The Uses and Limitations of Real GDP

21. The United Nations' Human Development Index (HDI) is based on real GDP per person, life expectancy at birth, and indicators of the quality and quantity of education.
    a. Explain why the HDI might be better than real GDP as a measure of economic welfare.
    b. Which items in the HDI are part of real GDP and which items are not in real GDP?
    c. Do you think the HDI should be expanded to include items such as pollution, resource depletion, and political freedom? Explain.
    d. What other items should be included in a comprehensive measure of economic welfare?

22. **China is About to Overtake the US to Become World's Largest Economy**

    Figures published by the IMF show that China is set to overtake the US to become the world's largest economy. Purchasing power parity or PPP of China will climb to $17.632 trillion this year, compared with $17.416 trillion for the US. But analysis by IHS points out that China is not expected to rise above the US until 2024 in terms of nominal GDP.

    Source: *Telegraph*, October 9, 2014

    If PPP of China becomes greater than that of the U.S. but the GDP of the U.S remains higher, does this comparison of PPP really tell us which country has the higher standard of living? What does the news clip mean by 'nominal GDP'?

23. Use the news clip in Problem 20.
    a. Why might China's recent GDP growth rates overstate the actual increase in the level of production taking place in China?
    b. Explain the complications involved with attempting to compare the economic welfare in China and the United States by using the GDP for each country.

24. **Poor India Makes Millionaires at Fastest Pace**

    India, with the world's largest population of poor people, created millionaires at the fastest pace in the world in 2007. India added another 23,000 more millionaires in 2007 to its 2006 tally of 100,000 millionaires measured in dollars. That is 1 millionaire for about 7,000 people living on less than $2 a day.

    Source: *The Times of India*, June 25, 2008

    a. Why might real GDP per person misrepresent the standard of living of the average Indian?
    b. Why might $2 a day underestimate the standard of living of the poorest Indians?

Economics in the News

25. After you have studied *Economics in the News* on pp. 542–543, answer the following questions.
    a. By what percentage did real GDP grow from the second quarter of 2013 to the second quarter of 2014? (You can find the data you need to calculate this percentage change on p. 543.)
    b. Comparing the increase in the second quarter with the year-on-year increase, what can you say about the change in the real GDP growth rate? Is it slowing or speeding up?
    c. Describe the relationship between the fluctuations in the change in real GDP and business inventory investment. Why might inventory changes sometimes lag real GDP changes?

26. **Totally Gross**

    GDP has proved useful in tracking both short-term fluctuations and long-run growth. Which isn't to say GDP doesn't miss some things. Amartya Sen, at Harvard, helped create the United Nations' Human Development Index, which combines health and education data with per capita GDP to give a better measure of the wealth of nations. Joseph Stiglitz, at Columbia, advocates a "green net national product" that takes into account the depletion of natural resources. Others want to include happiness in the measure. These alternative benchmarks have merit but can they be measured with anything like the frequency, reliability, and impartiality of GDP?

    Source: *Time*, April 21, 2008

    a. Explain the factors that the news clip identifies as limiting the usefulness of GDP as a measure of economic welfare.
    b. What are the challenges involved in trying to incorporate measurements of those factors in an effort to better measure economic welfare?
    c. What does the ranking of the United States in the Human Development Index imply about the levels of health and education relative to other nations?

Mathematical Note

27. Use the information in Problem 18 to calculate the chained-dollar real GDP in 2013 expressed in 2012 dollars.

22 MONITORING JOBS AND INFLATION

After studying this chapter, you will be able to:

- Explain why unemployment is a problem and how we measure the unemployment rate and other labor market indicators
- Explain why unemployment occurs and why it is present even at full employment
- Explain why inflation is a problem and how we measure the inflation rate

Each month, we chart the course of unemployment and inflation as measures of U.S. economic health. How do we measure the unemployment rate and the inflation rate and are they reliable vital signs for the economy?

As the U.S. economy slowly expanded after a recession in 2008 and 2009, job growth was weak and questions about the health of the labor market became of vital importance to millions of American families. *Economics in the News*, at the end of this chapter, puts the spotlight on the labor market through recession and a weak 2010–2014 expansion.

Employment and Unemployment

What kind of job market will you enter when you graduate? Will there be plenty of good jobs to choose among, or will jobs be so hard to find that you end up taking one that doesn't use your education and pays a low wage? The answer depends, to a large degree, on the total number of jobs available and on the number of people competing for them.

The class of 2014 had a tough time in the jobs market. In July 2014, four years after a recession, 10 million Americans wanted a job but couldn't find one, and another 8 million had either given up the search for a job or had reluctantly settled for a part-time job.

Despite the high unemployment, the U.S. economy is an incredible job-creating machine. Even in 2009 at the depths of recession, 139 million people had jobs—22 million more than in 1989. But in recent years, population growth has outstripped jobs growth, so unemployment is a serious problem.

Why Unemployment Is a Problem

Unemployment is a serious personal and social economic problem for two main reasons. It results in

- Lost incomes and production
- Lost human capital

Lost Incomes and Production The loss of a job brings a loss of income and lost production. These losses are devastating for the people who bear them and they make unemployment a frightening prospect for everyone. Unemployment benefits create a safety net, but they don't fully replace lost earnings.

Lost production means lower consumption and a lower investment in capital, which lowers the living standard in both the present and the future.

Lost Human Capital Prolonged unemployment permanently damages a person's job prospects by destroying human capital.

ECONOMICS IN ACTION

What Kept Ben Bernanke Awake at Night

The Great Depression began in October 1929, when the U.S. stock market crashed. It reached its deepest point in 1933, when 25 percent of the labor force was unemployed, and lasted until 1941, when the United States entered World War II. The depression quickly spread globally to envelop most nations.

The 1930s were and remain the longest and worst period of high unemployment in history. Failed banks, shops, farms, and factories left millions of Americans without jobs, homes, and food. Without the support of government and charities, millions would have starved.

The Great Depression was an enormous political event: It fostered the rise of the German and Japanese militarism that were to bring the most devastating war humans have ever fought. It also led to President Franklin D. Roosevelt's "New Deal," which enhanced the role of government in economic life and made government intervention in markets popular and the market economy unpopular.

The Great Depression also brought a revolution in economics. British economist John Maynard Keynes published his *General Theory of Employment, Interest, and Money* and created what we now call macroeconomics.

Many economists have studied the Great Depression and tried to determine why what started out as an ordinary recession became so devastating. Among them is Ben Bernanke, the former Chairman of the Federal Reserve.

One of the reasons the Fed was so aggressive in cutting interest rates and saving banks from going under is that Ben Bernanke is so vividly aware of the horrors of total economic collapse and was determined to avoid any risk of a repeat of the Great Depression.

Think about a manager who loses his job when his employer downsizes. The only work he can find is driving a taxi. After a year in this work, he discovers that he can't compete with new MBA graduates. Eventually, he gets hired as a manager but in a small firm and at a lower wage than before. He has lost some of his human capital.

The cost of unemployment is spread unequally, which makes it a highly charged political problem as well as a serious economic problem.

Governments make strenuous efforts to measure unemployment accurately and to adopt policies to moderate its level and ease its pain. Here, we'll learn how the U.S. government monitors unemployment.

Current Population Survey

Every month, the U.S. Census Bureau surveys 60,000 households and asks a series of questions about the age and job market status of the members of each household. This survey is called the Current Population Survey (or CPS). The Census Bureau uses the answers to chart the course of the labor force.

Figure 22.1 shows the population categories used by the Census Bureau and the relationships among the categories.

The population divides into two broad groups: the working-age population and others who are too young to work or who live in institutions and are unable to work. The **working-age population** is the total number of people aged 16 years and over who are not in jail, hospital, or some other form of institutional care.

The Census Bureau divides the working-age population into two groups: those in the labor force and those not in the labor force. It also divides the labor force into two groups: the employed and the unemployed. So the **labor force** is the sum of the employed and the unemployed.

To be counted as employed in the Current Population Survey, a person must have either a full-time job or a part-time job. To be counted as *un*employed, a person must be available for work and must be in one of three categories:

1. Without work but has made specific efforts to find a job within the previous four weeks
2. Waiting to be called back to a job from which he or she has been laid off
3. Waiting to start a new job within 30 days

FIGURE 22.1 Population Labor Force Categories

The total population is divided into the working-age population and the young and institutionalized. The working-age population is divided into those in the labor force and those not in the labor force. The labor force is divided into the employed and the unemployed.

Source of data: Bureau of Labor Statistics.

MyEconLab Animation

Anyone surveyed who satisfies one of these three criteria is counted as unemployed. People in the working-age population who are neither employed nor unemployed are classified as *not in the labor force*.

In June 2014, the population of the United States was 318 million; the working-age population was 248 million. Of this number, 92 million were not in the labor force. Most of these people were in school full time or had retired from work. The remaining 156 million people made up the U.S. labor force. Of these, 146.3 million were employed and 9.7 million were unemployed.

Three Labor Market Indicators

The Census Bureau calculates three indicators of the state of the labor market. They are

- The unemployment rate
- The employment-to-population ratio
- The labor force participation rate

The Unemployment Rate The amount of unemployment is an indicator of the extent to which people who want jobs can't find them. The **unemployment rate** is the percentage of the people in the labor force who are unemployed. That is,

$$\text{Unemployment rate} = \frac{\text{Number of people unemployed}}{\text{Labor force}} \times 100$$

and

$$\text{Labor force} = \text{Number of people employed} + \text{Number of people unemployed.}$$

In June 2014, the number of people employed was 146.3 million and the number unemployed was 9.7 million. By using the above equations, you can verify that the labor force was 156 million (146.3 million plus 9.7 million) and the unemployment rate was 6.2 percent (9.7 million divided by 156.0 million, multiplied by 100).

Figure 22.2 shows the unemployment rate from 1980 to 2014. The average unemployment rate during this period is 6.5 percent—equivalent to 10.1 million people being unemployed in 2014

The unemployment rate fluctuates over the business cycle and reaches a peak value after a recession ends.

Each peak unemployment rate in the recessions of 1982, 1990–1991, and 2001 was lower than the previous one. But the recession of 2008–2009 ended the downward trend.

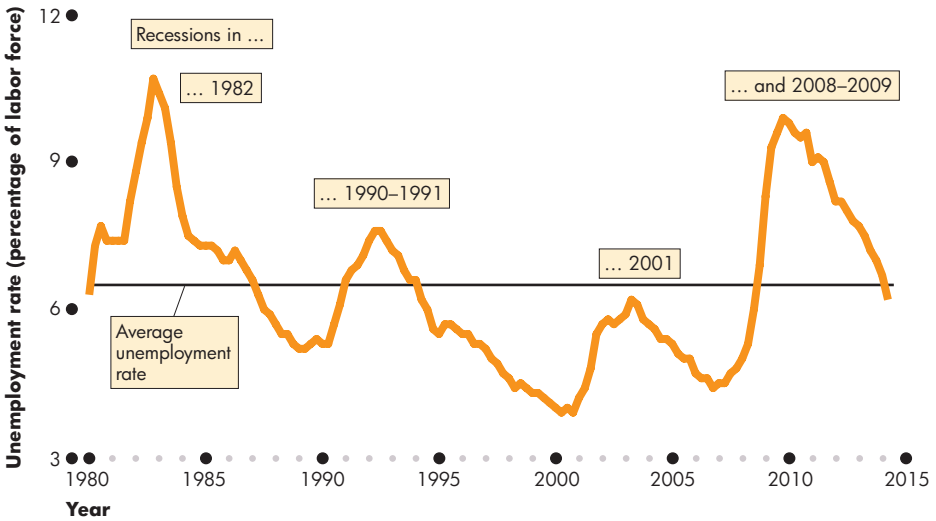
The Employment-to-Population Ratio The number of people of working age who have jobs is an indicator of both the availability of jobs and the degree of match between people's skills and jobs. The **employment-to-population ratio** is the percentage of people of working age who have jobs. That is,

$$\text{Employment to population ratio} = \frac{\text{Number of people employed}}{\text{Working-age population}} \times 100.$$

In June 2014, the number of people employed was 146.3 million and the working-age population was 248 million. By using the above equation, you can verify that the employment-to-population ratio was 59 percent (146.3 million divided by 248 million, multiplied by 100).

Figure 22.3 shows the employment-to-population ratio. This indicator followed an upward trend before 2000 and then a downward trend. The increase before 2000 means that the U.S. economy created

FIGURE 22.2 The Unemployment Rate: 1980–2014

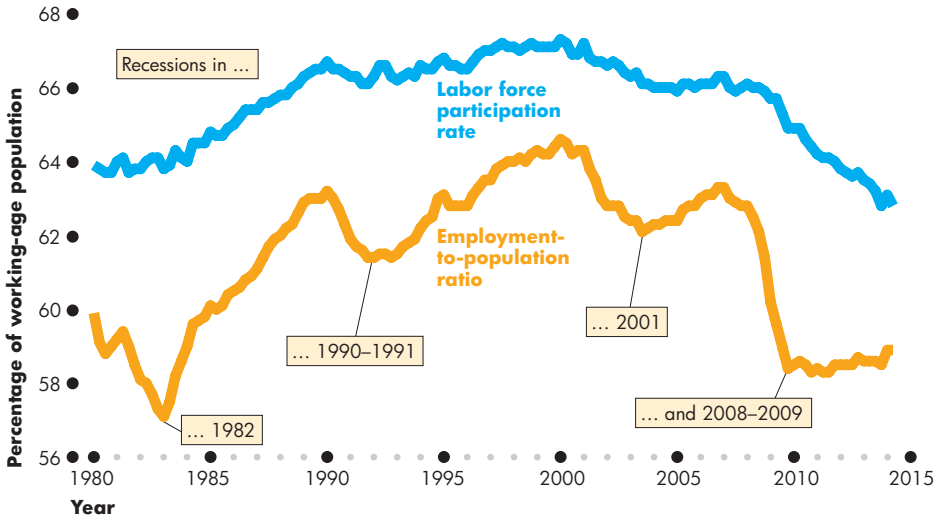


Source of data: Bureau of Labor Statistics.

The average unemployment rate from 1980 to 2014 was 6.5 percent. The unemployment rate increases in a recession, peaks after the recession ends, and decreases in an expansion. The peak unemployment rate during a recession was on a downward trend before the 2008–2009 recession, with each successive recession having a lower unemployment rate. The severe recession of 2008–2009 broke this trend.

MyEconLab Real-time data

FIGURE 22.3 Labor Force Participation and Employment: 1980–2014



The trend in the labor force participation rate and the employment-to-population ratio is upward before 2000 and downward after 2000.

The employment-to-population ratio fluctuates more than the labor force participation rate over the business cycle and reflects cyclical fluctuations in the unemployment rate.

The fall in both measures was steep during 2008 and 2009.

Source of data: Bureau of Labor Statistics.

MyEconLab Real-time data

jobs at a faster rate than the working-age population grew. This indicator also fluctuates: It falls during a recession and increases during an expansion.

The Labor Force Participation Rate The number of people in the labor force is an indicator of the willingness of people of working age to take jobs. The **labor force participation rate** is the percentage of the working-age population who are members of the labor force. That is,

$$\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Working-age population}} \times 100.$$

In June 2014, the labor force was 156.0 million and the working-age population was 248.0 million. By using the above equation, you can verify that the labor force participation rate was 62.9 percent (156.0 million divided by 248.0 million, multiplied by 100).

Figure 22.3 shows the labor force participation rate. Like the employment-to-population ratio, this indicator has an upward trend before 2000 and then a downward trend. It also has mild fluctuations around the trend but a steep decrease in 2008 and 2009. Unsuccessful job seekers left the labor force during the recession and didn't reenter during the weak expansion that began in 2010.

Other Definitions of Unemployment

Do fluctuations in the labor force participation rate over the business cycle mean that people who leave the labor force during a recession should be counted as unemployed? Or are they correctly counted as being not in the labor force?

The Bureau of Labor Statistics believes that the official unemployment definition gives the correct measure. But it provides data on two types of *underemployed* labor excluded from the official measure. They are

- Marginally attached workers
- Part-time workers who want full-time jobs

Marginally Attached Workers A **marginally attached worker** is a person who currently is neither working nor looking for work but has indicated that he or she wants and is available for a job and has looked for work sometime in the recent past. A marginally attached worker who has stopped looking for a job because of repeated failure to find one is called a **discouraged worker.**

The official unemployment measure excludes marginally attached workers because they haven't made specific efforts to find a job within the past four weeks. In all other respects, they are unemployed.

Part-Time Workers Who Want Full-Time Jobs Many part-time workers want to work part time. This arrangement fits in with the other demands on their time. But some part-time workers would like full-time jobs and can't find them. In the official statistics, these workers are called economic part-time workers and they are partly unemployed.

Most Costly Unemployment

All unemployment is costly, but the most costly is long-term unemployment that results from job loss.

People who are unemployed for a few weeks and then find another job bear some costs of unemployment. But these costs are low compared to the costs borne by people who remain unemployed for many weeks.

Also, people who are unemployed because they voluntarily quit their jobs to find better ones or because they have just entered or reentered the labor market bear some costs of unemployment. But these costs are lower than those borne by people who lose their job and are forced back into the job market.

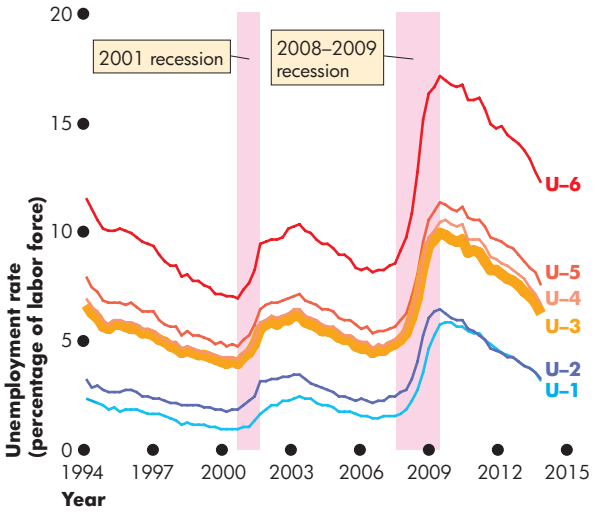
The unemployment rate doesn't distinguish among these different categories of unemployment. If most of the unemployed are long-term job losers, the situation is much worse than if most are short-term voluntary job searchers.

Alternative Measures of Unemployment

To provide information about the aspects of unemployment that we've just discussed, the Bureau of Labor Statistics reports six alternative measures of the unemployment rate: two that are narrower than the official measure and three that are broader. The narrower measures focus on the personal cost of unemployment and the broader measures focus on assessing the full amount of underemployed labor resources.

Figure 22.4 shows these measures from 1994 (the first year for which all six are available) to 2014. U–3 is the official unemployment rate. Long-term unemployment (U–1) and unemployed job losers (U–2) are about 40 percent of the unemployed on average but 60 percent in a deep recession. Adding discouraged workers (U–4) makes very little difference to the unemployment rate, but adding all other marginally attached workers (U–5) adds one percentage point. A big difference is made by adding the economic part-time workers (U–6). In June 2014, after adding these workers the *underemployment rate* was 12 percent.

FIGURE 22.4 Six Alternative Measures of Unemployment



U–1 are those unemployed for 15 weeks or more, and U–2 are job losers. U–3 is the official unemployment rate. U–4 adds discouraged workers, and U–5 adds all other marginally attached workers. The broadest measure, U–6, adds part-time workers who want full-time jobs. Fluctuations in all the alternative measures are similar to those in the official measure, U–3.

Source of data: Bureau of Labor Statistics.

MyEconLab Real-time data

REVIEW QUIZ

1. What determines if a person is in the labor force?
2. What distinguishes an unemployed person from one who is not in the labor force?
3. Describe the trends and fluctuations in the U.S. unemployment rate from 1980 to 2014.
4. Describe the trends and fluctuations in the U.S. employment-to-population ratio and labor force participation rate from 1980 to 2014.
5. Describe the alternative measures of unemployment.

Work these questions in Study Plan 22.1 and get instant feedback. Do a Key Terms Quiz. MyEconLab

You've seen how we measure employment and unemployment. Your next task is to see what we mean by full employment and how unemployment and real GDP fluctuate over the business cycle.

Unemployment and Full Employment

There is always someone without a job who is searching for one, so there is always some unemployment. The key reason is that the economy is a complex mechanism that is always changing—it experiences frictions, structural change, and cycles.

Frictional Unemployment

There is an unending flow of people into and out of the labor force as people move through the stages of life—from being in school to finding a job, to working, perhaps to becoming unhappy with a job and looking for a new one, and finally, to retiring from full-time work.

There is also an unending process of job creation and job destruction as new firms are born, firms expand or contract, and some firms fail and go out of business.

The flows into and out of the labor force and the processes of job creation and job destruction create the need for people to search for jobs and for businesses to search for workers. Businesses don't usually hire the first person who applies for a job, and unemployed people don't usually take the first job that comes their way. Instead, both firms and workers spend time searching for what they believe will be the best available match. By this process of search, people can match their own skills and interests with the available jobs and find a satisfying job and a good income.

The unemployment that arises from the normal labor turnover we've just described—from people entering and leaving the labor force and from the ongoing creation and destruction of jobs—is called **frictional unemployment.** Frictional unemployment is a permanent and healthy phenomenon in a dynamic, growing economy.

Structural Unemployment

The unemployment that arises when changes in technology or international competition change the skills needed to perform jobs or change the locations of jobs is called **structural unemployment.** Structural unemployment usually lasts longer than frictional unemployment because workers must retrain and possibly relocate to find a job. When a steel plant in Gary, Indiana, is automated, some jobs in that city disappear. Meanwhile, new jobs for security guards, retail clerks, and life-insurance salespeople are created in Chicago and Indianapolis. The unemployed former steelworkers remain unemployed for several months until they move, retrain, and get one of these jobs. Structural unemployment is painful, especially for older workers for whom the best available option might be to retire early or take a lower-skilled, lower-paying job.

Cyclical Unemployment

The higher than normal unemployment at a business cycle trough and the lower than normal unemployment at a business cycle peak is called **cyclical unemployment.** A worker who is laid off because the economy is in a recession and who gets rehired some months later when the expansion begins has experienced cyclical unemployment.

"Natural" Unemployment

Natural unemployment is the unemployment that arises from frictions and structural change when there is no cyclical unemployment—when all the unemployment is frictional and structural. Natural unemployment as a percentage of the labor force is called the **natural unemployment rate.**

Full employment is defined as a situation in which the unemployment rate equals the natural unemployment rate.

What determines the natural unemployment rate? Is it constant or does it change over time?

The natural unemployment rate is influenced by many factors but the most important ones are

- The age distribution of the population
- The scale of structural change
- The real wage rate
- Unemployment benefits

The Age Distribution of the Population An economy with a young population has a large number of new job seekers every year and has a high level of frictional unemployment. An economy with an aging population has fewer new job seekers and a low level of frictional unemployment.

The Scale of Structural Change The scale of structural change is sometimes small. The same jobs using the same machines remain in place for many years. But sometimes there is a technological upheaval. The

old ways are swept aside and millions of jobs are lost and the skill to perform them loses value. The amount of structural unemployment fluctuates with the pace and volume of technological change and the change driven by fierce international competition, especially from fast-changing Asian economies. A high level of structural unemployment is present in many parts of the United States today (as you can see in *Economics in Action* below).

The Real Wage Rate The natural unemployment rate is influenced by the level of the real wage rate. Real wage rates that bring unemployment are a *minimum wage* and an *efficiency wage*. Chapter 6 (see pp. 169–171) explains how the minimum wage creates unemployment. An *efficiency wage* is a wage set above the going market wage to enable firms to attract the most productive workers, get them to work hard, and discourage them from quitting.

Unemployment Benefits Unemployment benefits increase the natural unemployment rate by lowering the opportunity cost of job search. European countries have more generous unemployment benefits and higher natural unemployment rates than the United States. Extending unemployment benefits increases the natural unemployment rate.

There is no controversy about the existence of a natural unemployment rate. Nor is there disagreement that the natural unemployment rate changes. But economists don't know its exact size or the extent to which it fluctuates. The Congressional Budget Office estimates the natural unemployment rate and its estimate for 2012 was 6 percent—about 70 percent of the unemployment in that year.

Real GDP and Unemployment Over the Cycle

The quantity of real GDP at full employment is *potential GDP* (Chapter 21, p. 536). Over the business cycle, real GDP fluctuates around potential GDP. The gap between real GDP and potential GDP is called the **output gap.** As the output gap fluctuates over the business cycle, the unemployment rate fluctuates around the natural unemployment rate.

ECONOMICS IN ACTION

Structural and Cyclical Unemployment in Michigan

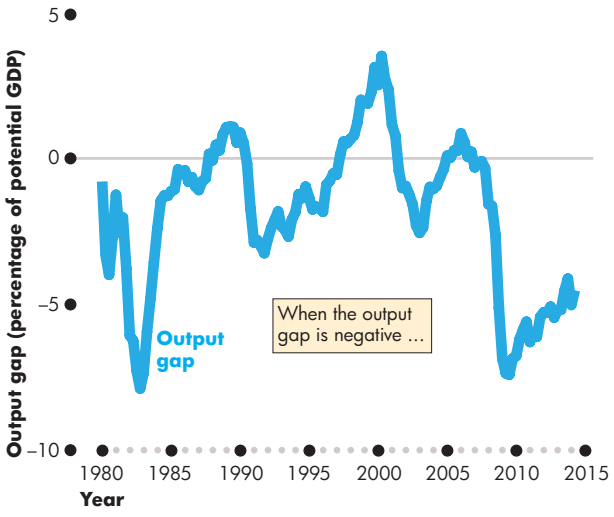
In 2010, 13.6 percent of Michigan's labor force was unemployed—the nation's highest official unemployment rate—and when marginally attached workers and part-time workers who want full-time jobs are added, almost 22 percent of the state's labor force was unemployed or underemployed. And 8.4 percent of Michigan's labor force were unemployed for long spells.

One of Michigan's problems was structural—a collapse of manufacturing jobs centered on the auto industry. These jobs had been disappearing steadily as robot technologies spread to do ever more of the tasks in the assembly of automobiles. The 2008–2009 recession accelerated this rate of job loss.

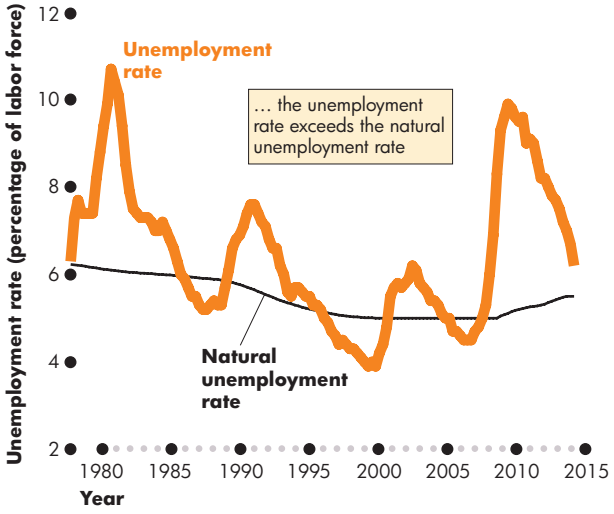
But by 2014, Michigan's unemployment rate had fallen to 7.5 percent, a fall larger than the fall in the U.S. average.

Around 11,000 businesses in Michigan produce high-tech scientific instruments and components for defense equipment, energy plants, and medical equipment. In 2010, these businesses employed around 400,000 people, which was more than 10 percent of the state's labor force and two thirds of all manufacturing jobs. Although the recession hit these firms, they cut employment by only 10 percent, compared with a 24 percent cut in manufacturing jobs in the rest of the Michigan economy. And these businesses and some new ones together with Michigan's traditional auto industry added jobs at a rapid pace after 2010. By mid-2014, more than 100,000 new manufacturing jobs had been created in Michigan.

FIGURE 22.5 The Output Gap and the Unemployment Rate



(a) Output gap



(b) Unemployment rate

As real GDP fluctuates around potential GDP in part (a), the unemployment rate fluctuates around the natural unemployment rate in part (b). In recessions, cyclical unemployment increases and the output gap becomes negative. At business cycle peaks, the unemployment rate falls below the natural rate and the output gap becomes positive. The natural unemployment rate decreased during the 1980s and 1990s.

Sources of data: Bureau of Economic Analysis, Bureau of Labor Statistics, and Congressional Budget Office.

MyEconLab Real-time data

Figure 22.5 illustrates these fluctuations in the United States between 1980 and 2014—the output gap in part (a) and the unemployment rate and natural unemployment rate in part (b).

When the economy is at full employment, the unemployment rate equals the natural unemployment rate and real GDP equals potential GDP so the output gap is zero. When the unemployment rate is less than the natural unemployment rate, real GDP is greater than potential GDP and the output gap is positive. And when the unemployment rate is greater than the natural unemployment rate, real GDP is less than potential GDP and the output gap is negative.

Figure 22.5(b) shows the natural unemployment rate estimated by the Congressional Budget Office. This estimate puts the natural unemployment rate at 6.2 percent in 1980 and falling steadily through the 1980s and 1990s to 5.0 percent by the early 2000s and rising in the most recent recession to 6 percent.

REVIEW QUIZ

1. Why does unemployment arise and what makes some unemployment unavoidable?
2. Define frictional unemployment, structural unemployment, and cyclical unemployment. Give examples of each type of unemployment.
3. What is the natural unemployment rate?
4. How does the natural unemployment rate change and what factors might make it change?
5. Why is the unemployment rate never zero, even at full employment?
6. What is the output gap? How does it change when the economy goes into recession?
7. How does the unemployment rate fluctuate over the business cycle?

Work these questions in Study Plan 22.2 and get instant feedback. Do a Key Terms Quiz. MyEconLab

Your next task is to see how we monitor the price level and the inflation rate. You will learn about the Consumer Price Index (CPI), which is monitored every month. You will also learn about other measures of the price level and the inflation rate.

The Price Level, Inflation, and Deflation

What will it *really* cost you to pay off your student loan? What will your parents' life savings buy when they retire? The answers depend on what happens to the **price level,** the average level of prices, and the value of money. A persistently rising price level is called **inflation;** a persistently falling price level is called **deflation.**

We are interested in the price level, inflation, and deflation for two main reasons. First, we want to measure the annual percentage change of the price level—the inflation rate or deflation rate. Second, we want to distinguish between the money values and real values of economic variables such as your student loan and your parents' savings.

We begin by explaining why inflation and deflation are problems. Then we'll look at how we measure the price level and the inflation rate. Finally, we'll return to the task of distinguishing real values from money values.

Why Inflation and Deflation Are Problems

Low, steady, and anticipated inflation or deflation isn't a problem, but an unexpected burst of inflation or period of deflation brings big problems and costs. An unexpected inflation or deflation

- Redistributes income
- Redistributes wealth
- Lowers real GDP and employment
- Diverts resources from production

Redistributes Income Workers and employers sign wage contracts that last for a year or more. An unexpected burst of inflation raises prices but doesn't immediately raise the wages. Workers are worse off because their wages buy less than they bargained for and employers are better off because their profits rise.

An unexpected period of deflation has the opposite effect. Wage rates don't fall but the prices fall. Workers are better off because their fixed wages buy more than they bargained for and employers are worse off with lower profits.

Redistributes Wealth People enter into loan contracts that are fixed in money terms and that pay an interest rate agreed as a percentage of the money borrowed and lent. With an unexpected burst of inflation, the money that the borrower repays to the lender buys less than the money originally loaned. The borrower wins and the lender loses. The interest paid on the loan doesn't compensate the lender for the loss in the value of the money loaned. With an unexpected deflation, the money that the borrower repays to the lender buys *more* than the money originally loaned. The borrower loses and the lender wins.

Lowers Real GDP and Employment Unexpected inflation that raises firms' profits brings a rise in investment and a boom in production and employment. Real GDP rises above potential GDP and the unemployment rate falls below the natural rate. But this situation is *temporary*. Profitable investment dries up, spending falls, real GDP falls below potential GDP and the unemployment rate rises. Avoiding these swings in production and jobs means avoiding unexpected swings in the inflation rate.

An unexpected deflation has even greater consequences for real GDP and jobs. Businesses and households that are in debt (borrowers) are worse off and they cut their spending. A fall in total spending brings a recession and rising unemployment.

Diverts Resources from Production Unpredictable inflation or deflation turns the economy into a casino and diverts resources from productive activities to forecasting inflation. It can become more profitable to forecast the inflation rate or deflation rate correctly than to invent a new product. Doctors, lawyers, accountants, farmers—just about everyone—can make themselves better off, not by specializing in the profession for which they have been trained but by spending more of their time dabbling as amateur economists and inflation forecasters and managing their investments.

From a social perspective, the diversion of talent that results from unpredictable inflation is like throwing scarce resources onto a pile of garbage. This waste of resources is a cost of inflation.

At its worst, inflation becomes **hyperinflation**—an inflation rate of 50 percent a month or higher that grinds the economy to a halt and causes a society to collapse. Hyperinflation is rare, but Zimbabwe in recent years and several European and Latin American countries have experienced it.

We pay close attention to the inflation rate, even when its rate is low, to avoid its consequences. We monitor the price level every month and devote considerable resources to measuring it accurately. You're now going to see how we do this.

The Consumer Price Index

Every month, the Bureau of Labor Statistics (BLS) measures the price level by calculating the **Consumer Price Index (CPI),** which is a measure of the average of the prices paid by urban consumers for a fixed basket of consumer goods and services. What you learn here will help you to make sense of the CPI and relate it to your own economic life. The CPI tells you about the *value* of the money in your pocket.

Reading the CPI Numbers

The CPI is defined to equal 100 for a period called the *reference base period*. Currently, the reference base period is 1982–1984. That is, for the average of the 36 months from January 1982 through December 1984, the CPI equals 100.

In June 2014, the CPI was 237.7. This number tells us that the average of the prices paid by urban consumers for a fixed market basket of consumer goods and services was 137.7 percent *higher* in June 2014 than it was on average during 1982–1984.

Constructing the CPI

Constructing the CPI involves three stages:

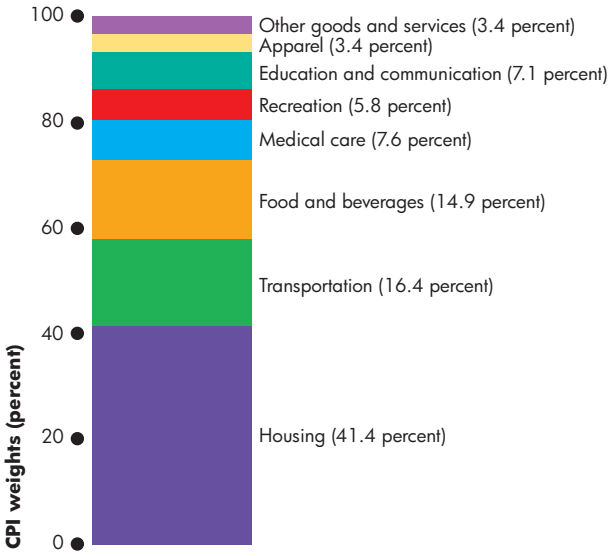
- Selecting the CPI basket
- Conducting the monthly price survey
- Calculating the CPI

The CPI Basket The first stage in constructing the CPI is to select what is called the *CPI basket*. This basket contains the goods and services represented in the index, each weighted by its relative importance. The idea is to make the relative importance of the items in the CPI basket the same as that in the budget of an average urban household. For example, because people spend more on housing than on bus rides, the CPI places more weight on the price of housing than on the price of a bus ride.

To determine the CPI basket, the BLS conducts a Consumer Expenditure Survey. Today's CPI basket is based on data gathered in the Consumer Expenditure Survey of 2012–2013.

Figure 22.6 shows the CPI basket. As you look at the relative importance of the items in the CPI basket, remember that it applies to the *average* household. *Individual* households' baskets are spread around the average. Think about what you buy and compare your basket with the CPI basket.

FIGURE 22.6 The CPI Basket



The CPI basket consists of the items that an average urban household buys. It consists mainly of housing (41.4 percent), transportation (16.4 percent), and food and beverages (14.9 percent). All other items sum to 27.3 percent of the total.

MyEconLab Animation

The Monthly Price Survey Each month, BLS employees check the prices of the 80,000 goods and services in the CPI basket in 30 metropolitan areas. Because the CPI aims to measure price *changes*, it is important that the prices recorded each month refer to exactly the same item. For example, suppose the price of a box of jelly beans has increased but a box now contains more beans. Has the price of jelly beans increased? The BLS employee must record the details of changes in quality or packaging so that price changes can be isolated from other changes.

Once the raw price data are in hand, the next task is to calculate the CPI.

Calculating the CPI To calculate the CPI, we

1. Find the cost of the CPI basket at base-period prices.
2. Find the cost of the CPI basket at current-period prices.
3. Calculate the CPI for the base period and the current period.

We'll work through these three steps for the simple artificial economy in Table 22.1, which shows the quantities in the CPI basket and the prices in the base period (2014) and current period (2015).

Part (a) contains the data for the base period. In that period, consumers bought 10 oranges at $1 each and 5 haircuts at $8 each. To find the cost of the CPI basket in the base-period prices, multiply the quantities in the CPI basket by the base-period prices. The cost of oranges is $10 (10 at $1 each), and the cost of haircuts is $40 (5 at $8 each). So the total cost of the CPI basket in the base period at base-period prices is $50 ($10 + $40).

Part (b) contains the price data for the current period. The price of an orange increased from $1 to $2, which is a 100 percent increase—($1 ÷ $1) × 100 = 100. The price of a haircut increased from $8 to $10, which is a 25 percent increase—($2 ÷ $8) × 100 = 25.

The CPI provides a way of averaging these price increases by comparing the cost of the basket rather than the price of each item. To find the cost of the CPI basket in the current period, 2015, multiply the quantities in the basket by their 2015 prices. The cost of oranges is $20 (10 at $2 each), and the cost of haircuts is $50 (5 at $10 each). So total cost of the fixed CPI basket at current-period prices is $70 ($20 + $50).

You've now taken the first two steps toward calculating the CPI: calculating the cost of the CPI basket in the base period and the current period. The third step uses the numbers you've just calculated to find the CPI for 2014 and 2015.

The formula for the CPI is

$$\text{CPI} = \frac{\text{Cost of CPI basket at current prices}}{\text{Cost of CPI basket at base-period prices}} \times 100.$$

In Table 22.1, you established that in 2014 (the base period), the cost of the CPI basket was $50 and in 2015, it was $70. If we use these numbers in the CPI formula, we can find the CPI for 2014 and 2015. For 2014, the CPI is

$$\text{CPI in 2014} = \frac{\$50}{\$50} \times 100 = 100.$$

For 2015, the CPI is

$$\text{CPI in 2015} = \frac{\$70}{\$50} \times 100 = 140.$$

The principles that you've applied in this simplified CPI calculation apply to the more complex calculations performed every month by the BLS.

TABLE 22.1 The CPI: A Simplified Calculation

(a) The cost of the CPI basket at base-period prices: 2014

CPI basket			
Item	**Quantity**	**Price**	**Cost of CPI Basket**
Oranges	10	$1.00	$10
Haircuts	5	$8.00	$40
Cost of CPI basket at base-period prices			$50

(b) The cost of the CPI basket at current-period prices: 2015

CPI basket			
Item	**Quantity**	**Price**	**Cost of CPI Basket**
Oranges	10	$2.00	$20
Haircuts	5	$10.00	$50
Cost of CPI basket at current-period prices			$70

Measuring the Inflation Rate

A major purpose of the CPI is to measure changes in the cost of living and in the value of money. To measure these changes, we calculate the *inflation rate* as the annual percentage change in the CPI. To calculate the inflation rate, we use the formula:

$$\text{Inflation rate} = \frac{\text{CPI this year} - \text{CPI last year}}{\text{CPI last year}} \times 100.$$

We can use this formula to calculate the inflation rate in 2014. The CPI in June 2014 was 237.7, and the CPI in June 2013 was 232.9. So the inflation rate during the 12 months to June 2014 was

$$\text{Inflation rate} = \frac{(237.7 - 232.9)}{232.9} \times 100 = 2.1\%.$$

Distinguishing High Inflation from a High Price Level

Figure 22.7 shows the CPI and the inflation rate in the United States between 1970 and 2014. The two parts of the figure are related and emphasize the distinction between high inflation and high prices.

When the price level in part (a) *rises rapidly*, (1970 through 1982), the inflation rate in part (b) is *high*. When the price level in part (a) *rises slowly*, (after 1982), the inflation rate in part (b) is *low*.

A high inflation rate means that the price level is rising rapidly. A high price level means that there has been a sustained period of rising prices.

When the price level in part (a) *falls* (2009), the inflation rate in part (b) is negative—deflation.

The CPI is not a perfect measure of the price level and changes in the CPI probably overstate the inflation rate. Let's look at the sources of bias.

The Biased CPI

The main sources of bias in the CPI are

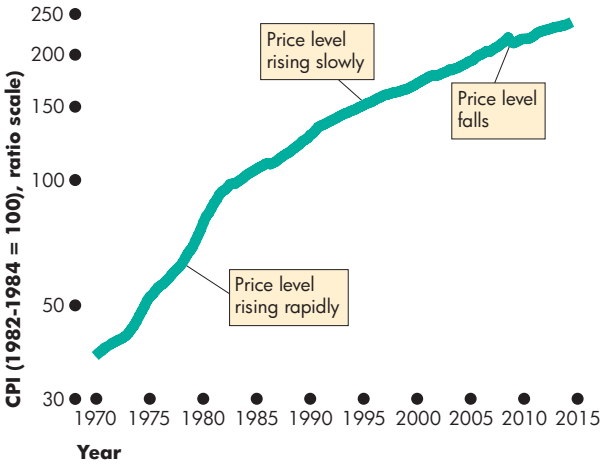
- New goods bias
- Quality change bias
- Commodity substitution bias
- Outlet substitution bias

New Goods Bias If you want to compare the price level in 2014 with that in 1970, you must somehow compare the price of a computer today with that of a typewriter in 1970. Because a PC is more expensive than a typewriter was, the arrival of the PC puts an upward bias into the CPI and its inflation rate.

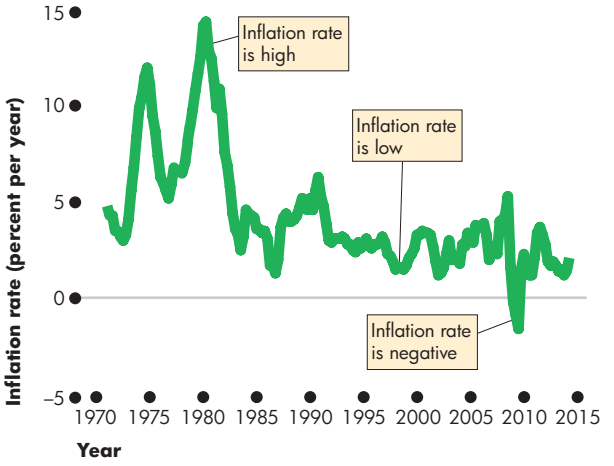
Quality Change Bias Cars and many other goods get better every year. Part of the rise in the prices of these goods is a payment for improved quality and is not inflation. But the CPI counts the entire price rise as inflation and so overstates inflation.

Commodity Substitution Bias Changes in relative prices lead consumers to change the items they buy. For example, if the price of beef rises and the price of chicken remains unchanged, people buy more chicken and less beef. This switch from beef to chicken might provide the same amount of meat and the same enjoyment as before and expenditure is the same as before. The price of meat has not changed. But because the CPI ignores the substitution of chicken for beef, it says the price of meat has increased.

FIGURE 22.7 The CPI and the Inflation Rate



(a) CPI



(b) Inflation rate

When the price level rises rapidly, the inflation rate is high; when the price level rises slowly, the inflation rate is low. When the price level falls, the inflation rate is negative.

From 1970 through 1982, the price level increased rapidly in part (a) and the inflation rate was high in part (b). After 1982, the price level rose slowly in part (a) and the inflation rate was low in part (b). In 2009, the price level fell and the inflation rate was negative—there was deflation.

Source of data: Bureau of Labor Statistics.

MyEconLab Real-time data

Outlet Substitution Bias When confronted with higher prices, people use discount stores more frequently and convenience stores less frequently. This phenomenon is called *outlet substitution*. The CPI surveys do not monitor outlet substitutions.

The Magnitude of the Bias

You've reviewed the sources of bias in the CPI. But how big is the bias? This question was tackled in 1996 by a Congressional Advisory Commission on the Consumer Price Index chaired by Michael Boskin, an economics professor at Stanford University. This commission said that the CPI overstates inflation by 1.1 percentage points a year. That is, if the CPI reports that inflation is 3.1 percent a year, most likely inflation is actually 2 percent a year.

Some Consequences of the Bias

The bias in the CPI distorts private contracts and increases government outlays. Many private agreements, such as wage contracts, are linked to the CPI. For example, a firm and its workers might agree to a three-year wage deal that increases the wage rate by 2 percent a year *plus* the percentage increase in the CPI. Such a deal ends up giving the workers more real income than the firm intended.

Close to a third of federal government outlays, including Social Security checks, are linked directly to the CPI. And while a bias of 1 percent a year seems small, accumulated over a decade it adds up to almost a trillion dollars of additional expenditures.

Alternative Price Indexes

The CPI is just one of many alternative price level index numbers and because of the bias in the CPI, other measures are used for some purposes. We'll describe three alternatives to the CPI and explain when and why they might be preferred to the CPI. The alternatives are

- Chained CPI
- Personal consumption expenditure deflator
- GDP deflator

Chained CPI The *chained CPI* is a price index that is calculated using a similar method to that used to calculate *chained-dollar real GDP* described in Chapter 21 (see pp. 546–547).

The *chained* CPI overcomes the sources of bias in the CPI. It incorporates substitutions and new goods bias by using current and previous period quantities rather than fixed quantities from an earlier period.

The chained CPI measures a lower inflation rate, on average, than the standard CPI. Between 2000 and 2014, the average inflation rate as measured by the chained CPI is only 0.7 percentage points lower than the standard CPI—1.7 percent versus 2.4 percent per year.

Personal Consumption Expenditure Deflator The *personal consumption expenditure deflator* (or *PCE deflator*) is calculated from data in the national income accounts that you studied in Chapter 21. When the Bureau of Economic Analysis calculates *real GDP*, it also calculates the real values of its expenditure components: real consumption expenditure, real investment, real government expenditure, and real net exports. These calculations are done in the same way as that for real GDP described in simplified terms on p. 535 and more technically on pp. 546–547 in Chapter 21.

To calculate the PCE deflator, we use the formula:

$$\text{PCE deflator} = (\text{Nominal } C \div \text{Real } C) \times 100,$$

where C is personal consumption expenditure.

The basket of goods and services included in the PCE deflator is broader than that in the CPI because it includes all consumption expenditure, not only the items bought by a typical urban family.

The difference between the PCE deflator and the CPI is small. Since 2000, the inflation rate measured by the PCE deflator is 1.9 percent per year, 0.5 percentage points lower than the CPI inflation rate.

GDP Deflator The *GDP deflator* is a bit like the PCE deflator except that it includes all the goods and services that are counted as part of GDP. So it is an index of the prices of the items in consumption, investment, government expenditure, and net exports.

$$\text{GDP deflator} = (\text{Nominal GDP} \div \text{Real GDP}) \times 100.$$

This broader price index is appropriate for macroeconomics because it is a comprehensive measure of the cost of the real GDP basket of goods and services.

Since 2000, the GDP deflator has increased at an average rate of 2.0 percent per year, 0.4 percentage points below the CPI inflation rate.

Core Inflation

No matter whether we calculate the inflation rate using the CPI, the chained CPI, the PCE deflator, or the GDP deflator, the number bounces around a good deal from month to month or quarter to quarter. To determine the trend in the inflation rate, we need to strip the raw numbers of their volatility. The **core inflation rate** is a measure of the inflation rate that excludes volatile prices in an attempt to reveal the underlying inflation trend. (The inflation rate that *includes* all prices is called the *headline* inflation rate.)

As a practical matter, the core inflation rate is calculated as the percentage change in a price index excluding the prices of food and fuel. The prices of these two items are among the most volatile.

While the core PCE inflation rate removes the volatile elements in inflation, it can give a misleading view of the true underlying inflation rate. If the relative prices of the excluded items are changing, the core PCE inflation rate will give a biased measure of the true underlying inflation rate.

Such a misleading account was given during the years between 2003 and 2008 when the relative prices of food and fuel were rising. The result was a core inflation rate that was systematically below the headline inflation rate.

Figure 22.8 graphs the core and headline inflation rates since 2000 and shows how core inflation removes the extreme swings in the headline rate.

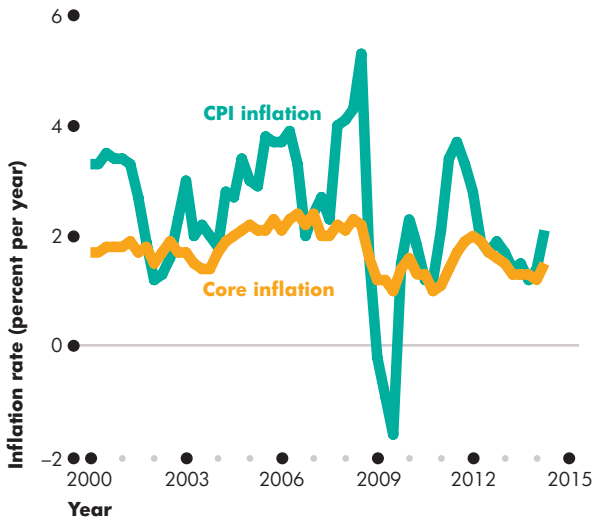
The Real Variables in Macroeconomics

You saw in Chapter 21 how we measure real GDP. And you've seen in this chapter how we can use nominal GDP and real GDP to provide another measure of the price level—the GDP deflator. But viewing real GDP as nominal GDP deflated, opens up the idea of other real variables. By using the GDP deflator, we can deflate other nominal variables to find their real values. For example, the *real wage rate* is the nominal wage rate divided by the GDP deflator.

We can adjust any nominal quantity or price variable for inflation by deflating it—by dividing it by the price level.

There is one variable that is a bit different—an interest rate. A real interest rate is *not* a nominal interest rate divided by the price level. You'll learn how to adjust the nominal interest rate for inflation to find the real interest rate in Chapter 24. But all the other real variables of macroeconomics are calculated by dividing a nominal variable by the price level.

FIGURE 22.8 Core Inflation



The core inflation rate excludes volatile price changes of food and fuel. Since 2003, the core inflation rate has mostly been below the CPI inflation rate because the relative prices of food and fuel have been rising.

Source of data: Bureau of Labor Statistics.

MyEconLab Real-time data

REVIEW QUIZ

1. What is the price level?
2. What is the CPI and how is it calculated?
3. How do we calculate the inflation rate and what is its relationship with the CPI?
4. What are the four main ways in which the CPI is an upward-biased measure of the price level?
5. What problems arise from the CPI bias?
6. What are the alternative measures of the price level and how do they address the problem of bias in the CPI?

Work these questions in Study Plan 22.3 and get instant feedback. Do a Key Terms Quiz. MyEconLab

You've now completed your study of the measurement of macroeconomic performance. Your next task is to learn what determines that performance and how policy actions might improve it. But first, take a close-up look at the weak 2010–2014 expansion in *Economics in the News* on pp. 568–569.

Jobs Growth in Recovery

United States Adds 209,000 Jobs as Hiring Slows

The Financial Times
August 1, 2014

The United States added 209,000 jobs in July—below expectations of 233,000—indicating a slowdown in the pace of hiring since June but steady growth in the labor market overall.

The unemployment rate rose to 6.2 percent when it was expected to hold steady at 6.1 percent, reflecting the slight rise in the labor force participation rate at 62.9 percent in July.

While employment growth was not as strong as in June, when the United States added 298,000 jobs, July's figures reflected the sixth consecutive month of growth above 200,000. …

The jobs market in June was more robust than initially reported, with the government revising figures to add an additional 10,000 positions. The May numbers were also changed from 224,000 to 229,000.

"This encouraging trend in the labor market is consistent with other recent economic indicators, including the strong second-quarter [gross domestic product] growth reported on Wednesday," said Jason Furman, chairman of the White House's Council of Economic Advisers. …

Almost all of the jobs growth came from the private services sector, with business services adding 47,000 positions. Healthcare and the leisure sector remained static, with no meaningful change from June. Construction added 22,000 jobs and manufacturing put on 28,000. …

Earlier this week, the U.S. government reported that the economy enjoyed annualized growth of 4 percent in the second quarter, showing the recovery is back on track. GDP growth had fallen to a disappointing 2.1 percent in the first quarter, leading to questions about the strength of the economy.

ESSENCE OF THE STORY

- The United States added 209,000 jobs in July 2014 compared with 298,000 in June.
- The unemployment rate rose to 6.2 percent and the labor force participation rate rose to 62.9 percent.
- Private services created most of the jobs; 28,000 were in manufacturing and 22,000 in construction.
- The labor market trend is consistent with the annualized 4 percent second-quarter growth rate of real GDP.

MyEconLab More Economics in the News

ECONOMIC ANALYSIS

- This news article reports and comments on some labor market data for July 2014.
- The 209,000 jobs added during July 2014 are measured by a survey of payroll jobs at business establishments, called the *Current Employment Survey* (CES).
- The CES measures the change in the number of non-farm jobs.
- The CES is different from the *Current Population Survey* (CPS), a survey of households described on p. 517, which measures the number of people with a job—the number employed.
- In July 2014, the CPS reported that employment increased by 131,000.
- Although the two surveys can give a conflicting account in a single month, as they did in July 2014, over a longer period, they give the same message.
- To lower unemployment and to increase the labor force participation rate, the number of jobs must increase by more than the increase in population, which for the population (aged 16 and over) is about 200,000 per month.
- Figure 1 shows the change in the number of jobs (the blue curve) and the change in the population (the red curve) over the year from July 2013 to July 2014.
- You can see that in most months, the number of jobs created exeeded the increase in population.
- Figure 2 shows how job creation has changed the unemployment rate. With the exceptions of February and July 2014, the unemployment rate has fallen every month from 7.3 percent in July 2013 to 6.2 percent in July 2014.
- Figure 3 shows how job creation has changed the labor force participation rate, which fell from July to November 2013, but then increased through March 2014 before falling again.
- Look closely at the numbers on the *y*-axis of Fig. 3. The labor force participation rate changed by a very small amount from 63.4 percent in July 2013 to 62.9 percent in July 2014.
- To create enough jobs to employ the growing labor force plus the unemployed and the underemployed and to bring others back into the labor force, the pace of job creation will need to increase to beyond its level during 2014.

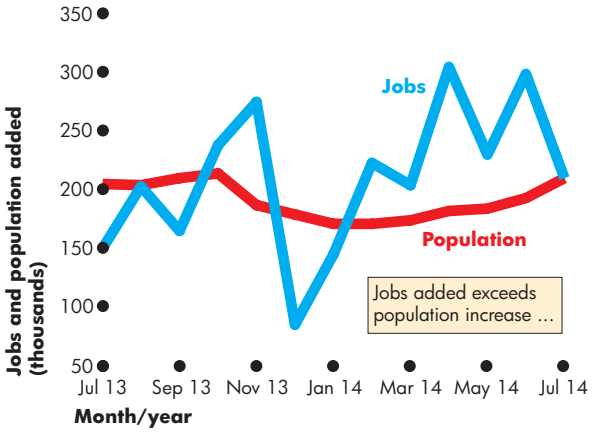


Figure 1 Jobs Created

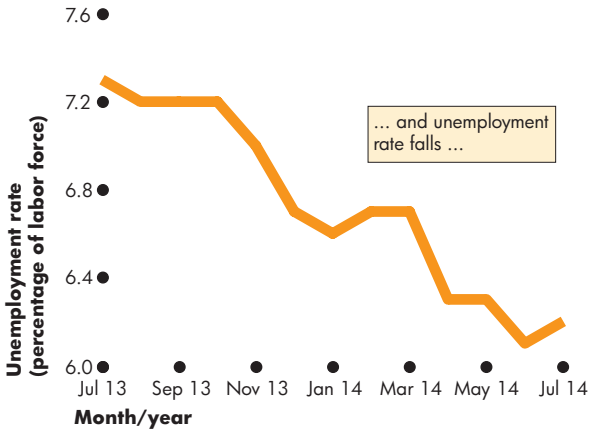


Figure 2 Unemployment Rate

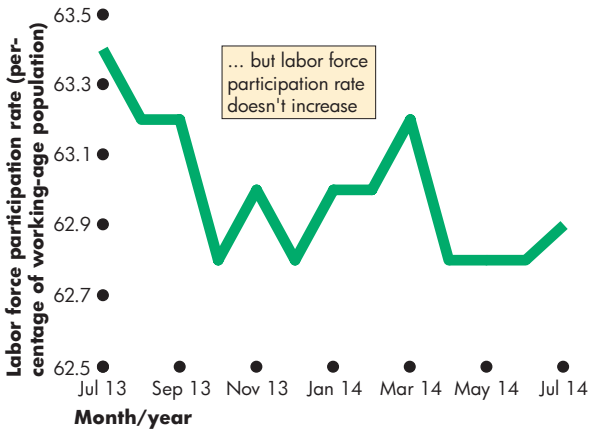


Figure 3 Labor Force Participation Rate

SUMMARY

Key Points

Employment and Unemployment (pp. 554–562)

- Unemployment is a serious personal, social, and economic problem because it results in lost output and income and a loss of human capital.
- The unemployment rate averaged 6.5 percent between 1980 and 2014. It increases in recessions and decreases in expansions.
- The labor force participation rate and the employment-to-population ratio have an upward trend and fluctuate with the business cycle.
- Two alternative measures of unemployment, narrower than the official measure, count the long-term unemployed and unemployed job losers.
- Three alternative measures of unemployment, broader than the official measure, count discouraged workers, other marginally attached workers, and part-time workers who want full-time jobs.

Working Problems 1 to 5 will give you a better understanding of employment and unemployment.

Unemployment and Full Employment (pp. 559–561)

- Some unemployment is unavoidable because people are constantly entering and leaving the labor force and losing or quitting jobs; also firms that create jobs are constantly being born, expanding, contracting, and dying.
- Unemployment can be frictional, structural, or cyclical.
- When all unemployment is frictional and structural, the unemployment rate equals the natural unemployment rate, the economy is at full employment, and real GDP equals potential GDP.
- Over the business cycle, real GDP fluctuates around potential GDP and the unemployment rate fluctuates around the natural unemployment rate.

Working Problems 6 and 7 will give you a better understanding of unemployment and full employment.

The Price Level, Inflation, and Deflation (pp. 562–567)

- Inflation and deflation that are unexpected redistribute income and wealth and divert resources from production.
- The Consumer Price Index (CPI) is a measure of the average of the prices paid by urban consumers for a fixed basket of consumer goods and services.
- The CPI is defined to equal 100 for a reference base period—currently 1982–1984.
- The inflation rate is the percentage change in the CPI from one period to the next.
- Changes in the CPI probably overstate the inflation rate because of the bias that arises from new goods, quality changes, commodity substitution, and outlet substitution.
- The bias in the CPI distorts private contracts and increases government outlays.
- Alternative price level measures such as the PCE deflator and GDP deflator avoid the bias of the CPI but do not make a large difference to the measured inflation rate.
- Real economic variables are calculated by dividing nominal variables by the price level.

Working Problems 8 to 11 will give you a better understanding of the price level, inflation, and deflation.

Key Terms

MyEconLab Key Terms Quiz

Consumer Price Index (CPI), 601
Core inflation rate, 605
Cyclical unemployment, 597
Deflation, 600
Discouraged worker, 595
Employment-to-population ratio, 594
Frictional unemployment, 597
Full employment, 597
Hyperinflation, 600
Inflation, 600
Labor force, 593
Labor force participation rate, 595
Marginally attached worker, 595
Natural unemployment rate, 597
Output gap, 598
Price level, 600
Structural unemployment, 597
Unemployment rate, 594
Working-age population, 593

WORKED PROBLEM

MyEconLab You can work this problem in Chapter 22 Study Plan.

The Current Population Survey reported the following situations in July 2014:

- Sarah works 10 hours a week at McDonald's. She is available to work more hours but hasn't looked for extra work.
- Kevin spent the first six months of 2014 actively searching for a job but he didn't get hired. He believes there are no jobs, so he has given up looking.
- Pat quit the job he had for the past two years and is actively looking for a better paying job. He is available to work and is still searching for a job.
- Mary is a new graduate who was hired while she was a student to start a job in August.
- Johnnie quit his band in June, has no job in July, and is not looking for work.

Questions

1. Who does the BLS classify as being unemployed, a part-time worker, an employed person, a discouraged worker, and not in the labor force? Explain your classification.
2. How will the labor force change if Sarah starts a second job, Pat finds a good job and is hired, and Mary takes a job at McDonald's while she waits to start her new job?
3. How will the unemployment rate change if Sarah quits and starts to search for a full-time job?
4. How will the labor force participation rate change if Kevin starts creating football apps in his garage and they turn out to be very popular?

Solutions

1. Sarah is a part-time worker. As a part-time worker, BLS classifies Sarah as employed. She does not need to be looking for extra work.

   Kevin is a discouraged worker. He spent time looking for work but could not find a job, so he has given up the search. He is not unemployed because he didn't look for work, was not laid off, and is not waiting to start a job. The labor force includes those employed and those unemployed, so Kevin is not in the labor force. He is a marginally attached worker.

   Pat is unemployed. He doesn't have a job but is available and looked for a job during July.

   Mary doesn't have a job, but she is available for work. Because she will start a job within 30 days, she is classified as unemployed.

   Johnnie is a marginally attached worker. When he played in the band he was employed. But now he is not unemployed because he is not looking, not laid off, and not waiting to start a new job.

Key Point: To be in the labor force a person must be either employed or unemployed. To be counted as employed, a person must have a job or be starting one within 30 days. To be counted as unemployed, a person must have looked for a job in the last 30 days and be available for work.

2. The labor force consists of the people who are counted by the BLS survey as employed or unemployed.

   Sarah is already counted as employed, so when she starts a second job the labor force does not change.

   Pat is currently unemployed, so when he is hired he transfers from being unemployed to being employed. So his change of status does not change the labor force.

   Mary is currently counted as employed, so taking on a part-time job at McDonald's while she waits to start the new job does not change the labor force.

Key Point: The labor force increases if working-age people who are not currently in the labor force start to look for work and become unemployed or start a job and become employed.

3. The unemployment rate is the percentage of the labor force who are classified as unemployed. If Sarah quits her job and searches for a full-time job, she becomes unemployed. The labor force doesn't change, so the unemplyment rate rises.

Key Point: The unemployment rate rises as people quit or are laid off and start searching for a new job.

4. The labor force participation rate is the percentage of the working-age population who are in the labor force. Kevin is currently not in the labor force because he is a discouraged worker. When Kevin starts creating football apps in his garage and they turn out to be very popular, Kevin becomes employed. He is now in the labor force, so the labor force participation rate rises.

Key Point: The labor force participation rate changes as working-age people enter and exit the labor force.

STUDY PLAN PROBLEMS AND APPLICATIONS

MyEconLab You can work Problems 1 to 11 in Chapter 22 Study Plan and get instant feedback. Problems marked update with real-time data.

Employment and Unemployment (Study Plan 22.1)

1. The BLS reported the following data for 2010:

   Labor force: 153.7 million
   Employment: 139.1 million
   Working-age population: 237.9 million

   Calculate the

   a. Unemployment rate.
   b. Labor force participation rate.
   c. Employment-to-population ratio.

2. In July 2014, in the economy of Sandy Island, 10,000 people were employed, 1,000 were unemployed, and 5,000 were not in the labor force. During August 2014, 80 people lost their jobs and didn't look for new ones, 20 people quit their jobs and retired, 150 unemployed people were hired, 50 people quit the labor force, and 40 people entered the labor force to look for work. Calculate for July 2014

   a. The unemployment rate.
   b. The employment-to-population ratio.

   And calculate for the end of August 2014

   c. The number of people unemployed.
   d. The number of people employed.
   e. The unemployment rate.

Use the following data to work Problems 3 and 4.
In October 2009, the U.S. unemployment rate was 10.0 percent. In October 2011, the unemployment rate was 8.9 percent. Predict what happened to

3. Unemployment between October 2009 and October 2011, if the labor force was constant.
4. The labor force between October 2009 and October 2011, if unemployment was constant.
5. **Shrinking U.S. Labor Force Keeps Unemployment Rate From Rising**

   An exodus of discouraged workers from the job market kept the unemployment rate from climbing above 10 percent. Had the labor force not decreased by 661,000, the unemployment rate would have been 10.4 percent. The number of discouraged workers rose to 929,000 last month.

   Source: Bloomberg, January 9, 2010

   What is a discouraged worker? Explain how an increase in discouraged workers influences the official unemployment rate and U–4.

Unemployment and Full Employment (Study Plan 22.2)

Use the following news clip to work Problems 6 and 7.

Some Firms Struggle to Hire Despite High Unemployment

Matching people with available jobs is always difficult after a recession as the economy remakes itself, but the disconnect is particularly acute this time. Since the recovery began in mid-2009, the number of job openings has risen more than twice as fast as actual hires. If the job market were working normally, openings would be getting filled as they appear. Some 5 million more would be employed and the unemployment rate would be 6.8%, instead of 9.5%.

Source: *The Wall Street Journal*, August 9, 2010

6. If the labor market is working properly, why would there be any unemployment at all?
7. Are the 5 million workers who cannot find jobs because of mismatching in the labor market counted as part of the economy's structural unemployment or part of cyclical unemployment?

The Price Level, Inflation, and Deflation (Study Plan 22.3)

Use the following data to work Problems 8 and 9.
The people on Coral Island buy only juice and cloth. The CPI basket contains the quantities bought in 2013. The average household spent $60 on juice and $30 on cloth in 2013 when juice was $2 a bottle and cloth was $5 a yard. In 2014, juice is $4 a bottle and cloth is $6 a yard.

8. Calculate the CPI basket and the percentage of the household's budget spent on juice in 2013.
9. Calculate the CPI and the inflation rate in 2014.

Use the following data to work Problems 10 and 11.
The BLS reported the following CPI data:

June 2008	217.3
June 2009	214.6
June 2010	216.9

10. Calculate the inflation rates for the years ended June 2009 and June 2010. How did the inflation rate change in 2010?
11. Why might these CPI numbers be biased? How can alternative price indexes avoid this bias?

ADDITIONAL PROBLEMS AND APPLICATIONS

MyEconLab You can work these problems in MyEconLab if assigned by your instructor. Problems marked update with real-time data.

Employment and Unemployment

12. What is the unemployment rate supposed to measure and why is it an imperfect measure?
13. According to Statistics New Zealand, in the fourth quarter of 2014, the labor force was 2,394,000, employment equaled 2,254,500, and working-age population was 2,984,600 in New Zealand. Calculate the
    a. Labor force participation rate.
    b. Employment-to-population ratio.
    c. Unemployment rate.
14. **Jobs Report: Hiring Up, Unemployment Down**
    The Labor Department reported that hiring accelerated in November, and the unemployment rate fell to 8.6 percent from 9 percent in October. Two reasons for the fall are that more Americans got jobs, but even more people gave up on their job searches altogether.
    Source: CNNMoney, December 2, 2011
    a. If the only change was that all the newly hired people had been unemployed in October, explain how the labor force and unemployment would have changed.
    b. If the only change was that people gave up on their job searches, explain how the labor force and unemployment would have changed.
15. The BLS reported that in July 2012, employment decreased by 195,000 to 142,220,000 and the unemployment rate increased from 8.2 percent to 8.3 percent. About 3.4 million people were marginally attached workers and 0.9 million of them were discouraged.
    a. Calculate the change in unemployment in July 2012.
    b. With 3.4 million marginally attached workers and 0.9 million of them discouraged workers, what are the characteristics of the other 2.5 million marginally attached workers?
16. A high unemployment rate tells us that a large percentage of the labor force is unemployed but not why the unemployment rate is high. What unemployment measure tells us if (i) people are searching longer than usual to find a job, (ii) more people are economic part-time workers, or (iii) more unemployed people are job losers?
17. **Some Firms Struggle to Hire Despite High Unemployment**
    With about 15 million Americans looking for work, some employers are swamped with job applicants, but many employers can't hire enough workers. The U.S. jobs market has changed. During the recession, millions of middle-skill, middle-wage jobs disappeared. Now with the recovery, these people can't find the skilled jobs that they seek and have a hard time adjusting to lower-skilled work with less pay.
    Source: *The Wall Street Journal*, August 9, 2010
    If the government extends the period over which it pays unemployment benefits to 99 weeks, how will the cost of being unemployed change?
18. Why might the unemployment rate underestimate the underutilization of labor resources?

Unemployment and Full Employment

Use the following data to work Problems 19 to 21. The IMF *World Economic Outlook* reports the following unemployment rates:

Region	2010	2011
United States	9.6	9.0
Euro area	10.1	10.9
Japan	5.1	4.5

19. What do these numbers tell you about the phase of the business cycle in the three regions in 2011?
20. What do these numbers tell us about the relative size of their natural unemployment rates?
21. Do these numbers tell us anything about the relative size of their labor force participation rates and employment-to-population ratios?
22. **A Half-Year of Job Losses**
    For the first six months of 2008, the U.S. economy lost 438,000 jobs. The job losses in June were concentrated in manufacturing and construction, two sectors that have been badly battered in the recession.
    Source: CNN, July 3, 2008
    a. Based on the news clip, what might be the main source of increased unemployment?
    b. Based on the news clip, what might be the main type of increased unemployment?