Learning Objectives

After you have studied this chapter, you should be able to

1. define aggregate demand, aggregate supply, long-run aggregate supply curve, base-year dollars, endowments, aggregate demand curve, interest rate effect, open economy effect, and real balance effect;

2. distinguish between aggregate demand and an aggregate demand curve and between long-run aggregate supply and the long-run aggregate supply curve;

3. predict whether an aggregate demand curve will shift to the right or to the left when specific changes in nonprice-level determinants occur;

4. determine the long-run equilibrium price level and the long-run equilibrium real GDP when given an aggregate demand curve and a long-run aggregate supply curve;

5. list three reasons why the aggregate demand curve is negatively sloped;

6. recognize changes that will shift the aggregate demand curve; and

7. use the aggregate demand-aggregate supply approach to recognize how it is possible to have economic growth without inflation.

Outline

1. An aggregate supply curve shows the relationship between planned rates of total production for the entire economy and various price levels.
   a. The long-run aggregate supply (LRAS) curve relates the nation’s level of real GDP to the price level, when full information and full adjustments have occurred.
   b. The LRAS curve has the following properties:
      i. The LRAS curve is vertical at that level of real GDP determined by tastes, technology, and the endowments of resources that exist in the nation.
      ii. The LRAS curve is vertical in the long run because a higher price level will be accompanied by higher costs for producers. Hence, after all these adjustments are
made, firms have no incentive to increase aggregate production of goods and services merely because the price level is higher.

iii. The LRAS curve shifts rightward over time, as technological improvements occur and as the nation’s endowments increase.

2. The aggregate demand curve indicates the various quantities of all goods and services demanded at various price levels.
   a. The aggregate demand curve is downward sloping for at least three reasons.
      i. When the price level rises (falls), those people who own cash balances will experience a reduction (an increase) in the purchasing power of their wealth. They consequently will plan to spend less (more) on goods and services. This is known as the real-balance effect.
      ii. When the price level rises (falls), people want to hold more (less) money in order to make the same transactions. Given the supply of money, this increase (decrease) in the relative demand for money will cause interest rates to rise (fall). Planned purchases on consumer durables and capital goods will therefore fall (rise). This is known as the interest rate effect.
      iii. When the price level rises (falls), domestic residents will export less (more) and import more (less). These two effects (which result from international relative price changes) cause a decrease (an increase) in planned purchases of domestically produced goods and services. This is known as the open economy effect.
   b. When the nonprice-level determinants of aggregate demand change, the aggregate demand curve shifts.
      i. If the money supply rises (falls), then the AD curve will shift to the right (left). If taxes fall (rise), the AD curve will shift to the right (left).
      ii. If expectations about the future economic outlook become more (less) favorable, the AD curve will shift to the right (left).
      iii. If a nation’s exchange rate decreases (increases), the AD curve will shift to the right (left).

3. The long-run equilibrium price level and long-run equilibrium real GDP are determined at the intersection of the AD curve with the LRAS curve.

4. Inflation does not necessarily accompany economic growth.
   a. Economic growth—increases in a nation’s endowments of factors such as labor and capital or improvements in technology—shifts the LRAS curve rightward.
   b. In the absence of any change in aggregate demand, the price level actually would fall in a growing economy, as it did in the United States in the latter part of the nineteenth century. That is, there would be secular deflation.

5. Long-run inflation cannot result from economic growth.
   a. In the long run, inflation can result from supply-side factors only if the LRAS curve shifts leftward, which does not occur in a growing economy.
b. Maintaining a constant long-run equilibrium price level in a growing economy requires the aggregate demand curve to shift outward at the same pace as the outward shift of the LRAS curve. Hence, in the long run inflation results when the aggregate demand curve shifts rightward at a faster pace than rightward shifts in the LRAS curve.

**Key Terms**

| Aggregate demand | Aggregate supply | Base-year dollars | Endowments | Secular deflation |

**Key Concepts**

<table>
<thead>
<tr>
<th>Aggregate demand curve</th>
<th>Long-run aggregate supply curve</th>
<th>Real-balance effect</th>
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<tr>
<td>Interest rate effect</td>
<td>Open economy effect</td>
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</tbody>
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**Completion Questions**

Fill in the blank, or circle the correct term.

1. The sum of all planned expenditures in an economy is called (aggregate demand, aggregate demand curve). The sum of planned production in the economy is called (aggregate supply, aggregate supply curve).

2. The long-run aggregate supply curve is (horizontal, vertical) because, in the long run, there is (full, incomplete) information, and full adjustment to changes in the price level can occur.

3. The aggregate demand curve relates planned purchase rates of all goods and services to various __________________________. The aggregate supply curve relates planned rates of total production for the entire economy to various __________________________.

4. The aggregate demand curve is __________________________ sloped due to three effects: __________________________, __________________________, and __________________________.

5. When the price level rises (other things being constant), the real wealth of people who hold cash balances (falls, rises). Therefore, planned purchases of goods and services will (fall, rise).

6. When a nation’s price level falls (other things being constant), its exports (rise, fall) and its imports (rise, fall). Therefore, total planned purchases will (rise, fall).

7. When the price level rises, people will want to hold (more, less) money in order to carry out the same transactions. This increase in the demand for money causes interest rates to (rise, fall). Such a change in the interest rate causes households to plan to purchase (more, fewer) consumer durables, and businesses to plan to purchase (more, fewer) capital goods.
8. Nonprice-level determinants of aggregate demand include __________________________, __________________________, __________________________, __________________________, and __________________________.

9. If government spending rises and taxes fall, the \( AD \) curve will shift to the (left, right). If the economic forecast is rosy, the \( AD \) curve will shift to the (left, right). If the money supply falls, the \( AD \) curve shifts to the _____________________.

10. If the position of the (aggregate demand, long-run aggregate supply) curve remains unchanged, then economic growth causes the long-run equilibrium price level to (decline, increase).

**True-False Questions**

Circle the T if the statement is true, the F if it is false. Explain to yourself why a statement is false.

T F 1. The \( LRAS \) curve is vertical because firms can make adjustments and information is complete.

T F 2. The \( LRAS \) curve is vertical and does not shift in a growing economy.

T F 3. Aggregate demand relates planned purchases to price levels.

T F 4. The aggregate supply curve relates planned rates of total production to various price levels.

T F 5. As the price level falls, other things being constant, the purchasing power of cash balances rises.

T F 6. As the price level of a nation rises, other things being constant, the value of its imports and exports falls.

T F 7. As the price level falls, other things being constant, the demand for money falls and the interest rate rises.

T F 8. If the price level falls, the \( AD \) curve shifts to the right.

T F 9. A key factor causing the long-run equilibrium price level to rise in a growing economy is the accompanying decline in long-run aggregate supply.

T F 10. If the aggregate demand curve shifts rightward at a slower pace than rightward shifts in the \( LRAS \) curve in a growing economy, then secular deflation occurs. 
Multiple Choice Questions

Circle the letter that corresponds to the best answer.

1. Which one of the following certainly will not shift the LRAS curve?
   a. a change in the price level
   b. a new oil discovery
   c. freer trade among nations
   d. economic growth

2. The LRAS curve
   a. is a short-run phenomenon.
   b. shows real GDP rising with the price level.
   c. does not shift over time, due to economic growth.
   d. reflects the price level/real GDP situation with full information and complete adjustment.

3. Analogy: Price is to demand as the price level is to
   a. aggregate demand.
   b. aggregate supply.
   c. aggregate demand curve.
   d. aggregate supply curve.

4. Aggregate demand includes
   a. planned production rates by businesses.
   b. planned saving.
   c. planned purchases by households and businesses.
   d. various price levels.

5. The aggregate demand curve
   a. relates planned purchases to various price levels.
   b. is negatively sloped.
   c. includes planned expenditures on consumption, investment, and governmentally provided goods.
   d. All of the above.

6. The aggregate demand curve is negatively sloped because, other things being constant,
   a. as the price level rises, the demand for money falls.
   b. as the price level falls, the purchasing power of cash balances rises.
   c. as the price level falls, the $AD$ curve shifts to the right.
   d. as the price level rises, exports rise.
7. When the price level falls, other things being constant,
   a. the demand for money falls.
   b. the interest rate falls.
   c. household and business planned expenditures rise.
   d. All of the above.

8. Which one of the following does not occur when the price level rises, other things being constant?
   a. Exports rise and imports fall.
   b. The demand for money rises.
   c. The purchasing power of cash balances falls.
   d. Aggregate demand falls.

9. Which one of the following does not cause the $AD$ curve to shift?
   a. an increase in taxes
   b. a decrease in the real interest rate
   c. a decrease in the price level
   d. a change in the money supply

10. Which one of the following does not cause secular deflation?
    a. economic growth
    b. a decrease in long-run aggregate supply
    c. a decrease in aggregate demand at a faster pace than a decrease in long-run aggregate supply
    d. failure of aggregate demand to increase in the face of an increase in long-run aggregate supply

11. Which of the following must be true of a long-run deflationary situation in which real GDP is increasing?
   I. The $AD$ curve must be shifting rightward.
   II. The $LRAS$ curve must be shifting leftward.
   III. The $LRAS$ curve must be shifting rightward.
    a. I only
    b. III only
    c. both I and II only
    d. both II and III only
12. Which of the following must be true of a long-run deflationary situation in which real GDP is decreasing?
   I. The \( AD \) curve must be shifting leftward.
   II. The \( LRAS \) curve must be shifting leftward.
   III. The \( LRAS \) curve must be shifting rightward.
   a. I only
   b. III only
   c. both I and II only
   d. both II and III only

Matching

Choose the item in Column (2) that best matches an item in Column (1).

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
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<tbody>
<tr>
<td>(a) aggregate demand</td>
<td>(g) change in government spending or taxing</td>
</tr>
<tr>
<td>(b) aggregate supply</td>
<td>(h) changes in imports and exports due to price changes</td>
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<tr>
<td>(c) aggregate demand shift</td>
<td>(i) planned production</td>
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<td>(d) real-balance effect</td>
<td>(j) changes in the demand for money due to changes in the</td>
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<td></td>
<td>price level</td>
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<td>(e) open economy effects</td>
<td>(k) planned expenditures</td>
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<tr>
<td>(f) interest rate effects</td>
<td>(l) change in the value of cash balances</td>
</tr>
</tbody>
</table>
1. Consider the graph below, and then answer the following questions.

![Graph of LRAS and AD]

a. What is the current long-run equilibrium level of real GDP? What is the current long-run equilibrium price level?

b. If the economy grows sufficiently that $2 trillion in additional real GDP is forthcoming in the long run, and if aggregate demand remains unchanged, what will be the new long-run equilibrium price level?

2. Consider the diagram below, and suppose that long-run equilibrium real GDP rises by $2 trillion, but the equilibrium price level remains unchanged. Assuming parallel shift(s) of any schedule, draw new schedules showing how this could take place.

![Graph of LRAS and AD after a shift]

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■ Answers

Completion Questions

1. aggregate demand; aggregate supply  
2. vertical; full  
3. price levels; price levels  
4. negatively; real balance; interest rate; substitution of foreign goods  
5. falls; fall  
6. rise, fall; rise  
7. more; rise; fewer, fewer  
8. government spending and taxing policies; exchange rates; expectations; money supply; real interest rates  
9. right; right; left  
10. aggregate demand; decline

True-False Questions

1. T  
2. F It shifts rightward in a growing economy.  
3. F The $AD$ curve relates planned purchases to price levels.  
4. T  
5. T  
6. F The value of exports falls, while the value of imports rises.  
7. F Interest rates fall.  
8. F A lower price level leads to a movement down the $AD$ curve. There is no shift.  
9. F In a growing economy, aggregate supply increases, so the $LRAS$ curve shifts rightward.  
10. T

Multiple Choice Questions

1. (a)  
2. (d)  
3. (a)  
4. (c)  
5. (d)  
6. (b)  
7. (d)  
8. (a)  
9. (c)  
10. (b)

Matching

(a) and (k)  
(b) and (i)  
(c) and (g)  
(d) and (l)  
(e) and (h)  
(f) and (j)
Working with Graphs

1. a. The initial long-run equilibrium level of real GDP at Point $E_1$ is 15 trillion base-year dollars, and the initial long-run equilibrium price level is 110.

b. If the economy grows sufficiently that $2$ trillion in additional real GDP is forthcoming in the long run, then the long-run aggregate supply curve shifts to the right by this amount, and the new long-run equilibrium price level falls to 100 at Point $E_2$. There is secular deflation.

2. If long-run equilibrium real GDP rises by $2$ trillion, then the long-run aggregate supply curve shifts rightward by this amount. The equilibrium price level can remain unchanged at Point $E_2$ only if the aggregate demand curve shifts up sufficiently, as shown, to prevent secular deflation from occurring.
Glossary

Aggregate demand  The total of all planned expenditures in the entire economy.

Aggregate demand curve  A curve showing planned purchase rates for all final goods and services in the economy at various price levels, all other things held constant.

Aggregate supply  The total of all planned production for the economy.

Base-year dollars  The value of a current sum expressed in terms of prices in a base year.

Endowments  The various resources in an economy, including both physical resources and such human resources as ingenuity and management skills.

Interest rate effect  One of the reasons that the aggregate demand curve slopes downward: Higher price levels increase the interest rate, which in turn causes businesses and consumers to reduce desired spending due to the higher cost of borrowing.

Long-run aggregate supply curve  A vertical line representing the real output of goods and services after full adjustment has occurred. It can also be viewed as representing the real GDP of the economy under conditions of full employment—the full-employment level of real GDP.

Open economy effect  One of the reasons that the aggregate demand curve slopes downward: Higher price levels result in foreign residents desiring to buy fewer U.S.-made goods, while U.S. residents now desire more foreign-made goods, thereby reducing net exports. This is equivalent to a reduction in the amount of real goods and services purchased in the United States.

Real-balance effect  The change in expenditures resulting from a change in the real value of money balances when the price level changes, all things held constant; also called the wealth effect.

Secular deflation  A persistent decline in prices resulting from economic growth in the presence of stable aggregate demand.