Chapter 13: Aggregate Demand and Aggregate Supply Analysis

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Learning Objectives

1. Identify the determinants of aggregate demand and distinguish between a movement along the aggregate demand curve and a shift of the curve.

2. Identify the determinants of aggregate supply and distinguish between a movement along the short-run aggregate supply curve and a shift of the curve.

3. Use the aggregate demand and aggregate supply model to illustrate the difference between short-run and long-run macroeconomic equilibrium.

4. Use the dynamic aggregate demand and aggregate supply model to analyze macroeconomic conditions.

Aggregate Demand

- In the short-run, *real GDP* fluctuates around the long-run upward trend because of business cycles (BC). *Real GDP and employment* co-move during BC.

- The BC also causes *changes in prices and wages*. Some firms react to a decline in sales by cutting back on *production*, but they may also cut the *prices* they charge and the *wages* they pay.

- *Aggregate demand and aggregate supply model:* A model that explains short-run fluctuations in *real GDP* and *the price level*. This model will help us analyze the effects of recessions and expansions on *production, employment, and prices*.

- (Cont.) *Aggregate demand curve (AD)*: A curve showing the relationship between *the price level* (PL) and the quantity of *real GDP demanded* by households, firms, and the government.
- *Short-run aggregate supply curve (SRAS)*: A curve showing the relationship in the short run between the PL and the quantity of real GDP supplied by firms.
- *Fluctuations in real GDP and the PL* are caused by shifts in the AD curve or the AS curve.

Aggregate demand and aggregate supply model A model that explains short-run fluctuations in real GDP and the price level.

Figure 13.1

Aggregate Demand and Aggregate Supply

In the short run, real GDP and the price level are determined by the intersection of the aggregate demand curve and the short-run aggregate supply curve. Real GDP is measured on the horizontal axis, and the price level is measured on the vertical axis by the GDP deflator. In this example, the equilibrium real GDP is $14.0 trillion, and the equilibrium price level is 100.
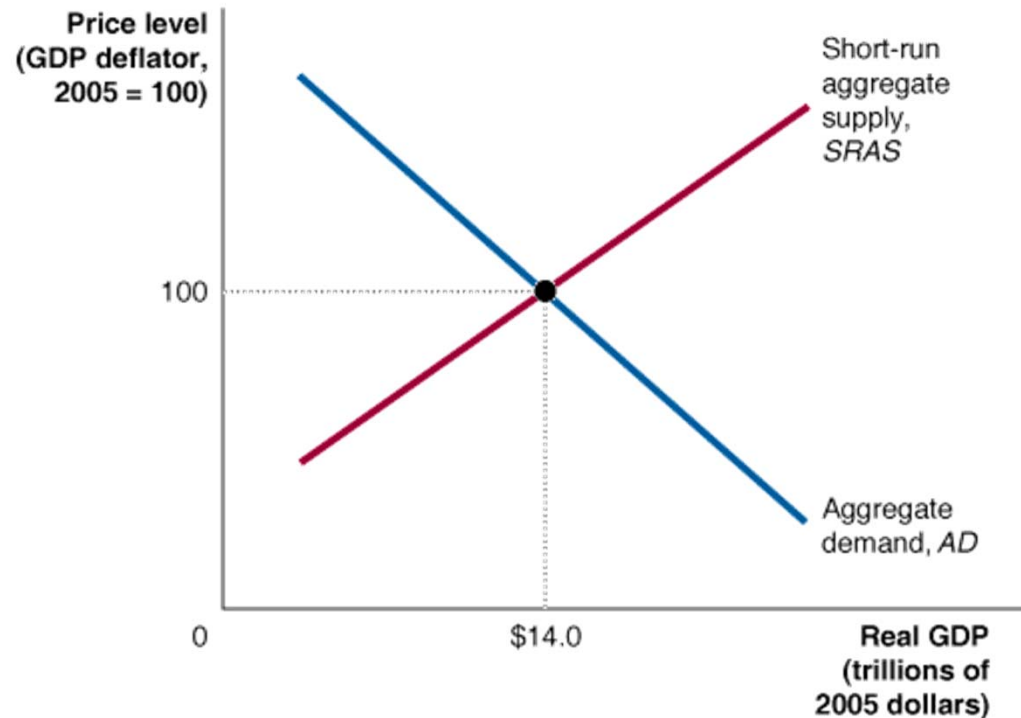
Why Is the Aggregate Demand Curve Downward Sloping?

▶ Because a fall in the PL increases the quantity of real GDP *demanded*.

$$Y = C + I + G + NX \qquad (1)$$

▶ *The wealth effect:* How a change in the PL affects consumption?

  ▶ Some of a household's wealth is held in cash or other nominal assets that lose value as the price level rises and gain value as the PL falls.
  ▶ As the PL falls, the real value of HH wealth rises, and so will consumption because consumption is positively correlated with real wealth.
  ▶ This effect of the PL on consumption is called the wealth effect.

- (cont.) *The interest rate effect:* How a change in the PL affects investment?
  - When prices rise, HHs and firms need more money to finance buying and selling; consequently, they try to increase the amount of money they hold by withdrawing funds from banks, borrowing from banks, or selling bonds. These actions will increase the interest rate (IR) charged on loans and bonds.
  - A higher IR raises the cost of borrowing for firms and HHs (e.g., borrow less to build new buildings, new houses, or autos). Investment and consumption will therefore be reduced.

- (cont.) *The international-trade effect*: How a change in the PL affects net exports?
  - If the PL in the US rises relative to the PLs in other countries, US exports will become relatively more expensive and foreign imports will become relatively less expensive.
  - Consequently, some consumers in foreign countries will shift from buying US products to buying domestic products, and some US consumers will also shift from buying US products to buying imported products, US exports will fall and US imports will rise, causing NXs to fall.

Shifts of the AD Curve versus Movements Along It

- Note that the AD curve tells the relationship bw the PL and the quantity of real GDP *demanded*, *holding everything else constant*.

- If the PL changes, but *other variables* that affect the willingness of HHs, firms, and gov. to spend are *unchanged*, the economy will move *up or down a stationary AD curve*.

- If any variable changes other than the PL, the AD curve will *shift*. E.g., if gov spending increases and the PL remains unchanged, the AD curve will shift to the right at every PL.

Three Variables That Shift the AD Curve

- Changes in *government policies (Monetary and fiscal policies)*
  - *Monetary policy (MP)*: The actions the Federal Reserve takes to manage the money supply and interest rates to pursue macroeconomic policy objectives.
  - *Fiscal policy (FP)*: Changes in federal taxes and purchases that are intended to achieve macroeconomic policy objectives.
  - Gov uses *monetary and fiscal policies* to shift the AD curve.
  - Lower IRs lower the cost to firms and HHs of borrowing. Lower borrowing costs increase consumption and investment, which shifts the AD to the right. An increase in gov. purchases also shifts the AD to the right because they are one component of AD.
  - An increase in personal income taxes reduce consumption spending and shift the AD curve to the left. Increases in business taxes reduce the profitability and shift the AD to the left.

- ▶ (Cont.) Changes in *the expectations of households and firms*
  - ▶ If HHs and firms become more optimistic (pessimistic) about their future incomes, they are likely to increase (reduce) their current consumption spending, which will increase (reduce) AD.
  - ▶ Similarly, if firms become more optimistic (pessimistic) about their future profitability of investment spending, the AD curve will shift to the right.

- ▶ Changes in *foreign variables:* If firms and HHs in other countries buy fewer U.S. goods or if firms and households in the U.S. buy more foreign goods, net exports will fall, and the AD curve will shift to the left.
  - ▶ If real GDP in the US increases faster than the real GDP in other countries, US imports will increase faster than US exports, and NXs will decline.
  - ▶ If the exchange rate bw. the dollar and foreign currencies rises, NXs will also fall.
  - ▶ Both changes will shift the AD curve to the left.

- ▶ (Cont.) If the exchange rate between the dollar and foreign currencies rises, NXs will fall because the price in foreign currency of U.S. products sold in other countries will rise, and the dollar price of foreign products sold in the U.S. will fall.
- ▶ NXs will increase if the value of the dollar falls against other currencies.
- ▶ An increase in NXs at every price level will shift the AD curve to the right.
- ▶ A change in NXs that results from a change in the price level in the U.S. will result in a movement along the AD curve, not a shift of the AD curve.

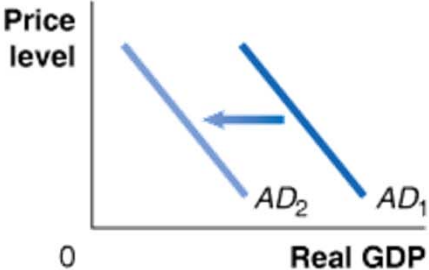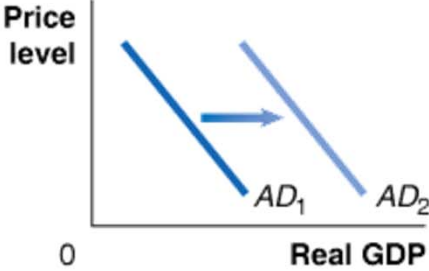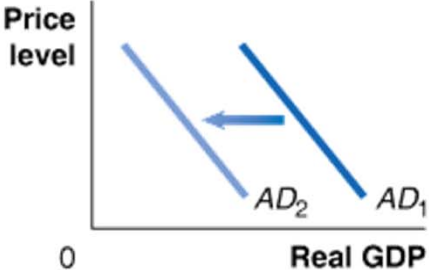**Table 13.1** Variables That Shift the Aggregate Demand Curve

An increase in…	shifts the aggregate demand curve…	because…
interest rates		higher interest rates raise the cost to firms and households of borrowing, reducing consumption and investment spending.
government purchases		government purchases are a component of aggregate demand.
personal income taxes or business taxes		consumption spending falls when personal taxes rise, and investment falls when business taxes rise.

Table 13.1 Variables That Shift the Aggregate Demand Curve
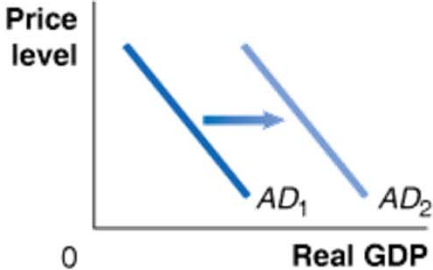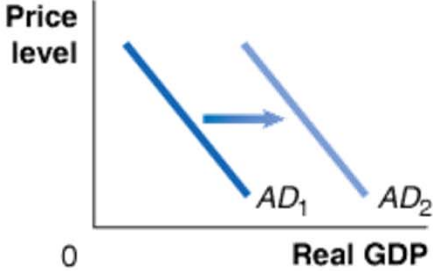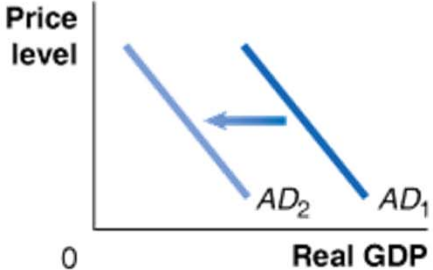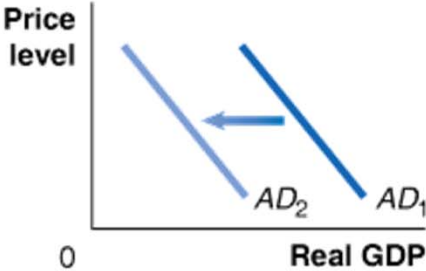
An increase in…	shifts the aggregate demand curve…	because…
households' expectations of their future incomes	Price level / AD₁ / AD₂ / Real GDP	consumption spending increases.
firms' expectations of the future profitability of investment spending	Price level / AD₁ / AD₂ / Real GDP	investment spending increases.
the growth rate of domestic GDP relative to the growth rate of foreign GDP	Price level / AD₂ / AD₁ / Real GDP	imports will increase faster than exports, reducing net exports.

Table 13.1   **Variables That Shift the Aggregate Demand Curve**

An increase in…	shifts the aggregate demand curve…	because…
the exchange rate (the value of the dollar) relative to foreign currencies		imports will rise and exports will fall, reducing net exports.

The table shows the shift in the aggregate demand curve that results from an increase in each of the variables.

A *decrease* in these variables would cause the aggregate demand curve to shift in the opposite direction.

Which Components of Aggregate Demand Changed the Most during the 2007–2009 Recession?

The following graphs illustrate the components of aggregate demand that showed the largest movements *relative to potential GDP* during the 2007-2009 recession, which is represented by the red bar.
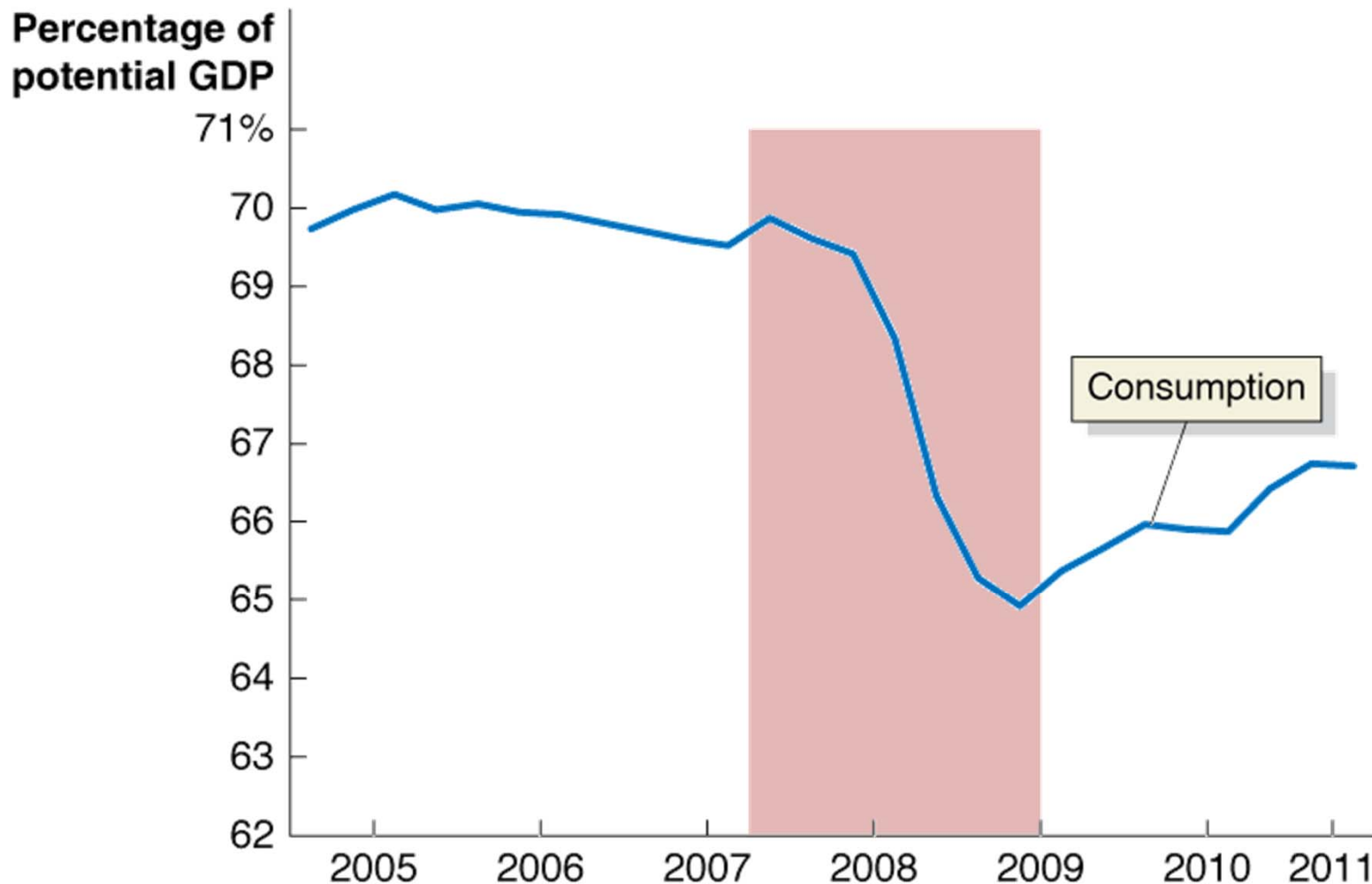
Which Components of Aggregate Demand Changed the Most during the 2007–2009 Recession?

Which Components of Aggregate Demand Changed the Most during the 2007–2009 Recession?

Percentage of potential GDP

Net exports
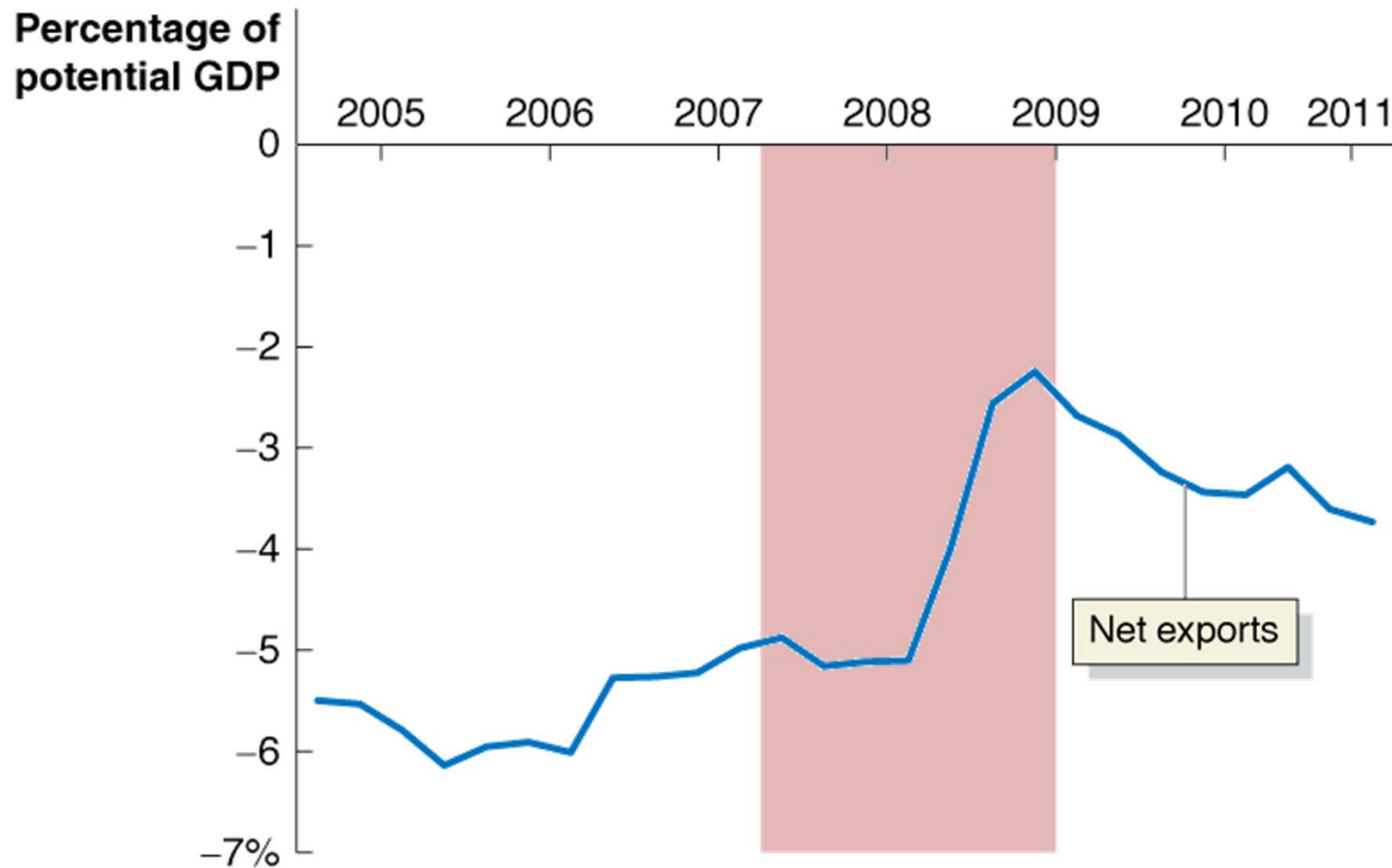
MyEconLab **Your Turn:** Test your understanding by doing related problem 1.8 at the end of this chapter.

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Solved Problem **13.1**

Movements along the Aggregate Demand Curve versus Shifts of the Aggregate Demand Curve

Suppose the current price level is 110, and the current level of real GDP is $14.2 trillion. Illustrate the following situation on a graph.

a. The price level rises to 115, while all other variables remain constant.

Solving the Problem

Step 1: Review the chapter material.
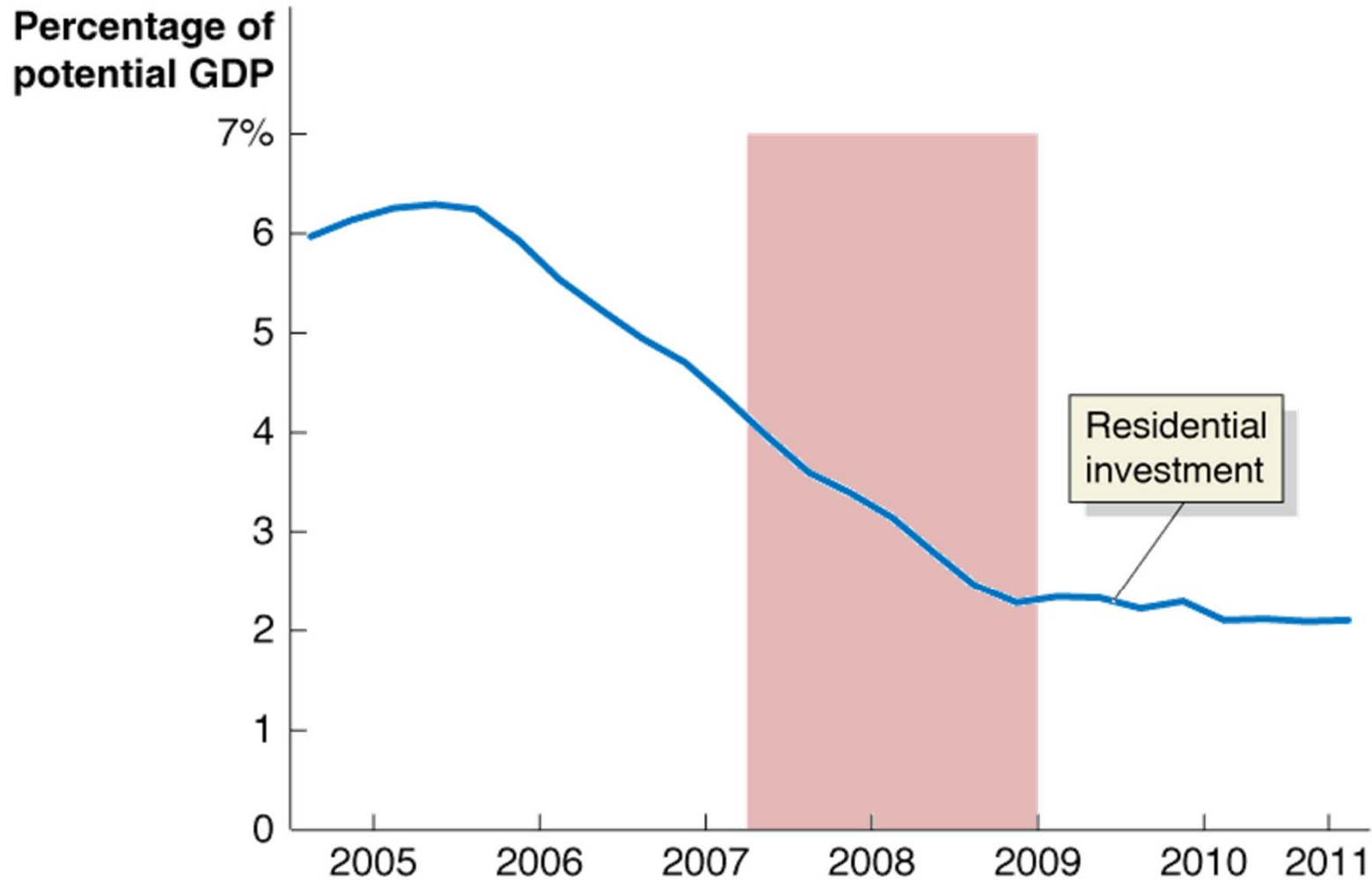
Step 2: To answer part a., draw a graph that shows a movement along the aggregate demand curve.
Because there will be a movement along the aggregate demand curve but no shift of the aggregate demand curve, your graph should look like this.
We don't have enough information to be certain what the new level of real GDP demanded will be except that it will be less than the initial level of $14.2 trillion; the graph shows the value as $14.0 trillion.
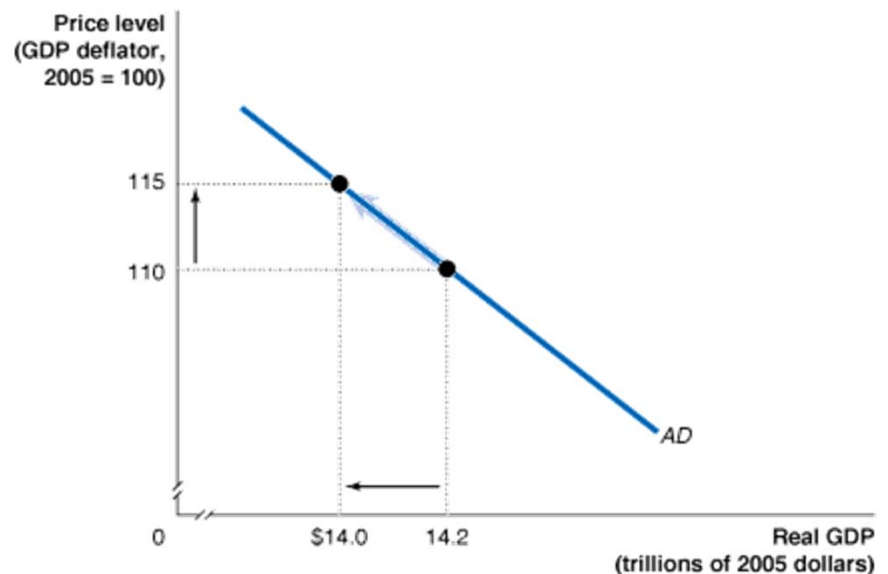
Solved Problem 13.1

Movements along the Aggregate Demand Curve versus Shifts of the Aggregate Demand Curve

Suppose the current price level is 110, and the current level of real GDP is $14.2 trillion. Illustrate the following situation on a graph, assuming that the price level remains constant.

b. Firms become pessimistic and reduce their investment.

Step 3: To answer part b., draw a graph that shows a shift of the aggregate demand curve.
We know that the aggregate demand curve will shift to the left, but we don't have enough information to know how far to the left it will shift.
Assuming that at every price level, the quantity of real GDP demanded declines by $300 billion (or $0.3 trillion), your graph should look like this.
The graph shows a parallel shift in the aggregate demand curve at a price level of 110, where the quantity of real GDP demanded declines from $14.2 trillion to $13.9 trillion.
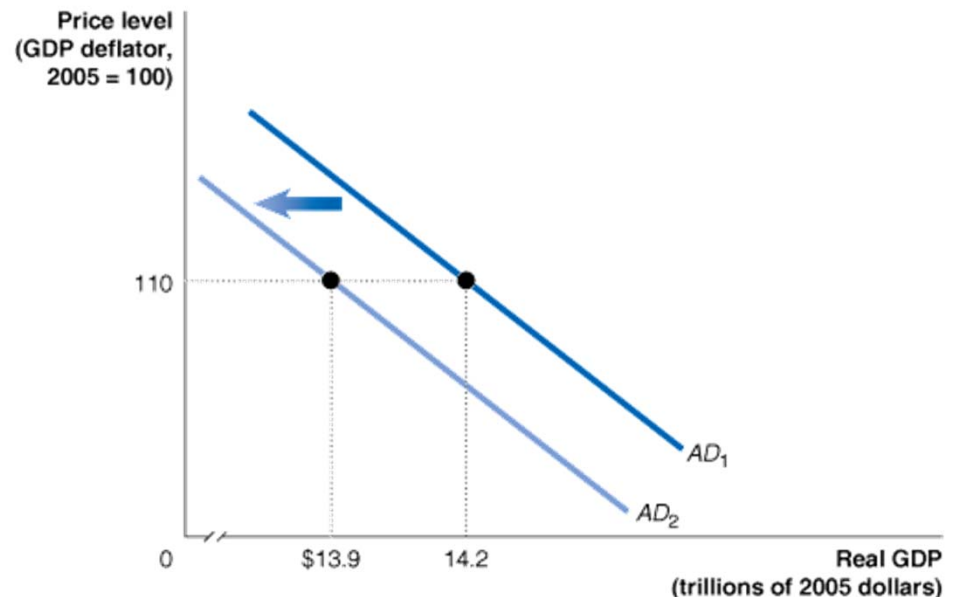
The Long-Run Aggregate Supply Curve

- ▶ The effect of change in the PL on aggregate supply (i.e., the quantity of GS that firms are willing and able to supply) is very different in the short run (SR) than in the long run (LR), so we need *two AS curves: one for SR and one for LR.*

- ▶ *Long-run aggregate supply (LRAS)* A curve showing the relationship in the long run between the PL and the quantity of real GDP supplied.

- ▶ In the LR the level of real GDP is determined by *the number of workers, the capital stock, and the technology*.

- ▶ In the LR changes in the PL doesn't affect real GDP because it *doesn't* affect the number of workers, the capital stock, and technology.

- ▶ Note that the level of real GDP in the LR is called *potential GDP or full employment GDP*. There is no reason for this normal level of capacity to change just because the PL has changed.

Figure 13.2 **The Long-Run Aggregate Supply Curve**
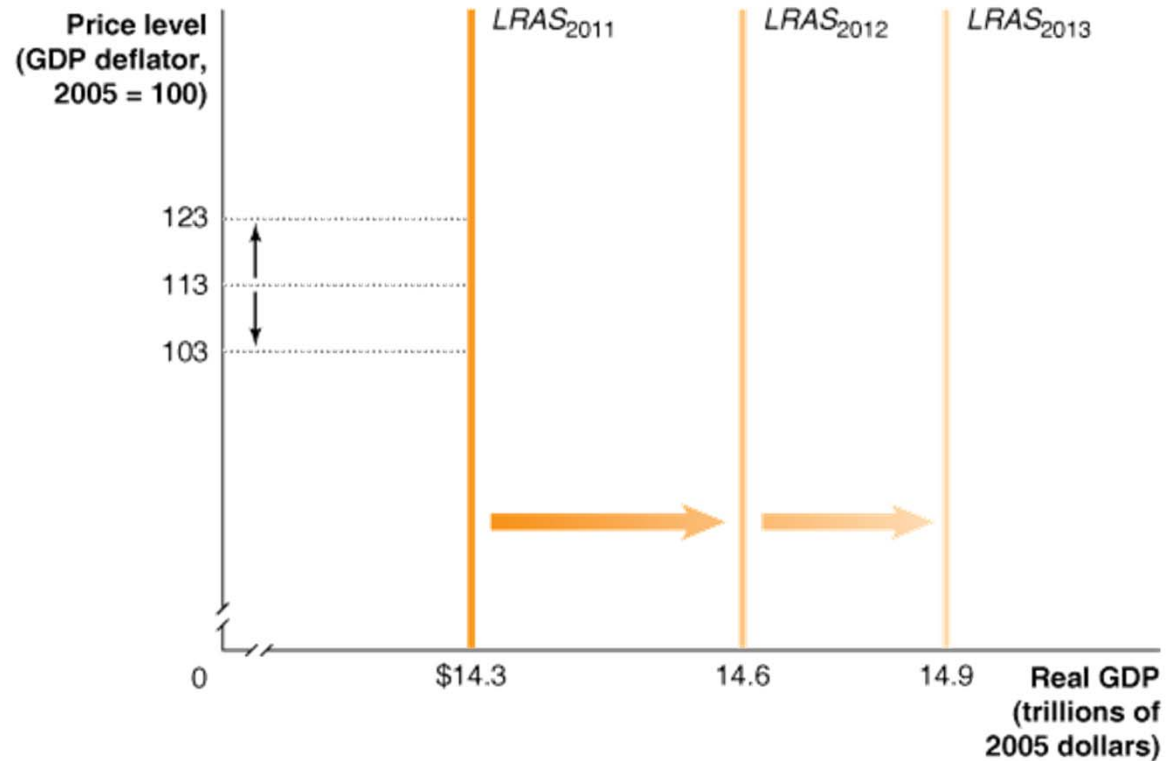
Changes in the price level do not affect the level of aggregate supply in the long run. Therefore, the long-run aggregate supply (*LRAS*) curve is a vertical line at the potential level of real GDP.

For instance, the price level was 113 in 2011, and potential real GDP was $14.3 trillion. If the price level had been 123, or if it had been 103, long-run aggregate supply would still have been a constant $14.3 trillion.

Each year, the long-run aggregate supply curve shifts to the right, as the number of workers in the economy increases, more machinery and equipment are accumulated, and technological change occurs.

The Short-Run Aggregate Supply Curve

▶ The SRAS is *upward sloping* because over the SR, as the PL increases, the quantity of G&S firms are willing to supply will increase. As *prices of final G&S* rise, *prices of inputs* (such as the wages or the prices of natural resources) rise more slowly.

▶ The reason for this is that some firms and workers fail to accurately predict changes in the price level.

▶ Profits rise when the prices of the G&S firms sell rise more rapidly than the prices they pay for inputs. *Therefore, a higher PL leads to higher profits and increases the willingness of firms to supply more G&S.*

▶ As the PL rises or falls, *some firms* are slow to adjust their prices. A firm that is slow to raise (reduce) its prices when the PL is increasing (decreasing) may find its sales increasing (falling) and therefore will increase (decrease) production.

- ▶ (Cont.) Next questions are:
  - ▶ Why some firms adjust *prices* more slowly than others?
  - ▶ Why might *the wages and the prices of other inputs* change more slowly than the prices of final G&S?
- ▶ Most economists believe the explanation is that *some firms and workers fail to predict accurately changes in the PL*. The three most common reasons:
  1. *Contracts make some wages and prices "sticky"*: Prices and wages are said to be "sticky" when they don't respond quickly to changes in demand or supply. Consider the Ford Motor company case. Suppose their managers negotiate a 3-year contract with the Labor union. Suppose that after the contract is signed, the demand starts to increase rapidly and prices rise. Producing more is profitable because they can increase prices and wages are fixed by contract.

- ▶ (Cont.) The three most common reasons:
    2. *Firms are often slow to adjust wages*. Many nonunion workers also have their wages adjusted only once a year. If firms adjust wages only slowly, a rise in the PL will increase the profitability of hiring more workers and producing more output, and a fall in the price level will decrease the profitability of hiring more workers and producing more output.
    3. *Menu costs (The costs to firms of changing prices) make some prices sticky*. Firms base their prices today partly on what they expect future prices to be. Consider the effect of an *unexpected* increase in the PL. Firms will want to increase the prices they charge. However, some firms may not be willing to increase prices because of MCs. Because of their relatively low prices, these firms will find their sales increasing, which cause them to increase output.

Shifts of the SR-AS Curve vs. Movements Along It

- The SR-AS curve is the SR relationship bw the PL and the quantity *supplied*, holding constant all other variables that affect the willingness of firms to supply G&S.
- If the PL changes but other variables are unchanged, the economy will move up or down a stationary AS curve.
- If any variable other than the PL changes, the AS curve will shift.

Variables That Shift the SR-AS Curve

- *Increases in the labor force and in the capital stock.* As the LF and the capital stock grow, firms will supply more output *at every PL*, and the SR-AS curve will shift to the right.

- *Technological change.* As TC takes place, the productivity of capital and labor increases, which means that firms can produce more G&S with the same amount of labor and capital. Firms are then willing to produce more *at every PL* and AS shifts to the right.

- *Expected changes in the future price level.* If workers and firms expect the PL to increase by a certain percentage, the SR-AS curve will shift by an equivalent amount, holding constant all other variables that affect the SR-AS curve.

Figure 13.3 **How Expectations of the Future Price Level Affect the Short-Run Aggregate Supply Curve**
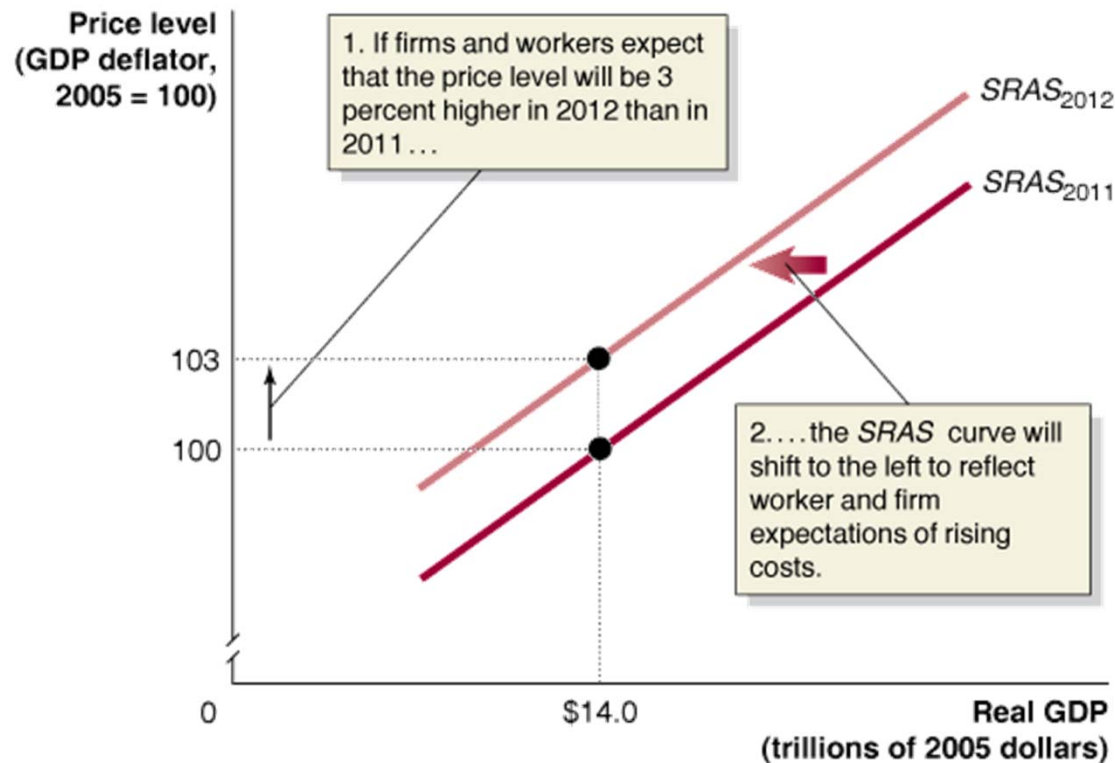
The *SRAS* curve shifts to reflect worker and firm expectations of future prices.

1. If workers and firms expect that the price level will rise by 3 percent, from 100 to 103, they will adjust their wages and prices by that amount.

2. Holding constant all other variables that affect aggregate supply, the short-run aggregate supply curve will shift to the left.

If workers and firms expect that the price level will be lower in the future, the short-run aggregate supply curve will shift to the right.

- ▶ (Cont.) *Adjustments of workers and firms to errors in past expectations about PL*.
    - ▶ They sometimes make wrong predictions about the PL, so they will attempt to compensate for these errors.
    - ▶ If increases in the PL turn out to be unexpected high, the union will take this into account when negotiating the next contract. The higher wages under the new contract will increase the company's costs and result in the company's needing to receive higher prices to produce the same quantity.
- ▶ *Unexpected changes in the price of an important natural resource*.
    - ▶ They can cause firms' costs to be different from what they had expected.
    - ▶ E.g., *Oil prices*. If oil prices rise unexpectedly, firms will face rising costs and thus only supply the same level of product at higher prices, and the SR-AS curve will shift to the left.
- ▶ *Supply shock* An unexpected event that causes the SR-AS curve to shift.

Table 13.2 Variables That Shift the Short-Run Aggregate Supply Curve
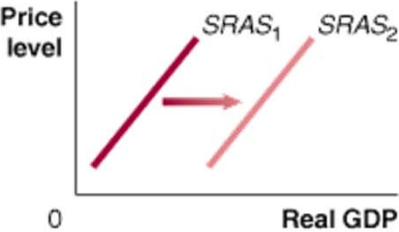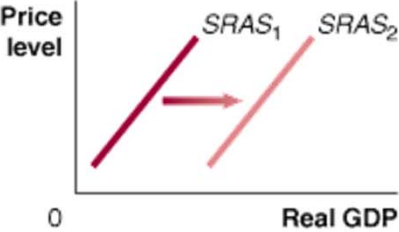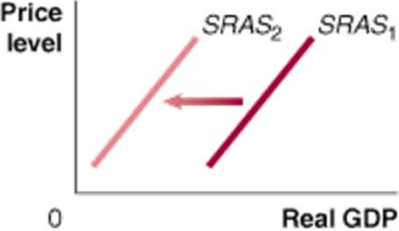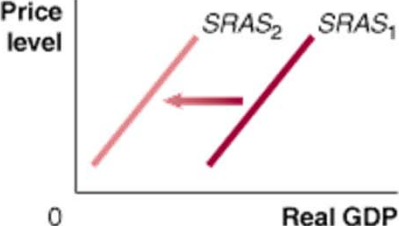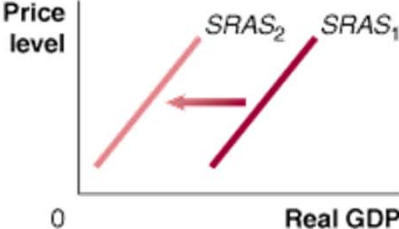
An increase in…	shifts the short-run aggregate supply curve…	because…
the labor force or the capital stock		more output can be produced at every price level.
productivity		costs of producing output fall.
the expected future price level		workers and firms increase wages and prices.

Table 13.2 Variables That Shift the Short-Run Aggregate Supply Curve

An increase in…	shifts the short-run aggregate supply curve…	because…
workers and firms adjusting to having previously under-estimated the price level	Price level — SRAS₂ SRAS₁ — Real GDP	workers and firms increase wages and prices.
the expected price of an important natural resource	Price level — SRAS₂ SRAS₁ — Real GDP	costs of producing output rise.

The table shows the shift in the *SRAS* curve that results from an *increase* in each of the variables.

A *decrease* in these variables would cause the *SRAS* curve to shift in the opposite direction.

Figure 13.4

Long-Run Macroeconomic Equilibrium

In long-run macroeconomic equilibrium, the *AD* and *SRAS* curves intersect at a point on the *LRAS* curve.
In this case, equilibrium occurs at real GDP of $14.0 trillion and a price level of 100.
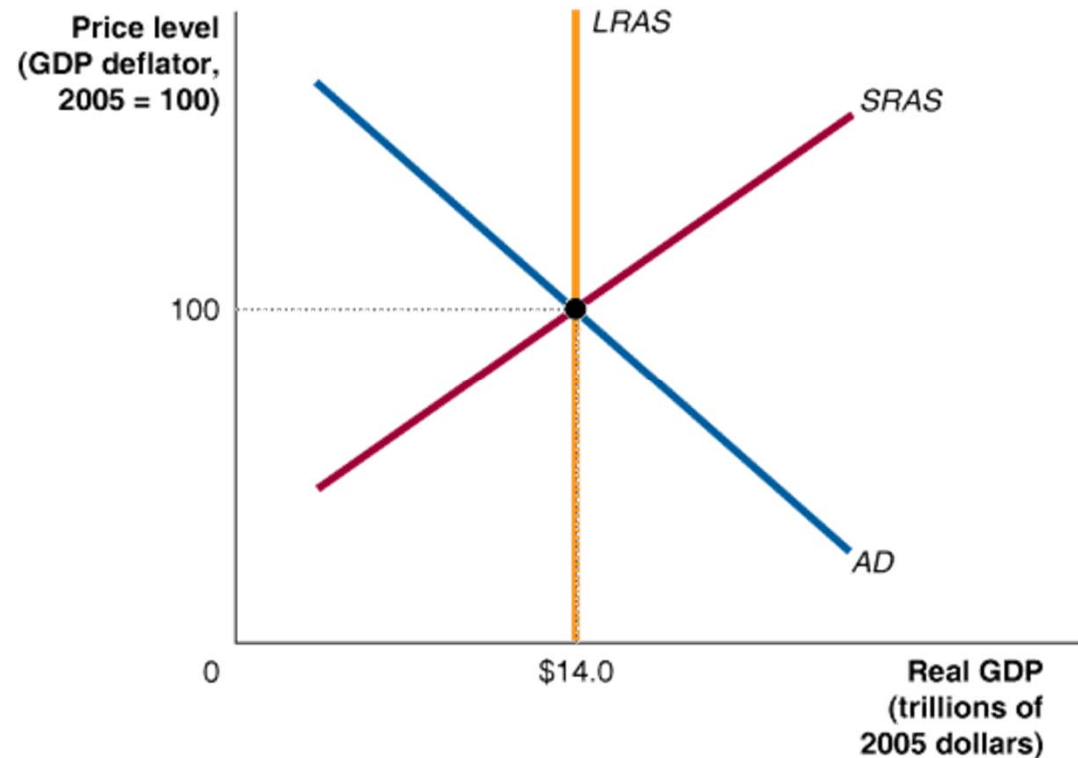
We bring the aggregate demand curve, the short-run aggregate supply curve, and the long-run aggregate supply curve together in one graph to show the *long-run macroeconomic equilibrium* for the economy.

Recessions, Expansions, and Supply Shocks

- ▶ Because the full analysis of the AD-AS model can be complicated, we begin with a simplified case, using two assumptions:

1. The economy has not been experiencing any inflation. The PL is currently 100, and workers and firms expect it to remain at 100 in the future.
2. The economy is not experiencing any long-run growth. Potential real GDP is $14.0 trillion and will remain at that level in the future.

- ▶ *Stagflation* A combination of inflation and recession, usually resulting from a supply shock.

Recession

Figure 13.5

The Short-Run and Long-Run Effects of a Decrease in Aggregate Demand

In the short run, a decrease in aggregate demand causes a recession. In the long run, it causes only a decrease in the price level.

1. A decline in investment shifts *AD* to the left, causing a recession.

2. As firms and workers adjust to the price level being lower than they had expected, costs will fall and cause *SRAS* to shift to the right.

3. Equilibrium moves from point *B* back to potential GDP at point *C*, with a lower price level.
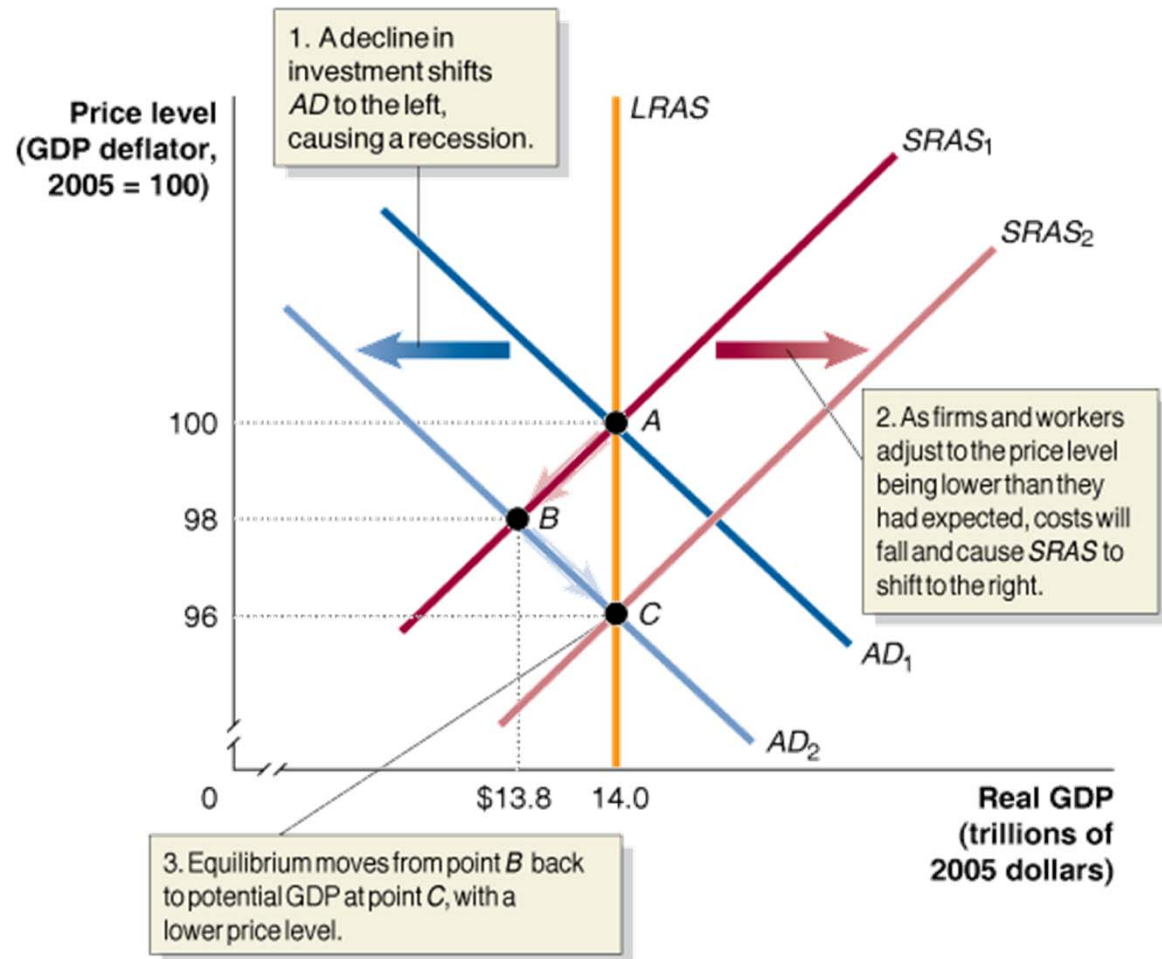
In the new *short-run macroeconomic equilibrium*, real GDP declines below its potential level and the economy moves into a recession.

Economists refer to the process of adjustment back to potential GDP as an *automatic mechanism* because it occurs without any actions by the government.

Does It Matter What Causes a Decline in Aggregate Demand?

The collapse in spending on housing added to the severity of the 2007– 2009 recession.

Index of real
residential
construction
(2005 = 100)
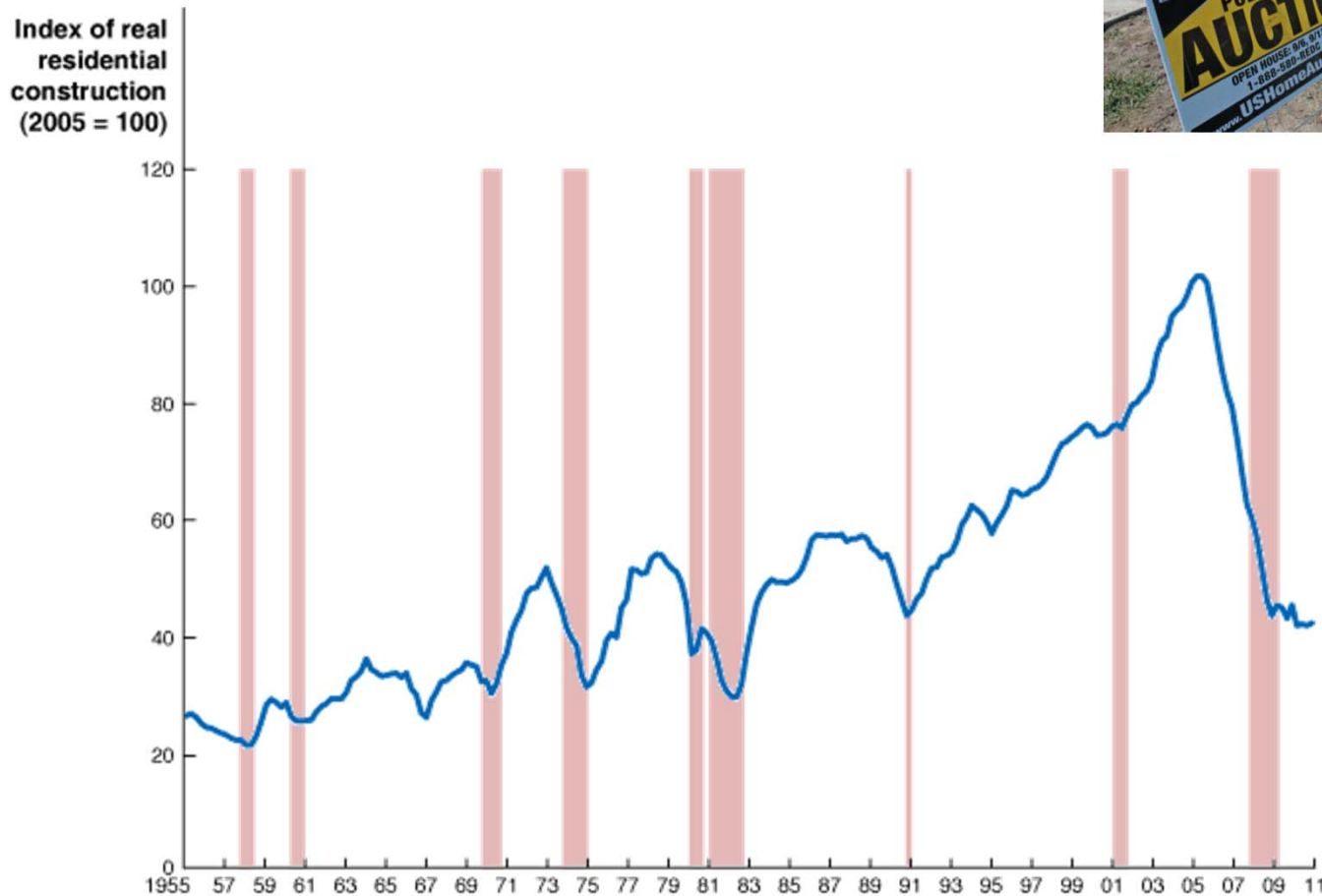
Declines in aggregate demand that result from financial crises tend to be larger and more long lasting than declines due to other factors.

The shaded periods represent recessions.

MyEconLab **Your Turn:** Test your understanding by doing related problem 3.6 at the end of this chapter.

Expansion

Figure 13.6

The Short-Run and Long- Run Effects of an Increase in Aggregate Demand

In the short run, an increase in aggregate demand causes an increase in real GDP.
In the long run, it causes only an increase in the price level.
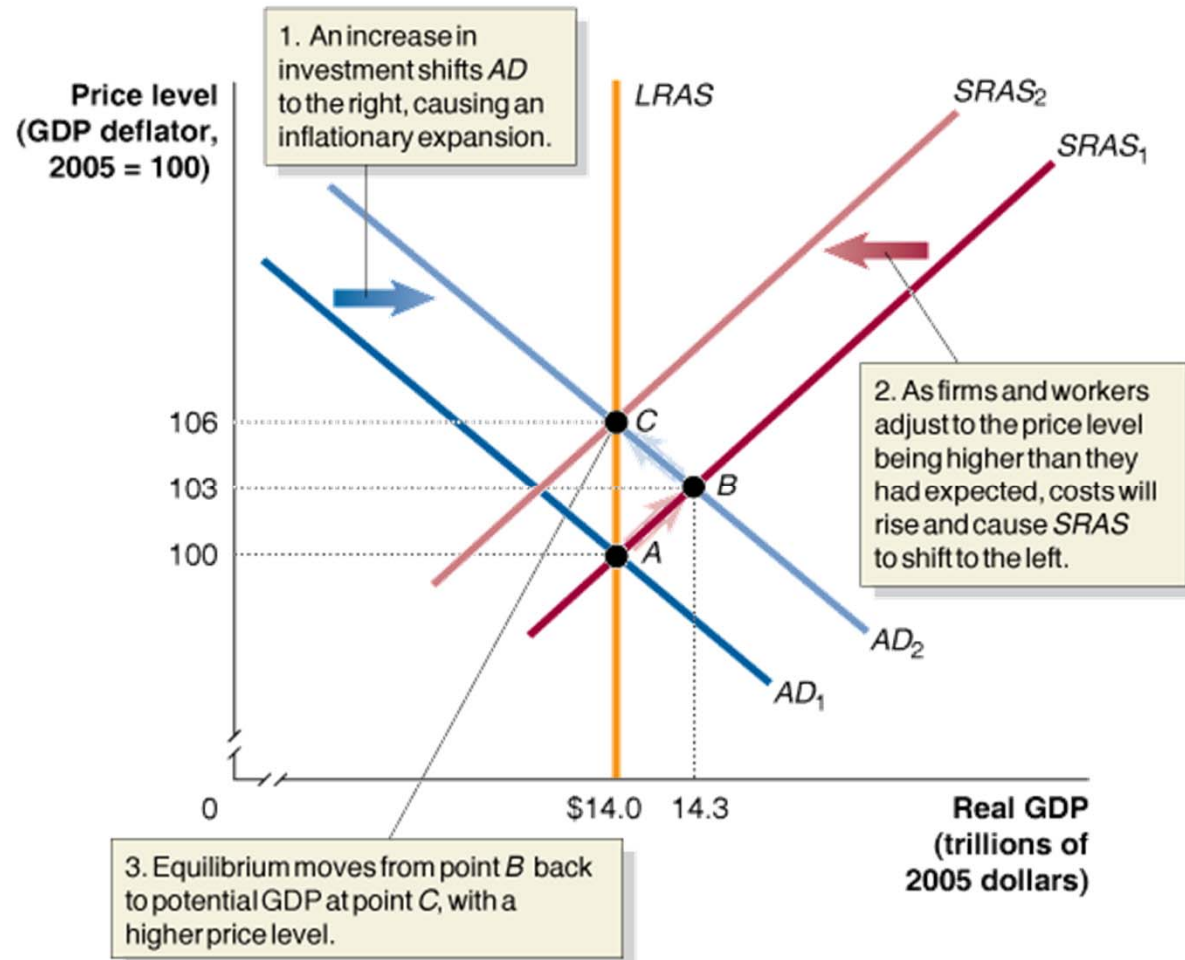
1. An increase in investment shifts *AD* to the right, causing an inflationary expansion.

2. As firms and workers adjust to the price level being higher than they had expected, costs will rise and cause *SRAS* to shift to the left.

3. Equilibrium moves from point *B* back to potential GDP at point *C*, with a higher price level.

Stagflation A combination of inflation and recession, usually resulting from a supply shock.

Supply Shock

(a) A recession with a rising price level—the short-run effect of a supply shock

(b) Adjustment back to potential GDP—the long-run effect of a supply shock
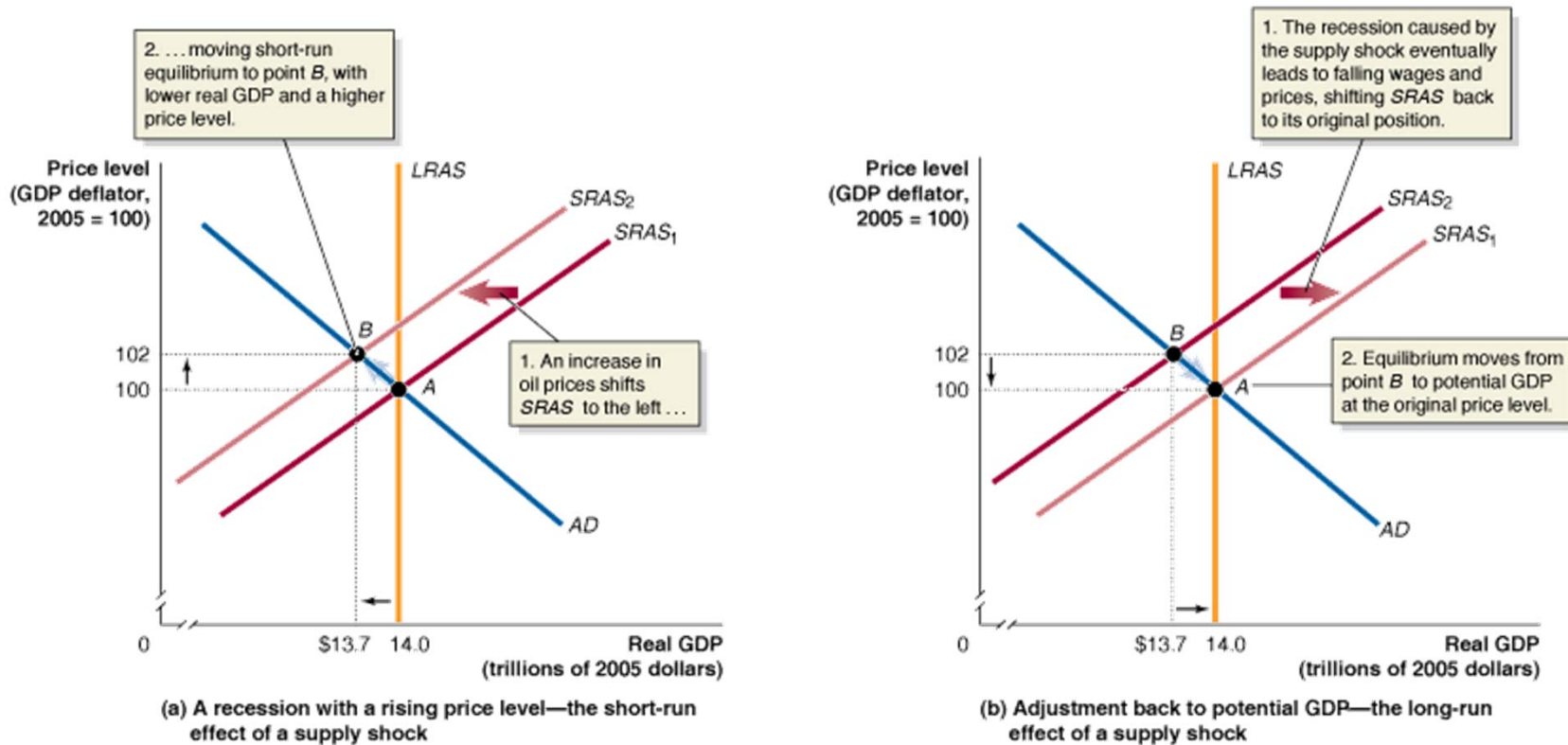
Figure 13.7   The Short-Run and Long-Run Effects of a Supply Shock

Panel (a) shows that a supply shock, such as a large increase in oil prices, will cause a recession and a higher price level in the short run.

The recession caused by the supply shock increases unemployment and reduces output.

In panel (b), rising unemployment and falling output result in workers being willing to accept lower wages and firms being willing to accept lower prices.

The short-run aggregate supply curve shifts from $SRAS_2$ to $SRAS_1$.

Equilibrium moves from point *B* back to potential GDP and the original price level at point *A*.

How Long Does It Take to Return to Potential GDP? Economic Forecasts Following the Recession of 2007–2009
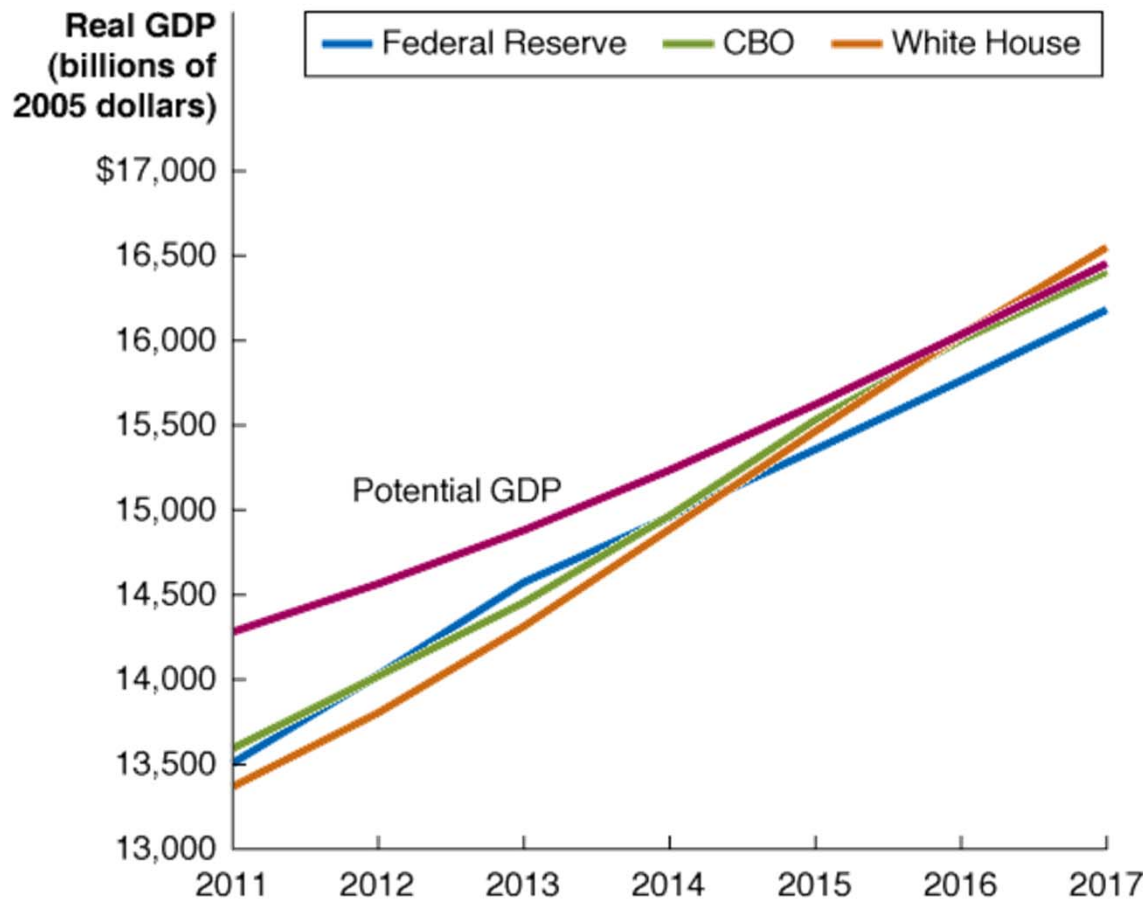
Alan Krueger, the chair of the Council of Economic Advisers in the Obama administration, estimates how long the economy would take to return to potential GDP.

Note: The Federal Reserve's forecast uses averages of the forecasts of the individual members of the Federal Open Market Committee.

MyEconLab **Your Turn:** Test your understanding by doing related problem 3.9 at the end of this chapter.

A Dynamic AD-AS Model

- The basic AD-AS model just discussed gives some misleading results:
  - It incorrectly predicts that a recession caused by the AD curve shifting to the left will *cause the PL to fall*, which has not happened for an entire year since the 1930s.
- The problem arises from the two assumptions:
  1. no continuing inflation
  2. no long-run growth.
- In the *dynamic* setting, we assume *potential real GDP* grows over time and *inflation* continues every year.

- ▶ (Cont.) We can then create a *dynamic* AD-AS model by making three changes to the basic model.

    1. Potential real GDP increases continually, shifting the long-run AS curve to the right.

        - ▶ If assuming that no other variables that affect the SR-AS curve have changed, the LR-AS and SR-AS curves will shift to the right *by the same amount*. Note that SR-AS is also affected by other factors.

    2. During most years, the AD curve will be shifting to the right.

        - ▶ As population grows and income grows, consumption, investment, and gov spending will increase over time. The AD curve will shift to the right. The AD curve shifting to the left will push the economy into recession.

- ▶ 3 (cont.) Except during periods when workers and firms expect high rates of inflation, the short-run AS curve will be shifting to the right.
    - ▶ The dynamic model provides a more accurate explanation of the source of most inflation. In Figure 13.9, the SR-AS curve shifts to the right by *less than* the LR-AS because the anticipated increase in prices offsets some of the TC and increases in the LF and capital stock.
    - ▶ Although inflation is generally a result of total spending growing faster than total production, a shift to the left of SR-AS can also cause an increase in the PL, just like the supply shock.

Figure 13.8 A Dynamic Aggregate Demand and Aggregate Supply Model

Price level

1. The economy begins in equilibrium at point A, with SRAS₁ and AD₁ intersecting at a point on LRAS₁.

2. During the course of a year, increases in the labor force and capital stock as well as technological change cause a shift from LRAS₁ to LRAS₂.

LRAS₁   LRAS₂

SRAS₁

SRAS₂

3. The same factors that cause the LRAS curve to shift during the year also cause the SRAS curve to shift.

A   B

100

4. During the course of the year, rising income and population, increasing investment, and increasing government purchases cause the AD curve to shift, and the economy ends in a new equilibrium at point B.

5. The dynamic AD-AS model allows us to give a more accurate account of changes in real GDP and the price level.

AD₁   AD₂

0        $14.0   14.3   **Real GDP**

We start with the basic aggregate demand and aggregate supply model.

In the dynamic model, increases in the labor force and capital stock as well as technological change cause long-run aggregate supply to shift over the course of a year, from $LRAS_1$ to $LRAS_2$.

Typically, these same factors cause short-run aggregate supply to shift from $SRAS_1$ to $SRAS_2$.

Aggregate demand will shift from AD_1 to AD_2 if, as is usually the case, spending by consumers, firms, and the government increases during the year.

What Is the Usual Cause of Inflation?

Using Dynamic Aggregate Demand and Aggregate Supply to Understand Inflation

The most common cause of inflation is total spending increasing faster than total production.
1. The economy begins at point *A,* with real GDP of $14.0 trillion and a price level of 100.
   An increase in full-employment real GDP from $14.0 trillion to $14.3 trillion causes long-run aggregate supply to shift from *LRAS₁* to *LRAS₂.*
   Aggregate demand shifts from *AD₁ to AD₂.*
2. Because *AD* shifts to the right by more than the *LRAS* curve, the price level in the new equilibrium rises from 100 to 104.

Price level
(GDP deflator,
2005 = 100)

LRAS₁ LRAS₂

SRAS₁

SRAS₂

104 .... B

100 .... A

1. If *AD* shifts to the right more than *LRAS*…

2. …the price level rises.

AD₂

AD₁

0   $14.0   14.3   Real GDP
(trillions of
2005 dollars)
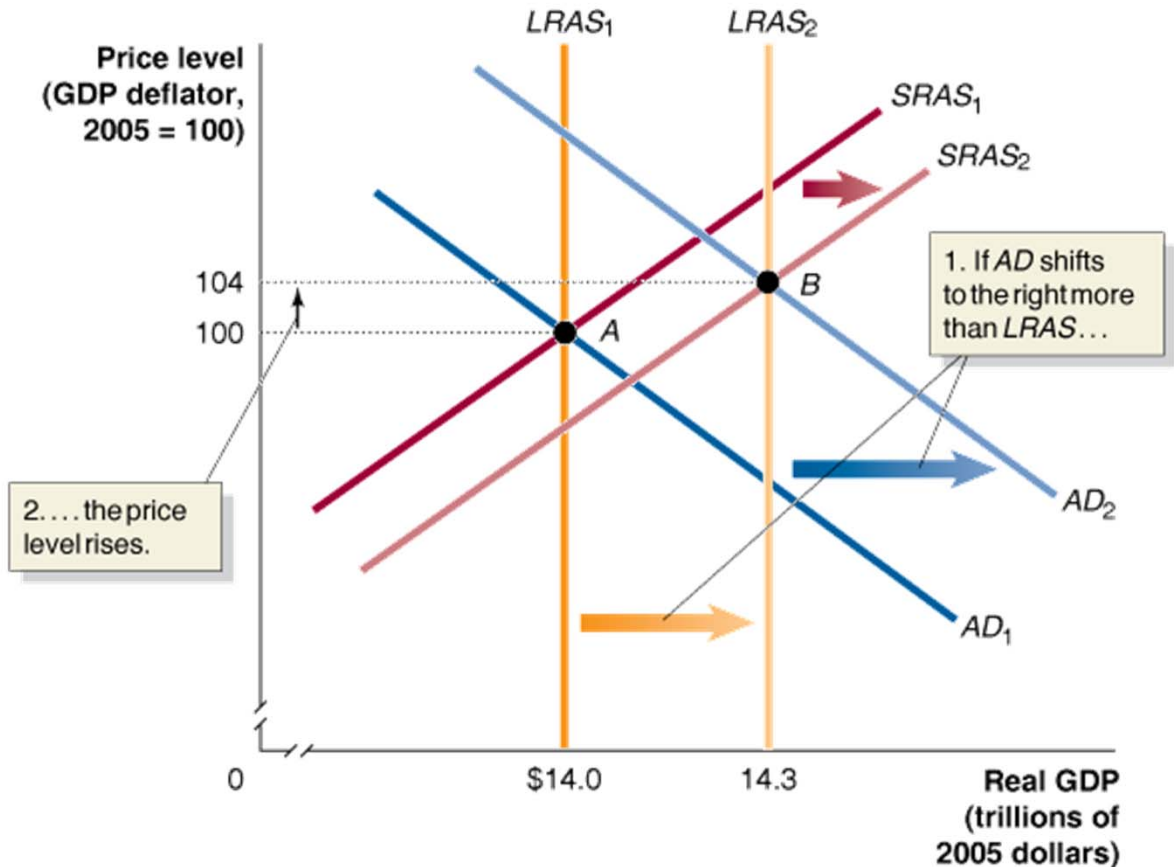
The Recession of 2007-2009

With the end of the economic expansion that had begun in November 2001, several factors combined to bring on the recession in December 2007:

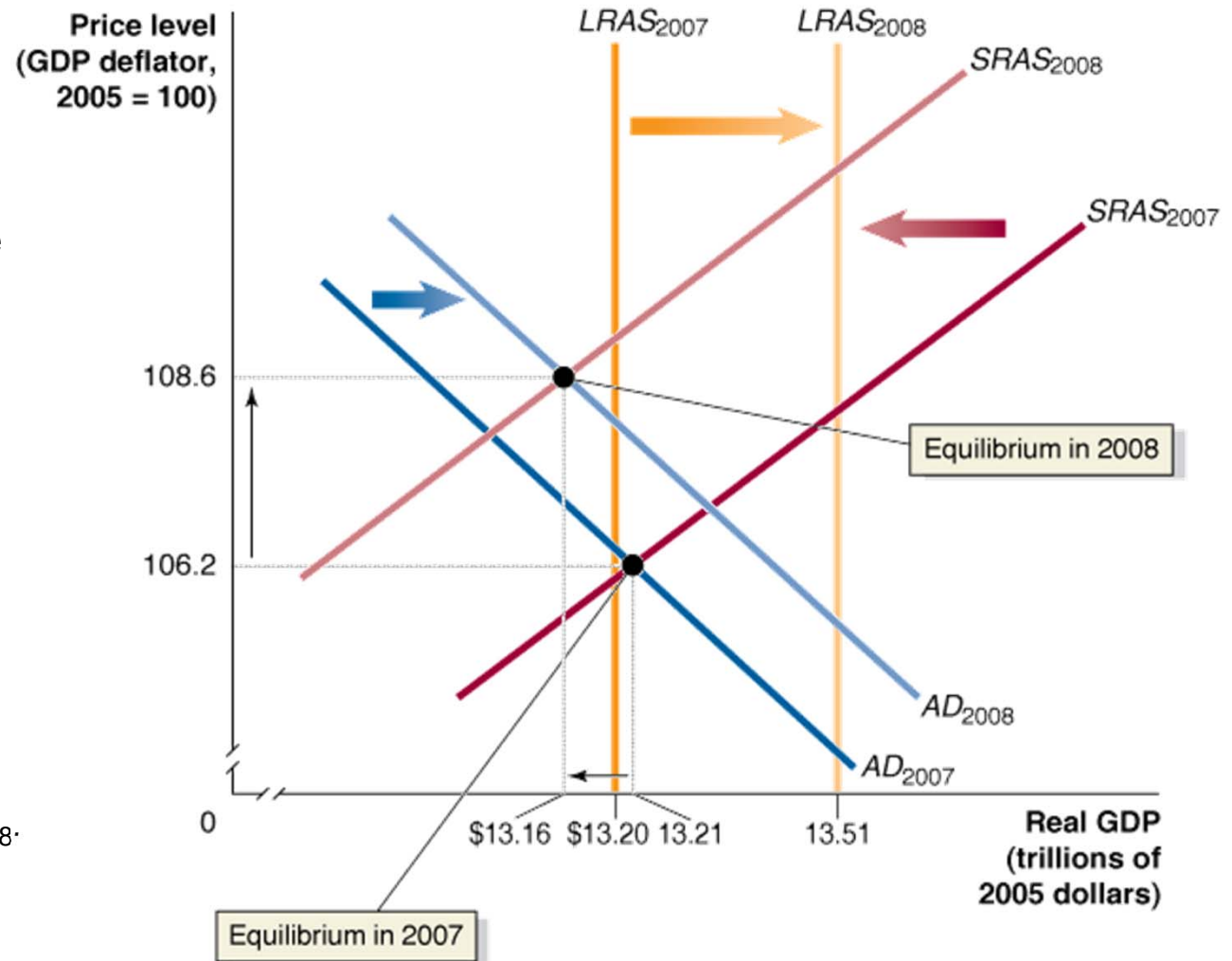- **The end of the housing bubble.** A speculative bubble—the expectation of an asset increasing in value despite its underlying value—contributed to the rapidly rising housing prices between 2002 and 2005 before deflating in 2006, as both new home sales and existing home values began to decline. The growth of aggregate demand slowed as spending on residential construction fell more than 60 percent over the next four years.

- **The financial crisis.** The financial crisis led to a "credit crunch" that made it difficult for many households and firms to obtain the loans they needed to finance their spending, which contributed to declines in consumption spending and investment spending.

- **The rapid increase in oil prices during 2008.** Although rising oil prices can result in a *supply shock* that causes the short-run aggregate supply curve to shift to the left, it did not shift as far to the left during 2008 as it had from the increases in oil prices 30 years earlier because many firms had since switched to less oil-dependent production processes.

Figure 13.10

The Beginning of the Recession of 2007–2009

Between 2007 and 2008, the *AD* curve shifted to the right, but not by nearly enough to offset the shift to the right of the *LRAS* curve, which represented the increase in potential real GDP from $13.20 trillion to $13.51 trillion. Because of a sharp increase in oil prices, short-run aggregate supply shifted to the left, from *SRAS*$_{2007}$ to *SRAS*$_{2008}$. Real GDP decreased from $13.21 trillion in 2007 to $13.16 trillion in 2008, which was far below the potential real GDP, shown by *LRAS*$_{2008}$.

As a result, the unemployment rate rose from 4.6 percent in 2007 to 5.8 percent in 2008. Because the increase in aggregate demand was small, the price level increased only from 106.2 in 2007 to 108.6 in 2008, so the inflation rate for 2008 was only 2.3 percent.

Price level (GDP deflator, 2005 = 100)

LRAS$_{2007}$ LRAS$_{2008}$ SRAS$_{2008}$

SRAS$_{2007}$

108.6

Equilibrium in 2008

106.2

AD$_{2008}$

AD$_{2007}$

Equilibrium in 2007

0    $13.16 $13.20 13.21   13.51   Real GDP (trillions of 2005 dollars)

Solved Problem 13.4

Showing the Oil Shock of 1974–1975 on a Dynamic Aggregate Demand and Aggregate Supply Graph

	Actual Real GDP	Potential Real GDP	Price Level
1974	$4.89 trillion	$4.92 trillion	30.7
1975	$4.88 trillion	$5.09 trillion	33.6

Following the Arab–Israeli War of 1973, the Organization of the Petroleum Exporting Countries (OPEC) increased the price of a barrel of oil from less than $3 to more than $10.
Use this information and the statistics in the table above to draw a dynamic aggregate demand and aggregate supply graph showing macroeconomic equilibrium for 1974 and 1975, assuming that the aggregate demand curve did not shift between these two years.
Provide a brief explanation of your graph.

Solving the Problem

Step 1: Review the chapter material.

Step 2: Use the information in the table to draw the graph.
You need to draw five curves:
SRAS and *LRAS* for both 1974 and 1975, and *AD*, which is the same for both years.
You know that the two *LRAS* curves will be vertical lines at the values given for potential GDP in the table.
Because of the large supply shock, you know that the *SRAS* curve shifted to the left.
You are instructed to assume that the *AD* curve did not shift.

Solved Problem 13.4

Showing the Oil Shock of 1974–1975 on a Dynamic Aggregate Demand and Aggregate Supply Graph

|	Actual Real GDP	Potential Real GDP	Price Level
1974	$4.89 trillion	$4.92 trillion	30.7
1975	$4.88 trillion	$5.09 trillion	33.6

Your graph should look like this.

Step 3: Explain your graph.
$LRAS_{1974}$ and $LRAS_{1975}$ are at the levels of potential real GDP for each year. Macroeconomic equilibrium occurs where the *AD* curve intersects the *SRAS* curves.
As a result of the supply shock, the economy moved from an equilibrium output just below potential GDP in 1974 to an equilibrium well below potential GDP in 1975.
The unemployment rate soared from 5.6 percent in 1974 to 8.5 percent in 1975.
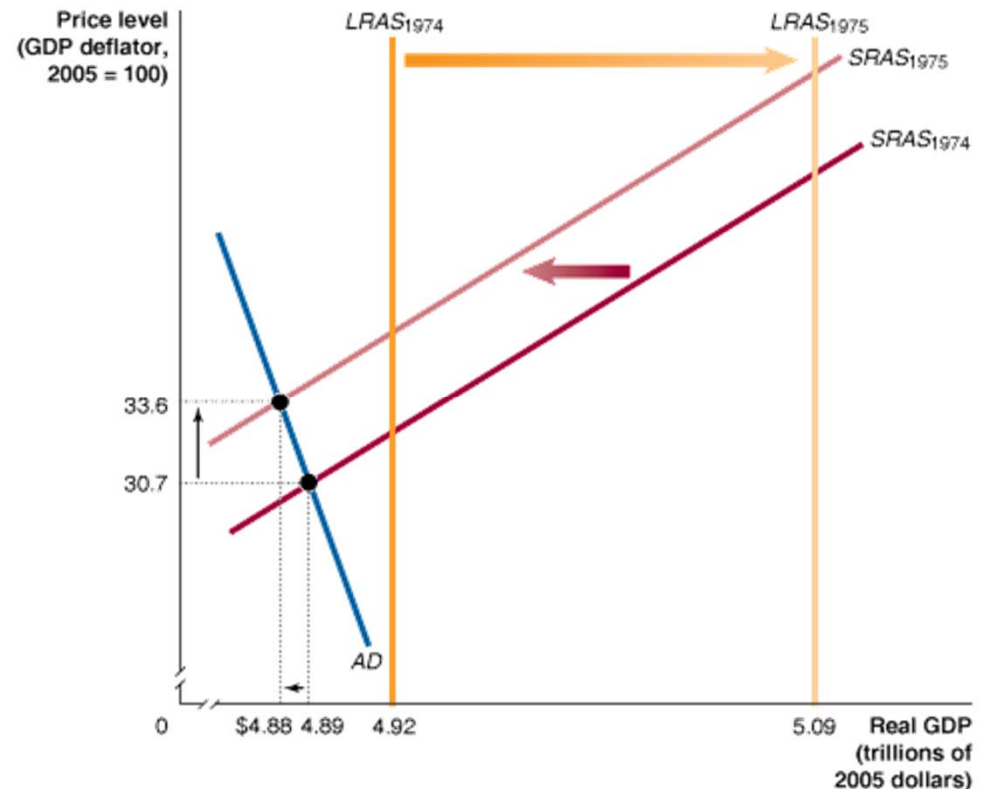
MyEconLab   **Your Turn:** For more practice, do related problems 4.5 and 4.6 at the end of this chapter.

Appendix   Macroeconomic Schools of Thought

Understand macroeconomic schools of thought.

Keynesian revolution The name given to the widespread acceptance during the 1930s and 1940s of John Maynard Keynes's macroeconomic model.

Because the aggregate demand and aggregate supply model has been modified significantly from Keynes's day, many economists who use it today refer to themselves as *new Keynesians*.

There are three major alternative models used by other *schools of thought* that differ significantly from the standard aggregate demand and aggregate supply model:

1. The monetarist model

2. The new classical model

3. The real business cycle model

The Monetarist Model

The monetarist model—also known as the neo-Quantity Theory of Money model—was developed beginning in the 1940s by Milton Friedman, an economist at the University of Chicago who was awarded the Nobel Prize in Economics in 1976.

Friedman argued that most fluctuations in real output were caused by fluctuations in the money supply rather than in consumption spending or investment spending.

Monetary growth rule A plan for increasing the quantity of money at a fixed rate that does not respond to changes in economic conditions.

Monetarism The macroeconomic theories of Milton Friedman and his followers, particularly the idea that the quantity of money should be increased at a constant rate.

The *quantity theory of money* underlies the monetarist model.

The New Classical Model

The new classical model was developed in the mid-1970s by a group of economists, including Nobel Laureate Robert Lucas of the University of Chicago, who de-emphasize the stickiness in wages and prices, believing both adjust quickly to changes in demand and supply.

New classical macroeconomists also believe that the economy normally will be at potential real GDP.

Lucas argues that workers and firms have *rational expectations*, meaning that they form their expectations of the future values of economic variables by making use of all available information that might affect aggregate demand.

New classical macroeconomics The macroeconomic theories of Robert Lucas and others, particularly the idea that workers and firms have rational expectations.

Supporters of the new classical model agree that the Federal Reserve should adopt a monetary growth rule, arguing that it will help workers and firms to accurately forecast the price level, thereby reducing fluctuations in real GDP.

The Real Business Cycle Model

Some economists in the 1980s, while supporting Lucas's assumption of rational expectations and that wages and prices adjust quickly to supply and demand, began to argue that fluctuations in real GDP are caused by temporary productivity shocks, whether positive or negative.

According to this school of thought, shifts in the aggregate demand curve have no impact on real GDP because the short-run aggregate supply curve is vertical.

Other schools of thought believe that the short-run aggregate supply curve is upward sloping and that only the *long-run* aggregate supply curve is vertical.

Real business cycle model A macroeconomic model that focuses on real, rather than monetary, causes of the business cycle.