Why It Matters

People often say that you can’t do anything about the weather. If it’s snowing, raining, or sleet today—so be it. Some people also think certain economic events, such as inflation, deflation, the business cycle, and economic growth, are natural, unavoidable events. However, these upturns and downturns in the economy are not really natural economic events. They are not inevitable in the same sense that rain in Seattle or snow in Buffalo is inevitable. Inflation, for example, doesn’t have to happen—certain conditions make it more or less likely.

Economists say that an understanding of economics will not necessarily keep you out of the unemployment line, but if you are there, at least you will understand why. The same is true for economic occurrences such as inflation. A better understanding of inflation will not help you avoid rising prices, but at least you will know why they are rising.
The following events occurred one day in September.

9:00 A.M. Emma and Blake Stevens are driving around various neighborhoods looking for houses. They want to sell the house they currently live in and buy another. Emma says, "The price of houses has really gone up in the last few years." "They sure have," adds Blake. "I guess you could say there has been a lot of inflation over the last few years."

• Is Blake using the word inflation correctly?

10:13 A.M. Frank is watching CNN. The reporter says, "About 24,000 people die every day from hunger or hunger-related causes. This number is down from 35,000 ten years ago, and 41,000 twenty years ago. Three-fourths of the deaths are children under the age of five."

• What does death from hunger have to do with economic growth?

3:34 P.M. Willie graduated from college in June, four months ago. So far, he hasn’t found a good-paying job. He is still living at home with his parents. Currently, he is waiting for the interviewer at a small auto parts company to call him into the office. He is reading a magazine and thinking, I hope I get this job. I really need to move out of my parents’ home.

• What do Willie’s prospects of getting a job have to do with the business cycle?

7:32 P.M. Harry is in the grocery store looking at the different varieties of salad dressing. He counts 37. He says underneath his breath, "Whatever happened to the good ol’ days when there was just blue cheese, Italian, ranch, and French?"

• Why are so many varieties of salad dressing available today?
What Is Inflation?

Each good produced and sold in the economy has a price. An average of all these prices is called the price level.

When someone says that the price level increased, it means that the prices of goods produced and sold in the economy are higher on average than they were previously. This does not necessarily mean that every single price in the economy is higher—only that on average, prices are higher. Inflation is defined as an increase in the price level.

**Example:** Suppose that an economy has three goods (A, B, C), and the prices of the goods are currently $1, $2, and $3, respectively. The average price of these three goods is $2. Now suppose prices change to $1.50, $2.99, and $2.50, respectively. Notice that two prices increased and one decreased. The new average price is $2.33. Because the new average price is higher than the old average price, we have inflation. Notice that it is possible to have inflation even if some prices fall.
Inflation rate =
\[
\frac{\text{CPI later year} - \text{CPI earlier year}}{\text{CPI earlier year}} \times 100
\]

Filling in the numbers, we get the following:

\[
\text{Inflation rate} = \frac{187 - 180}{180} \times 100 = 3.89\%
\]

A positive change (rise) in the CPI means inflation occurred; the inflation rate is 3.89 percent.

Exhibit 12-1 shows the CPI over the period 1913 to 2005. As you can see, the CPI rose only slightly during the period from 1913 to 1968, but then begins to increase substantially after that date. One way to interpret this graph is an indicator of what happens to the value of the dollar over time. When the CPI rises, that simply means that a dollar buys less than it used to buy. So, as the CPI rises (in Exhibit 12-1), the value of the dollar falls.

Exhibit 12-2 on the next page shows the inflation rate in the United States during the period from 1960 to 2005. Notice the inflation rate in the late 1970s and early 1980s compared with today.

**Demand-Side Versus Supply-Side Inflation**

Chapters 4 and 5 discussed supply and demand in a market setting. When the demand for a good increases and supply remains the same, price increases; and when the supply of a good decreases and demand remains the same, price increases. Chapter 11 introduced the concept of supply and demand in an economy. The demand side of the economy was represented by aggregate demand, and the supply side of the economy was represented by aggregate supply.

Inflation, which is an increase in the price level, can originate on either the demand side or the supply side of the economy. Consider Exhibit 12-3(a), which depicts an aggregate demand curve (AD₁) and an aggregate supply curve (AS₁). The equilibrium price level is P₁. Suppose aggregate demand increases; the aggregate demand curve shifts rightward, from AD₁ to AD₂.

**EXHIBIT 12-1 Consumer Price Index (CPI), 1913–2005**

How would you describe the relationship between the value of the dollar and the CPI?
Consequently, the price level increases, from $P_1$ to $P_2$. The increase in the price level indicates that inflation occurred. We conclude that if aggregate demand increases and aggregate supply stays the same, inflation will occur. When an increase in the price level originates on the demand side of the economy, economists call it demand-side inflation.

One of the things that can cause demand-side inflation is an increase in the money supply. For example, suppose the Fed increases the money supply. The result is more money in the economy, and so people end up buying more goods and services. In other words, aggregate demand in the economy rises. As a consequence of the increased aggregate demand, the price level increases.

**EXHIBIT 12-2 Inflation Rate, 1960–2005**

This graph charts the inflation rate over a 45-year period.

**EXHIBIT 12-3 Inflation**

An increase in the price level can be caused by an increase in aggregate demand, or $AD$, as shown in part (a), or by a decrease in aggregate supply, or $AS$, as shown in part (b).
Exhibit 12-3(b) shows a decrease in aggregate supply, from $AS_1$ to $AS_2$. As a result of this decrease, the price level increases, from $P_1$ to $P_2$. Again, the increase in price level indicates that inflation occurred. Thus, if aggregate supply decreases and aggregate demand stays the same, inflation will occur. An increase in the price level that originates on the supply side of the economy is called supply-side inflation. One of the things that can cause supply-side inflation is a major drought that lowers the output of agricultural goods. As a result the supply of goods in the economy is smaller, and the price level increases.

**A Student Asks**

**QUESTION:** What if both aggregate demand and aggregate supply increase? Will this cause inflation?

**ANSWER:** It depends on how much aggregate demand increases compared to a specific increase in aggregate supply. For example, look at Exhibit 12-4. Initially, the economy is at point 1, and the price level is $P_1$. Then both aggregate demand and aggregate supply increase, so both the AD and AS curves shift rightward, to $AD_2$ and $AS_2$, respectively. Notice, though, that aggregate demand increases more; its curve shifts rightward by more than the aggregate supply curve shifts rightward. In this case, the increase in the price level from $P_1$ to $P_2$ indicates inflation.

**The Simple Quantity Theory of Money**

The simple quantity theory of money presents a clear picture of what causes inflation. Before examining this theory, though, we must know something about velocity and the exchange equation.

**Velocity**

The average number of times a dollar is spent to buy final goods and services is called velocity. To illustrate the concept of velocity, consider a tiny economy with only five $1 bills. In January, the first of the $1 bills moves from Maria’s hands to Nancy’s hands to buy a newspaper. Then, in June, it goes from Nancy’s hands to Bob’s hands to buy a bagel. And in December, it goes from Bob’s hands to Tu’s hands to buy a used paperback book. Over the course of the year, this $1 bill has changed hands three times. The other $1 bills also change hands during the year. The second bill changes hands five times; the third, six times; the fourth, three times; and the fifth, three times. Given this information, we can calculate the number of times the average dollar changes hands in purchases. We do so by finding the sum of the times each dollar changed hands ($3 + 5 + 6 + 3 + 3 = 20$ times) and then dividing by the number of dollars ($5$). The answer is $4$, which is the velocity in this example.

**The Exchange Equation**

In the exchange equation

$$M \times V = P \times Q$$

$M$ stands for the money supply, $V$ stands for velocity, $P$ stands for the price level or average price, and $Q$ stands for the quantity of output (quantity of goods and services). $M$ times $V$ must equal $P$ times $Q$. To see why, think of the equation on a personal basis. Suppose you have $40; this amount is your

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*When aggregate demand (AD) increases by more than aggregate supply (AS), the price level (P) increases; we have inflation.*

---
money supply \( (M) \). You spend the $40 one time, so velocity \( (V) \) is 1. You spend the $40 on 5 books, so 5 is the quantity of goods and services you purchase—it is your \( Q \) in the exchange equation. Now ask yourself what \( P \) must equal, given that \( M \) is $40, \( V \) is 1, and \( Q \) is 5. If you spend $40 on 5 books, the average price per book must be $8. \( P \) must be $8, because $8 times 5 books equals $40. Here is the exchange equation using the numbers in this example:

\[
M(40) \times V(1) = P(8) \times Q(5 \text{ books})
\]

\[
40 = 40
\]

**Explaining Inflation**

The simple quantity theory of money is used to explain inflation. The theory begins by making two assumptions: that velocity \( (V) \) is constant and that the quantity of output or goods and services \( (Q) \) is constant. Let’s set \( V \) at 2 and \( Q \) at 100 units. These numbers will remain constant throughout our discussion.

Suppose the money supply \( (M) \) equals $500. If \( V \) is 2 and \( Q \) is 100 units, then the price level must equal $10:

\[
M(500) \times V(2) = P(10) \times Q(100 \text{ units})
\]

\[
100 = 1,000
\]

Now suppose the money supply increases from $500 to $1,000, a doubling of the money supply. As stated earlier, velocity and output are constant. Velocity \( (V) \) is still 2, and output \( (Q) \) is still 100 units. The price level \( (P) \), however, increases to $20:

\[
M(1,000) \times V(2) = P(20) \times Q(100 \text{ units})
\]

\[
2,000 = 2,000
\]

In other words, if the money supply doubles (from $500 to $1,000), the price level doubles (from $10 to $20; see Exhibit 12-5).

**In Theory**  The simple quantity theory of money states that changes in the money supply will bring about strictly proportional changes in the price level. For example, if the money supply increases by 100 percent, the price level will increase by 100 percent; and if the money supply increases by 20 percent, the price level will increase by 20 percent.

**Real-World Application**  In the real world, the strict proportionality between changes in the money supply and the price level does not usually hold. An increase in the money supply of, say, 10 percent does not usually bring about a 10 percent increase in the price level.

What we do see in the real world is that the greater the increase in the money supply, the greater the increase in the price level. For example, a nation that increased its money supply by 30 percent would usually have a greater increase in its price level (its inflation rate) than a nation that increased its money supply by 20 percent. This finding is consistent with the “spirit” of the simple quantity theory of money. After all, the theory says that changes in the money supply bring about strictly propor-
tional changes in the price level, so it follows that larger changes in the money supply should bring about larger changes in the price level.

**EXAMPLE:** The money supply in country A rises by 10 percent and the money supply in country B rises by 2 percent. Let’s also assume that velocity is constant and the output of goods and services in each country is constant. In which country would we predict the higher inflation rate, A or B? Well, according to the simple quantity theory of money, the greater the increase in the money supply, the greater the inflation rate, so we would predict a higher inflation rate in country A.

**QUESTION:** How long after the money supply rises does the price level rise? Is it the next day?

**ANSWER:** A lag occurs between the time the money supply rises and the price level rises. That lag is usually between 10 months to 18 months. In other words, if the money supply rises in January, prices might not go up until October.

**The Effects of Inflation**

We tend to think that inflation affects only the buyer of goods, as when a person pays $60 instead of $50 a week for groceries. In truth, however, people are affected by inflation in many other ways as well.

**Inflation and Individuals on Fixed Incomes**

Denise has lived on a fixed income for the last 10 years; that is, every year for the past 10 years, her income has been the same. However, each year for the past 10 years, the price level increased and inflation occurred. Thus inflation lowered the purchasing power of Denise’s money. She can buy fewer units of goods with a given amount of money than she could previously buy, and her material standard of living is reduced.

**Inflation and Savers**

On January 1, Lorenzo puts $2,000 into a savings account that pays 6 percent interest. On December 31, he removes $2,120 from the account ($2,000, which is the original amount, and $120 in interest). Suppose that during the year prices did not increase at all—an inflation rate of 0 percent. Saving made Lorenzo better off, because at the end of the year he can purchase $120 more of goods and services than he could at the beginning of the year.

Now suppose instead that during the year, prices increased by 10 percent—an inflation rate of 10 percent. How much money would Lorenzo need at the end of the year to buy exactly what $2,000 could buy at the beginning of the year? If prices had increased by 10 percent, he would need 10 percent more money, or a total of $2,200. Instead of having $2,200, Lorenzo has only $2,120 from his savings account; he must settle for purchasing $80 less of goods and services than he could at the beginning of the year. Because the inflation rate of 10 percent was greater than the interest rate of 6 percent that Lorenzo earned on his savings, he ended up worse off. It is clear that inflation hurts savers.

If inflation persists, however, it is customary for financial institutions to compete for customers by offering an interest rate that

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*“By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens.”* —John Maynard Keynes, economist

Many senior citizens live on a fixed income. How would their grocery shopping be affected by the combination of a fixed income and inflation?
has been adjusted upward by the inflation rate. Suppose financial institutions would offer a 4 percent interest rate next year if prices were going to stay the same as this year (meaning no inflation). However, they anticipate a 5 percent inflation rate during the year. Many institutions will begin to compete for customers by offering a 9 percent interest rate, the sum of the interest rate they would offer if prices did not change plus the anticipated inflation rate (4% + 5% = 9%).

Inflation and Past Decisions

Inflation often turns past decisions into mistakes. Consider the building contractor who last year signed a contract to build a shopping mall for $30 million. He agreed to this dollar figure based on his estimates of what it would cost to buy the materials and hire the labor to build the mall. He estimated $28 million in costs. All of a sudden, inflation hits. Prices of labor, concrete, nails, tile, and roofing rise. Now the
A negative (downward) change in the CPI indicates deflation. The deflation rate is 2.8 percent. Notice that when we calculated the deflation rate we had a minus sign in front of the percentage change. However, when you speak of a deflation rate, you don’t usually mention the minus. In other words, you would not say, “The deflation rate is minus 2.8 percent.” It is understood that deflation refers to a decrease in the price level, so you would simply say, “The deflation rate is 2.8 percent.”

**Demand-Side Versus Supply-Side Deflation**

Just like inflation, deflation can originate on either the demand side or the supply side of the economy. Consider Exhibit 12-6(a) on the next page, which shows an aggregate demand curve ($AD_1$) and an aggregate supply curve ($AS_1$). The equilibrium price level is $P_1$. Suppose the aggregate demand curve decreases and shifts from $AD_1$ to $AD_2$. Consequently, the price level decreases from $P_1$ to $P_2$. Because the price level decreased, deflation occurred. We conclude that if aggregate demand decreases and aggregate supply stays the same, deflation will occur. One of the things that can cause aggregate demand to fall is a decrease in the money supply, so a decrease in the money supply can cause deflation.

Next, consider an increase in aggregate supply, from $AS_1$ to $AS_2$ in Exhibit 12-6(b). As a result, the price level drops from $P_1$ to $P_2$. Again, because the price level decreased, deflation occurred. If aggregate supply increases and aggregate demand stays the same, deflation will occur. One of the things that can cause deflation (from the supply side) is an increase in technology that makes it possible to produce more goods and services with the same level of resources.

**QUESTION:** I often read about and hear people on the news talking about inflation, but rarely do I hear a mention of deflation. Why don’t they talk about deflation?
ANSWER: You haven’t heard people talking about deflation for a very simple reason—there hasn’t been any deflation for some time. In the recent economic history of the United States, we have not had a period of deflation; instead, we have had an extended period of low inflation. Go back to Exhibit 12-2 and look at the inflation rate for the different years, 1960 through 2005. Notice that in every year during this period, inflation—not deflation—occurred.

Perhaps we should be asking why inflation—but not deflation—has been the more common condition to appear on the economic scene. Much of the answer to this question has to do with increases in the money supply (M) as compared to increases in output (Q). Often the Fed will increase the money supply at a faster rate than the growth of output rises.

QUESTION: I noticed that computer prices are lower in recent years. For example, a few years ago a computer cost $2,000. Today you can get the same computer for, say, $700. Would you call this trend “computer deflation”?

ANSWER: The price of one good falling does not constitute deflation. Remember, you need a decline in the price level, or in the average price of goods, before you can say deflation occurred.

Simple Quantity Theory of Money and Deflation

Just as the simple quantity theory of money can be used to explain inflation, it can be used to explain deflation, too. Suppose the money supply (M) equals $500, velocity (V) equals 2, and quantity of goods and services (Q) is 100 units. We know that $M \times V$ must equal $P \times Q$, so the price level (P) must equal $10$.

\[
M(\$500) \times V(2) = P(\$10) \times Q(100 \text{ units})
\]

\[
$1,000 = $1,000
\]

Suppose the money supply drops to $250, and all other things remain the same. What happens to the price level? It must drop to $5:

\[
M(\$250) \times V(2) = P(\$5) \times Q(100 \text{ units})
\]

In other words, a fall in the money supply will bring about deflation (assuming that velocity and the quantity of goods and services do not change).

A Major Effect of Deflation

When prices fall, they do not all fall at the same time. This situation often presents a problem. For example, suppose Latoya produces wooden tables. To produce wooden tables, she needs wood, glue, and laborers. In short, in her business Latoya is interested
Suppose someone has $20,000. We ask that person if he would prefer to have $50,000 instead. His first response is to ask us what he has to do to get the extra money. We say nothing. He quickly smiles and says, “Sure, I’ll take the extra money.”

No one, it seems, turns down money for doing nothing in return. More money is always better than less money.

Now what is odd is that even though an individual may never have “too much money,” the sum of individuals (the society) may have “too much money.” To understand how, all that is needed are two things: first, a short history lesson, and second, an understanding of the simple quantity theory of money.

In 1923, prices were rising quite rapidly in Germany. Not by 10 percent or 20 percent a year, but by 41 percent a day. In 1946 in Hungary, prices were tripling each day. Both situations are examples of hyperinflation.

To understand what caused the hyperinflation in Germany? It is simple: too much money. The German government was increasing the money supply at an astronomical rate: that’s what caused prices to soar. Prices rose by 854 billion percent in the five-month period from July to November 1923.

You might think that you could never possibly have too much money. But what many of us forget is that when we think that we can never get enough money, we are assuming that the nation’s money supply remains constant. In other words, you are assuming that you have $4 million more, and that collectively everyone else has $4 million less.

Think of the difference in effects between (1) your having $4 million more and collectively everyone else having $4 million less; and (2) you and everyone else having $4 million more. In the first case, the nation’s money supply stays the same and so do prices. It’s just that you have $4 million more to spend for goods whose prices have not changed. In the second case, the nation’s money supply increases by $4 million times the population. In the United States, we would multiply $4 million times a population of about 300 million. That means the money supply increases by 12 followed by 14 zeros. You can expect prices to rise so fast and so high that soon you’ll be paying hundreds of thousands of dollars for a hamburger.

What is the lesson? For the individual, there may not be such a thing as “too much money.” For the sum of individuals—for a society—there is.

Can you think of other things for which more is better for the individual but more is not necessarily better for the “sum of individuals”?
in four prices: the prices of wooden tables, wood, glue, and laborers. She is interested in the price of wooden tables because it relates to her total revenue. For example, if the price of wooden tables is $100 and she sells 50, her total revenue is $5,000. If the price of wooden tables is lower, at $40, her total revenue is $2,000.

Latoya is interested in the price of wood, glue, and laborers because these prices relate to her total cost. The higher these prices, the higher her overall costs.

Suppose that the money supply in the economy drops, and deflation occurs. Furthermore, not all prices fall at the same time. The price of wooden tables falls first, and the prices of wood, glue, and laborers fall many months later.

What happens to Latoya as a result of the price of wooden tables falling but the prices of wood, glue, and laborers staying constant (for a few months)? Her total revenue falls, but her total costs stay the same. As a result, her profits fall—so much that Latoya ends up getting out of the business of producing wooden tables. She closes up shop, lays off the workers she currently employs, and looks for different work.

In short, when prices do not fall at the same time, deflation can lead to firms going out of business and workers being laid off. Because it is unusual for all prices to fall at the same time, these results are common in deflation.

**Defining Terms**

1. Define:
   a. inflation
   b. demand-side inflation
   c. supply-side inflation
   d. velocity
   e. simple quantity theory of money
   f. hedge
   g. deflation

**Reviewing Facts and Concepts**

2. The CPI is 167 in year 1 and 189 in year 2. What is the inflation rate between the two years?
3. The CPI is 180 in year 1 and 174 in year 2. What is the deflation rate between the two years?

4. “An increase in the money supply is more likely to cause supply-side inflation than demand-side inflation.” Do you agree or disagree? Explain your answer.

5. Explain how a change in aggregate demand and aggregate supply can cause deflation.

**Critical Thinking**

6. A theory that predicts that changes in the money supply bring about larger changes in the price level also predicts that larger changes in the money supply should bring about larger changes in the price level. Do you agree or disagree? Explain your answer.

**Applying Economic Concepts**

7. The simple quantity theory of money assumes that velocity and the quantity of goods and services are constant. Suppose we drop the second assumption, and something happens so that the quantity of goods and services in the economy falls. What will happen to the price level?
What Is a Business Cycle?

Chapter 11 discussed both GDP and real GDP. As you recall, GDP is the total market value of all final goods and services produced annually in a country. Real GDP is simply GDP adjusted for price changes. To calculate real GDP, we take the quantity of goods and services produced in a country in a current year and multiply by the prices that existed in a base year:

\[
\text{Real GDP} = \text{P}_{\text{Base Year}} \times \text{Q}_{\text{Current Year}}
\]

If real GDP is on a roller-coaster—rising and falling and rising and falling—the economy is said to be incurring a business cycle. Economists usually talk about four or five phases of the business cycle. Five phases are identified here and in Exhibit 12-7.

1. **Peak.** At the peak of a business cycle, real GDP is at a temporary high (Q₁ in Exhibit 12-7).
2. **Contraction.** If real GDP decreases, the economy is said to be in a contraction. If real GDP declines for two consecutive quarters (with four quarters in a year), the economy is said to be in a recession. Usually when the economy contracts (real GDP falls), the unemployment rate rises. A higher unemployment rate not only hurts those who are unemployed, but it hurts the country as a whole. More unemployment means fewer goods and services are being produced, and therefore the overall material standard of living of people declines.

### Focus Questions

- What is a business cycle?
- How do economists forecast business cycles?
- What are some economic indicators?
- What causes business cycles?
- How does politics cause upward and downward movements in the economy?

### Key Terms

- **business cycle**
- **recession**

The phases of a business cycle include the peak, contraction, trough, recovery, and expansion. A business cycle is measured from peak to peak.
3. **Trough.** The low point in real GDP, just before it begins to turn up, is called the trough of the business cycle.

4. **Recovery.** The recovery is the period when real GDP is rising; it begins at the trough and ends at the initial peak. For example, the recovery in Exhibit 12-7 extends from the trough to where real GDP is again at Q₁.

5. **Expansion.** The expansion refers to increases in real GDP beyond the recovery. In Exhibit 12-7, it refers to increases in real GDP above Q₁.

An entire business cycle is measured from peak to peak.

**Forecasting Business Cycles**

Economists try to predict changes in the economy. Comparing the economy to your health might help you see how they go about making their predictions.

Think of yourself when you have the flu. Your illness usually has three stages: (1) when you are coming down with the flu, (2) when you have the flu, and (3) when you are getting over the flu but still do not feel like your old self. Each stage includes a sign or indicator of what is happening.

**Flu Signs**

In the first stage, when you are coming down with the flu, you feel a little sluggish and tired. We might call this condition a **leading indicator** of the flu, in that it precedes the flu; it lets you know what is coming.

In the stage when you have the flu, you feel achy, and you might have a fever. We could call this condition a **coincident indicator** of the flu, in that it coincides with having the flu.

Finally, during the period when you are getting over the flu, your temperature returns to normal. You are slightly more alert, but you do not have all your energy back. We could call this condition a **lagging indicator** of the flu. Thus, we established a few indicators of your health and sickness.

**Economic Indicators**

Similarly, economists devised a few indicators of the health and sickness of the economy—leading, coincident, and lagging indicators. These indicators do what their names suggest: lead economic upturns or downturns (in real GDP), coincide with economic upturns or downturns, and lag behind economic upturns and downturns.

We would expect a leading indicator to rise before an upturn in real GDP and to fall before a downturn in real GDP. A coincident indicator should reach its high point at the same time as a peak of a business cycle and reach its low point with the trough of a business cycle. Finally, we would expect a lagging indicator to reach its high sometime after the peak of a business cycle and to reach its low sometime after the trough.

Leading economic indicators tend to be more often cited in the news than either coincident or lagging indicators, perhaps because people seem particularly interested in predicting or forecasting the future. They want to know what lies ahead—contraction or expansion. What will the economic future hold?
A few of the leading indicators include stock prices, the money supply (in inflation-adjusted dollars), consumer expectations, and average weekly hours worked in manufacturing. For example, a stock market that is up generally reflects good economic times ahead, and a stock market that is down generally reflects bad economic conditions to come.

An increase in average weekly hours worked reflects good times ahead. The reasoning is that when good things are happening in the economy—when sales and profits are expected to rise—companies will adjust upward the number of hours their employees work before hiring more people. Similarly, a decline in average weekly hours worked reflects bad times ahead. When this indicator goes down, it usually means that sales and profits are expected to fall, and companies are cutting back on the number of hours their employees work.

**A Student Asks**

**QUESTION:** I have two questions. First, has the United States experienced many business cycles?

**ANSWER:** Between 1854 and 2001, the United States experienced 32 business cycles. The average business cycle—from peak to peak—has been 53 months. If you would like to see the dates of the 32 business cycles in U.S. history, you can go to www.emcp.net/businesscycles.

**QUESTION:** Second question: is an economic contraction the same thing as a recession?

**ANSWER:** A contraction refers to a declining period of real GDP. In Exhibit 12-7 on page 323, it is simply the declining part of the curve. Usually, when the decline is relatively mild (like going down a slide with only a slight incline) we often call the contraction a recession. For example, if real GDP drops by 2 percent, for two consecutive quarters, we would say the economy is in a recession. If the decline in real GDP is sharp (like going down a steep slide), we usually call the contraction a depression.

**What Causes the Business Cycle?**

Since the end of World War II, the United States has gone through 10 business cycles. What causes a business cycle? As you might expect, different economists identify different causes of the business cycle.

**Money Supply**

Some economists believe that changes in the money supply cause economic contractions and expansions. For example, when either the absolute money supply drops (say from $1.200 billion down to $1.150 billion) or the growth rate in the money supply...
declines (say from 5 percent down to 1 percent), people end up buying fewer goods and services, and the economy falls into a contraction. In contrast, an increase in the money supply means more buying, and leads to an economic expansion.

These economists say the ups and downs of the business cycle are caused by the erratic behavior of the monetary authorities or the Fed. Sometimes the Fed puts the monetary accelerator to the floor, dramatically increasing the money supply and causing expansion. At other times it slams on the monetary brakes, causing the money supply to drop and the economy to dive into a contraction.

**EXAMPLE:** Suppose the money supply goes up in one six-month period, and then down in the next six-month period, and then up again in the next six-month period. This up and down movement in the money supply is what causes the up and down in economic activity (real GDP) according to some economists. In a way, increasing the money supply acts as a “stimulant” to the economy and reducing the money supply acts as a “depressant” on the economy.

### Business Investment, Residential Construction, and Government Spending

Some economists point to changes in business investment (firms cut back on buying factories and machinery), residential construction (contractors stop building as many homes), or government spending (government spending is cut substantially) as the cause of a business cycle. For example, a contraction might result from a cutback in business investment or government spending that lowers aggregate demand in the economy. With lower aggregate demand, firms do not sell as many goods and services, so they end up firing workers. Fired workers do not have the income they once had, so overall income in the economy falls. With a lower income, people do not buy as many goods. Thus the initial cut in spending results in even further declines in spending, and the economy falls deeper into recession. Things are reversed when either the business sector or government starts to spend more.

**EXAMPLE:** Suppose the federal government is spending $1.5 trillion a year and then it cuts back to $1.1 trillion. According to some economists, this cutback in government spending can reduce the overall demand for goods and services in the economy, and lead to a decline in economic activity. Similarly, they argue that a rise in government spending could lead to a pickup in economic activity.

### Politics

Some economists believe that at least some business cycles have been caused by politicians trying to get reelected to office. Suppose it is a year or so before the members of Congress will be running for reelection. They know that their chances of reelection are greater if the economy is in good shape on election day. To this end, they pass more spending bills in Congress, hoping to increase aggregate demand in the economy. With greater aggregate demand, they reason, firms will sell more goods and services and hire more workers. People will
have jobs and income. When times are good, voters are more likely to reward the people in office who (they believe) made this possible.

Of course, things may get out of hand after the election. The greater aggregate demand can cause inflation (as we saw in earlier in the chapter). Congress may then reverse its strategy by trying to cut spending to lower aggregate demand and cool off the economy. If Congress cuts spending too much, though, the economy could slide into a contraction.

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Every two years, the members of the House of Representatives and one-third of U.S. senators are up for reelection. Suppose the economy is contracting currently: real GDP is declining, more people are becoming unemployed, and so on. The members of Congress are afraid that if election day comes during poor economic times, they will not be reelected to office. So, prior to election day, they decide to pass various spending bills, including more money for national defense, more money for Medicare, more money for education, and more money for highway development. As a result, some economists argue that economic activity will pick up, but they also remind us that the motivation for the pickup in economic activity was the reelection prospects of members of Congress.

**Example:** Every two years, the members of the House of Representatives and one-third of U.S. senators are up for reelection. Suppose the economy is contracting currently: real GDP is declining, more people are becoming unemployed, and so on. The members of Congress are afraid that if election day comes during poor economic times, they will not be reelected to office. So, prior to election day, they decide to pass various spending bills, including more money for national defense, more money for Medicare, more money for education, and more money for highway development. As a result, some economists argue that economic activity will pick up, but they also remind us that the motivation for the pickup in economic activity was the reelection prospects of members of Congress.

**Innovation**

Some economists believe that major innovations are the seeds of business cycles. For example, a company develops a major new technology or product, and its sales skyrocket. To stay competitive, other companies must try to copy what the innovator has done or come up with a better innovation themselves. For a time, these copycat firms invest heavily to maintain their market positions relative to the innovator. In time, though, investment spending tends to slow, and the economy turns down.

**Supply Shocks**

Some economists argue that the contraction phase of the business cycle is brought about by major supply-side changes in the economy that reduce the capacity of the economy to produce. For example, a war can destroy factories and people and lower the productive capacity of an economy. Consider a major cutback in oil production brought on by conflict in the Middle East. With less oil, which is an important resource in the production process, the productive capability of the economy declines. Firms end up producing less, so they fire some of their workers. Real GDP goes down, and the unemployment rate goes up.

**Defining Terms**

1. Define:
   a. business cycle
   b. recession

**Reviewing Facts and Concepts**

2. What are the five phases of a business cycle?
3. If the initial peak of a business cycle was January 1, year 1, the trough was July 1, year 2, and the final peak was July 1, year 4, how long was the contraction (in months)?
4. What is a coincident indicator?

**Critical Thinking**

5. One leading indicator is average weekly hours worked. If this indicator rises, what does it indicate about the future performance of the economy? Explain your answer.

**Applying Economic Concepts**

6. One explanation of the business cycle is that changes in business investment, residential construction, or government spending cause the business cycle. If this explanation is correct, how could you use this information to determine whether it is a good time or bad time to buy stocks in the stock market?
What Is Economic Growth?

So far in this chapter we talked about inflation (increase in the price level), deflation (decrease in the price level), and the business cycle (real GDP on a roller-coaster ride: going up and down).

The last topic we need to discuss is economic growth. Specifically, we can talk about absolute real economic growth and per capita real economic growth.

**Absolute real economic growth** is an increase in real GDP from one period to the next. For example, if real GDP was $10.2 trillion in year 1 and $11.1 trillion in year 2, the economy experienced absolute real economic growth. See Exhibit 12-8 on the next page for real GDP over the period 1980–2005.

**Per capita real economic growth** is an increase from one period to the next in per capita real GDP, which is real GDP divided by population:

\[
\text{Per capita real GDP} = \frac{\text{Real GDP}}{\text{Population}}
\]

For example, if in year 1 per capita real GDP is $23,000 and it is $25,000 in year 2, then the economy experienced per capita real economic growth.

### Per Capita Real GDP Growth and the Rule of 72

In Chapter 11, the Economics in the Real World feature on page 299 explained the effects of real GDP growth. In that example, we looked at what happens when the annual growth rate of per capita real GDP is 1.1 percent. A person born today will be 65 years old before his or her standard of living (as measured by per capita real GDP) will double. But if the annual growth rate of per capita real GDP is just 1 percent higher, at 2.1 percent, this person will be only 34 years old when his or her standard of living doubles. If the person lives to 68 years old, this person will see his or her standard of living double twice.

How do we know that a person will be 65 years old before his or her standard of living would double (assuming per capita real GDP grows at a rate of 1.1 percent)? We use the Rule of 72, which says that the way to find out the time required for any variable to double is simply to divide its percentage growth by 72. These types of calculations have been used for centuries to estimate the amount of time required for an investment or an asset to double.

### Focus Questions

- What is the difference between absolute real economic growth and per capita real economic growth?
- What is the purpose of the Rule of 72?
- Do small differences in economic growth rates matter?
- What causes economic growth?
- Why might someone argue against economic growth?

### Key Terms

- **absolute real economic growth**
- **per capita real economic growth**
- **human capital**
growth rate (expressed as a whole number, not a decimal) into 72.

Rule of 72 = \( \frac{72}{\text{Growth rate}} \)  
Number of years for a variable to double

If you earn an annual interest rate of 5 percent on a savings account, how many years will it take for the money you deposit into the account to double? The answer is 14.4 years because 72 divided by 5 is 14.4. Or suppose your weight increases by 2 percent per year. How many years will it be before your weight doubles? The answer is 36 years because 72 divided by 2 is 36.

Based on what you have learned about real GDP and one’s standard of living, do you think this farmer lives in a country with relatively high or low economic growth?
Economic Growth and a Production Possibilities Frontier

In Chapter 1, we defined the production possibilities frontier (PPF). You might remember that the PPF shows us all possible combinations of two goods that an economy can produce in a certain period of time. (If you have forgotten how we derived the PPF, you might want to go back to Chapter 1 and review the material. We are assuming in our discussion here that you remember the details of a PPF.)

Using a PPF, in Exhibit 12-9, we can show what absolute real economic growth looks like. Economic growth can occur from a position either below or on the PPF.

Economic Growth from a Position Below the PPF

An economy can be located on or below its PPF. For example, an economy could be located at either point A or point B in Exhibit 12-9(a). Suppose an economy is located at point A, a point below the PPF. Obviously at this point some resources in the economy remain unused, because only when the economy is on the PPF are all resources fully used. At point A the economy is producing 100 units of X and 100 units of Y, but it can produce more with the resources it has; it can produce 150 units of X and 200 units of Y by using all its resources and producing at point B. A movement from point A to point B is evidence of economic growth. More of both goods are produced at point B than at point A. This means that real GDP is higher at point B than point A.

Economic Growth from a Position on the PPF

Now suppose the economy is located at point B in Exhibit 12-9(b), on PPF, producing 150 units of X and 200 units of Y. How does an economy that is currently on its production possibilities frontier experience economic growth? Obviously, the only way is to shift its PPF to the right, say, from PPF \(_1\) to PPF \(_2\). In other words, if an economy is already on its PPF, the only way it can experience economic growth is if its PPF shifts rightward. Then, as we see in Exhibit 12-9(b), the economy can move from point B to point C (where more goods are produced and the real GDP is higher).

What Causes Economic Growth?

What factors cause economic growth of the type shown in Exhibit 12-9(b), that is, economic growth brought on by a rightward shift in the PPF? A few factors that can affect economic growth can occur from a position below the PPF as shown in part (a) or from a position on the PPF as shown in part (b).
Capital investment can lead to increases in productivity and growth. Explain how capital has made workers in this photograph more productive than the farmer shown on page 330.

growth are natural resources, labor, capital, human capital, technological advances, and incentives.

**Natural Resources**

With more natural resources, a country can produce more goods and services. For this reason, people often think that countries with a plentiful supply of natural resources experience economic growth, whereas countries that are short of natural resources do not. In reality, however, some countries with an abundant supply of natural resources have experienced rapid economic growth in the past (such as the United States), and some have experienced no growth or only slow growth. Also, some countries that are short of natural resources, such as Singapore, have grown quickly in the past.

Natural resources are neither sufficient nor necessary for economic growth. However, it is still more likely for a country rich in natural resources to experience growth, all other things being equal. In other words, if two countries, A and B, are the same in nearly all aspects except that A has more natural resources than B, then A is likely to grow more than B.

**Labor**

With more labor, it is possible to produce more output. In other words, we can get more output with 100 people working than with 70 working. More labor, by itself, however, is not what matters most to the economic growth. More important is the productivity of the labor. Government statisticians measure labor productivity by dividing the total output produced by the number of hours it takes to produce the output:

\[
\text{Labor productivity} = \frac{\text{Total output produced}}{\text{Total hours it takes to produce total output}}
\]

For example, if $6 trillion of output is produced in 200 billion labor hours, then labor productivity is $30 per hour.

An increase in labor productivity causes economic growth. The real question, then, is how an economy can achieve an increase in labor productivity. One way is through increased education and training. Another way is through capital investment. Combining workers with more capital goods tends to increase the labor productivity of the workers. For example, a farmer with a tractor is more productive than a farmer without one, and an accountant with a computer is more productive than an accountant without one.

**Capital**

As just mentioned, capital investment can lead to increases in labor productivity and therefore to increases in output or real GDP. However, more capital goods do not just fall
from the sky. Recall from an earlier chapter that getting more of one thing often means forfeiting something else. To produce more capital goods, which are not directly consumable, present consumption must be sacrificed. Consider Robinson Crusoe, alone on an island and fishing with a spear. He must give up some of his present fish to take time to weave a net (a capital good) with which he hopes to catch more fish.

Human Capital

Production of goods and services requires not only physical or tangible capital (a machine, for example), but also human capital. Human capital consists of the knowledge and skill that people obtain from education, on-the-job training, and work experience. It also consists of such things as honesty, creativity, and perseverance—traits that lend themselves to finding work.
themselves to finding work. Human capital is part of a person and cannot be separated from him or her the way physical or tangible capital can be. (You can separate a person from a machine but you cannot separate a person from his or her education, skills, and other personal qualities.)

Many economists argue that human capital is related to economic growth. Generally speaking, the more human capital a group of people have, the greater economic growth will be. It is important to point out how important human capital is to economic growth. Some countries, lacking natural resources, have experienced economic growth by relying on a well-trained, educated, hardworking, and conscientious labor force. For example, in the past, the so-called “Asian tigers” (Hong Kong, Singapore, South Korea, and Taiwan) experienced economic growth in this way.

**Technological Advances**

Technological advances make it possible to obtain more output from the same amount of resources. Compare the amount of work that can be done by a business that uses computers with the amount accomplished by a business that does not.

Technological advances may be the result of new capital goods or of new ways of producing goods. The use of computers is an example of a technological advance that is the result of a new capital good. New and improved management techniques are an example of a new way of producing goods.

Technological advances usually result from companies and countries investing in research and development (R&D). R&D is a general term that encompasses such things as scientists working in a lab to develop a new product and managers figuring out, through experience, how to motivate employees to work to their potential.

**Incentives**

Some economists have argued that economic growth first appeared in areas that directed people to effective economic projects. In other words, economic growth developed where people were given the incentive to produce and innovate.

Consider two incentive structures: In one, people are allowed to keep the full monetary rewards of their labor, and in the other, people are allowed to keep only half. Many economists would predict that the first incentive structure would stimulate more economic activity than the second, all other things being the same. Individuals invest more, take more risks, and work harder when the incentive structure allows them to keep more of the monetary rewards of their investment, risk taking, and labor.

**Two Worries About Future Economic Growth**

Two worries commonly crop up in discussions of economic growth. One concerns the costs of growth. Some individuals argue that more economic growth means more pollution, more factories, more crowded cities, more emphasis on material goods and getting ahead, more rushing around, more

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**BY THE NUMBERS**

The table below shows the U.S. absolute economic growth rate (percentage change in real GDP) in the period 1990–2004.

<table>
<thead>
<tr>
<th>Year</th>
<th>Absolute economic growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1.9%</td>
</tr>
<tr>
<td>1991</td>
<td>-0.2</td>
</tr>
<tr>
<td>1992</td>
<td>3.3</td>
</tr>
<tr>
<td>1993</td>
<td>2.7</td>
</tr>
<tr>
<td>1994</td>
<td>4.0</td>
</tr>
<tr>
<td>1995</td>
<td>2.5</td>
</tr>
<tr>
<td>1996</td>
<td>3.7</td>
</tr>
<tr>
<td>1997</td>
<td>4.5</td>
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<tr>
<td>1998</td>
<td>4.2</td>
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<tr>
<td>1999</td>
<td>4.5</td>
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<tr>
<td>2000</td>
<td>3.7</td>
</tr>
<tr>
<td>2001</td>
<td>0.8</td>
</tr>
<tr>
<td>2002</td>
<td>1.6</td>
</tr>
<tr>
<td>2003</td>
<td>2.7</td>
</tr>
<tr>
<td>2004</td>
<td>4.2</td>
</tr>
</tbody>
</table>
psychological problems, more people using drugs, more suicides, and so on. They argue for less growth instead of more.

Others maintain that no evidence indicates economic growth (or faster, as opposed to slower, economic growth) causes any or all of these problems. They argue that growth brings many positive things: more wealth, less poverty, a society that is better able to support art projects and museums, a society more likely to protect the environment, and so forth.

The debate between those who favor more growth and those who favor less is complex. Economists have joined in, as have psychologists, biologists, sociologists, and many others. The debate promises to continue for a long time.

The second worry concerns the relationship between economic growth and the future availability of resources. Some people believe that continued economic and population growth will Hasten the time when there will be no more natural resources, clean air, or pure water, and no more land for people to live on comfortably. These people urge social policies that will slow growth and preserve what we have.

Critics of this position often charge that such “doomsday forecasts,” as they have come to be called, are based on unrealistic assumptions, oversights, and flimsy evidence. For example, economist Julian Simon pointed out that, contrary to popular opinion, population growth does not hinder economic growth, nor does it increase the incidence of famine. Furthermore, he points out that natural resources are not becoming increasingly more scarce. In fact, Simon had a wager with Paul Ehrlich, author and professor of population studies and biological sciences, about the relative price of natural resources in the period 1980–1990. Ehrlich said that natural resources were becoming increasingly more scarce and therefore would rise in price during this period. Simon, to the contrary, said that natural resources were becoming more plentiful and would actually fall in price. Simon won the bet easily.

### Defining Terms

1. Define:
   - a. absolute real economic growth
   - b. per capita real economic growth
   - c. human capital

### Reviewing Facts and Concepts

2. Can real GDP rise as per capita real GDP falls? Explain your answer.

3. You put $1,000 into a savings account that pays an interest rate of 6 percent annually. How many years before your savings doubles?

### Critical Thinking

4. Natural resources are neither necessary nor sufficient for economic growth. Explain.

### Applying Economic Concepts

5. Can labor productivity decline as total output is rising? Explain your answer.

6. What do you see as the costs of economic growth? What do you see as the benefits?

---

**What potential costs of economic growth come to mind as you look at this photograph?**
As you learned in reading this chapter, human capital refers to the knowledge and skills that people use to produce goods and services. Economists talk about two types of human capital: specific and generic. What's the difference? An economist once explained it by saying that specific human capital is an employee knowing where the restroom is; generic human capital is knowing how to read signs on doors.

**Specific Capital**

Anybody who works for a business acquires certain specific human capital; he or she learns certain things that are useful and important in that particular business. Suppose you go to work for a company that produces movies. You may learn how movies are made, how they are distributed, what makes some movies more profitable than others. You will also learn certain things about the people who work in the movie industry. No doubt, you will have much more specific knowledge about the movie industry than many people have.

Now ask yourself how transferable that specific human capital will be. In other words, will it be easy or hard for you to transfer the knowledge and skills—the human capital—you acquired in the movie industry? If it is hard to transfer, then it is likely that the human capital you acquired is specific—that is, it can only be used in that particular industry. If it is easy to transfer, then it is likely that the human capital you acquired is generic and can be used in almost any industry.

**Comparing Specific to Generic Capital**

As another example, let’s look at two jobs: one as a machine operator at a car plant and the other as a computer programmer. It is likely that the machine operator has specific human capital. He can operate a particular machine in an auto plant, but he can't transfer this knowledge and skill to operating a different kind of machine in a non-auto plant. On the other hand, it is likely that the computer programmer has generic human capital. She can transfer her knowledge and skills in computer programming among a number of different industries.

**Human Capital and Unions**

How might these differences between specific and generic human capital affect unionism in the United States? Unionism tends to be strong and visible in manufacturing, where it is likely that workers have specific human capital. Unionism does not tend to be strong or visible in computer programming, where it is likely that workers have generic human capital.

Why is unionism in one place and not in the other? Some economists say unionism appears where workers need strong bargaining muscle (the places where the workers have specific human capital). If you have generic human capital, strong bargaining muscle is less crucial because you can work for so many different companies in so many different industries.

In recent years, the percentage of the labor force that is unionized declined. For example, in 1983, 20.1 percent of the labor force was...
unionized. By 2003, that percentage fell to 12.9 percent. Why the decline over the years? Some suggested it is because production in the United States moved from manufacturing to service sector jobs, which means that generic human capital became more important than specific human capital.

Learning to Solve Problems

This trend away from specific human capital and toward generic human capital is likely to continue. Now, perhaps more than ever before, it is important to acquire generic human capital. You need to acquire—while in school—as much generic human capital as possible. You need to acquire the skills and knowledge that more and more employers want—critical thinking skills, an ability at mathematics, an ability to write and reason clearly. You want to acquire the knowledge and skills that are in high demand in a world that is coming to value generic human capital more than specific human capital.

Sometimes students take an algebra, trigonometry, or chemistry course in high school and wonder what good that course will ever be to them in the “real world.” You might hear statements such as, “I don’t know what use algebra is going to be to me when I’m out in the real world working,” or “I’ll never use what I learned in chemistry ever again. I don’t plan to be a chemist.” Well, you may not plan to be an algebra teacher or a chemist, but it doesn’t mean the “thinking skills” you acquire learning algebra or chemistry are not useful in the “real world.” Thinking skills, after all, are what transfer easily among jobs. It is becoming increasingly more important in the U.S. economy to know how to solve many problems than how to solve a single problem. But to solve many problems, one has to have good thinking skills.

My Personal Economics Action Plan

Here are some points you may want to consider and some guidelines you might want to put in practice:

1. You may never solve a geometry problem after completing your high school geometry course. The type of thinking you learn while studying geometry, however, can be very useful in the world in which you will live and work.

I will take __________ and __________ , which will be challenging courses for me, but will help me learn generic thinking skills.

2. During your work life, the persons who possess generic human capital that can be transferred from industry to industry are likely to earn more and possess greater job security than those who possess only specific human capital.

I will evaluate each course I take and each job at which I work to determine whether or not I am gaining specific or generic human capital.

Why do higher level math courses contribute to your generic human capital?
Chapter Summary

Be sure you know and remember the following key points from the chapter sections.

Section 1
► Inflation is an increase in the price level.
► A positive change (rise) in the consumer price index means inflation occurred.
► When an increase in the price level occurs because of increased demand, economists call it demand-side inflation.
► When an increase in the price level occurs because of decreased supply, it is called supply-side inflation.
► In the exchange equation, money supply (M) multiplied by velocity (V) equals price (P) times quantity of output (Q).
► Deflation is a decrease in the price level.

Section 2
► The recurrent swings in an economy’s real GDP are known as a business cycle.
► Economists identify five phases of a business cycle: (1) peak, (2) contraction, (3) trough, (4) recovery, and (5) expansion.
► Economists use leading indicators, including stock prices, money supply, consumer expectations, and manufacturing labor hours worked, to forecast the direction the economy is heading.
► Various theories are used to explain the phases of the business cycle, including changes in the money supply, levels of business investment and government spending, politics, innovation, and supply shocks.

Section 3
► Absolute real economic growth is an increase in real GDP from one period to the next, whereas per capita real economic growth is an increase in real GDP divided by population.
► Economic growth is the result of a number of factors, including the supply of natural resources, labor productivity, capital investment, human capital/experience, technological advances, and incentives to produce.

Economics Vocabulary

To reinforce your knowledge of the key terms in this chapter, fill in the following blanks on a separate piece of paper with the appropriate word or phrase.

1. Aggregate demand rises, and the price level rises. This scenario is an example of ______
2. Aggregate supply falls, and the price level rises. This is an example of ______.
3. The average number of times a dollar is spent to buy final goods and services in a year is called ______.
4. The ______ predicts that changes in the price level will be strictly proportional to changes in the money supply.
5. ______ is a decrease in the price level or average level of prices.
6. Real GDP is at a temporary high if it is at the ______ of a business cycle.
7. The ______ of a business cycle refers to increases in real GDP beyond the recovery.
8. If real GDP is at the low point of the business cycle, it is in the ______.
9. An increase in real GDP from one period to the next is referred to as ______ growth.
10. Real GDP divided by population is called ______.

Understanding the Main Ideas

Write answers to the following questions to review the main ideas in this chapter.

1. What is the difference between inflation and deflation?
2. Can both inflation and deflation be caused by changes in aggregate demand? Explain your answer.
3. How does inflation reduce the value or purchasing power of money?
4. Explain how deflation can lead to an increase in unemployment.
5. What might happen on the demand side of the economy to cause inflation?
6. What are the assumptions of the simple quantity theory of money? What is its prediction?
7. In year 1 the Fed increases the money supply 10 percent, and in year 4 it increases the money supply 20 percent. Following which year is the inflation rate likely to be higher if the simple quantity theory of money predicts well? Explain your answer.

8. Can both inflation and deflation be caused by changes in aggregate supply? Explain your answer.

9. Explain why the unemployment rate might rise if aggregate demand falls.

10. Explain how inflation affects both individuals on fixed incomes and savers.

11. How do incentives affect economic growth?

12. Explain how the Fed can cause a business cycle.

13. What is human capital and how does it relate to economic growth?

**Doing the Math**

Do the calculations necessary to solve the following problems.

1. The CPI is 145 in year 1 and 154 in year 2. What is the inflation rate between the two years?
2. The money supply is $2,000, velocity is 2, and the quantity of goods and services is 500 units. According to the exchange equation, what is the average price of a good?
3. Real GDP in year 1 is $4,233 billion, and in year 2 it is $4,456 billion. The population is 178 million in year 1 and 182 million in year 2. What is the per capita real GDP in each year? Did per capita real economic growth occur?
4. If positive absolute real economic growth and negative per capita real economic growth occur at the same time, what is the relationship between the change in real GDP and the change in population?

**Working with Graphs and Tables**

1. Illustrate the following:
   a. demand-side inflation

Solving Economic Problems

Use your thinking skills and the information you learned in this chapter to find solutions to the following problems.

1. **Application.** Explain how knowledge of the exchange equation can be used to explain both inflation and deflation.
2. **Analysis.** Can inflation occur in the face of an increase in the quantity of goods and services? Explain your answer.
3. **Cause and Effect.** Do higher interest rates cause higher inflation, or does higher inflation cause higher interest rates? Explain your answer.
4. **Economics in the Media.** Find a newspaper article that discusses economic growth. Identify and discuss the details of the article.

Go to www.emcp.net/economics and choose Economics: New Ways of Thinking, Chapter 12, if you need more help in preparing for the chapter test.