

SOLUTIONS TO TEXT PROBLEMS:

Quick Quizzes

1. Three key facts about economic fluctuations are: (1) economic fluctuations are irregular and unpredictable; (2) most macroeconomic quantities fluctuate together; and (3) as output falls, unemployment rises.

Economic fluctuations are irregular and unpredictable, as you can see by looking at a graph of real GDP over time. Some recessions are close together and others are far apart. There appears to be no recurring pattern.

Most macroeconomic quantities fluctuate together. In recessions, real GDP, consumer spending, investment spending, corporate profits, and other macroeconomic variables decline or grow much more slowly than during economic expansions. However, the variables fluctuate by different amounts over the business cycle, with investment varying much more than other variables.

As output falls, unemployment rises, because when firms want to produce less, they do so by laying off workers, thus causing a rise in unemployment.

2. The economy's behavior in the short run differs from its behavior in the long run because the assumption of monetary neutrality applies to the long run, not the short run. In the short run, real and nominal variables are highly intertwined.

Figure 1 shows the model of aggregate demand and aggregate supply. The horizontal axis shows the quantity of output and the vertical axis shows the price level.

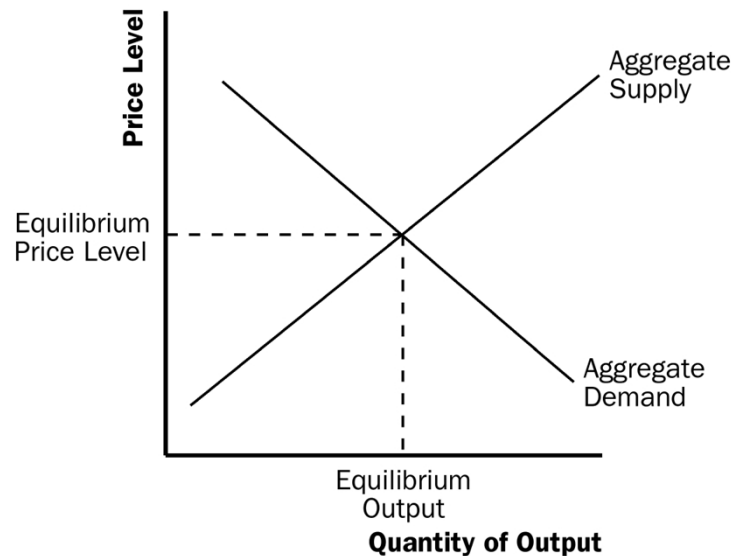


Figure 1

3. The aggregate-demand curve slopes downward for three reasons. First, when prices fall, the value of dollars in people's wallets and bank accounts rises, so they are wealthier. As a result, they spend more, so aggregate demand increases. Second, when prices fall, people need less money to make their purchases, so they lend more out, which reduces the interest rate. The lower interest rate encourages businesses to invest more, raising aggregate demand. Third,

since lower prices lead to a lower interest rate, investors move money from domestic investment to foreign investment, supplying dollars to the foreign-exchange market, thus causing the dollar to depreciate. The decline in the real exchange rate causes net exports to increase, which raises aggregate demand.

Any event that alters the level of consumption, investment, government purchases, or net exports at any price level will lead to a shift in aggregate demand. An increase in expenditure will shift the aggregate demand curve to the right, while a decline in expenditure will shift the aggregate demand curve to the left.

4. The long-run aggregate-supply curve is vertical because the price level does not affect the long-run determinants of real GDP, which include supplies of labor, capital, natural resources, and the level of available technology. This is just an application of the classical dichotomy and monetary neutrality.

There are three reasons why the short-run aggregate-supply curve slopes upward. First, the sticky-wage theory suggests that because nominal wages are slow to adjust, a decline in the price level means real wages are higher, so firms hire fewer workers and produce less, causing aggregate supply to decline. Second, the sticky-price theory suggests that the prices of some goods and services are slow to change. Then, if some economic event causes the overall price level to decline, prices that are sticky won't be able to adjust immediately, so relative prices of those goods will rise and the demand for those goods will decline, leading firms to cut back on production. Thus, lower overall prices lead to lower aggregate supply. Third, the misperceptions theory suggests that changes in the overall price level can temporarily mislead suppliers. When the price level falls below the level that was expected, suppliers think that the relative prices of their products have declined, so they produce less. Thus, a lower price level reduces aggregate supply.

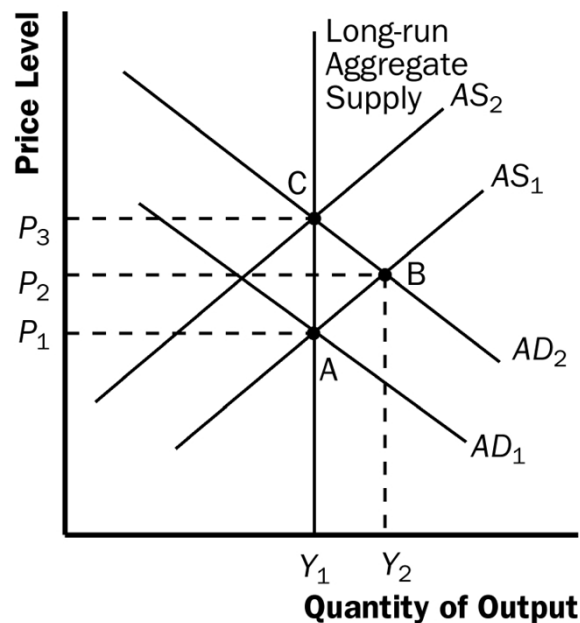


Figure 2

5. When a popular presidential candidate is elected, causing people to be more confident about the

future, they will spend more, causing the aggregate-demand curve to shift to the right, as shown in Figure 2. The economy begins at point A with aggregate-demand curve AD_1 and short-run aggregate-supply curve AS_1 . The equilibrium has price level P_1 and output level Y_1 . Increased confidence about the future causes the aggregate-demand curve to shift to AD_2 . Now the economy is at point B, with price level P_2 and output level Y_2 . Over time, the short-run aggregate-supply curve shifts up to AS_2 and the economy gets to equilibrium at point C, with price level P_3 and output level Y_1 .

Questions for Review

- Two macroeconomic variables that decline when the economy goes into a recession are real GDP and investment spending (many other answers are possible). A macroeconomic variable that rises during a recession is the unemployment rate.
- Figure 3 shows aggregate demand, short-run aggregate supply, and long-run aggregate supply.

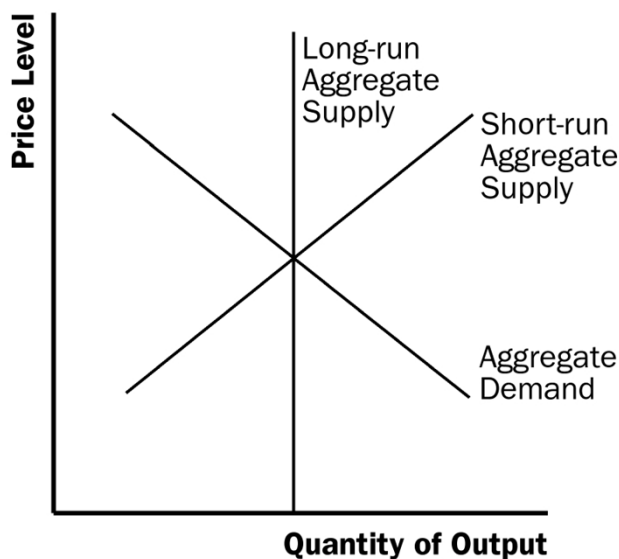


Figure 3

- The aggregate-demand curve is downward sloping because: (1) a decrease in the price level makes consumers feel wealthier, which in turn encourages them to spend more, so there is a larger quantity of goods and services demanded; (2) a lower price level reduces the interest rate, encouraging greater spending on investment, so there is a larger quantity of goods and services demanded; (3) a fall in the U.S. price level causes U.S. interest rates to fall, so the real exchange rate depreciates, stimulating U.S. net exports, so there is a larger quantity of goods and services demanded.
- The long-run aggregate supply curve is vertical because in the long run, an economy's supply of goods and services depends on its supplies of capital, labor, and natural resources and on the available production technology used to turn these resources into goods and services. The price level does not affect these long-run determinants of real GDP.
- Three theories explain why the short-run aggregate-supply curve is upward sloping: (1) the sticky-wage theory, in which a lower price level makes employment and production less profitable because wages do not adjust immediately to the price level, so firms reduce the

quantity of goods and services supplied; (2) the sticky-price theory, in which an unexpected fall in the price level leaves some firms with higher-than-desired prices because not all prices adjust instantly to changing conditions, which depresses sales and induces firms to reduce the quantity of goods and services they produce; and (3) the misperceptions theory, in which 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.

6. The aggregate-demand curve might shift to the left when something (other than a rise in the price level) causes a reduction in consumption spending (such as a desire for increased saving), a reduction in investment spending (such as increased taxes on the returns to investment), decreased government spending (such as a cutback in defense spending), or reduced net exports (such as when foreign economies go into recession, so our exports fall).

Figure 4 traces through the steps of such a shift in aggregate demand. The economy begins in equilibrium, with short-run aggregate supply, AS_1 , intersecting aggregate demand, AD_1 , at point A. When the aggregate-demand curve shifts to the left to AD_2 , the economy moves from point A to point B, reducing the price level and the quantity of output. Over time, people adjust their perceptions, wages, and prices, shifting the short-run aggregate-supply curve down to AS_2 , and moving the economy from point B to point C, which is back on the long-run aggregate supply curve and has a lower price level.

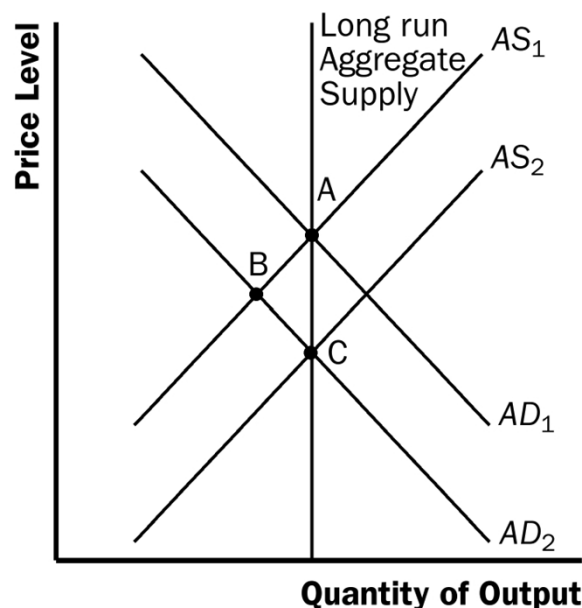


Figure 4

7. The aggregate-supply curve might shift to the left because of a decline in the economy's capital stock, labor supply, or productivity, or an increase in the natural rate of unemployment, all of which shift both the long-run and short-run aggregate supply curves to the left. An increase in the expected price level shifts just the short-run aggregate-supply curve (not the long-run aggregate-supply curve) to the left.

Figure 5 traces through the effects of such a shift. The economy starts in equilibrium at point A. The aggregate-supply curve then shifts to the left from AS_1 to AS_2 . The new equilibrium is at point B, the intersection of the aggregate-demand curve and AS_2 . As time goes on, the economy returns to long-run equilibrium at point A, as the short-run aggregate supply curve

shifts back to its original position.

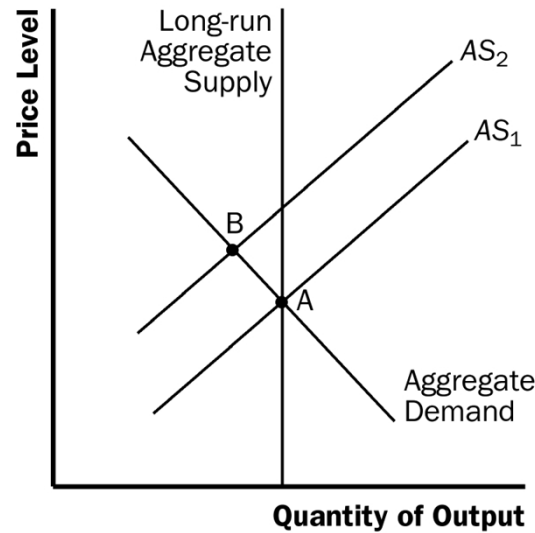


Figure 5

Problems and Applications

1. Investment is more variable than consumer spending over the business cycle because firms can curtail investment spending more easily than households can curtail consumption spending. In recessions, firms know they will not be able to sell as many goods, so they want to produce less and therefore they put off buying capital (they do not expand factories or buy new equipment). Much of consumer spending is on necessities, like food, which cannot decline as much in recessions. So, investment spending is more variable over the business cycle than consumer spending. For similar reasons, durable goods spending is the most volatile sector of consumer spending. Durable goods, such as furniture and car purchases, are more volatile over the business cycle than nondurable goods, such as food and clothing, or services, such as haircuts and medical care, for the same reason. People put off buying durable goods and just make do with older cars and furniture when economic times are bad.
2.
 - a. The current state of the economy is shown in Figure 6. The aggregate-demand curve and short-run aggregate-supply curve intersect at a point to the left of long-run aggregate supply.
 - b. A stock market crash leads to a leftward shift of aggregate demand. The equilibrium level of output and the price level will fall. Since the quantity of output is less than the natural rate of output, the unemployment rate will rise above the natural rate of unemployment.
 - c. If nominal wages are unchanged as the price level falls, firms will be forced to cut back on employment and production. Over time as expectations adjust, the short-run aggregate supply curve will shift to the right moving the economy back to the natural rate of output.

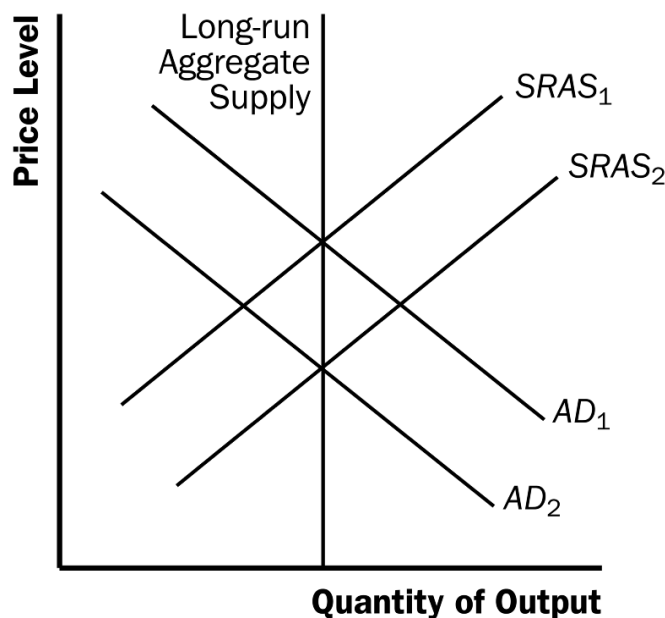


Figure 6

3.
 - a. When the United States experiences a wave of immigration, the labor force increases, so long-run aggregate supply increases as there are more people who can produce output.
 - b. When Congress raises the minimum wage to \$10 per hour, the natural rate of unemployment rises, so the long-run aggregate-supply curve shifts to the left.
 - c. When Intel invents a new and more powerful computer chip, productivity increases, so long-run aggregate supply increases as more output can be produced with the same inputs.
 - d. When a severe hurricane damages factories along the East Coast, the capital stock is smaller, so long-run aggregate supply declines.
4. In Figure 8 in the textbook, the unemployment rate at point B is higher than the unemployment rate at point A because output is lower at B than at A. The unemployment rate at point C is the same as that at point A because output is the same at both points. According to the sticky-wage explanation of the short-run aggregate supply curve, output is lower at point B than at point A because wages have not adjusted. The nominal wage at points A and B are the same, but since the price level is lower at point B the real wage is higher, so firms hire fewer workers and thus output is lower. Point C is on the long-run aggregate supply curve, as is point A, so the real wage must be the same at the two points. Since the price level is lower at point C, the nominal wage at point C must be lower.
5.
 - a. The statement that "the aggregate-demand curve slopes downward because it is the horizontal sum of the demand curves for individual goods" is false. The aggregate-demand curve slopes downward because a fall in the price level raises the overall quantity of goods and services demanded through the wealth effect, the interest-rate effect, and the exchange-rate effect.
 - b. The statement that "the long-run aggregate-supply curve is vertical because economic forces do not affect long-run aggregate supply" is false. Economic forces of various kinds (such as population and productivity) do affect long-run aggregate supply. The

long-run aggregate-supply curve is vertical because the price level does not affect long-run aggregate supply.

- c. The statement that "if firms adjusted their prices every day, then the short-run aggregate-supply curve would be horizontal" is false. If firms adjusted prices quickly and if sticky prices were the only possible cause for the upward slope of the short-run aggregate supply curve, then the short-run aggregate-supply curve would be vertical, not horizontal. The short-run aggregate supply curve would be horizontal only if prices were completely fixed.
 - d. The statement that "whenever the economy enters a recession, its long-run aggregate-supply curve shifts to the left" is false. An economy could enter a recession if the aggregate-demand curve or the short-run aggregate-supply curve shift to the left.
6. a. According to the sticky-wage theory, the economy is in a recession because the price level has declined so that real wages are too high, thus labor demand is too low. Over time, as nominal wages are adjusted so that real wages decline, the economy returns to full employment.

According to the sticky-price theory, the economy is in a recession because not all prices adjust quickly. Over time, firms are able to adjust their prices more fully, and the economy returns to the long-run aggregate-supply curve.

According to the misperceptions theory, the economy is in a recession when the price level is below what was expected. Over time, as people observe the lower price level, their expectations adjust, and the economy returns to the long-run aggregate-supply curve.

- b. The speed of the recovery in each theory depends on how quickly price expectations, wages, and prices adjust.

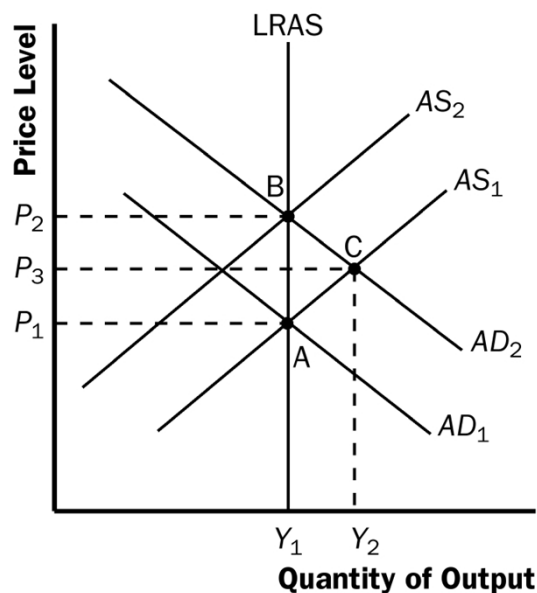


Figure 7

7. If the Fed increases the money supply and people expect a higher price level, the aggregate-demand curve shifts to the right and the short-run aggregate-supply curve shifts to the left, as

shown in Figure 7. The economy moves from point A to point B, with no change in output and a rise in the price level (to P_2). If the public does not change its expectation of the price level, the short-run aggregate-supply curve does not shift, the economy ends up at point C, and output increases along with the price level (to P_3).

8. Figure 8 depicts an economy in a recession. The short-run aggregate supply curve is AS_1 and the economy is at equilibrium at point A, which is to the left of the long-run aggregate-supply curve. If policymakers take no action, the economy will return to the long-run aggregate-supply curve over time as the short-run aggregate-supply curve shifts to the right to AS_2 . The economy's new equilibrium is at point B.

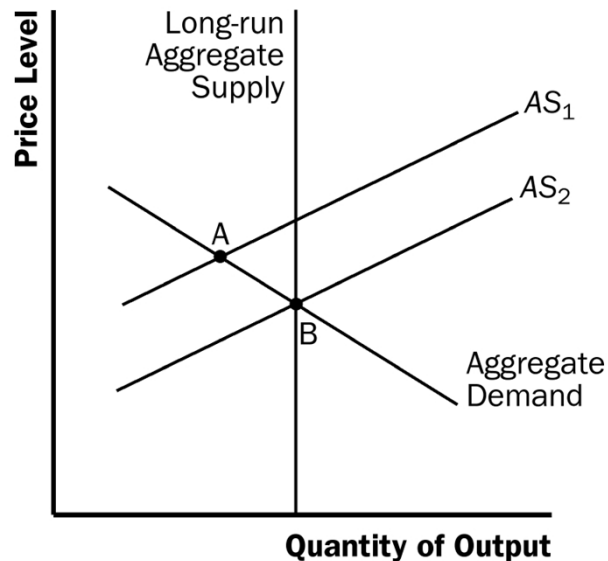


Figure 8

9. a. If people believe that inflation will be high over the next year, workers will want higher nominal wages. If the price level does not rise as much as wages do, real wages will increase, so firms will not hire as many workers.
- b. Figure 9 shows the economy starting out at point A on short-run aggregate-supply curve AS_1 . With higher nominal wages, the short-run aggregate-supply curve will shift to the left to AS_2 . The new equilibrium is at point B, with output less than long-run aggregate supply. In the short run, the price level rises and output falls. In the long-run, the economy will return to point A, as the decline in output eventually leads to a decline in the price level and the short-run aggregate-supply curve returns to AS_1 .

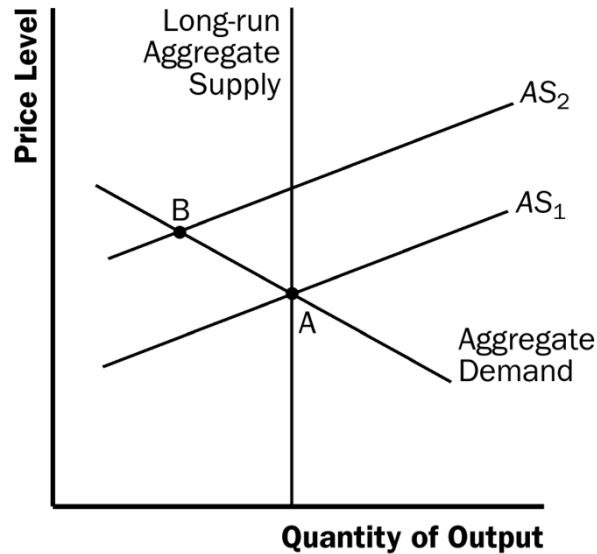


Figure 9

- c. In the short-run, expectations of higher inflation were somewhat accurate, as the price level is higher at point B than at point A (however, the price level at point B is not as high as was expected). But inflation expectations were wrong in the long run.

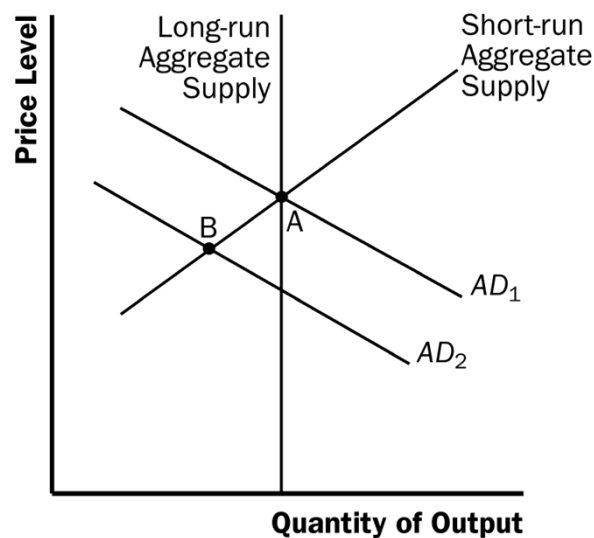


Figure 10

10. a. If households decide to save a larger share of their income, they must spend less on consumer goods, so the aggregate-demand curve shifts to the left, as shown in Figure 10. The equilibrium changes from point A to point B, so the price level declines and output declines.
- b. If Florida orange groves suffer a prolonged period of below-freezing temperatures, the orange harvest will be reduced. This is represented in Figure 11 by a shift to the left in the short-run aggregate-supply curve. The equilibrium changes from point A to point B, so the price level rises and output declines.

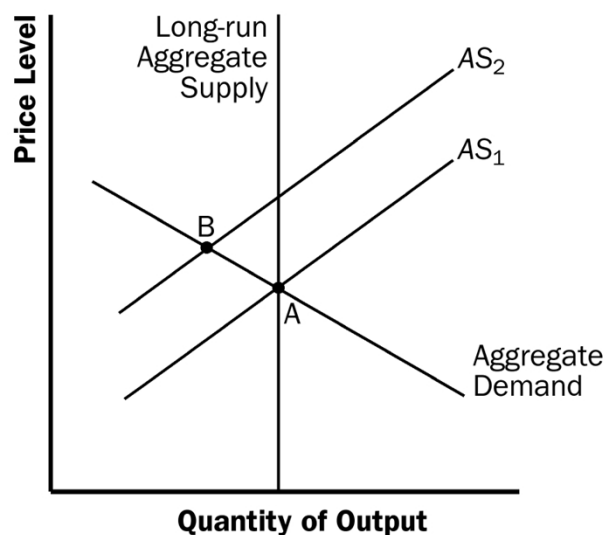


Figure 11

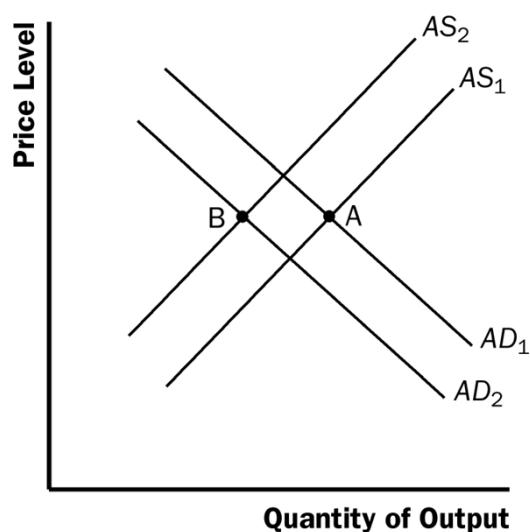


Figure 12

- c. If increased job opportunities cause people to leave the country, the short-run aggregate-supply curve will shift to the left because there are fewer people producing output. The aggregate-demand curve will shift to the left because there are fewer people consuming goods and services. The result is a decline in the quantity of output, as Figure 12 shows. Whether the price level rises or declines depends on the size of the shifts in the aggregate-demand curve and the short-run aggregate-supply curve.
11. a. When the stock market declines sharply, wealth declines, so the aggregate-demand curve shifts to the left, as shown in Figure 13. In the short run, the economy moves from point A to point B, as output declines and the price level declines. In the long run, the short-run aggregate-supply curve shifts to the right to restore equilibrium at point C, with unchanged output and a lower price level compared to point A.

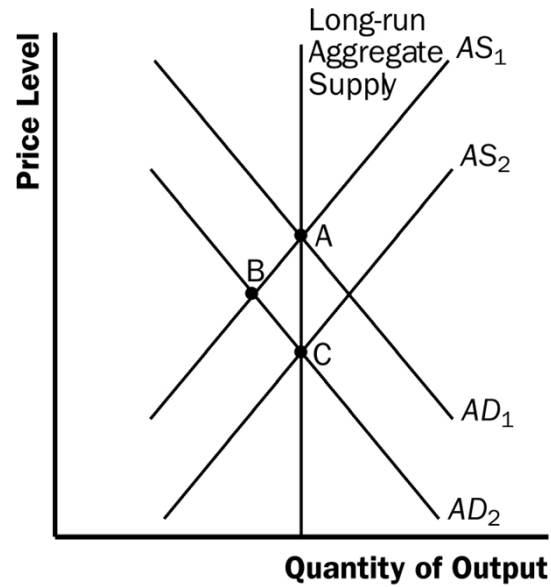


Figure 13

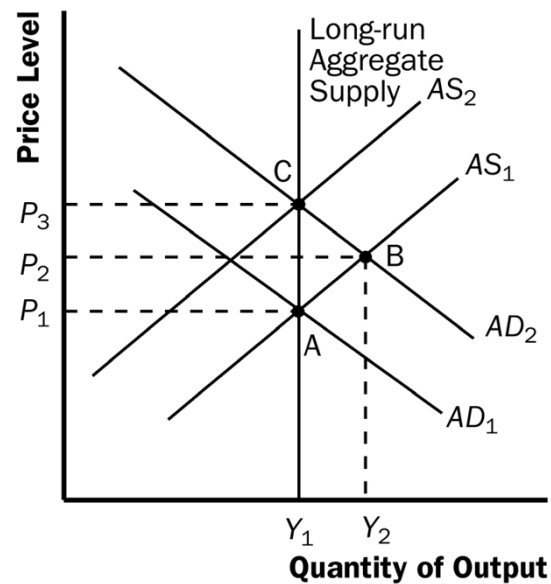


Figure 14

- b. When the federal government increases spending on national defense, the rise in government purchases shifts the aggregate-demand curve to the right, as shown in Figure 14. In the short run, the economy moves from point A to point B, as output and the price level rise. In the long run, the short-run aggregate-supply curve shifts to the left to restore equilibrium at point C, with unchanged output and a higher price level compared to point A.

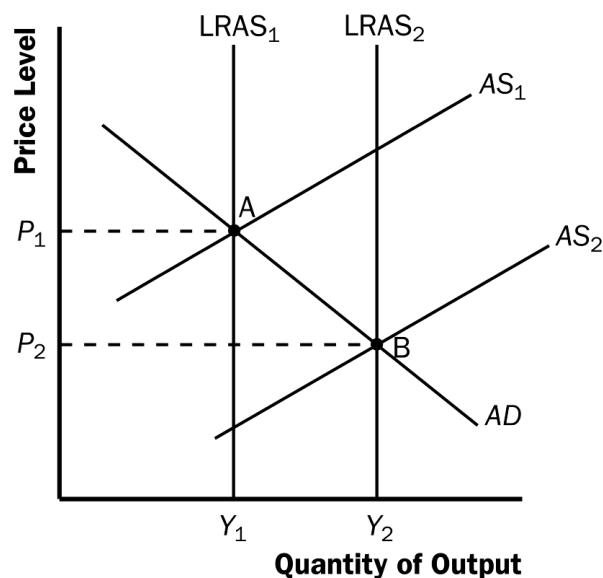


Figure 15

- c. When a technological improvement raises productivity, the long-run and short-run aggregate-supply curves shift to the right, as shown in Figure 15. The economy moves from point A to point B, as output rises and the price level declines.

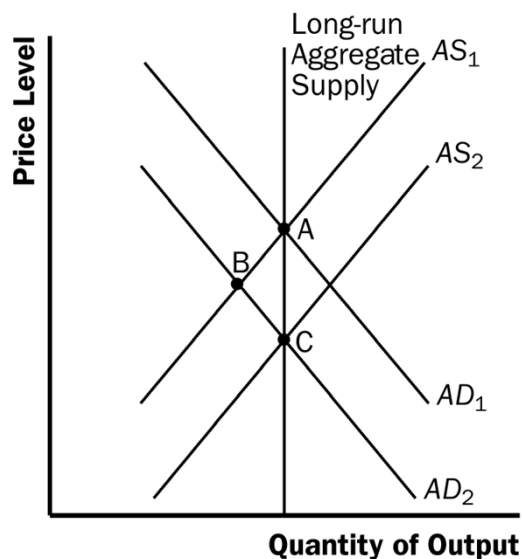


Figure 16

- d. When a recession overseas causes foreigners to buy fewer U.S. goods, net exports decline, so the aggregate-demand curve shifts to the left, as shown in Figure 16. In the short run, the economy moves from point A to point B, as output declines and the price level declines. In the long run, the short-run aggregate-supply curve shifts to the right to restore equilibrium at point C, with unchanged output and a lower price level compared to point A.

12. a. If firms become optimistic about future business conditions and invest a lot, the result is shown in Figure 17. The economy begins at point A with aggregate-demand curve AD_1 and short-run aggregate-supply curve AS_1 . The equilibrium has price level P_1 and output level Y_1 . Increased optimism leads to greater investment, so the aggregate-demand curve shifts to AD_2 . Now the economy is at point B, with price level P_2 and output level Y_2 . The aggregate quantity of output supplied rises because the price level has risen and people have misperceptions about the price level, wages are sticky, or prices are sticky, all of which cause output supplied to increase.
- b. Over time, as the misperceptions of the price level disappear, wages adjust, or prices adjust, the short-run aggregate-supply curve shifts up to AS_2 and the economy gets to equilibrium at point C, with price level P_3 and output level Y_1 . The quantity of output demanded declines as the price level rises.

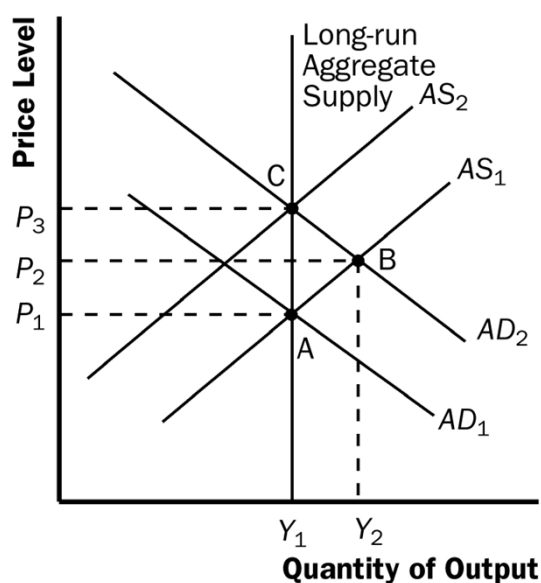


Figure 17

- c. The investment boom might increase the long-run aggregate-supply curve because higher investment today means a larger capital stock in the future, thus higher productivity and output.

13. The idea of lengthening the shopping period between Thanksgiving and Christmas was to increase aggregate demand. As Figure 18 shows, this could increase output back to its long-run equilibrium level.

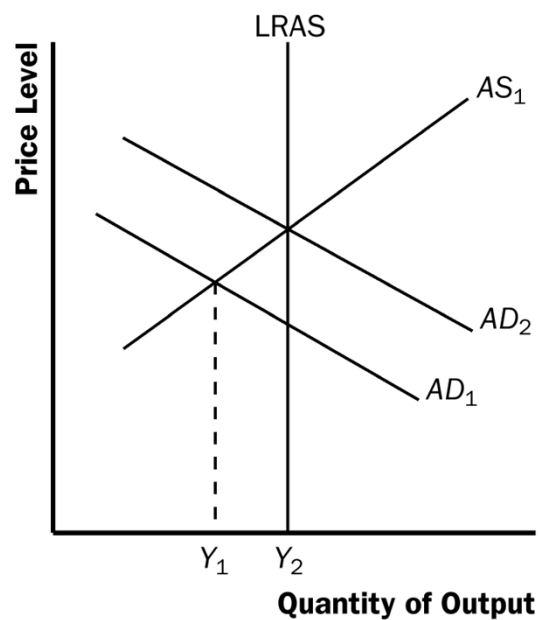


Figure 18

14. Many answers are possible.