-run aggregate-supply curve, called the sticky-price theory. As we just discussed, the sticky-wage theory emphasizes that nominal wages adjust slowly over time. The sticky-price theory emphasizes that the prices of some goods and services also adjust sluggishly in response to changing economic conditions. This slow adjustment of prices occurs in part because there are costs to adjusting prices, called menu costs. These menu costs include the cost of printing and distributing catalogs and the time required to change price tags. As a result of these costs, prices as well as wages may be sticky in the short run.
To see the implications of sticky prices for aggregate supply, suppose that each firm in the economy announces its prices in advance based on the economic conditions it expects to prevail. Then, after prices are announced, the economy experiences an unexpected contraction in the money supply, which (as we have learned) will reduce the overall price level in the long run. Although some firms reduce their prices immediately in response to changing economic conditions, other firms may not want to incur additional menu costs and, therefore, may temporarily lag behind. Because these lagging firms have prices that are too high, their sales decline. Declining sales, in turn, cause these firms to cut back on production and employment. In other words, because not all prices adjust instantly to changing conditions, an unexpected fall in the price level leaves some firms with higher-than-desired prices, and these higher-than-desired prices depress sales and induce firms to reduce the quantity of goods and services they produce.

**Summary**  There are three alternative explanations for the upward slope of the short-run aggregate-supply curve: (1) misperceptions, (2) sticky wages, and (3) sticky prices. Economists debate which of these theories is correct. For our purposes in this book, however, the similarities of the theories are more important than the differences. All three theories suggest that output deviates from its natural rate when the price level deviates from the price level that people expected. We can express this mathematically as follows:

\[
\text{Quantity of output supplied} = \text{Natural rate of output} + a \left( \frac{\text{Actual price level}}{\text{Price level}} - \frac{\text{Expected price level}}{\text{Price level}} \right)
\]

where \( a \) is a number that determines how much output responds to unexpected changes in the price level.

Notice that each of the three theories of short-run aggregate supply emphasizes a problem that is likely to be only temporary. Whether the upward slope of the aggregate-supply curve is attributable to misperceptions, sticky wages, or sticky prices, these conditions will not persist forever. Eventually, as people adjust their expectations, misperceptions are corrected, nominal wages adjust, and prices become unstuck. In other words, the expected and actual price levels are equal in the long run, and the aggregate-supply curve is vertical rather than upward sloping.

**WHY THE SHORT-RUN AGGREGATE-SUPPLY CURVE MIGHT SHIFT**

The short-run aggregate-supply curve tells us the quantity of goods and services supplied in the short run for any given level of prices. We can think of this curve as similar to the long-run aggregate-supply curve but made upward sloping by the presence of misperceptions, sticky wages, and sticky prices. Thus, when think-
ing about what shifts the short-run aggregate-supply curve, we have to consider all those variables that shift the long-run aggregate-supply curve plus a new variable—the expected price level—that influences misperceptions, sticky wages, and sticky prices.

Let’s start with what we know about the long-run aggregate-supply curve. As we discussed earlier, shifts in the long-run aggregate-supply curve normally arise from changes in labor, capital, natural resources, or technological knowledge. These same variables shift the short-run aggregate-supply curve. For example, when an increase in the economy’s capital stock increases productivity, both the long-run and short-run aggregate-supply curves shift to the right. When an increase in the minimum wage raises the natural rate of unemployment, both the long-run and short-run aggregate-supply curves shift to the left.

The important new variable that affects the position of the short-run aggregate-supply curve is people’s expectation of the price level. As we have discussed, the quantity of goods and services supplied depends, in the short run, on misperceptions, sticky wages, and sticky prices. Yet perceptions, wages, and prices are set on the basis of expectations of the price level. So when expectations change, the short-run aggregate-supply curve shifts.

To make this idea more concrete, let’s consider a specific theory of aggregate supply—the sticky-wage theory. According to this theory, when people expect the price level to be high, they tend to set wages high. High wages raise firms’ costs and, for any given actual price level, reduce the quantity of goods and services that firms supply. Thus, when the expected price level rises, wages rise, costs rise, and firms choose to supply a smaller quantity of goods and services at any given actual price level. Thus, the short-run aggregate-supply curve shifts to the left. Conversely, when the expected price level falls, wages fall, costs fall, firms increase production, and the short-run aggregate-supply curve shifts to the right.

A similar logic applies in each theory of aggregate supply. The general lesson is the following: An increase in the expected price level reduces the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the left. A decrease in the expected price level raises the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the right. As we will see in the next section, this influence of expectations on the position of the short-run aggregate-supply curve plays a key role in reconciling the economy’s behavior in the short run with its behavior in the long run. In the short run, expectations are fixed, and the economy finds itself at the intersection of the aggregate-demand curve and the short-run aggregate-supply curve. In the long run, expectations adjust, and the short-run aggregate-supply curve shifts. This shift ensures that the economy eventually finds itself at the intersection of the aggregate-demand curve and the long-run aggregate-supply curve.

You should now have some understanding about why the short-run aggregate-supply curve slopes upward and what events and policies can cause this curve to shift. Table 31-2 summarizes our discussion.

**QUICK QUIZ:** Explain why the long-run aggregate-supply curve is vertical. Explain three theories for why the short-run aggregate-supply curve is upward sloping.
Table 31-2

<table>
<thead>
<tr>
<th>Why Does the Short-Run Aggregate-Supply Curve Slope Upward?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>The Misperceptions Theory</em>: An unexpectedly low price level leads some suppliers to think their relative prices have fallen, which induces a fall in production.</td>
</tr>
<tr>
<td>2. <em>The Sticky-Wage Theory</em>: An unexpectedly low price level raises the real wage, which causes firms to hire fewer workers and produce a smaller quantity of goods and services.</td>
</tr>
<tr>
<td>3. <em>The Sticky-Price Theory</em>: An unexpectedly low price level leaves some firms with higher-than-desired prices, which depresses their sales and leads them to cut back production.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Why Might the Short-Run Aggregate-Supply Curve Shift?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>Shifts Arising from Labor</em>: An increase in the quantity of labor available (perhaps due to a fall in the natural rate of unemployment) shifts the aggregate-supply curve to the right. A decrease in the quantity of labor available (perhaps due to a rise in the natural rate of unemployment) shifts the aggregate-supply curve to the left.</td>
</tr>
<tr>
<td>2. <em>Shifts Arising from Capital</em>: An increase in physical or human capital shifts the aggregate-supply curve to the right. A decrease in physical or human capital shifts the aggregate-supply curve to the left.</td>
</tr>
<tr>
<td>3. <em>Shifts Arising from Natural Resources</em>: An increase in the availability of natural resources shifts the aggregate-supply curve to the right. A decrease in the availability of natural resources shifts the aggregate-supply curve to the left.</td>
</tr>
<tr>
<td>4. <em>Shifts Arising from Technology</em>: An advance in technological knowledge shifts the aggregate-supply curve to the right. A decrease in the available technology (perhaps due to government regulation) shifts the aggregate-supply curve to the left.</td>
</tr>
<tr>
<td>5. <em>Shifts Arising from the Expected Price Level</em>: A decrease in the expected price level shifts the short-run aggregate-supply curve to the right. An increase in the expected price level shifts the short-run aggregate-supply curve to the left.</td>
</tr>
</tbody>
</table>

Two Causes of Economic Fluctuations

Now that we have introduced the model of aggregate demand and aggregate supply, we have the basic tools we need to analyze fluctuations in economic activity. In the next two chapters we will refine our understanding of how to use these tools. But even now we can use what we have learned about aggregate demand and aggregate supply to examine the two basic causes of short-run fluctuations.

Figure 31-7 shows an economy in long-run equilibrium. Equilibrium output and the price level are determined by the intersection of the aggregate-demand curve and the long-run aggregate-supply curve, shown as point A in the figure. At this point, output is at its natural rate. The short-run aggregate-supply curve passes through this point as well, indicating that perceptions, wages, and prices
have fully adjusted to this long-run equilibrium. That is, when an economy is in its long-run equilibrium, perceptions, wages, and prices must have adjusted so that the intersection of aggregate demand with short-run aggregate supply is the same as the intersection of aggregate demand with long-run aggregate supply.

THE EFFECTS OF A SHIFT IN AGGREGATE DEMAND

Suppose that for some reason a wave of pessimism suddenly overtakes the economy. The cause might be a scandal in the White House, a crash in the stock market, or the outbreak of a war overseas. Because of this event, many people lose confidence in the future and alter their plans. Households cut back on their spending and delay major purchases, and firms put off buying new equipment.

What is the impact of such a wave of pessimism on the economy? Such an event reduces the aggregate demand for goods and services. That is, for any given price level, households and firms now want to buy a smaller quantity of goods and services. As Figure 31-8 shows, the aggregate-demand curve shifts to the left from $AD_1$ to $AD_2$.

In this figure we can examine the effects of the fall in aggregate demand. In the short run, the economy moves along the initial short-run aggregate-supply curve $AS_1$, going from point A to point B. As the economy moves from point A to point B, output falls from $Y_1$ to $Y_2$, and the price level falls from $P_1$ to $P_2$. The falling level of output indicates that the economy is in a recession. Although not shown in the figure, firms respond to lower sales and production by reducing employment. Thus, the pessimism that caused the shift in aggregate demand is, to some extent, self-fulfilling: Pessimism about the future leads to falling incomes and rising unemployment.
What should policymakers do when faced with such a recession? One possibility is to take action to increase aggregate demand. As we noted earlier, an increase in government spending or an increase in the money supply would increase the quantity of goods and services demanded at any price and, therefore, would shift the aggregate-demand curve to the right. If policymakers can act with sufficient speed and precision, they can offset the initial shift in aggregate demand, return the aggregate-demand curve back to $AD_1$, and bring the economy back to point A. (The next chapter discusses in more detail the ways in which monetary and fiscal policy influence aggregate demand, as well as some of the practical difficulties in using these policy instruments.)

Even without action by policymakers, the recession will remedy itself over a period of time. Because of the reduction in aggregate demand, the price level falls. Eventually, expectations catch up with this new reality, and the expected price level falls as well. Because the fall in the expected price level alters perceptions, wages, and prices, it shifts the short-run aggregate-supply curve to the right from $AS_1$ to $AS_2$, and the economy reaches point C, where the new aggregate-demand curve crosses the long-run aggregate-supply curve. The price level falls to $P_3$, and output returns to its natural rate, $Y_1$.

In the new long-run equilibrium, point C, output is back to its natural rate. Even though the wave of pessimism has reduced aggregate demand, the price level has fallen sufficiently (to $P_3$) to offset the shift in the aggregate-demand curve. Thus, in the long run, the shift in aggregate demand is reflected fully in the price level and not at all in the level of output. In other words, the long-run effect of a shift in aggregate demand is a nominal change (the price level is lower) but not a real change (output is the same).
To sum up, this story about shifts in aggregate demand has two important lessons:

- In the short run, shifts in aggregate demand cause fluctuations in the economy's output of goods and services.
- In the long run, shifts in aggregate demand affect the overall price level but do not affect output.

**CASE STUDY  TWO BIG SHIFTS IN AGGREGATE DEMAND: THE GREAT DEPRESSION AND WORLD WAR II**

At the beginning of this chapter we established three key facts about economic fluctuations by looking at data since 1965. Let's now take a longer look at U.S. economic history. Figure 31-9 shows data on real GDP going back to 1900. Most short-run economic fluctuations are hard to see in this figure; they are dwarfed by the 25-fold rise in GDP over the past century. Yet two episodes jump out as being particularly significant—the large drop in real GDP in the early 1930s and the large increase in real GDP in the early 1940s. Both of these events are attributable to shifts in aggregate demand.

The economic calamity of the early 1930s is called the Great Depression, and it is by far the largest economic downturn in U.S. history. Real GDP fell by 27 percent from 1929 to 1933, and unemployment rose from 3 percent to 25 percent.

**Figure 31-9**

U.S. REAL GDP SINCE 1900. Over the course of U.S. economic history, two fluctuations stand out as being especially large. During the early 1930s, the economy went through the Great Depression, when the production of goods and services plummeted. During the early 1940s, the United States entered World War II, and the economy experienced rapidly rising production. Both of these events are usually explained by large shifts in aggregate demand.

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**NOTE:** Real GDP is graphed here using a proportional scale. This means that equal distances on the vertical axis represent equal percentage changes. For example, the distance between 1,000 and 2,000 (a 100 percent increase) is the same as the distance between 2,000 and 4,000 (a 100 percent increase). With such a scale, stable growth—say, 3 percent per year—would show up as an upward-sloping straight line.

**SOURCE:** U.S. Department of Commerce.
percent. At the same time, the price level fell by 22 percent over these four years. Many other countries experienced similar declines in output and prices during this period.

Economic historians continue to debate the causes of the Great Depression, but most explanations center on a large decline in aggregate demand. What caused aggregate demand to contract? Here is where the disagreement arises.

Many economists place primary blame on the decline in the money supply: From 1929 to 1933, the money supply fell by 28 percent. As you may recall from our discussion of the monetary system in Chapter 27, this decline in the money supply was due to problems in the banking system. As households withdrew their money from financially shaky banks and bankers became more cautious and started holding greater reserves, the process of money creation under fractional-reserve banking went into reverse. The Fed, meanwhile, failed to offset this fall in the money multiplier with expansionary open-market operations. As a result, the money supply declined. Many economists blame the Fed’s failure to act for the Great Depression’s severity.

Other economists have suggested alternative reasons for the collapse in aggregate demand. For example, stock prices fell about 90 percent during this period, depressing household wealth and thereby consumer spending. In addition, the banking problems may have prevented some firms from obtaining the financing they wanted for investment projects, and this would have depressed investment spending. Of course, all of these forces may have acted together to contract aggregate demand during the Great Depression.

The second significant episode in Figure 31-9—the economic boom of the early 1940s—is easier to explain. The obvious cause of this event is World War II. As the United States entered the war overseas, the federal government had to devote more resources to the military. Government purchases of goods and services increased almost fivefold from 1939 to 1944. This huge expansion in aggregate demand almost doubled the economy’s production of goods and services and led to a 20 percent increase in the price level (although widespread government price controls limited the rise in prices). Unemployment fell from 17 percent in 1939 to about 1 percent in 1944—the lowest level in U.S. history.
The effects of a shift in aggregate supply

Imagine once again an economy in its long-run equilibrium. Now suppose that suddenly some firms experience an increase in their costs of production. For example, bad weather in farm states might destroy some crops, driving up the cost of production and shifting the aggregate-supply curve to the left. This would result in a new long-run equilibrium, where the price level rises and the real GDP decreases, as the economy adjusts to the higher production costs.
of producing food products. Or a war in the Middle East might interrupt the shipping of crude oil, driving up the cost of producing oil products.

What is the macroeconomic impact of such an increase in production costs? For any given price level, firms now want to supply a smaller quantity of goods and services. Thus, as Figure 31-10 shows, the short-run aggregate-supply curve shifts to the left from $AS_1$ to $AS_2$. The result is stagflation: Output falls from $Y_1$ to $Y_2$, and the price level rises from $P_1$ to $P_2$.

In this figure we can trace the effects of the leftward shift in aggregate supply. In the short run, the economy moves along the existing aggregate-demand curve, going from point A to point B. The output of the economy falls from $Y_1$ to $Y_2$, and the price level rises from $P_1$ to $P_2$. Because the economy is experiencing both stagnation (falling output) and inflation (rising prices), such an event is sometimes called stagflation.

1. An adverse shift in the short-run aggregate-supply curve...
2. . . . causes output to fall . . .
3. . . . and the price level to rise.

What should policymakers do when faced with stagflation? As we will discuss more fully later in this book, there are no easy choices. One possibility is to do nothing. In this case, the output of goods and services remains depressed at $Y_2$ for a while. Eventually, however, the recession will remedy itself as perceptions, wages, and prices adjust to the higher production costs. A period of low output and high unemployment, for instance, puts downward pressure on workers’ wages. Lower wages, in turn, increase the quantity of output supplied. Over time, as the short-run aggregate-supply curve shifts back toward $AS_1$, the price level falls, and the quantity of output approaches its natural rate. In the long run, the economy returns to point A, where the aggregate-demand curve crosses the long-run aggregate-supply curve.

Alternatively, policymakers who control monetary and fiscal policy might attempt to offset some of the effects of the shift in the short-run aggregate-supply curve.
Some of the largest economic fluctuations in the U.S. economy since 1970 have originated in the oil fields of the Middle East. Crude oil is a key input into the production of many goods and services, and much of the world’s oil comes from Saudi Arabia, Kuwait, and other Middle Eastern countries. When some event (usually political in origin) reduces the supply of crude oil flowing from this region, the price of oil rises around the world. U.S. firms that produce gasoline, tires, and many other products experience rising costs. The result is a leftward shift in the aggregate-supply curve, which in turn leads to stagflation.
The first episode of this sort occurred in the mid-1970s. The countries with large oil reserves got together as members of OPEC, the Organization of Petroleum Exporting Countries. OPEC was a cartel—a group of sellers that attempts to thwart competition and reduce production in order to raise prices. And, indeed, oil prices rose substantially. From 1973 to 1975, oil approximately doubled in price. Oil-importing countries around the world experienced simultaneous inflation and recession. The U.S. inflation rate as measured by the CPI exceeded 10 percent for the first time in decades. Unemployment rose from 4.9 percent in 1973 to 8.5 percent in 1975.

Almost the same thing happened again a few years later. In the late 1970s, the OPEC countries again restricted the supply of oil to raise the price. From 1978 to 1981, the price of oil more than doubled. Once again, the result was stagflation. Inflation, which had subsided somewhat after the first OPEC event, again rose above 10 percent per year. But because the Fed was not willing to accommodate such a large rise in inflation, a recession was soon to follow. Unemployment rose from about 6 percent in 1978 and 1979 to about 10 percent a few years later.

The world market for oil can also be a source of favorable shifts in aggregate supply. In 1986 squabbling broke out among members of OPEC. Member countries reneged on their agreements to restrict oil production. In the world market for crude oil, prices fell by about half. This fall in oil prices reduced costs to U.S. firms, which shifted the aggregate-supply curve to the right. As a result, the U.S. economy experienced the opposite of stagflation: Output grew rapidly, unemployment fell, and the inflation rate reached its lowest level in many years.

In recent years, the world market for oil has been relatively quiet. The only exception has been a brief period during 1990, just before the Persian Gulf War, when oil prices temporarily spiked up out of fear that a long military conflict might disrupt oil production. Yet this recent tranquillity does not mean that the United States no longer needs to worry about oil prices. Political troubles in the Middle East (or greater cooperation among the members of OPEC) could always send oil prices higher. The macroeconomic result of a large rise in oil prices could easily resemble the stagflation of the 1970s.

**QUICK QUIZ:** Suppose that the election of a popular presidential candidate suddenly increases people’s confidence in the future. Use the model of aggregate demand and aggregate supply to analyze the effect on the economy.

**CONCLUSION: THE ORIGINS OF AGGREGATE DEMAND AND AGGREGATE SUPPLY**

This chapter has achieved two goals. First, we have discussed some of the important facts about short-run fluctuations in economic activity. Second, we have introduced a basic model to explain those fluctuations, called the model of aggregate demand and aggregate supply. In the next two chapters we look at each piece of...
this model in more detail in order to understand more fully what causes fluctuations in the economy and how policymakers might respond to these fluctuations.

Now that we have a preliminary understanding of this model, it is worthwhile to step back from it and consider its history. How did this model of short-run fluctuations develop? The answer is that this model, to a large extent, is a by-product of the Great Depression of the 1930s. Economists and policymakers at the time were puzzled about what had caused this calamity and were uncertain about how to deal with it.

In 1936, economist John Maynard Keynes published a book titled *The General Theory of Employment, Interest, and Money*, which attempted to explain short-run economic fluctuations in general and the Great Depression in particular. Keynes’s primary message was that recessions and depressions can occur because of inadequate aggregate demand for goods and services. Keynes had long been a critic of classical economic theory—the theory we examined in Chapters 24 through 30—because it could explain only the long-run effects of policies. A few years before offering *The General Theory*, Keynes had written the following about classical economics:

> The long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us when the storm is long past, the ocean will be flat.

Keynes’s message was aimed at policymakers as well as economists. As the world’s economies suffered with high unemployment, Keynes advocated policies to increase aggregate demand, including government spending on public works. In the next chapter we examine in detail how policymakers can try to use the tools of monetary and fiscal policy to influence aggregate demand. The analysis in the next chapter, as well as in this one, owes much to the legacy of John Maynard Keynes.

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**Summary**

* All societies experience short-run economic fluctuations around long-run trends. These fluctuations are irregular and largely unpredictable. When recessions do occur, real GDP and other measures of income, spending, and production fall, and unemployment rises.

* Economists analyze short-run economic fluctuations using the model of aggregate demand and aggregate supply. According to this model, the output of goods and services and the overall level of prices adjust to balance aggregate demand and aggregate supply.

* The aggregate-demand curve slopes downward for three reasons. First, a lower price level raises the real value of households’ money holdings, which stimulates consumer spending. Second, a lower price level reduces the quantity of money households demand; as households try to convert money into interest-bearing assets, interest rates fall, which stimulates investment spending. Third, as a lower price level reduces interest rates, the dollar depreciates in the market for foreign-currency exchange, which stimulates net exports.

* Any event or policy that raises consumption, investment, government purchases, or net exports at a given price level increases aggregate demand. Any event or policy that reduces consumption, investment, government purchases, or net exports at a given price level decreases aggregate demand.

* The long-run aggregate-supply curve is vertical. In the long run, the quantity of goods and services supplied depends on the economy’s labor, capital, natural resources, and technology, but not on the overall level of prices.
Three theories have been proposed to explain the upward slope of the short-run aggregate-supply curve. According to the misperceptions theory, an unexpected fall in the price level leads suppliers to mistakenly believe that their relative prices have fallen, which induces them to reduce production. According to the sticky-wage theory, an unexpected fall in the price level temporarily raises real wages, which induces firms to reduce employment and production. According to the sticky-price theory, an unexpected fall in the price level leaves some firms with prices that are temporarily too high, which reduces their sales and causes them to cut back production. All three theories imply that output deviates from its natural rate when the price level deviates from the price level that people expected.

Events that alter the economy’s ability to produce output, such as changes in labor, capital, natural resources, or technology, shift the short-run aggregate-supply curve (and may shift the long-run aggregate-supply curve as well). In addition, the position of the short-run aggregate-supply curve depends on the expected price level.

One possible cause of economic fluctuations is a shift in aggregate demand. When the aggregate-demand curve shifts to the left, for instance, output and prices fall in the short run. Over time, as a change in the expected price level causes perceptions, wages, and prices to adjust, the short-run aggregate-supply curve shifts to the right, and the economy returns to its natural rate of output at a new, lower price level.

A second possible cause of economic fluctuations is a shift in aggregate supply. When the aggregate-supply curve shifts to the left, the short-run effect is falling output and rising prices—a combination called stagflation. Over time, as perceptions, wages, and prices adjust, the price level falls back to its original level, and output recovers.

Key Concepts
recession, p. 31-4
depression, p. 31-4
model of aggregate demand and aggregate supply, p. 31-8
aggregate-demand curve, p. 31-8
aggregate-supply curve, p. 31-8
stagflation, p. 31-28

Questions for Review
1. Name two macroeconomic variables that decline when the economy goes into a recession. Name one macroeconomic variable that rises during a recession.
2. Draw a diagram with aggregate demand, short-run aggregate supply, and long-run aggregate supply. Be careful to label the axes correctly.
3. List and explain the three reasons why the aggregate-demand curve is downward sloping.
4. Explain why the long-run aggregate-supply curve is vertical.
5. List and explain the three theories for why the short-run aggregate-supply curve is upward sloping.
6. What might shift the aggregate-demand curve to the left? Use the model of aggregate demand and aggregate supply to trace through the effects of such a shift.
7. What might shift the aggregate-supply curve to the left? Use the model of aggregate demand and aggregate supply to trace through the effects of such a shift.

Problems and Applications
1. Why do you think that investment is more variable over the business cycle than consumer spending? Which category of consumer spending do you think would be most volatile: durable goods (such as furniture and car
purchases), nondurable goods (such as food and clothing), or services (such as haircuts and medical care)? Why?

2. Suppose that the economy is undergoing a recession because of a fall in aggregate demand.
   a. Using an aggregate-demand/aggregate-supply diagram, depict the current state of the economy.
   b. What is happening to the unemployment rate?
   c. “Capacity utilization” is a measure of how intensively the capital stock is being used. In a recession, is capacity utilization above or below its long-run average? Explain.

3. Explain whether each of the following events will increase, decrease, or have no effect on long-run aggregate supply.
   a. The United States experiences a wave of immigration.
   b. Congress raises the minimum wage to $10 per hour.
   c. Intel invents a new and more powerful computer chip.
   d. A severe hurricane damages factories along the east coast.

4. In Figure 31-8, how does the unemployment rate at points B and C compare to the unemployment rate at point A? Under the sticky-wage explanation of the short-run aggregate-supply curve, how does the real wage at points B and C compare to the real wage at point A?

5. Explain why the following statements are false.
   a. “The aggregate-demand curve slopes downward because it is the horizontal sum of the demand curves for individual goods.”
   b. “The long-run aggregate-supply curve is vertical because economic forces do not affect long-run aggregate supply.”
   c. “If firms adjusted their prices every day, then the short-run aggregate-supply curve would be horizontal.”
   d. “Whenever the economy enters a recession, its long-run aggregate-supply curve shifts to the left.”

6. For each of the three theories for the upward slope of the short-run aggregate-supply curve, carefully explain the following:
   a. how the economy recovers from a recession and returns to its long-run equilibrium without any policy intervention
   b. what determines the speed of that recovery

7. Suppose the Fed expands the money supply, but because the public expects this Fed action, it simultaneously raises its expectation of the price level. What will happen to output and the price level in the short run? Compare this result to the outcome if the Fed expanded the money supply but the public didn’t change its expectation of the price level.

8. Suppose that the economy is currently in a recession. If policymakers take no action, how will the economy evolve over time? Explain in words and using an aggregate-demand/aggregate-supply diagram.

9. Suppose workers and firms suddenly believe that inflation will be quite high over the coming year. Suppose also that the economy begins in long-run equilibrium, and the aggregate-demand curve does not shift.
   a. What happens to nominal wages? What happens to real wages?
   b. Using an aggregate-demand/aggregate-supply diagram, show the effect of the change in expectations on both the short-run and long-run levels of prices and output.
   c. Were the expectations of high inflation accurate? Explain.

10. Explain whether each of the following events shifts the short-run aggregate-supply curve, the aggregate-demand curve, both, or neither. For each event that does shift a curve, use a diagram to illustrate the effect on the economy.
   a. Households decide to save a larger share of their income.
   b. Florida orange groves suffer a prolonged period of below-freezing temperatures.
   c. Increased job opportunities overseas cause many people to leave the country.

11. For each of the following events, explain the short-run and long-run effects on output and the price level, assuming policymakers take no action.
   a. The stock market declines sharply, reducing consumers’ wealth.
   b. The federal government increases spending on national defense.
   c. A technological improvement raises productivity.
   d. A recession overseas causes foreigners to buy fewer U.S. goods.

12. Suppose that firms become very optimistic about future business conditions and invest heavily in new capital equipment.
   a. Use an aggregate-demand/aggregate-supply diagram to show the short-run effect of this optimism on the economy. Label the new levels of
prices and real output. Explain in words why the aggregate quantity of output supplied changes.

b. Now use the diagram from part (a) to show the new long-run equilibrium of the economy. (For now, assume there is no change in the long-run aggregate-supply curve.) Explain in words why the aggregate quantity of output demanded changes between the short run and the long run.

c. How might the investment boom affect the long-run aggregate-supply curve? Explain.

13. In 1939, with the U.S. economy not fully recovered from the Great Depression, President Roosevelt proclaimed that Thanksgiving Day would fall a week earlier than usual so that the shopping period before Christmas would be lengthened. Explain this decision, using the model of aggregate demand and aggregate supply.