

fairly flat and that at high levels of aggregate output, the AS curve is vertical or nearly vertical. Thus, the AS curve slopes upward and becomes vertical when the economy reaches its capacity, or maximum, output.

- Anything that affects an individual firm's marginal cost curve can shift the AS curve. The two main factors are wage rates and energy prices.

#### THE EQUILIBRIUM PRICE LEVEL *p. 250*

- The *equilibrium price level* in the economy occurs at the point at which the AS and AD curves intersect. The intersection of the AS and AD curves corresponds to equilibrium in the goods and money markets *and* to a set of price/output decisions on the part of all the firms in the economy.

#### THE LONG-RUN AGGREGATE SUPPLY CURVE *p. 251*

- If wages fully adjust to prices in the long run, then the long-run AS curve will be vertical.
- The level of aggregate output that can be sustained in the long run without inflation is called *potential output* or *potential GDP*.

#### MONETARY AND FISCAL POLICY EFFECTS *p. 253*

- If the economy is initially producing on the flat portion of the AS curve, an expansionary policy—which shifts the AD curve to the right—will result in a small increase in the equilibrium price level relative to the increase in equilibrium output. If the economy is initially producing on the steep portion of the AS curve, an expansionary policy results in a small increase in equilibrium output and a large increase in the equilibrium price level.
- If the AS curve is vertical in the long run, neither monetary nor fiscal policy has any effect on aggregate output in the long run. For this reason, the exact length of the long run is one of the most pressing questions in macroeconomics.

#### CAUSES OF INFLATION *p. 255*

- Demand-pull inflation* is inflation initiated by an increase in aggregate demand. *Cost-push*, or *supply-side, inflation* is inflation initiated by an increase in costs like energy prices. An increase in costs may also lead to *stagflation*—the situation in which the economy is experiencing a contraction and inflation simultaneously.
- Inflation can become “built into the system” as a result of expectations. If prices have been rising and people form their expectations on the basis of past pricing behavior, firms may continue raising prices even if demand is slowing or contracting.
- When the price level increases, so too does the demand for money. If the economy is operating on the steep part of the AS curve and the Fed tries to keep the interest rate constant by increasing the supply of money, the result could be a *hyperinflation*—a period of very rapid increases in the price level.

#### THE BEHAVIOR OF THE FED *p. 259*

- In practice, the Fed controls the interest rate rather than the money supply. The interest rate value that the Fed chooses depends on the state of the economy. The Fed wants high output and low inflation. The Fed is likely to decrease the interest rate during times of low output and low inflation, and it is likely to increase the interest rate during times of high output and high inflation.
- The Fed generally had high interest rates in the 1970s and early 1980s as it fought inflation. Since 1983, inflation has been low by historical standards and the Fed focused in this period on trying to smooth fluctuations in output.
- Inflation targeting is the case where the monetary authority weights only inflation. It chooses its interest rate values with the aim of keeping the inflation rate within some specified band over some specified horizon.

## REVIEW TERMS AND CONCEPTS

aggregate supply, *p. 248*

aggregate supply (AS) curve, *p. 248*

cost-push, or supply-side, inflation, *p. 256*

cost shock, or supply shock, *p. 250*

demand-pull inflation, *p. 255*

equilibrium price level, *p. 250*

inflation targeting, *p. 264*

potential output, or potential GDP, *p. 253*

stagflation, *p. 256*

## PROBLEMS

All problems are available on [www.myeconlab.com](http://www.myeconlab.com)



- In Japan during the first half of 2000, the Bank of Japan kept interest rates at a near zero level in an attempt to stimulate demand. In addition, the government passed a substantial increase in government expenditure and cut taxes. Slowly, Japanese GDP began to grow with absolutely no sign of an increase in the price level. Illustrate the position of the Japanese economy with aggregate supply and demand curves. Where on the short-run AS curve was Japan in 2000?
- In 2008, the price of oil rose sharply on world markets. What impact would you expect there to be on the aggregate price level and on real GDP? Illustrate your answer with aggregate demand and supply curves. What would you expect to be the effect on interest rates if the Fed held the money supply constant? Tell a complete story.
- By using aggregate supply and demand curves to illustrate your points, discuss the impacts of the following events on the price level and on equilibrium GDP ( $Y$ ) in the *short run*:
  - A tax cut holding government purchases constant with the economy operating at near full capacity
  - An increase in the money supply during a period of high unemployment and excess industrial capacity

- c. An increase in the price of oil caused by a war in the Middle East, assuming that the Fed attempts to keep interest rates constant by accommodating inflation
  - d. An increase in taxes and a cut in government spending supported by a cooperative Fed acting to keep output from falling
4. During 1999 and 2000, a debate raged over whether the United States was at or above potential GDP. Some economists feared the economy was operating at a level of output above potential GDP and inflationary pressures were building. They urged the Fed to tighten monetary policy and increase interest rates to slow the economy. Others argued that a worldwide glut of cheap products was causing input prices to be lower, keeping prices from rising.

By using aggregate supply and demand curves and other useful graphs, illustrate the following:

- a. Those pushing the Fed to act were right, and prices start to rise more rapidly in 2000. The Fed acts belatedly to slow money growth (contract the money supply), driving up interest rates and pushing the economy back to potential GDP.
  - b. The worldwide glut gets worse, and the result is a falling price level (deflation) in the United States despite expanding aggregate demand.
5. [Related to the Economics in Practice on p. 252] The *Economics in Practice* describes the simple Keynesian aggregate supply curve as one in which there is a maximum level of output given the constraints of a fixed capital stock and a fixed supply of labor. The presumption is that increases in demand when firms are operating below capacity will result in output increases and no input price or output price changes but that at levels of output above full capacity, firms have no choice but to raise prices of demand increases. In reality, however, the short-run aggregate supply curve isn't flat and then vertical. Rather, it becomes steeper as we move from left to right on the diagram. Explain why. What circumstances might lead to an equilibrium at a very flat portion of the AS curve? at a very steep portion?
6. Using aggregate supply and aggregate demand curves to illustrate, describe the effects of the following events on the price level and on equilibrium GDP in the *long run* assuming that input prices fully adjust to output prices after some lag:
- a. An increase occurs in the money supply above potential GDP
  - b. A decrease in government spending and in the money supply with GDP above potential GDP occurs
  - c. Starting with the economy at potential GDP, a war in the Middle East pushes up energy prices temporarily. The Fed expands the money supply to accommodate the inflation.
7. Two separate capacity constraints are discussed in this chapter: (1) the actual physical capacity of existing plants and equipment, shown as the vertical portion of the short-run AS curve, and (2) potential GDP, leading to a vertical long-run AS curve. Explain the difference between the two. Which is greater, full-capacity GDP or potential GDP? Why?
8. In country A, all wage contracts are indexed to inflation. That is, each month wages are adjusted to reflect increases in the cost of living as reflected in changes in the price level. In country B, there are no cost-of-living adjustments to wages, but the workforce is completely unionized. Unions negotiate 3-year contracts. In which country is an expansionary monetary policy likely to have a larger effect on aggregate output? Explain your answer using aggregate supply and aggregate demand curves.
9. During 2001, the U.S. economy slipped into a recession. For the next several years, the Fed and Congress used monetary and fiscal policies in an attempt to stimulate the economy. Obtain data on

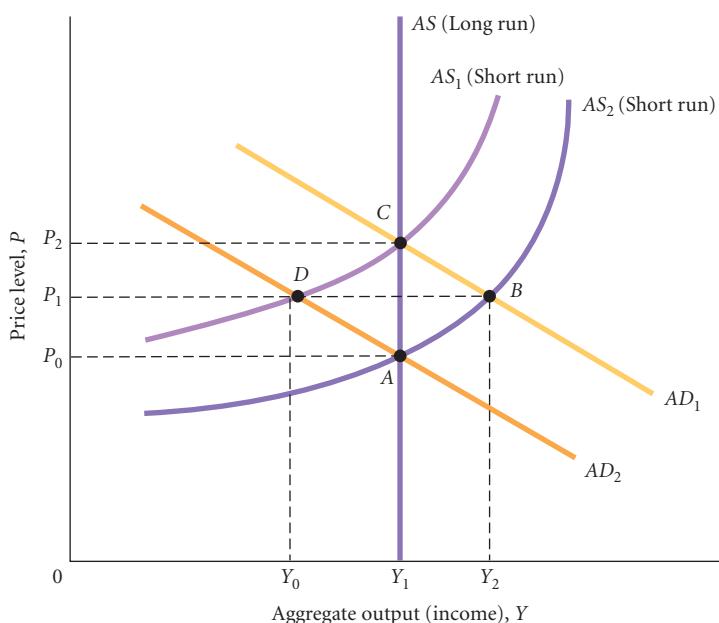
interest rates (such as the prime rate or the federal funds rate). Do you see evidence of the Fed's action? When did the Fed begin its expansionary policy? Obtain data on total federal expenditures, tax receipts, and the deficit. (Try [www.commerce.gov](http://www.commerce.gov)). When did fiscal policy become "expansionary"? Which policy seems to have suffered more from policy lags?

10. Describe the Fed's tendency to "lean against the wind." Do the Fed's policies tend to stabilize or destabilize the economy?
11. [Related to the Economics in Practice on p. 261] In August 2010, the Fed's discount rate was 0.75 percent and the federal funds rate was 0.25 percent, with a Fed target of 0–0.25 percent. The *Economics in Practice* states that all of the major investment banks employ economists to help them forecast what the Fed will do, and in mid-2010, many of these economists pushed back their expectations of when the Fed would raise interest rates, citing lower-than-anticipated inflation expectations, slow job growth, and an overall weak economy as reasons for the delay in rate increases. Go to [www.frb.gov](http://www.frb.gov), [www.bea.gov](http://www.bea.gov), and [www.bls.gov](http://www.bls.gov) to see what has happened to interest rates, the inflation rate, the unemployment rate, and GDP since August 2010. Were the economists' forecasts of the Fed delaying interest rate increases until 2011 correct? Describe any apparent correlation between the changes in interest rates and changes in the inflation rate, the unemployment rate, and GDP since August 2010.
12. From the following graph, identify the initial equilibrium, the short-run equilibrium, and the long-run equilibrium based on the scenarios below. Explain your answers and identify what happens to the price level and aggregate output.

Scenario 1. The economy is initially in long-run equilibrium at point A, and a cost shock causes cost-push inflation. The government reacts by implementing an expansionary fiscal policy.

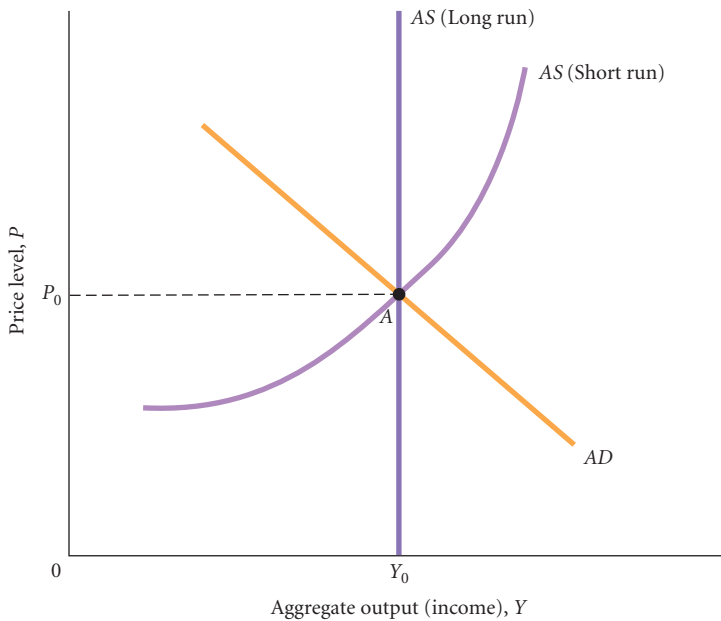
Scenario 2. The economy is initially in long-run equilibrium at point A, and an increase in government purchases causes demand-pull inflation. In the long run, wages respond to the inflation.

Scenario 3. The economy is initially in long-run equilibrium at point C, and the federal government implements an increase in corporate taxes and personal income taxes. In the long run, firms and workers adjust to the new price level and costs adjust accordingly.



Scenario 4. The economy is initially in equilibrium at point C, and energy prices decrease significantly. The government reacts by implementing a contractionary fiscal policy.

13. The economy of Mayberry is currently in equilibrium at point A on the graph below. Prince Barney of Mayberry has decided that he wants the economy to grow and has ordered the Royal Central Bank of Mayberry to print more currency so banks can expand their loans to stimulate growth. Explain what will most likely happen to the economy of Mayberry as a result of Prince Barney's actions and show the result on the graph.



14. Evaluate the following statement: In the short run, if an economy experiences inflation of 10 percent, the cause of the inflation is unimportant. Whatever the cause, the only important issue the government needs to be concerned with is the 10 percent increase in the price level.

15. [Related to the *Economics in Practice* on p. 258] A monthly survey conducted by Torcuato Di Tella University in Buenos Aires showed that in August 2010, people in Argentina expected inflation to increase 25 percent over the next 12 months, a similar response to the previous month's survey. This shows a large discrepancy between inflation expectations and the Argentine Central Bank's monthly index of consumer prices which showed prices rising at an annual rate of 11.2 percent, the highest level in 4 years. Use aggregate supply and demand curves to show the effect of these expectations of inflation on the Argentine economy, assuming firms increase prices in response to the expectations. What can the Argentine Central Bank do to try to lower the expectations to their projected inflation level of 11.2 percent? What impact would this have on the aggregate supply and demand curves?

Source: "Twelve months inflation expectations in Argentina steady at 25%," *MercoPress*, August 20, 2010.