9.1 Measuring the Unemployment Rate, the Labor Force Participation Rate, and the Employment-Population Ratio (pages 268–277)

Define the unemployment rate, the labor force participation rate, and the employment-population ratio and understand how they are computed. The U.S. Bureau of Labor Statistics uses the results of the monthly household survey to calculate the unemployment rate and the labor force participation rate. The labor force is the total number of people who have jobs plus the number of people who do not have jobs but are actively looking for them. The unemployment rate is the percentage of the labor force that is unemployed. Discouraged workers are people who are available for work but who are not actively looking for a job. Discouraged workers are not counted as unemployed. The labor force participation rate is the percentage of the working-age population in the labor force. Since 1950, the labor force participation rate of women has been rising, while the labor force participation rate of men has been falling. White men and women have below-average unemployment rates. Teenagers and black men and women have above-average unemployment rates. Except during severe recessions, the typical unemployed person finds a new job or returns to his or her previous job within a few months. Each year, millions of jobs are created and destroyed in the United States.

9.2 Types of Unemployment (pages 277–280)

Identify the three types of unemployment. There are three types of unemployment: frictional, structural, and cyclical. Frictional unemployment is short-term unemployment that arises from the process of matching workers with jobs. One type of frictional unemployment is seasonal unemployment, which refers to unemployment due to factors such as weather, variations in tourism, and other calendar-related events. Structural unemployment arises from a persistent mismatch between the job skills or attributes of workers and the requirements of jobs. Cyclical unemployment is caused by a business cycle recession. The natural rate of unemployment is the normal rate of unemployment, consisting of structural unemployment and frictional unemployment. The natural rate of unemployment is also sometimes called the full-employment rate of unemployment.

9.3 Explaining Unemployment (pages 280–282)

Explain what factors determine the unemployment rate. Government policies can reduce the level of frictional and structural unemployment by aiding the search for jobs and the retraining of workers. Some government policies, however, can add to the level of frictional and structural unemployment. Unemployment insurance payments can raise the unemployment rate by extending the time that unemployed workers search for jobs. Government policies have caused the unemployment rates in most other industrial countries to be higher than in the United States. Wages above market levels can also increase unemployment. Wages may be above market levels because of the minimum wage, labor unions, and efficiency wages. An efficiency wage is a higher-than market wage that a firm pays to increase worker productivity.
9.4 Measuring Inflation (pages 282–286)

Define price level and inflation rate and understand how they are computed. The price level measures the average prices of goods and services. The inflation rate is equal to the percentage change in the price level from one year to the next. The federal government compiles statistics on three different measures of the price level: the consumer price index (CPI), the GDP price deflator, and the producer price index (PPI). The consumer price index (CPI) is an average of the prices of goods and services purchased by the typical urban family of four. Changes in the CPI are the best measure of changes in the cost of living as experienced by the typical household. Biases in the construction of the CPI cause changes in it to overstate the true inflation rate by 0.5 percentage point to 1 percentage point. The producer price index (PPI) is an average of prices received by producers of goods and services at all stages of production.

9.5 Using Price Indexes to Adjust for the Effects of Inflation (pages 286–288)

Use price indexes to adjust for the effects of inflation. Price indexes are designed to measure changes in the price level over time, not the absolute level of prices. To correct for the effects of inflation, we can divide a nominal variable by a price index and multiply by 100 to obtain a real variable. The real variable will be measured in dollars of the base year for the price index.

9.6 Real versus Nominal Interest Rates (pages 288–289)

Distinguish between the nominal interest rate and the real interest rate. The stated interest rate on a loan is the nominal interest rate. The real interest rate is the nominal interest rate minus the inflation rate. Because it is corrected for the effects of inflation, the real interest rate provides a better measure of the true cost of borrowing and the true return from lending than does the nominal interest rate. The nominal interest rate is always greater than the real interest rate unless the economy experiences deflation. Deflation is a decline in the price level.

9.7 Does Inflation Impose Costs on the Economy? (pages 289–293)

Discuss the problems that inflation causes. Inflation does not reduce the affordability of goods and services to the average consumer, but it does impose costs on the economy. When inflation is anticipated, its main costs are that paper money loses some of its value and firms incur menu costs. Menu costs include the costs of changing prices on products and printing new catalogs. When inflation is unanticipated, the actual inflation rate can turn out to be different from the expected inflation rate. As a result, income is redistributed as some people gain and some people lose.

Chapter Review

Chapter Opener: Bank of America Announces Plans to Lay Off 30,000 Employees (page 267)

In September 2011, Bank of America, the largest bank in the United States, announced that it would be laying off 30,000 of its 288,000 employees. The layoffs reflected not only the problems banks had been having since the financial crisis in 2008 and the slow pace of recovery from the 2007–2009 economic recession. Unemployment remained high in 2011, leading some economists to speculate that unemployment would be stuck at high levels for many years.
Our measures of unemployment come from a survey conducted each month by the U.S. Bureau of the Census. The Current Population Survey, often referred to as the household survey, collects the data needed to compute the unemployment rate. The survey asks questions about the employment status of people in the household and attempts to determine if a worker is employed, out of the work force (neither employed nor looking for a job), or unemployed. The sum of employed and unemployed persons in the economy is known as the labor force. The unemployment rate is the percentage of the labor force that cannot find work. People who are not actively looking for a job are not considered to be a part of the labor force. This includes discouraged workers as well as retirees, homemakers, full-time students, and people on active military service, in prison, or in mental hospitals. The labor force participation rate is the percentage of the working age population that is in the labor force. Working age is defined as 16 years or older.

The results of the Current Population Survey provide the data to calculate unemployment rates and labor force participation rates. These two statistics are more precisely defined as:

\[
\text{Unemployment rate} = \frac{\text{Number of Unemployed}}{\text{Labor Force}} \times 100
\]

\[
\text{Labor Force Participation Rate} = \frac{\text{Labor Force}}{\text{Working Age Population}} \times 100
\]

The unemployment and labor force data provide a useful picture of employment, but the measures are not perfect due to sampling and reporting errors in the survey. For instance, there are some people who are not counted in the labor force who might still be considered unemployed. Discouraged workers, for example, are workers who have dropped out of the labor force because they believe no jobs are available for them. These workers are not included in the measured unemployment rate, and if included would raise the measured unemployment rate.

The labor force participation rate of men and women and other demographic groups has varied over time in the United States. The participation rate of women increased rapidly in the 1960s and 1970s before leveling off in recent years. The participation rate of men has steadily declined over the years. A gap still exists between male and female labor force participation rates, although it is much smaller today than it was sixty years ago. There are wide differences in the unemployment rates of different demographic groups. The average unemployment rate was 9.1 percent in September 2011. Unemployment rates among
white adults fell slightly below that rate, while white teenagers, Hispanic teenagers, and black teenagers had much higher rates.

In addition to the Current Population Survey, the establishment survey, or the payroll survey, is another way for the Department of Labor to measure total employment in the economy. The establishment survey provides information on the total number of people who are employed and on a company payroll by surveying about 300,000 business establishments. The establishment survey has the following drawbacks:

1. Does not provide information on the number of self-employed persons.
2. Fails to count people employed at newly opened businesses.
3. Does not provide information on the unemployed.

### 9.2 Types of Unemployment (pages 277–280)

**Learning Objective:** Identify the three types of unemployment.

It is useful to divide unemployment into three types: frictional, structural, and cyclical. *Frictional unemployment* includes unemployed workers who have left one job and are looking for another job or are out of a job due to seasonal factors. Frictionally unemployed people usually find new jobs quickly. *Structural unemployment* includes workers who have lost their jobs because their skills do not match those employers want. Structurally unemployed workers are usually out of work longer than those who are frictionally unemployed because they must learn new job skills, which takes time. *Cyclical unemployment* occurs when workers lose jobs due to a recession. As the economy begins to recover, these workers are sometimes rehired by the same firms that laid them off.

When the only types of unemployment are structural and frictional, the economy is said to be at full employment. Sometimes this is also referred to as the *natural rate of unemployment.*

### Extra Solved Problem 9.2

**The Reason for Unemployment**

Supports Learning Objective 9.2: Identify the three types of unemployment.

The BLS collects data about the reasons people are unemployed. Some of this data is in the table below (the numbers are in thousands).

<table>
<thead>
<tr>
<th>Year</th>
<th>Unemployment Rate</th>
<th>Number of Unemployed</th>
<th>Job losers</th>
<th>Reason for unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>On layoff</td>
</tr>
<tr>
<td>2000</td>
<td>4.0</td>
<td>5,692</td>
<td>2,517</td>
<td>852</td>
</tr>
<tr>
<td>2001</td>
<td>4.7</td>
<td>6,801</td>
<td>3,476</td>
<td>1,067</td>
</tr>
<tr>
<td>2002</td>
<td>5.8</td>
<td>8,377</td>
<td>4,607</td>
<td>1,124</td>
</tr>
<tr>
<td>2003</td>
<td>6.0</td>
<td>8,774</td>
<td>4,838</td>
<td>1,121</td>
</tr>
<tr>
<td>2004</td>
<td>5.5</td>
<td>8,149</td>
<td>4,197</td>
<td>998</td>
</tr>
<tr>
<td>2005</td>
<td>5.1</td>
<td>7,591</td>
<td>3,667</td>
<td>933</td>
</tr>
<tr>
<td>2006</td>
<td>4.6</td>
<td>7,001</td>
<td>3,321</td>
<td>921</td>
</tr>
<tr>
<td>2007</td>
<td>4.7</td>
<td>7,078</td>
<td>3,515</td>
<td>976</td>
</tr>
<tr>
<td>2008</td>
<td>5.8</td>
<td>8,924</td>
<td>4,789</td>
<td>1,176</td>
</tr>
<tr>
<td>2009</td>
<td>9.3</td>
<td>14,265</td>
<td>9,160</td>
<td>1,630</td>
</tr>
<tr>
<td>2010</td>
<td>9.6</td>
<td>14,825</td>
<td>9,250</td>
<td>1,431</td>
</tr>
</tbody>
</table>

a. Calculate the percentage of the unemployed who have just lost their jobs and the percentage of those who have left their jobs.

b. Calculate the percentage of the unemployed who are unemployed as the result of entering the labor force, either for the first time or as a reentrant.

Solving the Problem

Step 1: **Review the chapter material.**

This problem is about definitions of unemployment, so you may want to review the section “Types of Unemployment,” which begins on page 277 in the textbook.

Step 2: **Answer question (a) by calculating the percentages of unemployed.**

For example, the percentage of job losers in 2002 can be calculated as: \( \frac{4,607}{8,377} \times 100 = 55.0\% \). The percentage of reentrants and new entrants in 2002 is: \( \frac{2,368 + 536}{8,377} \times 100 = 34.7\% \). The percentages for the three categories in each year are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Job losers</th>
<th>Job leavers</th>
<th>Reentrants and new entrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>44.2%</td>
<td>13.7%</td>
<td>42.1%</td>
</tr>
<tr>
<td>2001</td>
<td>51.1%</td>
<td>12.3%</td>
<td>36.6%</td>
</tr>
<tr>
<td>2002</td>
<td>55.0%</td>
<td>10.3%</td>
<td>34.7%</td>
</tr>
<tr>
<td>2003</td>
<td>55.1%</td>
<td>9.3%</td>
<td>35.5%</td>
</tr>
<tr>
<td>2004</td>
<td>51.5%</td>
<td>10.5%</td>
<td>38.0%</td>
</tr>
<tr>
<td>2005</td>
<td>48.3%</td>
<td>11.5%</td>
<td>40.2%</td>
</tr>
<tr>
<td>2006</td>
<td>47.4%</td>
<td>11.8%</td>
<td>40.8%</td>
</tr>
<tr>
<td>2007</td>
<td>49.7%</td>
<td>11.2%</td>
<td>39.1%</td>
</tr>
<tr>
<td>2008</td>
<td>53.7%</td>
<td>10.0%</td>
<td>36.3%</td>
</tr>
<tr>
<td>2009</td>
<td>64.2%</td>
<td>6.2%</td>
<td>29.6%</td>
</tr>
<tr>
<td>2010</td>
<td>62.4%</td>
<td>6.0%</td>
<td>31.6%</td>
</tr>
</tbody>
</table>

Step 3: **Answer part (b) by comparing the different sources of unemployment.**

Notice that the major source of unemployment is job losers, followed by reentrants and new entrants. The majority of the reentrants and new entrants group is reentrants, which are people who lost or quit jobs in the past, dropped out of the labor force for some reason, and are now looking for jobs.

9.3 **Explaining Unemployment (pages 280–282)**

Learning Objective: Explain what factors determine the unemployment rate.

The business cycle is the cause of cyclical unemployment. Frictional and structural unemployment are influenced by government policies, such as unemployment insurance. This insurance program provides payments of about half the average wage to provide unemployed workers with some income while they search for a new job. Unemployment insurance helps workers take sufficient time to find a job that is a good match for their skills. Unfortunately, as workers spend more time searching, they are also unemployed longer, increasing the unemployment rate. Unemployment insurance also helps the unemployed maintain their income and lessens the severity of a recession. The minimum wage also has an impact on the unemployment rate, particularly for teenage workers. By forcing employers to pay some
workers a wage above the market equilibrium wage, the minimum wage contributes to increased
unemployment among those with few job skills. Firms may also pay a wage above the market level,
called an efficiency wage, which is designed to increase worker productivity. This higher wage may
result in the quantity demanded of labor being less than the quantity supplied. The result can be
unemployment, even when cyclical employment is zero. Labor unions can also temporarily increase
unemployment by bargaining for wages that are higher than the equilibrium level. Workers who are
unable to find employment in the unionized sector can generally find employment—possibly for lower
wages—in the non-unionized sector. Unions have a relatively small impact on labor markets in the United
States because only about 9 percent of non-government workers are members of unions.

Extra Solved Problem 9.3
Unemployment Insurance
Supports Learning Objective 9.3: Explain what factors determine the unemployment rate.

Suppose the U.S. government increases the length of time that an unemployed worker can receive
unemployment insurance benefits. Predict how this will influence the unemployment rate.

Solving the Problem
Step 1: Review the chapter material.
This problem is about the effects of government policy on unemployment rates, so you may
want to review the section “Government Policies and the Unemployment Rate,” which begins
on page 280 in the textbook.

Step 2. Predict the effects.
If the government extends the period for receiving unemployment insurance payments, the
extension will reduce the opportunity cost of unemployment. This may cause some workers
to continue their search for employment, increasing the duration of unemployment, the level
of unemployment, and the unemployment rate.

9.4 Measuring Inflation (pages 282–286)
Learning Objective: Define price level and inflation rate and understand how they are
computed.

The price level measures the average prices of goods and services in the economy, while the inflation
rate is the percentage increase in the price level from one year to the next. There are several price
indexes. The GDP deflator measures the average price of all goods and services included in GDP. The
consumer price index (CPI) measures the average price of the goods and services purchased by a typical
urban household. The producer price index (PPI) measures the average price paid by firms for
intermediate goods. Any price index is the average price of a set of goods and services. These price
indexes differ in terms of which goods are included in them and in terms of how the index is calculated.
The GDP deflator is the ratio of nominal GDP to real GDP multiplied by 100:

$$ \text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100 $$

The GDP deflator is an average of the prices of all final goods and services produced during a year. The
CPI includes goods and services purchased by consumers. Every two years, the BLS does a large-scale
survey to determine the goods and services a typical urban household purchases. The CPI is the ratio of
the current value of that market basket of goods and services to the value of that basket in the base year multiplied by 100:

\[ \text{CPI} = \frac{\text{Expenditures in the current year}}{\text{Expenditures in the base year}} \times 100 \]

**Study Hint**

Remember that a value of the CPI of 218 in the year 2010 means that in that year, the average price of the market basket has increased 118 percent from the base year (the average of 1982–84). What additional information would you need to calculate the inflation rate for that year compared to the previous year? (Answer: You would need the value of the CPI for 2009.) Suppose the CPI was 82 in 1980. What does that number tell us about the price level relative to the base year? (Answer: It tells us that the price level in 1980 was 18 percent lower than in the base year.)

The PPI is a measure of the average prices received by producers at all stages of production. The PPI includes intermediate goods and may sometimes give an early warning of possible future movements in the CPI.

Regardless of which price index you use, the inflation rate is the rate of change in the index from one year to the next. In the following formula, \( t \) refers to the current year and \( t-1 \) refers to the previous year:

\[ \text{Inflation Rate}_t = \frac{\text{Price Index}_t - \text{Price Index}_{t-1}}{\text{Price Index}_{t-1}} \times 100 \]

**Study Hint**

Remember that if the inflation rate falls between two years, (for example, if it is 5 percent one year and 4 percent the next year), then prices are still rising, but at a smaller rate of increase. Economists call a decline in the inflation rate disinflation.

Because the CPI is the most widely used measure of inflation, it is important that the CPI be as accurate as possible. There are however, four reasons why the CPI inflation rate overstates the true inflation rate.

1. The CPI has a substitution bias because it is constructed with the assumption that people buy the same goods and services and do not substitute for lower priced goods and services as relative prices change.
2. The CPI does not fully take into account increases in the quality of products over time. For example, the price of a particular car model might increase from one year to the next, but part of that increase may be due to improvements in the car’s safety and gas mileage. Because of increases in quality, increases in prices overstate the true rate of inflation.
3. Sometimes older products are replaced with new, less-expensive products. If these newer products, such as HD-DVD players, are not properly included in the CPI market basket, then decreases in their prices will be reflected in the inflation rate.
4. The CPI collects data from traditional stores, and does not sample prices at less expensive outlet stores, such as Sam’s Club, creating an outlet bias.
Extra Solved Problem 9.4
Calculating the CPI
Supports Learning Objective 9.4: Define price level and inflation rate and understand how they are computed.

The CPI compares the cost of a market basket of goods with the cost of the same quantities of goods and services in the base year. Suppose that the basket includes (1) admission for two to the local theatre for a Friday evening movie, (2) a large popcorn at the theatre, (3) a large pepperoni pizza (carry-out from the local pizza place), and (4) a two-liter bottle of diet Coke.

<table>
<thead>
<tr>
<th>Year</th>
<th>Theatre Admission for One Person</th>
<th>Popcorn</th>
<th>Pizza</th>
<th>Diet Coke</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$5.00</td>
<td>$2.00</td>
<td>$12.00</td>
<td>$1.25</td>
</tr>
<tr>
<td>2</td>
<td>6.00</td>
<td>2.50</td>
<td>12.50</td>
<td>1.40</td>
</tr>
<tr>
<td>3</td>
<td>6.50</td>
<td>3.00</td>
<td>13.00</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Calculate the value of the market basket in each year.

Solving the Problem
Step 1: Review the chapter material.
This problem is about using a price index to measure inflation, so you may want to review the section “Measuring Inflation,” which begins on page 282 in the textbook.

Step 2: Determine the value of the market basket.
The value of the market basket is the sum of the prices of each good or service multiplied by the quantity of that good or service in the basket. (The basket above has two theater admissions but one of each of the other goods.) The value of the market basket in Year 2 will be \((2 \times 6.00) + (1 \times 2.50) + (1 \times 12.50) + (1 \times 1.40) = 28.40\). The table below also gives the value of the market basket for Years 1 and 3.

Step 3: Calculate the CPI and CPI inflation rates for each year.
The CPI is the ratio of the value of the market basket in a given year to the value of the market basket in the base year. Once we have calculated the CPI, we can also calculate the CPI inflation rate. These values are in the table below.
Extra Solved Problem 9.4
Comparing Inflation Rates
Supports Learning Objective 9.4: Define price level and inflation rate and understand how they are computed.

Below are price level data for the GDP deflator, the consumer price index (CPI), and the producer price index (PPI) for the period 2000–2010. Calculate the inflation rates for each of these price indexes for each time period. Do the different price indexes give the same inflation rate? The data are from the Economic Report of the President, found online at www.gpoaccess.gov/eop/.

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP Deflator</th>
<th>CPI</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>100.0</td>
<td>172.2</td>
<td>138.0</td>
</tr>
<tr>
<td>2001</td>
<td>102.4</td>
<td>177.1</td>
<td>140.7</td>
</tr>
<tr>
<td>2002</td>
<td>104.1</td>
<td>179.9</td>
<td>138.9</td>
</tr>
<tr>
<td>2003</td>
<td>106.4</td>
<td>184.0</td>
<td>143.3</td>
</tr>
<tr>
<td>2004</td>
<td>109.4</td>
<td>188.9</td>
<td>148.5</td>
</tr>
<tr>
<td>2005</td>
<td>112.7</td>
<td>195.3</td>
<td>155.7</td>
</tr>
<tr>
<td>2006</td>
<td>116.0</td>
<td>201.6</td>
<td>160.3</td>
</tr>
<tr>
<td>2007</td>
<td>119.8</td>
<td>207.4</td>
<td>166.6</td>
</tr>
<tr>
<td>2008</td>
<td>122.4</td>
<td>215.3</td>
<td>177.2</td>
</tr>
<tr>
<td>2009</td>
<td>123.7</td>
<td>214.6</td>
<td>172.7</td>
</tr>
<tr>
<td>2010</td>
<td>125.1</td>
<td>218.1</td>
<td>180.0</td>
</tr>
</tbody>
</table>

Solving the Problem
Step 1: Review the chapter material.
This problem is about using a price index to measure inflation, so you may want to review the section “Measuring Inflation,” which begins on page 282 in the textbook.

Step 2: Use the inflation formula.
\[
\text{Inflation Rate}_t = \frac{\text{Price Index}_t - \text{Price Index}_{t-1}}{\text{Price Index}_{t-1}} \times 100
\]
<table>
<thead>
<tr>
<th>Year</th>
<th>GDP Deflator Inflation Rate</th>
<th>CPI Inflation Rate</th>
<th>PPI Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2.4%</td>
<td>2.8%</td>
<td>2.0%</td>
</tr>
<tr>
<td>2002</td>
<td>1.7</td>
<td>1.6</td>
<td>−1.3</td>
</tr>
<tr>
<td>2003</td>
<td>2.2</td>
<td>2.3</td>
<td>3.2</td>
</tr>
<tr>
<td>2004</td>
<td>2.8</td>
<td>2.7</td>
<td>3.6</td>
</tr>
<tr>
<td>2005</td>
<td>3.0</td>
<td>3.4</td>
<td>4.8</td>
</tr>
<tr>
<td>2006</td>
<td>2.9</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>2007</td>
<td>3.3</td>
<td>2.9</td>
<td>3.9</td>
</tr>
<tr>
<td>2008</td>
<td>2.2</td>
<td>3.8</td>
<td>6.4</td>
</tr>
<tr>
<td>2009</td>
<td>1.1</td>
<td>−0.3</td>
<td>−2.5</td>
</tr>
<tr>
<td>2010</td>
<td>1.2</td>
<td>1.6</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Notice that while the numbers are different, because each price index measures the price level differently, they show a similar pattern. So which is the correct inflation rate? The answer is all are the correct inflation rate. The inflation rate measures a rate of change in prices. There are many ways to measure prices. Each measurement implies a different inflation rate.

### 9.5 Using Price Indexes to Adjust for the Effects of Inflation (pages 286–288)

Learning Objective: Use price indexes to adjust for the effects of inflation.

Price indexes, such as the CPI, give us a way of adjusting for the effects of inflation so that we can compare the purchasing power of dollar values in different years. The formula we would use to calculate the value in 2010 dollars of a good or service in the year 2000 would be:

\[
\text{Value in 2010 dollars} = \text{Value in 2000 dollars} \times \frac{\text{CPI in 2010}}{\text{CPI in 2000}}
\]

For example, suppose a pizza and two drinks from the local pizza place cost $7.99 in 2000. If the CPI in 2010 is 218 and the CPI in 2000 is 172, then the value of the pizza and two drinks in 2010 dollars is

\[
\text{Value in 2010 dollars} = \$7.99 \times \frac{218}{172} = \$10.13
\]

### 9.6 Real versus Nominal Interest Rates (pages 288–289)

Learning Objective: Distinguish between the nominal interest rate and the real interest rate.

The interest rate is the return to lending or the cost of borrowing. If you lend $100 at a 5 percent interest rate, you will receive $5.00 in interest one year from now. If there is inflation over that year, the $5.00 will not buy the same amount of goods and services at the end of the year as at the beginning of the year.
The **nominal interest rate** is the stated interest rate on a loan. The **real interest rate** adjusts the nominal interest rate for inflation. The real interest rate is defined as:

\[
\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}
\]

The real interest rate provides a better measure of the true cost of borrowing and the true rate of return to lending than does the nominal interest rate. In a period of **deflation**, where the inflation rate is negative (the price level is falling), the real interest rate will be larger than the nominal interest rate.

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**Extra Solved Problem 9.6**

**Nominal and Real Interest Rates**

Supports Learning Objective 9.6: Distinguish between the nominal interest rate and the real interest rate.

The table below contains interest rate data on bonds issued by large corporations. In this case, the bonds have received a “AAA” rating, which means that the corporations that issued the bonds are not likely to go out of business. The table also shows the inflation rate calculated using the CPI. Calculate the real interest rate and compare changes in the nominal and real interest rates.

<table>
<thead>
<tr>
<th>Year</th>
<th>AAA Bond Interest Rate (nominal interest rate)</th>
<th>CPI Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7.1%</td>
<td>2.9%</td>
</tr>
<tr>
<td>2002</td>
<td>6.5%</td>
<td>1.6%</td>
</tr>
<tr>
<td>2003</td>
<td>5.7%</td>
<td>2.3%</td>
</tr>
<tr>
<td>2004</td>
<td>5.6%</td>
<td>2.7%</td>
</tr>
<tr>
<td>2005</td>
<td>5.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>2006</td>
<td>5.6%</td>
<td>3.2%</td>
</tr>
<tr>
<td>2007</td>
<td>5.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td>2008</td>
<td>5.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>2009</td>
<td>5.3%</td>
<td>–0.3%</td>
</tr>
<tr>
<td>2010</td>
<td>4.9%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

**Solving the Problem**

**Step 1:** **Review the chapter material.**

This problem is about calculating the real interest rate, so you may want to review the section “Real versus Nominal Interest Rates,” which begins on page 288 in the textbook.

**Step 2:** **Use the real interest rate formula.**

\[
\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}
\]
The resulting real interest rates are:

<table>
<thead>
<tr>
<th>Year</th>
<th>AAA Bond Interest Rate (nominal rate)</th>
<th>CPI Inflation Rate</th>
<th>AAA Bond Interest Rate (real rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7.1%</td>
<td>2.9%</td>
<td>4.2%</td>
</tr>
<tr>
<td>2002</td>
<td>6.5</td>
<td>1.6</td>
<td>4.9</td>
</tr>
<tr>
<td>2003</td>
<td>5.7</td>
<td>2.3</td>
<td>3.4</td>
</tr>
<tr>
<td>2004</td>
<td>5.6</td>
<td>2.7</td>
<td>2.9</td>
</tr>
<tr>
<td>2005</td>
<td>5.2</td>
<td>3.4</td>
<td>1.8</td>
</tr>
<tr>
<td>2006</td>
<td>5.6</td>
<td>3.2</td>
<td>2.4</td>
</tr>
<tr>
<td>2007</td>
<td>5.6</td>
<td>2.9</td>
<td>2.7</td>
</tr>
<tr>
<td>2008</td>
<td>5.6</td>
<td>3.8</td>
<td>1.8</td>
</tr>
<tr>
<td>2009</td>
<td>5.3</td>
<td>–0.3</td>
<td>5.6</td>
</tr>
<tr>
<td>2010</td>
<td>4.9</td>
<td>1.6</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Notice that because the inflation rate is positive during most years except 2009, the real interest rate was smaller than the nominal interest rate. In 2009, the real interest rate was greater than the nominal interest rate as a result of a negative inflation rate, or deflation. Also notice that the patterns of the real interest rate are sometimes different than the patterns of nominal interest rates. For instance, from 2001–2002, the nominal interest rate fell from 7.1 percent to 6.5 percent, while the real interest rate increased from 4.2 percent to 4.9 percent. But, if we examine 2007–2008 changes, the nominal interest rate did not change while the real interest rate decreased.

## 9.7 Does Inflation Impose Costs on the Economy? (pages 289–293)

Learning Objective: Discuss the problems that inflation causes.

Inflation affects the distribution of income and can, in turn, hurt some people. For example, people on fixed nominal incomes—such as retired people who rely on company pensions that pay them a fixed amount each month—are hurt by inflation. As prices rise, their incomes do not rise, so they are able to buy fewer goods and services. Inflation can be characterized as anticipated or unanticipated. Anticipated inflation imposes costs by reducing the purchasing power of assets, such as money in a checking account. Anticipated inflation can also create additional costs to firms from raising prices—these costs are called menu costs. Unanticipated inflation can affect the distribution of income, causing some people to gain and some people to lose.
Key Terms

**Consumer price index (CPI)** An average of the prices of the goods and services purchased by the typical urban family of four.

**Cyclical unemployment** Unemployment caused by a business cycle recession.

**Deflation** A decline in the price level.

**Discouraged workers** People who are available for work but have not looked for a job during the previous four weeks because they believe no jobs are available for them.

**Efficiency wage** A higher-than-market wage that a firm pays to increase worker productivity.

**Frictional unemployment** Short-term unemployment that arises from the process of matching workers with jobs.

**Inflation rate** The percentage increase in the price level from one year to the next.

**Labor force** The sum of employed and unemployed workers in the economy.

**Labor force participation rate** The percentage of the working-age population in the labor force.

**Menu costs** The costs to firms of changing prices.

**Natural rate of unemployment** The normal rate of unemployment, consisting of frictional unemployment plus structural unemployment.

**Nominal interest rate** The stated interest rate on a loan.

**Price level** A measure of the average prices of goods and services in the economy.

**Producer price index (PPI)** An average of the prices received by producers of goods and services at all stages of the production process.

**Real interest rate** The nominal interest rate minus the inflation rate.

**Structural unemployment** Unemployment that arises from a persistent mismatch between the skills and attributes of workers and the requirements of jobs.

**Unemployment rate** The percentage of the labor force that is unemployed.

Self-Test

(Answers are provided at the end of the Self-Test.)

Multiple-Choice Questions

1. The “misery index” gives a rough measure of the state of the economy by
   a. establishing the success or failure of government spending on social programs.
   b. determining why the economy is unable to generate a higher level of real GDP per person.
   c. adding together the inflation and unemployment rates.
   d. monitoring changes in the number of people on the welfare rolls.
2. Fill in the blanks. The *Current Population Survey*, conducted by the U.S. Bureau of the Census and often referred to as the household survey, is a sample of ________ households, and asks about the employment status of everyone in the household __________ and older.
   a. 1,000; 18 years of age
   b. 5,000; 21 years of age
   c. 60,000; 16 years of age
   d. 80,000; 19 years of age

3. Which of the following groups is included in the labor force?
   a. the unemployed
   b. retirees, homemakers, and full-time students
   c. people who could have a civilian job but are on active military service, in prison, or in mental hospitals
   d. none of the above

4. With respect to statistics on the labor market, we can say that
   a. the labor force is the sum of the employed and unemployed.
   b. the unemployment rate is calculated as: (number of unemployed/number of employed) × 100.
   c. the number of unemployed includes discouraged workers.
   d. the number of unemployed includes people who are not employed and not actively looking for jobs.

5. If you are available for work and have looked for a job at some point during the previous twelve months, but have not actively looked during the previous four weeks, you are considered
   a. in the labor force, but structurally unemployed.
   b. not in the labor force.
   c. in the labor force, but frictionally unemployed.
   d. none of the above.

6. Suppose that you are available for work but have not looked for a job for at least the last four weeks because you believe that no jobs are available. You would then be counted as
   a. part of the labor force.
   b. unemployed.
   c. a discouraged worker.
   d. underemployed.

7. At full employment,
   a. cyclical unemployment is zero.
   b. frictional unemployment is zero.
   c. structural unemployment is zero.
   d. no one is unemployed.

8. In September 2011, the working-age population of the United States numbered about
   a. 79 million.
   b. 240 million.
   c. 218 million.
   d. 304 million.
9. In September 2011, which of the following groups was smallest?
   a. the unemployed
   b. people who were not in the labor force and not available for work
   c. discouraged workers and those who were not working for other reasons
   d. the number of people in the labor force

10. Which of the following is the correct formula for calculating the unemployment rate?
   a. \[
   \frac{\text{Number of unemployed}}{\text{Labor force}} \times 100
   \]
   b. \[
   \frac{\text{Labor force}}{\text{Working-age population}} \times 100
   \]
   c. Both of the formulas above are used to calculate the unemployment rate.
   d. Neither of the formulas above is used to calculate the unemployment rate.

11. How would employment statistics be affected if they included people in the military?
   a. The unemployment rate would decrease.
   b. The working-age population would remain the same.
   c. The labor force participation rate would remain the same.
   d. all of the above

12. Among the following, who is counted by the BLS as unemployed?
   a. A person working part-time but prefers to have a full-time job.
   b. A person has stopped actively looking for a job after have trouble finding one.
   c. A worker who believes she is underpaid.
   d. none of the above

13. What would be the impact of counting as unemployed both discouraged workers and those who work part-time but would prefer to work full-time?
   a. The unemployment rate would remain the same because those people are already counted as unemployed.
   b. The unemployment rate would increase.
   c. The unemployment rate would decrease.
   d. The annual unemployment rate would have been close to 50 percent in the last decade.

14. Fill in the blanks. Two important trends in the labor force participation rates of adults aged twenty and over in the United States since 1950 are the ________ labor force participation rate of adult women and the ________ labor force participation rate of adult men.
   a. falling; rising
   b. falling; falling
   c. rising; falling
   d. rising; rising

15. In September 2011, which of the following demographic groups had a higher rate of unemployment than the unemployment rate for the total population?
   a. white adults
   b. black adults
   c. Hispanic adults
   d. None of the above. The unemployment rates for these groups were all lower than the overall unemployment rate.
16. In the U.S. economy today, how long does the typical unemployed person stay unemployed?
   a. less than 5 weeks
   b. 5 to 14 weeks
   c. 15 to 26 weeks
   d. 27 weeks or more

17. Relative to the household survey, which of the following is a strength of the establishment survey?
   a. It provides better information on the number of persons self-employed than the household survey.
   b. It provides information on unemployment, which the household survey does not provide.
   c. It is determined by actual payrolls, rather than by the unverified answers of the household survey.
   d. all of the above

18. The extent of job creation and job destruction is
   a. a serious shortcoming of our economic system.
   b. what we would expect in a vibrant market system.
   c. an ideal feature of our economy, because very few jobs are ever destroyed while many new ones are created all the time.
   d. the main reason why the U.S. unemployment rate is persistently high.

19. From 1950 until 2011, the behavior of the annual unemployment rate in the United States demonstrated that
   a. the unemployment rate rises during both recessions and expansions.
   b. the unemployment rate falls during both recessions and expansions.
   c. the unemployment rate falls during recessions and rises during expansions.
   d. the unemployment rate rises during recessions and falls during expansions.

20. The short-term unemployment that arises from the process of matching workers with jobs is called
   a. frictional unemployment.
   b. structural unemployment.
   c. cyclical unemployment.
   d. seasonal unemployment.

21. Unemployment arising from a persistent mismatch between the skills and characteristics of workers and the requirements of jobs is called
   a. frictional unemployment.
   b. structural unemployment.
   c. cyclical unemployment.
   d. seasonal unemployment.

22. When the economy is at full employment, which types of unemployment remain?
   a. cyclical and structural
   b. frictional and structural
   c. frictional and cyclical
   d. None of the above. Full employment means that there is no unemployment, so the unemployment rate would be zero.

23. The “normal” underlying level of unemployment in the economy is
   a. the sum of structural unemployment and frictional unemployment.
   b. the full-employment rate of unemployment.
   c. the natural rate of unemployment.
   d. all of the above.
24. Government policies can help to reduce the levels of frictional and structural unemployment, but they can also help to increase them. Which of the following policies can cause an increase in the levels of frictional or structural unemployment?
   a. increasing the length of time that the unemployed can receive payments from the government
   b. passing legislation that makes it more difficult for firms to fire workers
   c. increasing the minimum wage
   d. all of the above

25. Increases in the minimum wage will
   a. increase unemployment among workers whose market wage is higher than the new minimum wage.
   b. increase teenage unemployment.
   c. increase the level of unemployment for all groups of workers.
   d. have a large effect on the unemployment rate in the United States.

26. Which of the following is the prevailing view of economists about the unemployment insurance program in the United States?
   a. Unemployment insurance is a bad idea because the unemployed spend more time searching for jobs after they receive these payments.
   b. Unemployment insurance is a bad idea because it promotes laziness among the unemployed.
   c. Unemployment insurance is a good idea because it helps the unemployed maintain their income and spending, which helps reduce the severity of recessions.
   d. Most economists are against unemployment insurance, but they don’t explain why.

27. Fill in the blanks. The unemployment rate in the United States is usually ________ than the unemployment rates in most other high-income countries, partly because the United States has - ________ requirements for the unemployed to receive government payments.
   a. higher; less stringent
   b. higher; more stringent
   c. lower; less stringent
   d. lower; more stringent

28. If the minimum wage is set above the market-determined clearing wage,
   a. the quantity of labor demanded will be greater than the quantity of labor supplied.
   b. the unemployment rate will be higher than it would be without a minimum wage.
   c. the minimum wage generates a shortage of unskilled workers.
   d. All of the above are true.

29. A wage higher than the market wage paid by a firm in order to increase worker productivity is
   a. the idea behind the minimum wage.
   b. a burden on production costs and profits.
   c. an efficiency wage.
   d. a compensating differential.
30. Fill in the blanks. To obtain prices of a representative group of goods and services, the Bureau of Labor Statistics (BLS) conducts a monthly survey of ________ households nationwide on their spending habits. The results of this survey are used to construct a market basket of ________ goods and services purchased by the typical urban family of four.
   a. 1,000; 80,000
   b. 10,000; 525
   c. 30,000; 211
   d. 5,000; 75

31. In calculating the CPI,
   a. the largest group of items in the market basket is food and beverages.
   b. the BLS varies the quantity of a good in the market basket in response to changes in current sales of the good.
   c. the market basket of goods and services is updated monthly.
   d. the market basket does not include large equipment purchased by business firms.

32. Of the eight categories in the CPI market basket, which three categories make up more than 75 percent of the basket?
   a. medical care, recreation, and education
   b. food and beverages, apparel, and other goods and services
   c. housing, transportation, and food
   d. None of the above. Each category in the basket comprises the same percentage of the basket as the others.

33. Computation of the CPI assumes that households buy the same market basket of products each month. For this reason, one of the following is irrelevant in calculating the CPI. Which one?
   a. the prices of the products purchased in the base year
   b. the prices of the products purchased in the current year
   c. the quantities of the products purchased in the base year
   d. the quantities of the products purchased in the current year

34. Suppose the CPI in 2008 was 215.3 and the CPI in 2009 was 214.6, what was the inflation rate between 2008 and 2009?
   a. 3.0 percent
   b. 0.7 percent
   c. –0.3 percent
   d. –0.7 percent

35. Changes in the CPI overstate the true inflation rate due to four “biases.” If apple prices rise rapidly during the month while orange prices fall, consumers will reduce their apple purchases and increase their orange purchases. Which of the four biases is concerned with this tendency?
   a. the substitution bias
   b. the increase in quality bias
   c. the new product bias
   d. the outlet bias
36. Which of the following is a better measure of the average prices of all goods and services included in GDP?
   a. the consumer price index
   b. the producer price index
   c. the GDP deflator
   d. the inflation rate

37. If nominal GDP in a given year is $11,000 billion and real GDP is $10,000 billion, then the GDP price deflator in that year equals
   a. 1.1 percent.
   b. 110.
   c. 10 percent.
   d. 90.

38. If the inflation rate is 6 percent and the nominal interest rate is 4 percent, then the real interest rate is
   a. 16 percent, which is the sum of the nominal interest rate and the inflation rate.
   b. 2 percent, which is the inflation rate minus the nominal interest rate.
   c. –2 percent, which is the nominal interest rate minus the inflation rate.
   d. 1.5 percent, which is the ratio of the nominal interest rate to the inflation rate.

39. The inflation rate is
   a. the percentage change in nominal GDP from one year to the next.
   b. the percentage change in real GDP from one year to the next.
   c. the percentage difference between nominal GDP and real GDP in any given year.
   d. the percentage change in the GDP deflator from one year to the next.

40. Which market basket below specifically targets intermediate goods?
   a. the basket used by the consumer price index
   b. the basket used by the GDP deflator
   c. the basket used by the producer price index
   d. all of the above

41. If the consumer price index was 73 in 1979 and 225 in 2011, then prices in 2011 were on average
   a. half of what they were in 1979.
   b. three times as high as in 1979.
   c. 150 percent higher than in 1979.
   d. the same as they were in 1979.

42. If the CPI was 207 in 2007 and 225 in 2011, what pay raise would someone who earned $50,000 income in 2007 have to earn in order to keep her purchasing power constant in 2011?
   a. $1,252
   b. $4,000
   c. $4,348
   d. none of the above
43. Economic variables that are calculated in current year prices are referred to as ________ variables, while variables that have been corrected to account for the effects of inflation are ________ variables.
   a. nominal; real
   b. real; nominal
   c. updated; deflated
   d. deflated; updated

44. The stated interest rate on a loan is
   a. the nominal interest rate.
   b. the real interest rate.
   c. the rate of inflation.
   d. the credit rate.

45. The real interest rate equals
   a. the inflation rate minus the nominal interest rate.
   b. the nominal interest rate minus the inflation rate.
   c. the nominal interest rate plus the inflation rate.
   d. the nominal interest rate divided by the CPI for a given year.

Short Answer Questions

1. Suppose that the working-age population of a country is 1,000. Currently 600 are in the labor force. In addition, 550 people are currently employed. For this country, what are the labor force participation rate and the unemployment rate?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

2. Suppose that because of improvements in health care, people postpone their retirement and continue working until they are sixty-eight instead of sixty-three. How would this influence the labor force participation rate?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

3. Why would we expect there to be some frictional and structural unemployment in an economy with full employment?

_____________________________________________________________________________
_____________________________________________________________________________
4. Suppose that to calculate the CPI we use three goods: coffee, tea, and diet cola. A typical consumer buys 2 pounds of coffee, 3 boxes of tea, and 1 can of diet cola. Prices of these goods are given in the table below for each of three years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of Coffee</th>
<th>Price of Tea</th>
<th>Price of Diet Cola</th>
<th>Value of Market Basket</th>
<th>CPI</th>
<th>CPI Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$3.25</td>
<td>$2.00</td>
<td>$1.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$3.75</td>
<td>$2.22</td>
<td>$1.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$4.05</td>
<td>$2.50</td>
<td>$1.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assume Year 1 is the base year. Calculate the value of the market basket for each year. Remember the market basket of goods is the same from year to year. Then calculate the CPI and the CPI inflation rate. How would your answer differ if Year 3 were the base year? (Remember, as with the CPI, use the same market basket of goods for each time period.)

5. Jacob borrowed $500 from his friend Emma to buy a $500 bike. Jacob agreed to pay Emma a 4 percent interest rate to compensate her for not using her $500 for that year and to adjust for the 3 percent inflation in the past. That nominal interest rate would imply a 1 percent real interest rate on the loan. Suppose that over the year the inflation rate was 4 percent, rather than the 3 percent rate Jacob and Emma had expected. Who gains and who loses? How would your answer differ if the actual inflation rate over the year was 1 percent?

6. Suppose an economy has a population of 6,000 people (ages 16 and up). Of that number, 2,000 people are not in the labor force, and 300 people are unemployed. Use these numbers to calculate the labor force participation rate and the unemployment rate.

True/False Questions

T F 1. The unemployment rate is the percentage of the population that is unemployed.
T F 2. A discouraged worker is someone who is still working but is underemployed or paid less than she prefers.
T F 3. Over the last fifty years, the labor force participation rate tended to decline for men but rise for women.

T F 4. Teenage unemployment rates are about the same as adult unemployment rates.

T F 5. The household survey gives a higher total for people employed than the establishment survey because the household survey includes self-employment.

T F 6. Frictional unemployment includes people who quit their jobs to look for different jobs.

T F 7. Structural unemployment includes people who lost jobs because their job skills were no longer needed by their employer.

T F 8. Cyclical unemployment is caused by firms reducing employment due to decreased demand for their products during a recession.

T F 9. At full employment, the unemployment rate is zero.

T F 10. The CPI is the average price of all goods and services in the economy.

T F 11. The market basket for the CPI changes every month.

T F 12. The CPI in 2011 is 225. This indicates that prices have increased 225 percent from the base year.

T F 13. The GDP deflator is defined as the ratio of real GDP to nominal GDP multiplied by 100.

T F 14. The real interest rate is the nominal interest rate plus the inflation rate.

T F 15. If inflation is unexpectedly high, this will benefit lenders and harm borrowers.

**Answers to the Self-Test**

**Multiple-Choice Questions**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>c</td>
<td>In the 1960s, Arthur Okun, who was chairman of the Council of Economic Advisers during Lyndon Johnson’s administration, coined the term “misery index,” which adds together the inflation rate and the unemployment rate to give a rough measure of the state of the economy.</td>
</tr>
<tr>
<td>2.</td>
<td>c</td>
<td>The Current Population Survey, often referred to as the household survey, is a sample of 60,000 households, chosen to represent the U.S. population, and asks about the employment status of everyone in the household sixteen years of age or older.</td>
</tr>
<tr>
<td>3.</td>
<td>a</td>
<td>The labor force is the sum of the employed and the unemployed.</td>
</tr>
<tr>
<td>4.</td>
<td>a</td>
<td>The unemployment rate is the ratio of the number of people unemployed to the labor force, where the labor force is the sum of the employed and the unemployed. People are counted as unemployed if they are without a job, but are actively seeking a new job.</td>
</tr>
<tr>
<td>5.</td>
<td>b</td>
<td>People who are available for work and who have actively looked for a job at some point during the previous twelve months, but who have not looked during the previous four weeks, are not in the labor force.</td>
</tr>
<tr>
<td>6.</td>
<td>c</td>
<td>The definition of a discouraged worker is someone who is available for work, but has not looked for a job during the previous four weeks, because he or she believes no jobs are available.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td>Comment</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>7.</td>
<td>a</td>
<td>Frictional and structural unemployment will exist at full employment. At full employment there is no unemployment due to the business cycle, or in other words, no cyclical unemployment.</td>
</tr>
<tr>
<td>8.</td>
<td>b</td>
<td>In September 2011, the working-age population of the United States was 240 million. The working-age population is divided into those in the labor force (154 million) and those not in the labor force (86 million).</td>
</tr>
<tr>
<td>9.</td>
<td>c</td>
<td>The smallest group consisted of people who could possibly work but were not in the labor force, such as discouraged workers (1 million) and those not working for other reasons (1.6 million).</td>
</tr>
<tr>
<td>10.</td>
<td>a</td>
<td>The unemployment rate measures the percentage of the labor force that is unemployed.</td>
</tr>
<tr>
<td>11.</td>
<td>a</td>
<td>Including people in the military would increase the number of people counted as being in the labor force, but would leave unchanged the number of people counted as unemployed. Therefore, the unemployment rate would decrease.</td>
</tr>
<tr>
<td>12.</td>
<td>d</td>
<td>The BLS counts a person as employed even if he or she prefers to work more hours or wishes to earn more. A person who is not actively looking for a job after having trouble finding one is considered as a discouraged worker. Discouraged workers are not considered as unemployed either.</td>
</tr>
<tr>
<td>13.</td>
<td>b</td>
<td>For example, in September 2011, if the BLS counted as unemployed all the people who were available for work but not actively looking for a job, and all the people who were in part-time jobs but wanted full-time jobs, the unemployment rate would have increased from 9.1 percent to 16.5 percent.</td>
</tr>
<tr>
<td>14.</td>
<td>c</td>
<td>Textbook Figure 9.2 highlights two important trends in labor force participation rates of adults aged twenty and over in the United States since 1950: the rising labor force participation rate of adult women and the falling labor force participation rate of adult men.</td>
</tr>
<tr>
<td>15.</td>
<td>b</td>
<td>Textbook Figure 9.3 shows that different groups in the population can have very different unemployment rates.</td>
</tr>
<tr>
<td>16.</td>
<td>a</td>
<td>In September 2011, the percentage of total unemployed was as follows: less than 5 weeks: 20 percent; 5 to 14 weeks: 21 percent; 15 to 26 weeks: 15 percent, and 27 weeks or more: 45 percent.</td>
</tr>
<tr>
<td>17.</td>
<td>c</td>
<td>The establishment survey has the strength of being determined by actual payrolls, rather than by unverified answers, as is the case with the household survey. In recent years, some economists have come to rely more on establishment survey data than on household survey data in analyzing current labor market conditions.</td>
</tr>
<tr>
<td>18.</td>
<td>b</td>
<td>In 2010, for example, about 26.6 million jobs were created and about 25.5 million jobs were also destroyed. This degree of job creation and destruction is what we would expect in a vibrant market system where new firms are constantly being started, some existing firms are expanding, some existing firms are contracting, and some firms are going out of business.</td>
</tr>
<tr>
<td>19.</td>
<td>d</td>
<td>Figure 9.6 illustrates that the unemployment rate follows the business cycle, rising during recessions and falling during expansions.</td>
</tr>
<tr>
<td>20.</td>
<td>a</td>
<td>The definition of frictional unemployment is the short-term unemployment that arises from the process of matching workers with jobs.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td>Comment</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>21.</td>
<td>b</td>
<td>The definition of structural unemployment is unemployment that arises from a persistent mismatch between the job skills or attributes of workers and the requirements of jobs.</td>
</tr>
<tr>
<td>22.</td>
<td>b</td>
<td>When the only remaining unemployment is structural and frictional unemployment, the economy is said to be at full employment.</td>
</tr>
<tr>
<td>23.</td>
<td>d</td>
<td>Economists often think of frictional and structural unemployment as being the “normal” underlying level of unemployment in the economy. This normal level of unemployment, which is the sum of frictional and structural unemployment, is referred to as the natural rate of unemployment. The natural rate of unemployment is also sometimes called the full-employment rate of unemployment.</td>
</tr>
<tr>
<td>24.</td>
<td>d</td>
<td>Some government policies can add to the level of frictional and structural unemployment by either increasing the time workers devote to searching for jobs, by providing disincentives to firms to hire workers, or by keeping wages above their market level.</td>
</tr>
<tr>
<td>25.</td>
<td>b</td>
<td>Increases in the minimum wage mostly affect teenage unemployment rates.</td>
</tr>
<tr>
<td>26.</td>
<td>c</td>
<td>The unemployed spend more time searching for jobs because they receive these payments. This additional time spent searching raises the unemployment rate. Does this mean that the unemployment insurance program is a bad idea? Most economists would say no. Reduced spending contributes to the severity of recessions. Unemployment insurance helps the unemployed maintain their income and spending, which helps reduce the severity of recessions.</td>
</tr>
<tr>
<td>27.</td>
<td>d</td>
<td>The unemployment rate in the United States is usually lower than the unemployment rates in most other high-income countries, partly because the United States has tougher requirements for the unemployed to receive government payments. This raises the costs of searching for a better job and lowers the unemployment rate.</td>
</tr>
<tr>
<td>28.</td>
<td>b</td>
<td>If the minimum wage is set above the market wage determined by the demand and supply of labor, then the quantity of labor supplied will be greater than the quantity of labor demanded. As a result, the unemployment rate will be higher than it would be without a minimum wage.</td>
</tr>
<tr>
<td>29.</td>
<td>c</td>
<td>An efficiency wage is a wage higher than the market wage paid by a firm in order to increase worker productivity. An efficiency wage also helps to retain and motivate workers.</td>
</tr>
<tr>
<td>30.</td>
<td>c</td>
<td>To obtain prices of a representative group of goods and services, the Bureau of Labor Statistics (BLS) surveys 30,000 households nationwide on their spending habits. They use the results of this survey to construct a market basket of 211 goods and services purchased by the typical urban family of four.</td>
</tr>
<tr>
<td>31.</td>
<td>d</td>
<td>In calculating the CPI, the market basket includes only consumer purchases, not business purchases. Further, the market basket is updated only every few years.</td>
</tr>
<tr>
<td>32.</td>
<td>c</td>
<td>Almost three-quarters of the market basket is in the categories of housing, transportation, and food.</td>
</tr>
<tr>
<td>33.</td>
<td>d</td>
<td>The quantities of the products purchased in the current year are irrelevant in calculating the CPI because we are assuming that households buy the same market basket of products each month.</td>
</tr>
</tbody>
</table>
The inflation rate is computed as follows: \([(214.6 – 215.3)/215.3] \times 100 = -0.3\%.

In constructing the CPI, the Bureau of Labor Statistics assumes that each month consumers purchase the same amount of each product in the market basket. In fact, consumers are likely to buy fewer of those products that increase most in price and more of those products that increase least in price.

The GDP deflator provides the broadest measure we have of the price level because it includes the price of every final good and service. It is an average of the prices of all goods and services included in GDP.

We can calculate the value of the GDP deflator for any year by dividing the value of nominal GDP for that year by the value of real GDP and multiplying by 100. In this case, ($11,000/$10,000) \times 100 = 110.

The real interest rate is the nominal interest rate minus the inflation rate, or 4\% – 6\% = -2\%. When the inflation rate is greater than the nominal interest rate, the real interest rate is negative.

Like the consumer price index, the producer price index tracks the prices of a market basket of goods. But whereas the consumer price index tracks the prices of goods and services purchased by the typical household, the producer price index tracks the prices firms receive for goods and services at all stages of production.

On average, prices were about three times as high in 2011 as in 1979, because 225/73 = 3.1.

Value in 2011 dollars = Value in 2007 dollars \times (CPI in 2011/CPI in 2007). Then, $50,000 \times (225/207) = $50,000 \times 1.09 = $54,348. The pay raise required is $54,348 – $50,000 = $4,348.

Economic variables that are calculated in current year prices are referred to as nominal variables. When we are interested in tracking changes in an economic variable over time, rather than in seeing what its value would be in today’s dollars, or to correct for the effects of inflation, we can divide the nominal variable by a price index and multiply by 100 to obtain a real variable.

The stated interest rate on a loan is the nominal interest rate. The real interest rate corrects the nominal interest rate for the impact of inflation.

The real interest rate corrects the nominal interest rate for the impact of inflation and is equal to the nominal interest rate minus the inflation rate.
Short Answer Responses

1. Using the equations:

   \[
   \text{Labor force participation rate} = \left( \frac{\text{Labor force}}{\text{Working-age population}} \right) \times 100 = \left( \frac{600}{1000} \right) \times 100 = 60.0\%
   \]

   \[
   \text{Unemployment rate} = \left( \frac{\text{Number of unemployed}}{\text{Labor force}} \right) \times 100 = \left( \frac{600 - 550}{600} \right) \times 100 = 8.3\%
   \]

2. If workers stayed in the labor force longer, we would expect to see labor force levels increase. Given levels of the population, we would expect to see the labor force participation rate increase.

3. At full employment the economy cannot be in a recession. Therefore by definition there can be no cyclical unemployment. Frictional and structural unemployment are not due to the business cycle and can exist at any time, including at full employment.

4. With Year 1 as the base year, the results are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of Coffee</th>
<th>Price of Tea</th>
<th>Price of Diet Coke</th>
<th>Value of Market Basket</th>
<th>CPI</th>
<th>Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$3.25</td>
<td>$2.00</td>
<td>$1.10</td>
<td>$13.60</td>
<td>100</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>3.75</td>
<td>2.22</td>
<td>1.20</td>
<td>15.36</td>
<td>112.9</td>
<td>12.9%</td>
</tr>
<tr>
<td>3</td>
<td>4.05</td>
<td>2.50</td>
<td>1.25</td>
<td>16.85</td>
<td>123.9</td>
<td>9.7</td>
</tr>
</tbody>
</table>

   With Year 3 as the base year, the results are:

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of Coffee</th>
<th>Price of Tea</th>
<th>Price of Diet Coke</th>
<th>Value of Market Basket</th>
<th>CPI</th>
<th>Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$3.25</td>
<td>$2.00</td>
<td>$1.10</td>
<td>$13.60</td>
<td>80.7</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>3.75</td>
<td>2.22</td>
<td>1.20</td>
<td>15.36</td>
<td>91.2</td>
<td>12.9%</td>
</tr>
<tr>
<td>3</td>
<td>4.05</td>
<td>2.50</td>
<td>1.25</td>
<td>16.85</td>
<td>100.0</td>
<td>9.7</td>
</tr>
</tbody>
</table>

   Notice that the values for the CPI in each year are different, but the inflation rates are the same.

5. Jacob and Emma agreed on a 4 percent nominal interest rate and expected a 3 percent inflation rate. They implicitly agreed on a 1 percent real interest rate on the loan. If the actual inflation rate rose to 5 percent, the real interest rate on the loan would have been –1 percent. Emma’s real return would be lower than he wanted and, in fact, it would be negative. Emma loses. Jacob, on the other hand, only pays a real interest rate of –1 percent instead of 1 percent. Jacob gains from the higher inflation.
6. The labor force participation rate is the ratio of the number in the labor force to the working-age population multiplied by 100. In this economy, the working age population is 6,000, and because 2,000 people are not in the labor force, the labor force will be 4,000 (= 6,000 – 2,000 = 4000), so the labor force participation rate is 60 percent = \[100 \times (4,000/6,000) = 60\text{ percent}\]. The unemployment rate is 100 multiplied by the percentage of the labor force that is unemployed, or \[100 \times \text{(number unemployed/number in the labor force)},\text{ so the unemployment rate is 7.5 percent [= 100 \times (300/4,000) = 7.5 percent}].

True/False Answers

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>F</td>
<td>The unemployment rate is the percentage of the labor force that is unemployed.</td>
</tr>
<tr>
<td>2.</td>
<td>F</td>
<td>See page 269 in the textbook for the definition of discouraged workers.</td>
</tr>
<tr>
<td>3.</td>
<td>F</td>
<td>Female participation rates have risen while male rates have fallen.</td>
</tr>
<tr>
<td>4.</td>
<td>F</td>
<td>Teenage unemployment rates are much higher than adult rates.</td>
</tr>
<tr>
<td>5.</td>
<td>T</td>
<td>See page 268 in the textbook for the household survey.</td>
</tr>
<tr>
<td>6.</td>
<td>T</td>
<td>See page 278 in the textbook for the definition of frictional unemployment.</td>
</tr>
<tr>
<td>7.</td>
<td>T</td>
<td>See page 279 in the textbook for the definition of structural unemployment.</td>
</tr>
<tr>
<td>8.</td>
<td>T</td>
<td>See page 279 in the textbook for the definition of cyclical unemployment.</td>
</tr>
<tr>
<td>9.</td>
<td>F</td>
<td>There will always be some structural and frictional unemployment. The natural rate of unemployment is always positive.</td>
</tr>
<tr>
<td>10.</td>
<td>F</td>
<td>The CPI includes only those goods that are in the BLS market basket.</td>
</tr>
<tr>
<td>11.</td>
<td>F</td>
<td>The market basket is updated every two years.</td>
</tr>
<tr>
<td>12.</td>
<td>F</td>
<td>Because the CPI in the base year is 100. When the CPI is 225, prices increase by [(225 – 100)/100 = 125\text{ percent}].</td>
</tr>
<tr>
<td>13.</td>
<td>F</td>
<td>The GDP deflator is defined as the ratio of nominal GDP to real GDP multiplied by 100</td>
</tr>
<tr>
<td>14.</td>
<td>F</td>
<td>The real interest rate equals the nominal interest rate minus the inflation rate.</td>
</tr>
<tr>
<td>15.</td>
<td>F</td>
<td>Unexpectedly high inflation benefits borrowers and harms lenders. See page 291 in the textbook for the effects of unexpected inflation.</td>
</tr>
</tbody>
</table>