CHAPTER 4

AGGREGATE DEMAND AND AGGREGATE SUPPLY

Chapter in a Nutshell

You learned in Chapter 1 that economics is divided into two main branches — microeconomics and macroeconomics. We begin our detailed analysis of macroeconomics with this chapter. Macroeconomics focuses on the economy as a whole, rather than on individual economic behavior. Macroeconomists typically address such questions as why there are periods of recession and inflation, what causes prosperity, and what causes economic growth. Some of the concepts used by macroeconomists to measure changes in the economy will be introduced. For example, the gross domestic product (GDP) measures the dollar value of all final goods and services produced in the economy in a year. The consumer price index (CPI) is a measure comparing the prices of goods and services that a household typically purchases to the prices of those goods and services purchased in a base year. The GDP deflator is a measure comparing the prices of all goods and services produced in the economy during a given year to the prices of those goods and services purchased in a base year. The concepts of aggregate demand and aggregate supply are used to show how the level of real GDP (GDP excluding price changes) and the price level are determined in the economy. These are a few of the new concepts presented in this chapter that will enable you to explore macroeconomic topics.

After you study this chapter, you should be able to:

- Describe the phases of the business cycle.
- Explain how gross domestic product is used to measure output in a country.
- Transform nominal GDP to real GDP using the GDP deflator.
- Graph aggregate demand and aggregate supply.
- Account for the shapes of the aggregate demand and aggregate supply curves.
- Explain how the economy moves toward macroequilibrium.
- Show how an economy can be in equilibrium with either unemployment, or inflation, or both.
- Distinguish among demand-pull inflation, cost-push inflation, and stagflation

Concept Check — See how you do on these multiple choice questions.

The business cycle is characterized by different economic phenomena in different phases. Which phase of the business cycle is characterized by inflation? Which by high unemployment?

1. The business cycle alternates between periods of ____________, marked by inflation, and periods of ____________, marked by relatively high unemployment.
   a. depression; recession
   b. recovery; recession
   c. prosperity; recession
   d. recession; depression
   e. unemployment; inflation
For this question, think about which type of GDP includes price changes and which doesn’t.

2. The difference between **nominal GDP** and **real GDP** is that real GDP
   a. is larger than nominal GDP
   b. measures the level of output including price changes, while nominal GDP holds prices constant
   c. measures the level of output and nominal GDP measures the price level
   d. measures the price level and nominal GDP measures the level of output
   e. measures the level of output in constant prices, while nominal GDP includes price changes

How does the shape of the aggregate supply curve change as GDP increases?

3. If the **macroequilibrium** is at less than full employment, then
   a. the aggregate supply curve is relatively flat
   b. the aggregate supply curve is vertical
   c. the aggregate supply curve has a steep positive slope
   d. demand-pull inflation will be a problem
   e. cost-push inflation will be a problem

Learn the forumula for the GDP deflator.

4. The **GDP deflator** is used to calculate real GDP by
   a. multiplying the GDP deflator by nominal GDP
   b. dividing nominal GDP by the GDP deflator and multiplying by 100
   c. dividing nominal GDP by the GDP deflator and dividing by 100
   d. dividing nominal GDP by the GDP deflator
   e. dividing the GDP deflator by nominal GDP

What are the two types of inflation and what causes each one?

5. **Demand-pull inflation** is caused by ________________, and **cost-push inflation** is caused by ________________.
   a. an increase in aggregate demand; a decrease in aggregate supply
   b. a decrease in aggregate supply; an increase in aggregate demand
   c. a decrease in aggregate demand; an increase in aggregate supply
   d. leveraged buyouts; government spending
   e. oil embargoes; leveraged buyouts

Am I on the Right Track?

Your answers to the questions above should be c, e, a, b, and a. This chapter describes how the economy moves toward a macroequilibrium. Macroequilibrium occurs when the price level is such that the aggregate quantity demanded and aggregate quantity supplied are equal. This may occur when the economy’s resources are fully employed or when there are unemployed resources in the economy. Critical to your understanding of macroequilibrium is the aggregate demand and aggregate supply model. The graphing tutorial below describes the shapes of the aggregate demand and aggregate supply curves and the determination of macroequilibrium. Before doing that, there are many new key terms to learn.
Key Terms Quiz — Match the terms on the left with the definitions in the column on the right.

1. recession _____ a. a severe recession
2. real GDP _____ b. the reference year with which prices in other years are compared in a price index
3. depression _____ c. a phase in the business cycle, following a recession, in which real GDP increases and unemployment declines
4. consumer price index _____ d. a phase in the business cycle in which the decline in real GDP lasts for at least six months with high unemployment
5. prosperity _____ e. the total quantity of goods and services demanded by households, firms, foreigners, and government at varying price levels
6. base year _____ f. the bottom of a business cycle
7. inflation _____ g. alternating periods of growth and decline in an economy’s GDP
8. price level _____ h. a period of stagnating real GDP, high inflation, and relatively high levels of unemployment
9. business cycle _____ i. a phase in the business cycle in which real GDP declines, inflation moderates, and unemployment emerges
10. GDP deflator _____ j. the total quantity of goods and services that firms in the economy are willing to supply at varying price levels
11. trough _____ k. a phase in the business cycle marked by a relatively high level of real GDP, full employment, and inflation
12. aggregate supply _____ l. GDP measured in terms of current market prices, unadjusted for inflation
13. recovery _____ m. GDP adjusted for changes in the price level
14. aggregate demand _____ n. inflation caused primarily by an increase in aggregate demand
15. peak _____ o. total value of all final goods and services, measured in current market prices, produced in the economy during a year
16. macroequilibrium _____ p. a measure comparing the prices of all goods and services produced in the economy during a given year to the prices of those goods and services purchased in a base year
17. downturn _____ q. an increase in the price level
18. demand-pull inflation _____ r. inflation caused primarily by a decrease in aggregate supply
19. gross domestic product _____ s. the top of the business cycle
20. stagflation _____ t. a measure that compares the prices of consumer goods that a household purchases to the prices of those goods and services purchased in a base year
21. cost-push inflation _____ u. the level of real GDP and the price level that equate the aggregate quantity demanded and the aggregate quantity supplied
22. nominal GDP _____ v. a measure of prices in one year expressed in relation to prices in a base year

Graphing Tutorial

This chapter introduces you to the aggregate demand and aggregate supply curves that we use to derive the macroequilibrium for an economy. Aggregate demand and aggregate supply curves must not be confused with demand and supply curves that we use to represent markets in microeconomics. Aggregate demand and aggregate supply measure the quantities of all goods and services demanded and supplied in the economy at varying price levels. Demand and supply measure the quantities of particular goods and services demanded and supplied in particular markets at different prices. The axes measure different variables for aggregate demand and aggregate supply than we found for demand and supply graphs. For example, the horizontal axis in an aggregate demand and aggregate supply graph measures real GDP in dollars (trillions of dollars for the U.S. economy). The vertical axis in an aggregate demand and aggregate supply graph measures the price level. Recall that the
axes for demand and supply graphs in microeconomics have quantity measured in physical units per unit of time on the horizontal axis and price measured in dollars per unit on the vertical axis. Presented below is a representative aggregate demand and aggregate supply graph.

Note that the aggregate supply curve is drawn with three distinct segments. The horizontal segment shows that aggregate supply can increase up to point a without affecting the price level. In this range of GDP, there are readily available supplies of unemployed resources that can be used to increase aggregate supply with no increase in the price level. From point a to point b, the quantity of goods and services increases, but only with increases in the price level. Between points a and b, unused resources become less available, and firms may be willing to offer higher prices to employ them. The higher prices paid for these resources raises the prices of goods produced with them. Another way of explaining the upward-sloping segment is to suppose that the price level increases from 100 to 110. As the price level increases, so does the spread between prices and costs. Producers earn higher profits as a result. Higher profits stimulate greater production from existing firms and attract new firms into production. The vertical segment of the aggregate supply curve, above point b, shows the full-employment level of real GDP. Since all resources are fully employed, aggregate supply and real GDP cannot increase beyond the $7 trillion limit.

Aggregate demand represents the purchases of goods and services by households, firms, government, and foreigners. As the price level decreases, the total quantities demanded by these groups increase. Thus, the aggregate demand curve is downward sloping — as the price level decreases, the total quantities demanded of goods and services increases. This downward slope can be explained by three effects. First, the real wealth effect states that as the price level decreases, people’s wealth (assets held such as cash, savings accounts, stocks, and government bonds) increases, so they can purchase more goods and services. Second, the interest rate effect states that a decrease in the price level means that people need to borrow less to make desired purchases. The decreased demand for borrowed money causes the interest rate (the cost of borrowed money) to fall. However, a decrease in the interest rate will make borrowing to purchase goods and services more attractive to households and firms. Thus, people will demand more goods and services as interest rates decrease due to a decrease in the price level. Finally, the international trade effect of a price level decrease will cause the total quantities
demanded of goods and services to increase. If the price level in the United States decreases while price levels in the rest of the world stay the same, then U.S. goods are relatively less expensive to domestic consumers and foreigners. As a result, people will demand more goods and services as the U.S. price level declines.

Shifts in the aggregate demand and aggregate supply curves are fairly easy to explain. The aggregate demand curve shifts to the right (increases) as a result of increases in government spending or decreases in taxes; increases in spending by consumers, businesses and foreigners; and rising expectations about the future. As a result of decreases in government spending or increases in taxes, decreases in spending by consumers, businesses, and foreigners, and falling expectations about the future, the aggregate demand curve shifts to the left (decreases). Aggregate supply increases when it shifts to the right by the increased availability of resources — more workers, more capital, more land, and more entrepreneurial energies. A decrease in resource prices also shifts the aggregate supply to the right. On the other hand, if resources become less available, or if their prices increase, the aggregate supply curve shifts to the left — a decrease in aggregate supply.

Macroequilibrium occurs at the price level and real GDP combination that equates aggregate demand and aggregate supply. In our diagram, this happens at the intersection of aggregate demand and aggregate supply — a price level of about 106 and a real GDP level of approximately $6.7 trillion. At price levels above 106, aggregate quantity demanded is less than the aggregate quantity supplied, so the price level begins to fall due to competition among suppliers. Conversely, for price levels below 106, aggregate quantity demanded is greater than aggregate quantity supplied, so the price level begins to rise due to competition among demanders. In each case, the macroequilibrium is restored.

**Graphing Pitfalls**

Graphs that represent demand and supply in particular markets in microeconomics are labeled with price, measured in dollars per unit on the vertical axis, and quantity, measured in physical units on the horizontal axis. The axes are different in the aggregate demand and aggregate supply diagrams that we use in macroeconomics. The price level, not price, is measured on the vertical axis. The price level is the average of all prices in the economy measured with an index number like the GDP deflator. The dollar value of real GDP is measured on the horizontal axis. All goods and service produced are included rather than the good or service produced in just one market. So the demand and supply diagram you learned in Chapter 3 and the aggregate demand aggregate supply diagram you are learning now are completely different. Don’t mislabel the axes as shown in the graph on the following page.
Don’t make the mistake of mislabeling the axes on a graph of aggregate demand andaggregate supply in the same way you would for a demand and supply diagram inmicroeconomics. The price level is measured on the vertical axis, not price; and realGDP is measured on the horizontal axis, not quantity measured in some kind ofphysical units as shown above.

**True-False Questions** — If a statement is false, explain why.

1. Aggregate demand is basically the same concept as demand for a good or service, such as a banana orhealth services, that is the subject of analysis in microeconomics. (T/F)

2. One reason the aggregate demand curve is downward sloping is that as the price level decreases,real wealth increases so that people consume more. (T/F)

3. The horizontal segment of the aggregate supply curve suggests that ample resources are available toincrease real GDP without causing inflation. (T/F)

4. The most inclusive measure of inflation is the consumer price index. (T/F)

5. Real GDP is equal to nominal GDP multiplied by 100, divided by the GDP deflator. (T/F)

6. If an increase in the price level creates higher profits and, as a result, causes real GDP to increase, then theaggregate supply curve must be vertical. (T/F)
7. The depression of the 1930s was a period in American economic history marked by significant cost-push inflation. (T/F)

8. Real GDP remains constant if increases in the price level alone cause nominal GDP to increase. (T/F)

9. In order for a recession to exist, a decline in the nation's real GDP must persist for at least half a year. (T/F)

10. Stagflation is a period of rapidly growing real GDP, inflation, and relatively high unemployment. (T/F)

11. During a recovery, real GDP increases and unemployment declines. (T/F)

12. The upward-sloping portion of the aggregate supply curve suggests that an increase in the price level will be associated with an increase in real GDP. (T/F)

13. A cut in government spending will cause the aggregate demand curve to shift to the right. (T/F)

14. Demand-pull inflation occurs when increases in aggregate demand shift the aggregate demand curve to the right while the aggregate supply curve remains unchanged at full-employment real GDP. (T/F)

15. The price level increase associated with increased aggregate demand during World War II was exacerbated by a decrease in aggregate supply caused by a labor force shift to the military. (T/F)

Multiple-Choice Questions

1. The upward slope of the trend line through a business cycle indicates that  
   a. the economy is in a recovery phase  
   b. the economy is in a period of stagflation  
   c. there is a positive relationship between real GDP and the price level  
   d. the economy's output increases in the long run  
   e. the quantity supplied of a certain good increases as the price decreases

2. One characteristic of the recovery phase of the business cycle is that  
   a. upward pressure on the economy's price level begins to build  
   b. output reaches its maximum level  
   c. a recession will soon follow  
   d. inflation is moderating  
   e. unemployment is increasing
3. One way that the government can increase aggregate demand is by
   a. reducing government spending
   b. reducing income taxes
   c. increasing taxes
   d. creating stagflation
   e. reducing the economy's supply of labor

4. The measure that compares the prices of all goods and services produced in the economy in any year to the
   prices of those goods and services produced in a base year is known as the
   a. GDP deflator
   b. real GDP
   c. nominal GDP
   d. CPI
   e. full employment GDP

5. All of the following conditions are consistent with general prosperity in the economy except
   a. unemployment is relatively low
   b. wage rates are relatively high
   c. real GDP is relatively high
   d. morale among workers and management is relatively high
   e. the price level decreases

6. It is important to control for price increases when comparing GDP between two years because
   a. nominal GDP can rise due to either an increase in output or an increase in the price level
   b. economists are only interested in price changes
   c. price increases are usually larger in relative terms than quantity increases
   d. price increases can reduce nominal GDP
   e. price increases can increase real GDP

7. If nominal GDP was $6 trillion in 2006 and the GDP deflator was 120, then real GDP in 2006 was
   a. $5 trillion
   b. $50 trillion
   c. $7.2 trillion
   d. $72 trillion
   e. $12 trillion

8. The upward-sloping segment of the aggregate supply curve can be explained by
   a. tight resource markets, which, in turn, cause increases in the price of goods produced
   b. increases in the price level that raise profits, inducing firms to produce more
   c. the full employment of resources
   d. all of the above
   e. a and b

9. The aggregate supply curve shifts to the right when
   a. supplies of resources increase
   b. wage rates increase
   c. consumption decreases
   d. investment increases
   e. population decreases
10. Demand-pull inflation is the result of
   a. a leftward shift in the aggregate supply curve
   b. a rightward shift in the aggregate supply curve
   c. an increase in taxes
   d. a leftward shift in the aggregate demand curve
   e. a rightward shift in the aggregate demand curve

11. The difference between nominal and real GDP is that
   a. nominal GDP includes price changes while real GDP doesn't
   b. nominal GDP measures aggregate supply while real GDP measures aggregate demand
   c. real GDP is always equal to or higher than nominal GDP, depending on the phase of the business cycle
   d. real GDP includes price changes while nominal GDP doesn't
   e. real GDP is derived from the CPI while nominal GDP is derived from the GDP deflator

12. In the aggregate demand and aggregate supply model, the intersection of the AD and AS curves determines
   a. the price level and real GDP
   b. the equilibrium price and quantity combination
   c. the difference between real and nominal GDP
   d. the price level and the rate of inflation
   e. the rate of economic growth

13. The upward-sloping segment of the aggregate supply curve reflects
   a. the presence of large amounts of unemployed resources so that GDP can increase without an increase in the price level
   b. tightness in resource markets so that GDP can increase, but only with increases in the price level
   c. full employment of resources
   d. the absence of inflation
   e. an economy that is operating on its production possibilities curve

14. The aggregate supply curve shifts to the right when
   a. consumers, with no change in nominal GDP, save less and consume more
   b. consumers, with no change in nominal GDP, save more and consume less
   c. people, with no change in the price level, decrease their supply of labor
   d. people, with no change in the price level, increase their supply of labor
   e. as a result of war, people shift from civilian to military production

15. If real GDP is $1,600 billion and the GDP deflator is 125, then nominal GDP is
   a. $2,000 billion
   b. $2,500 billion
   c. $1,800 billion
   d. $2,400 billion
   e. $1,000 billion

16. If the price level in the United States is constant while price levels in other countries increase, then
   a. aggregate supply in the United States shifts to the right
   b. aggregate demand in other economies shifts to the left
   c. real GDP in the United States increases more rapidly than in other economies
   d. U.S. exports increase, shifting U.S. aggregate demand to the right
   e. U.S. exports decrease, shifting U.S. aggregate demand to the left
17. Which of the following is not a reason for the downward slope of the aggregate demand curve?
   a. as price decreases, quantity demanded increases
   b. as the price level decreases, interest rates decrease, so consumption increases
   c. as the price level decreases, American goods are more attractive than imports, so net exports increase
   d. as the price level decreases, interest rates decrease, so investment increases
   e. as the price level decreases, real wealth increases, so aggregate demand increases

18. If more capital is made available in an economy, one consequence will be
   a. a decrease in aggregate demand
   b. an increase in aggregate demand
   c. greater unemployment
   d. a shift to the right in the aggregate supply curve
   e. an increase in the slope of the upward-sloping portion of the aggregate supply curve

19. Cost-push inflation refers to an increase in the price level due to
   a. an increase in aggregate expenditures
   b. rising government spending due to national emergencies like war or depression
   c. a shift to the right in the aggregate supply curve
   d. rising costs of critical inputs such as energy, labor, and capital
   e. excessive government spending

20. One of the main reasons for the recession and economic stagnation of the early 1990s was
   a. an OPEC-designed increase in oil prices that caused stagflation
   b. an increase in defense spending due to the war in the Persian Gulf
   c. a decrease in consumer spending in response to high levels of debt
   d. unsuccessful leveraged buyouts
   e. a commercial real estate boom

The following questions relate to the interdisciplinary, applied, and global perspectives in the text.

21. Which of the following is not a phase of the business cycle?
   a. unemployment
   b. prosperity
   c. recession
   d. downturn
   e. recovery

22. The three groups of goods and services that are given the largest percentage weights in the calculation of the consumer price index are
   a. housing, transportation, food and beverages
   b. housing, medical care, education and communication
   c. housing, education and communication, food and beverages
   d. housing, transportation, medical care
   e. housing, transportation, apparel
23. Suppose that you are the Minister of Economics for Inflationland. Your president is challenged when it comes to understanding economic theory. You want to present the most impressive numbers possible regarding economic growth during his first three years in office. You should choose a base year
a. that is fairly recent and report real GDP statistics
b. that is fairly recent and report nominal GDP statistics
c. that is fairly recent and report the CPI levels
d. from long ago and report nominal GDP statistics
e. from long ago and report real GDP statistics

Fill in the Blanks

1. The business cycle consists of alternating periods of ________________ and ________________ in an economy’s GDP.

2. The ________________ is the reference year with which prices in other years are compared using a ________________.

3. The aggregate demand curve is downward sloping due to the ______________ effect, the ______________ effect, and the ______________ effect.

4. If workers’ ______________ decrease while the price level remains constant, then the aggregate supply curve will shift to the ________________.

5. During World War II, aggregate demand shifted to the ________________ while the aggregate supply curve shifted to the ________________, causing the price level to ________________.

Discussion Questions

1. Define gross domestic product. How can GDP increase over time?

2. How is the consumer price index constructed?

3. Why do we say that the GDP deflator is a more inclusive measure of inflation than the consumer price index?

4. What's the difference between nominal GDP and real GDP?
5. Why does the aggregate supply curve have three distinct segments?

6. Why is the aggregate demand curve downward sloping?

7. Distinguish between demand-pull inflation and cost-push inflation.

**Problems**

1. Suppose the GDP deflator is 140 for 2006. The base year is 2002. If nominal GDP in 2006 is $12.6 trillion, calculate real GDP in 2002 dollars. Show your work.

2. Suppose that the cost of the market basket of goods and services that represents the CPI is $3,000 in the base year, 2002. Suppose also that the cost of the same market basket of goods in 2004 was $3,300. What was the value of the CPI index for 2004? Explain what the 2004 CPI means.

3. Suppose the value of the market basket from question 3 was $4,000 in 2006. What was the average annual rate of inflation between 2004 and 2006? Show your work.
4. Use an aggregate demand/aggregate supply diagram to show what happened to the economy as a result of
the OPEC-designed oil price increases of the 1970s. Explain your graph in words and make sure it is
labeled carefully.

Everyday Applications

As you read the newspaper and watch the economic news on television, think about whether the U.S. economy is
currently in macroequilibrium. What economic data would you use to answer this question? Is the aggregate
demand/aggregate supply model relevant today?

Economics Online

Stat-USA is an Internet site that provides current and historical economic and financial data. The site is a service
of the U.S. Department of Commerce. Find out changes in real GDP, the price level, and other key economic
variables by visiting the site (http://www.stat-usa.gov/).

Answers to Questions

Key Terms Quiz

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True-False Questions

1. False. Aggregate demand refers to all goods and services purchased in the economy while demand refers to a particular good or service purchased in one market.
2. True
3. True
4. False. The most inclusive measure of inflation is the GDP deflator. The CPI measures the prices of goods and services typically bought by households, while the GDP deflator measures the prices of all goods and services produced in the economy.
5. True
6. False. Aggregate supply must be upward sloping for output to increase as the price level increases.
7. False. The depression of the 1930s was characterized by high unemployment and falling price levels caused by a dramatic decline in aggregate demand.
8. True
9. True
10. False. Stagflation is a period of stagnating or falling real GDP, inflation, and relatively high unemployment.
11. True
12. True
13. False. A cut in government spending will cause the aggregate demand curve to shift to the left.
14. True
15. True

Multiple-Choice Questions

1. d  6. a  11. a  16. d  21. a
2. a  7. a  12. a  17. a  22. a
3. b  8. e  13. b  18. d  23. d
4. a  9. a  14. d  19. d
5. e  10. e  15. a  20. c

Discussion Questions

1. Gross domestic product is the total value of all final goods and services produced in a country during a calendar year. GDP can increase if the quantity of goods and services produced increases or if the price of these goods and services increases.

2. The consumer price index is constructed by dividing the cost of a fixed market basket of goods and services purchased in a particular year by the cost of the same market basket of goods and services in a base year and multiplying by 100. The market basket represents purchases made by the typical American household.
3. The GDP deflator includes the prices of all final goods and services produced in a year, while the CPI includes only consumer goods and services that a household typically purchases. For instance, the GDP deflator includes airline ticket prices and the CPI does not.

4. Nominal GDP, measured in current market prices, includes the effect of price changes. Real GDP is adjusted for changes in the price level. Real GDP is equal to nominal GDP multiplied by 100 and divided by the GDP deflator.

5. Each segment of the aggregate supply curve reflects a different set of macroeconomic circumstances. For example, the horizontal segment reflects an economy operating well below full employment, so real GDP can be increased without any upward pressure on the price level. The upward-sloping segment shows that resources are becoming more scarce as the economy approaches full employment. Employers bid for resources, driving up their prices, which causes costs of production and the price level to rise. Price level increases raise employers' profits so they increase output. In the vertical segment, full employment exists and resources are unavailable to increase real GDP. Only the price level can rise.

6. The aggregate demand curve is downward sloping because of the real wealth effect, the interest rate effect, and the international trade effect. As the price level decreases, the purchasing power of wealth increases, and consumption spending increases as a result. As the price level decreases, consumers and businesses don’t have to borrow as much to finance their spending. Therefore, the demand for borrowed funds decreases and interest rates decrease. As a result of lower interest rates, spending by consumers and businesses increases. If the price level in the United States decreases while the price level in other countries stays the same, spending on U.S. exports by foreigners increases, and people in the United States buy fewer imports. As the price level decreases, foreign demand for exports increases and domestic demand for imports decreases.

7. Demand-pull inflation is caused by a shift to the right in the aggregate demand curve. Demand-pull inflation can result from an increase in aggregate demand beyond that necessary to achieve full employment. Spending by households, businesses, government, or foreigners or some combination of these can trigger demand-pull inflation. An example of demand-pull inflation is the inflation of the 1960s during the Vietnam War.

Cost-push inflation is caused by a shift to the left in the aggregate supply curve. Cost-push inflation can result from decreasing availability of resources including labor, capital, land (natural resources), and entrepreneurial energies or from an increase in the prices of these resources. A good example of cost-push inflation is that caused by OPEC’s increases in oil prices from 1973 through 1982. Because oil is an essential resource for many types of production and is used as a primary source of energy for heating and power generation, the prices of virtually all goods and services were affected by the increased price of oil.

Problems

1. Real GDP is equal to nominal GDP multiplied by 100 and divided by the GDP deflator. In this case, real GDP is equal to $12.6 trillion × 100/140 = $9 trillion.

2. The value of the CPI for 2004 is 3,300/3,000 multiplied by 100, which is 110. The 2004 CPI equal to 110 means that prices rose between 2002 and 2004 by 10 percent.

3. The value of the CPI for 2006 is 4,000/3,000 × 100 = 133. The average annual rate of inflation between 2004 and 2006 is (133 – 110)/110 multiplied by 100 then divided by 2, or 10.45 percent. You must divide by 2 because there are two years covered by the change in the CPI — 2004 -2006.

4. Your graph should look like the one shown on the following page. The OPEC-designed price increases
caused the aggregate supply curve to shift to the left. These events are shown by a shift in the aggregate supply curve from AS to AS', a decrease in the equilibrium level of GDP to GDP', and an increase in the equilibrium price level to P'.

![Diagram showing aggregate supply (AS) and aggregate demand (AD) curves with a shift from AS to AS']
Homework Questions

True-False Questions — If a statement is false, explain why.

1. The horizontal segment of the aggregate supply curve corresponds to a level of real GDP that represents full employment. (T/F)

2. The aggregate demand curve is downward sloping because as the price level decreases, real wealth increases, so people purchase more. (T/F)

3. Cost-push inflation occurs when the price of a critical resource like oil increases dramatically. (T/F)

4. The depression of the 1930s was a period when the economy was in equilibrium on the horizontal segment of the aggregate supply curve. (T/F)

5. An economy that is experiencing inflation will have a real GDP that is greater than the nominal GDP. (T/F)

Multiple-Choice Questions

1. If nominal GDP is $14 trillion in 2006 and the GDP deflator is 140, then real GDP is
   a. $140 trillion
   b. $10 trillion
   c. $1.4 trillion
   d. $10.6 trillion
   e. $7.8 trillion

2. The aggregate demand curve shifts to the left when
   a. consumers, with no change in the price level, save less and consume more
   b. consumers, with no change in the price level, save more and consume less
   c. people, with no change in the price level, decrease their supply of labor
   d. people, with no change in the price level, increase their supply of labor
   e. as a result of war, people shift from civilian to military production

3. Stagflation is the result of
   a. demand-pull inflation
   b. technological unemployment
   c. an advance in technology
   d. a shortage of labor
   e. a decrease in aggregate supply

4. The sequence of phases in a business cycle is
   a. recovery, recession, prosperity, downturn
   b. prosperity, recovery, downturn, recession
   c. prosperity, downturn, recovery, recession
   d. recession, recovery, prosperity, downturn
   e. recession, recovery, downturn, prosperity
5. One cause of the demand-pull inflation experienced from 1965-1975 was the
   a. OPEC oil embargo in 1973
   b. stagflation that resulted from increased costs of critical resources like oil
   c. dramatic increase in defense spending associated with the Vietnam war
   d. shift to the right in the aggregate supply curve
   e. relatively high rate of unemployment over the 10-year period

Discussion Questions/Problems

1. Discuss the difference between demand-pull inflation and cost-push inflation. Sketch a graph to depict each type of inflation.

2. Suppose that 2006 is chosen as the base year and a typical household’s market basket of goods and services costs $800. In 2007, the same market basket of goods costs $1,000. What is the value of the consumer price index in 2006? In 2007? Show your work.