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AGGREGATE DEMAND AND AGGREGATE SUPPLY

Questions for Review

1. 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.
2. Figure 3 shows aggregate demand, short-run aggregate supply, and long-run aggregate supply.

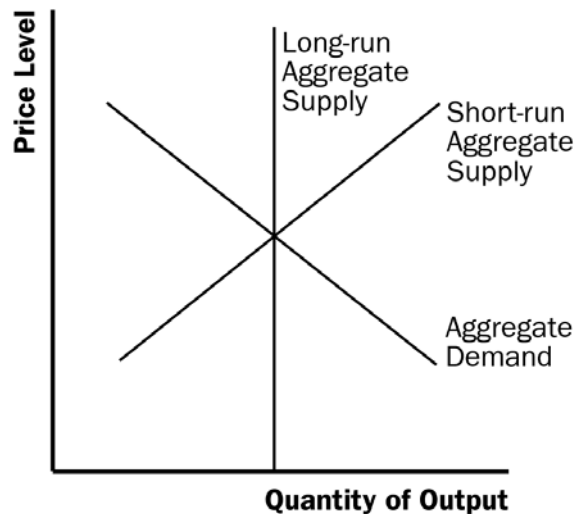


Figure 3

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.
4. 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.

5. 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).

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.

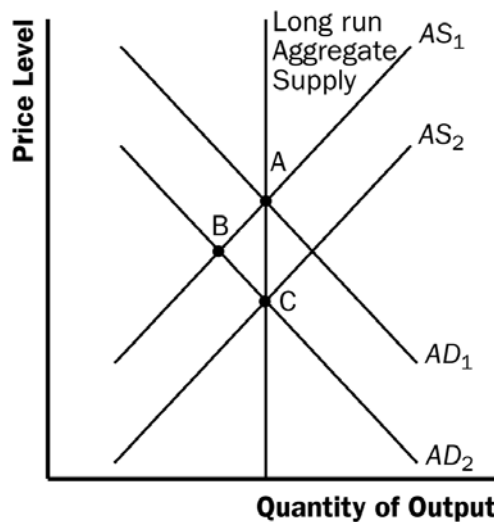


Figure 4

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 a shift in short-run aggregate supply. The economy starts in equilibrium at point A. The aggregate-supply curve 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, perceptions and expectations adjust and the economy returns to long-run equilibrium at point A, because the short-run aggregate-supply curve shifts back to its original position.

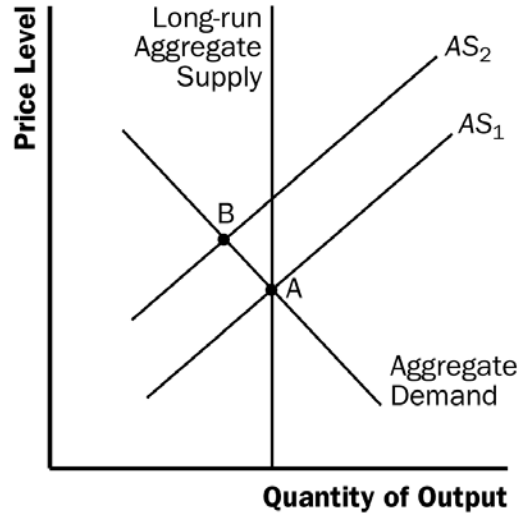


Figure 5

Problems and Applications

- 1 a. The current state of the economy is shown in Figure 7. The aggregate-demand curve and short-run aggregate-supply curve intersect at the same point on the long-run aggregate-supply curve.

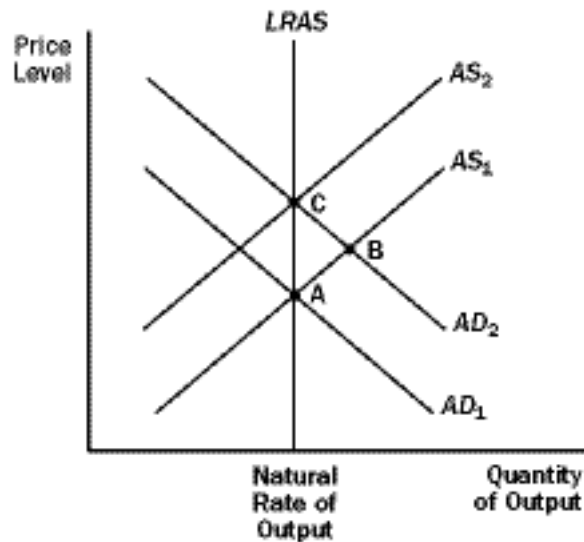


Figure 7

- b. If the central bank increases the money supply, aggregate demand shifts to the right (to point B). In the short run, there is an increase in output and the price level.

- c. Over time, nominal wages, prices, and perceptions will adjust to this new price level. As a result, the short-run aggregate-supply curve will shift to the left. The economy will return to its natural rate of output (point C).
- d. According to the sticky-wage theory, nominal wages at points A and B are equal. However, nominal wages at point C are higher.
- e. According to the sticky-wage theory, real wages at point B are lower than real wages at point A. However, real wages at points A and C are equal.
- f. Yes, this analysis is consistent with long-run monetary neutrality. In the long run, an increase in the money supply causes an increase in the nominal wage, but leaves the real wage unchanged.

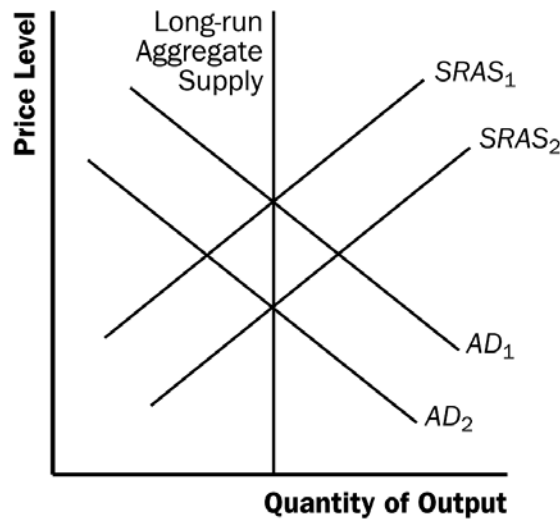


Figure 6

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 the same point on the long-run aggregate-supply curve.
 - b. A stock market crash leads to a leftward shift of aggregate demand. The equilibrium level of output and the price level will fall. Because 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.
3.
 - a. When the United States experiences a wave of immigration, the labor force increases, so long-run aggregate supply shifts to the right.
 - 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 because 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. The idea of lengthening the shopping period between Thanksgiving and Christmas was to increase aggregate demand. As Figure 8 shows, this could increase output back to its long-run equilibrium level.

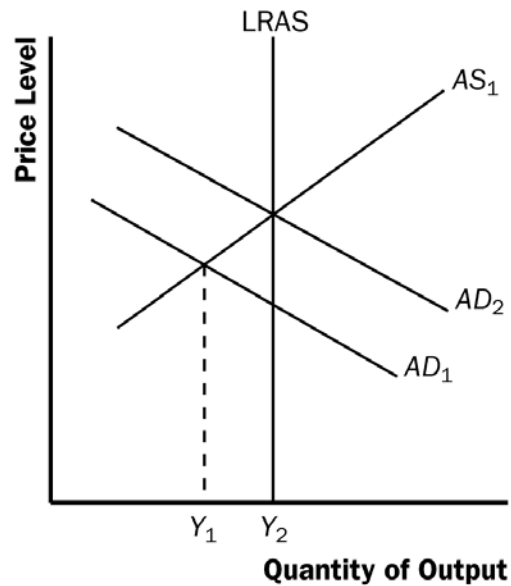


Figure 8

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 either the aggregate-demand curve or the short-run aggregate-supply curve shifts 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.

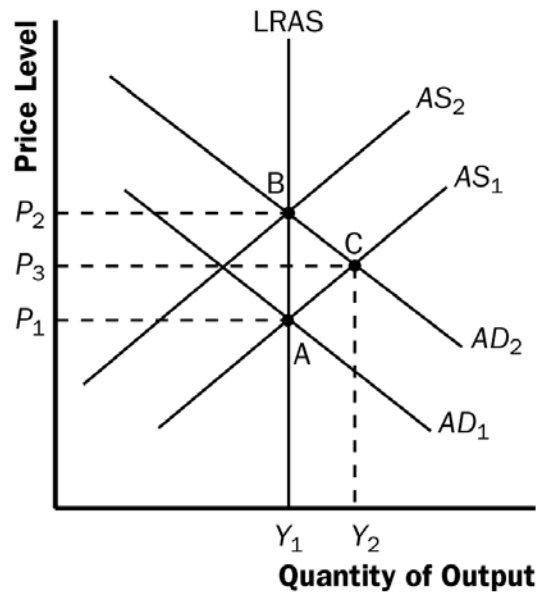


Figure 9

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 9. 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 10 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.

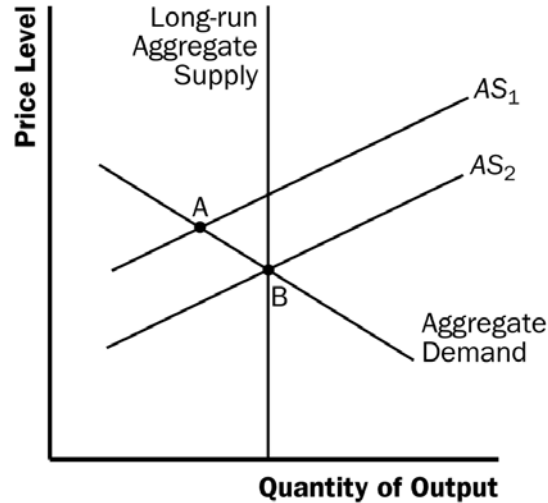


Figure 10

9. a. People will likely expect that the new chairman will not actively fight inflation so they will expect the price level to rise.
- b. If people believe that the price level will be higher over the next year, workers will want higher nominal wages.
- c. Higher labor costs lead to reduced profitability.
- d. The short-run aggregate-supply curve will shift to the left as shown in Figure 11.

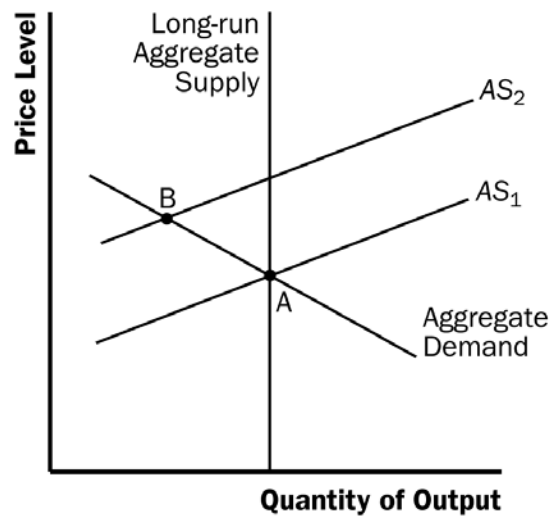


Figure 11

- e. A decline in short-run aggregate supply leads to reduced output and a higher price level.
- f. No, this choice was probably not wise. The end result is stagflation, which provides limited choices in terms of policies to remedy the situation.

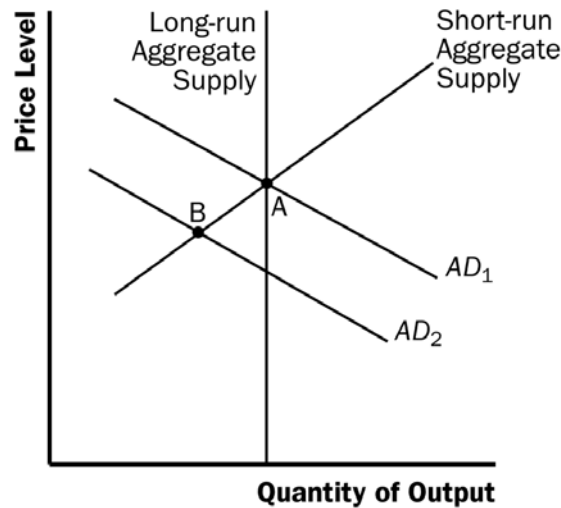
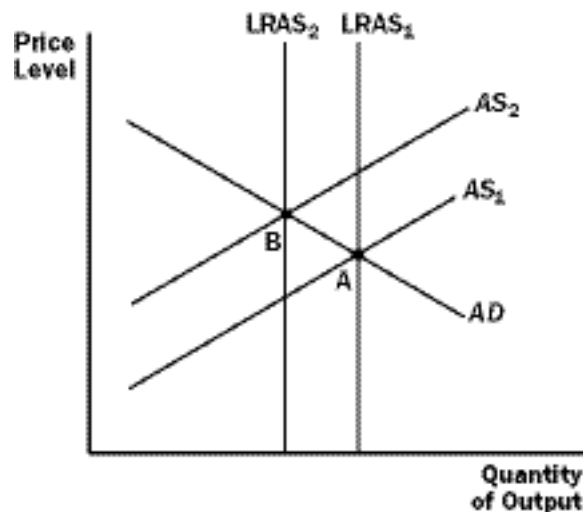


Figure 12

- 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 12. 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 decline in the natural rate of output is represented in Figure 13 by a shift to the left in both the short-run and long-run aggregate-supply curves. The equilibrium changes from point A to point B, so the price level rises and output declines.



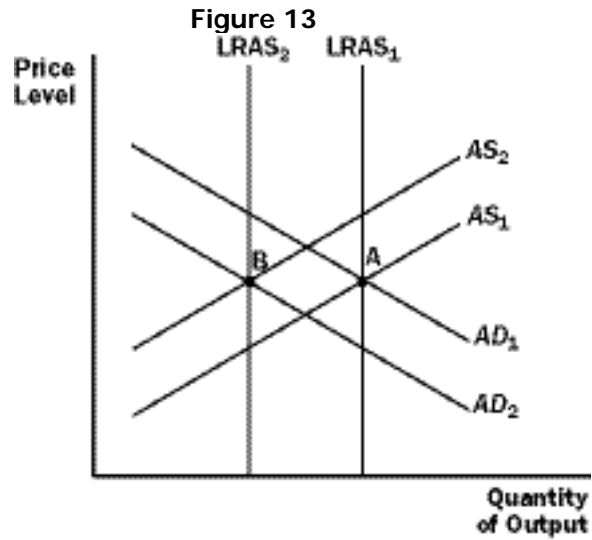


Figure 14

- c. If increased job opportunities cause people to leave the country, the long-run and short-run aggregate-supply curves 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 14 shows. Whether the price level rises or declines depends on the relative sizes of the shifts in the aggregate-demand curve and the aggregate-supply curves.
11. a. When the stock market declines sharply, wealth declines, so the aggregate-demand curve shifts to the left, as shown in Figure 15. 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.

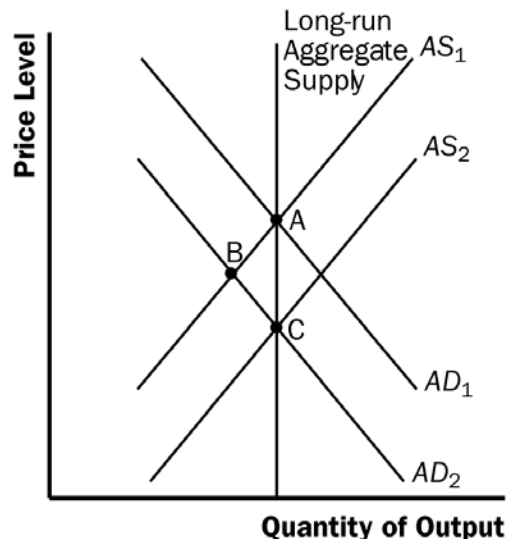


Figure 15

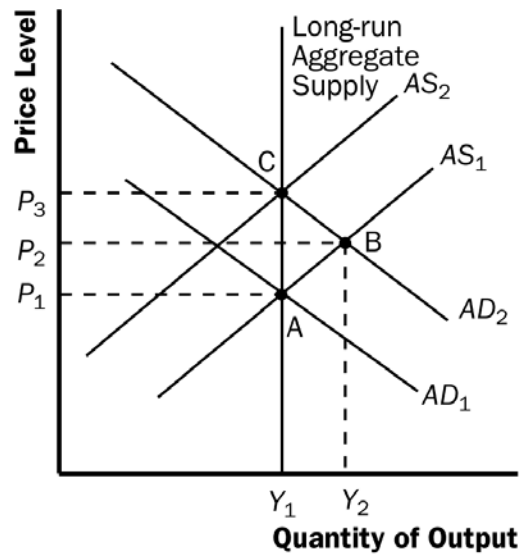


Figure 16

- 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 16. 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.

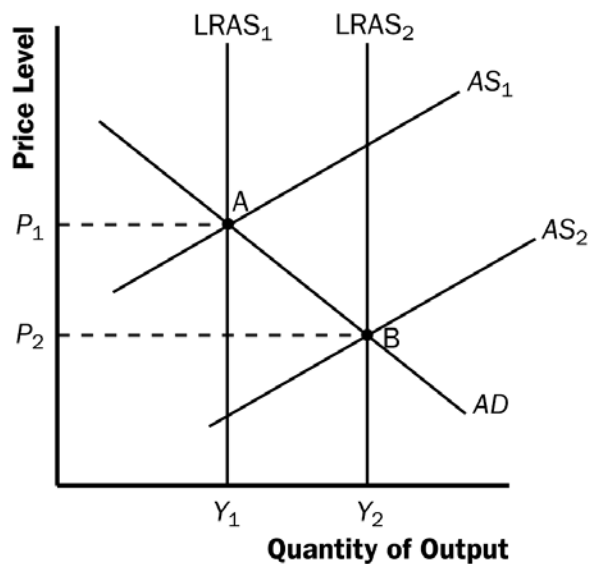


Figure 17

- c. When a technological improvement raises productivity, the long-run and short-run aggregate-supply curves shift to the right, as shown in Figure 17. The economy moves from point A to point B, as output rises and the price level declines.

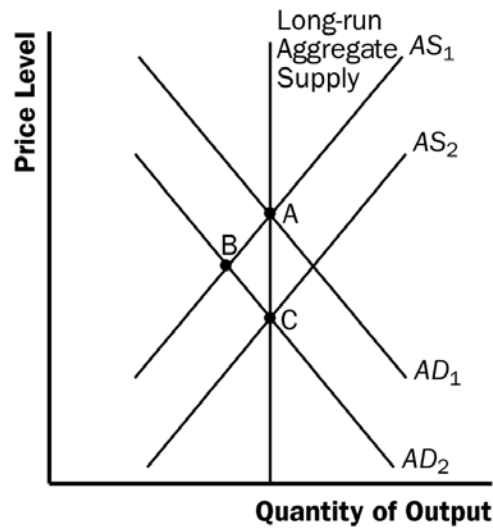


Figure 18

- 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 18. 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. If the value of the dollar falls in foreign exchange markets, U.S. exports will rise and imports will fall. This will cause the aggregate-demand curve to shift to the right (as shown in Figure 19). The price level and output will both rise in the short run.

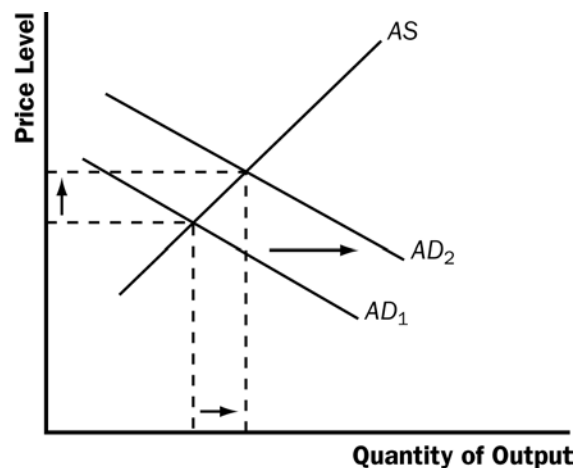


Figure 19

13. a. If firms become optimistic about future business conditions and increase investment, the result is shown in Figure 20. 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.

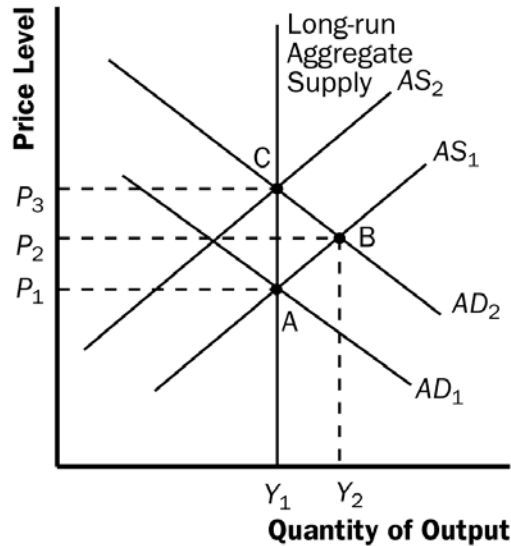


Figure 20

- 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.
- 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.
14. Economy B would have a more steeply sloped short-run aggregate-supply curve than would Economy A, because only half of the wages in Economy B are "sticky." A 5% increase in the money supply would have a larger effect on output in Economy A and a larger effect on the price level in Economy B.