



After studying this chapter, you will be able to:

- ◆ Explain why unemployment is a problem, define the unemployment rate, the employment-to-population ratio, and the labor force participation rate, and describe the trends and cycles in these labor market indicators
- ◆ Explain why unemployment is an imperfect measure of underutilized labor, why it is present even at full employment, and how unemployment and real GDP fluctuate together over a business cycle
- ◆ Explain why inflation is a problem, how we measure the price level and the inflation rate, and why the CPI measure of inflation might be biased

22

MONITORING JOBS AND INFLATION

Each month, we chart the course of employment and unemployment as measures of U.S. economic health. How do we count the number of people working and the number unemployed? What do the level of employment and the unemployment rate tell us? Are they reliable vital signs for the economy?

Having a good job that pays a decent wage is only half of the equation that translates into a good standard of living. The other half is the cost of living. We track the cost of the items that we buy with another number that is published every month, the Consumer Price Index, or CPI. What is the CPI? How is it calculated? And does it provide a reliable guide to the changes in our cost of living?

As the U.S. economy expanded after a recession in 2001, job growth was weak and questions about the health of the labor market became of vital importance to millions of American families. *Reading Between the Lines*, at the end of this chapter, puts the spotlight on the labor market during the expansion of the past few years and the slowdown of 2008.

We begin by looking at unemployment: What it is, why it matters, and how we measure it.

◆ 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 2009 had an unusually tough time in the jobs market. At the depth of recession in October 2009, 16.5 million Americans wanted a job but couldn't find one. In a normal year, unemployment is less than half that level. And the U.S. economy is an incredible job-creating machine. Even in 2009 at the depths of recession, 139 million people had jobs—4 million more than in 1999 and 22 million more than in 1989. But in recent years, population growth has outstripped jobs growth, so unemployment is a serious problem.

Economics in Action

What Keeps 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.

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.

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 Chairman of the Federal Reserve.

One of the reasons the Fed was so aggressive in cutting interest rates, saving Bear Stearns, and propping up Fannie Mae and Freddie Mac is because Ben Bernanke is so vividly aware of the horrors of total economic collapse and 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. The Census Bureau uses the answers to describe the anatomy of the labor force.

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

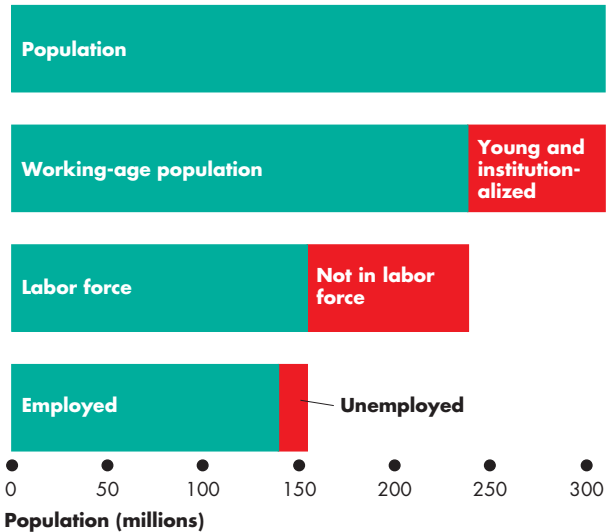
The population divides into two broad groups: the working-age population and others who are too young to work or who live in institutions and are unable to work. The **working-age population** is the total number of people aged 16 years and over who are not in jail, hospital, or some other form of institutional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

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 2010, the population of the United States was 309.6 million; the working-age population was 237.7 million. Of this number, 84 million were not in the labor force. Most of these people were in school full time or had retired from work. The remaining 153.7 million people made up the U.S. labor force. Of these, 139.1 million were employed and 14.6 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 2010, the number of people employed was 139.1 million and the number unemployed was 14.6 million. By using the above equations, you can verify that the labor force was 153.7 million (139.1 million plus 14.6 million) and the unemployment rate was 9.5 percent (14.6 million divided by 153.7 million, multiplied by 100).

Figure 22.2 shows the unemployment rate from 1980 to 2010. The average unemployment rate during this period is 6.2 percent—equivalent to 9.5 million people being unemployed in 2010.

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.

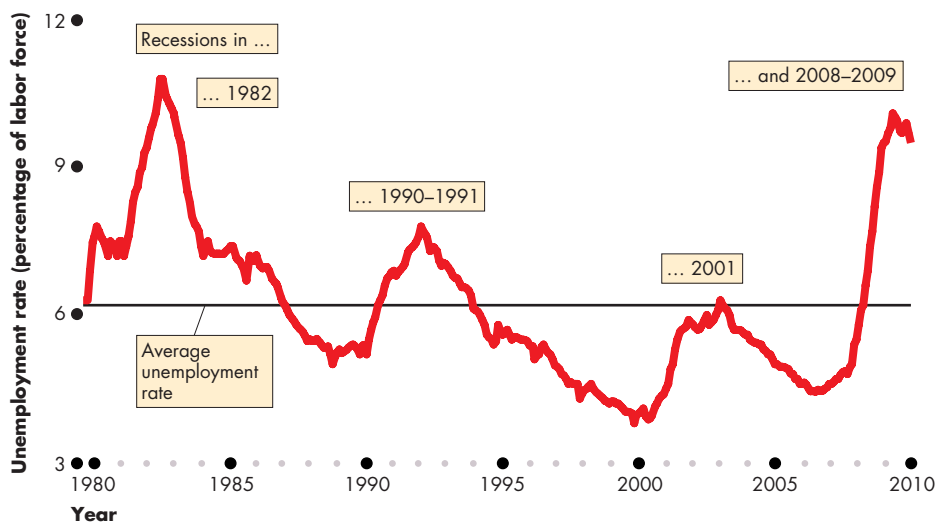
The Employment-to-Population Ratio The number of people of working age who have jobs is an indicator of both the availability of jobs and the degree of match between people's skills and jobs. The **employment-to-population ratio** is the percentage of people of working age who have jobs. That is,

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

In June 2010, the number of people employed was 139.1 million and the working-age population was 237.7 million. By using the above equation, you can verify that the employment-to-population ratio was 58.5 percent (139.1 million divided by 237.7 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

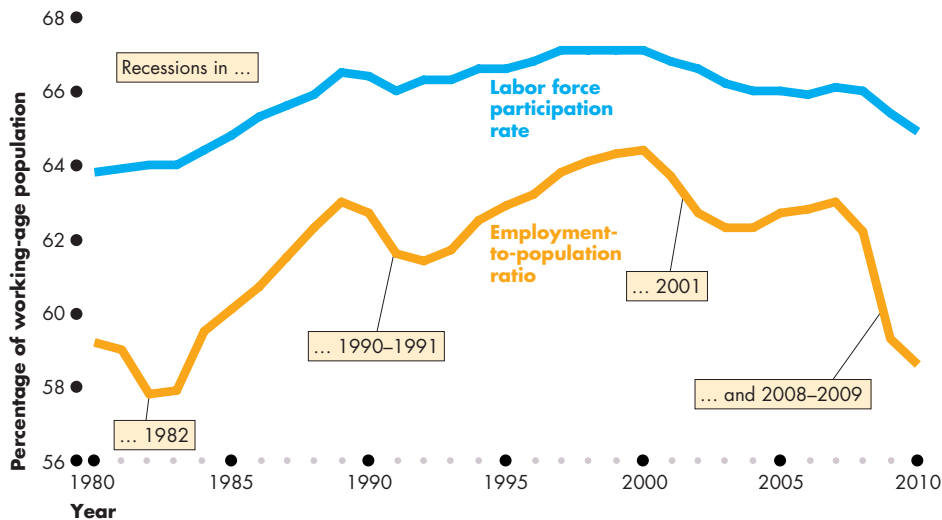
FIGURE 22.2 The Unemployment Rate: 1980–2010



Source of data: Bureau of Labor Statistics.

The average unemployment rate from 1980 to 2010 was 6.2 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.

FIGURE 22.3 Labor Force Participation and Employment: 1980–2010



Source of data: Bureau of Labor Statistics.



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.

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 2010, the labor force was 153.7 million and the working-age population was 237.7 million. By using the above equation, you can verify that the labor force participation rate was 64.7 percent (153.7 million divided by 237.7 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. These fluctuations result from unsuccessful job seekers leaving the labor force during a recession and reentering during an expansion.

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 not-in-the-labor force?

The Bureau of Labor Statistics (BLS) believes that the official unemployment definition gives the correct measure of the unemployment rate. But the BLS provides data on two types of underutilized 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.

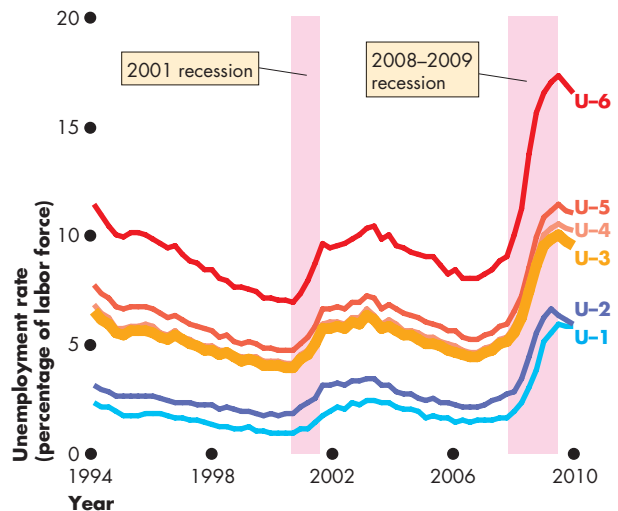
The unemployment rate doesn't distinguish among these different categories of unemployment. If most of the unemployed are long-term job losers, the situation is much worse than if most are short-term voluntary job searchers.

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 narrower than the official measure and three broader ones. The narrower measures focus on the personal cost of unemployment and the broader measures focus on assessing the full amount of unused labor resources.

Figure 22.4 shows these measures from 1994 (the first year for which they are available) to 2010. 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 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 2010, after adding these workers the unemployment rate was 16 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 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.

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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 2010.
- 4 Describe the trends and fluctuations in the U.S. employment-to-population ratio and labor force participation rate from 1980 to 2010.
- 5 Describe the alternative measures of unemployment.

You can work these questions in Study Plan 22.1 and get instant feedback.

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. 131–133) 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 coun-

tries 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 2010 was 4.8 percent—about a half of the unemployment in that year.

Real GDP and Unemployment Over the Cycle

The quantity of real GDP at full employment is *potential GDP* (p. 496). 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 Unemployment and Labor Reallocation in Michigan

At 13.6 percent, Michigan had the nation's highest official unemployment rate in 2010. The long-term unemployment rate was 8.4 percent 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.

Michigan's main problem is 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.

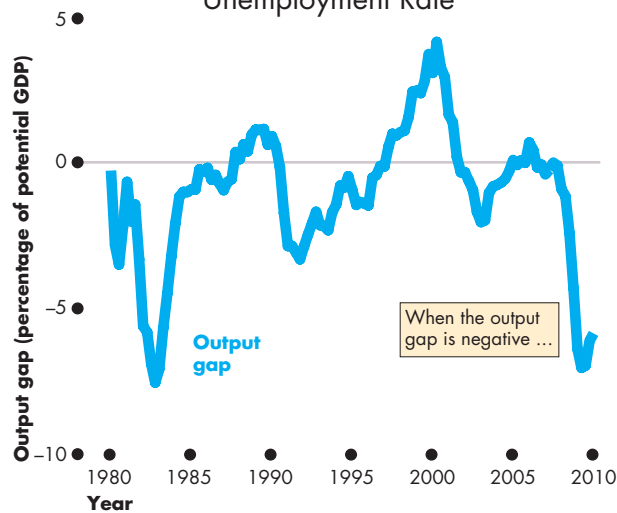
But the story is not all negative, and the outlook is not all bleak. Around 11,000 businesses in Michigan produce high-tech scientific instruments and components for defense equipment, energy plants, and medical equipment. These businesses employ almost 400,000 people, which is more than 10 percent of the state's labor force and two thirds of all manufac-

turing jobs. Workers in high-tech manufacturing enjoy incomes almost 60 percent higher than the state's average income. 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.

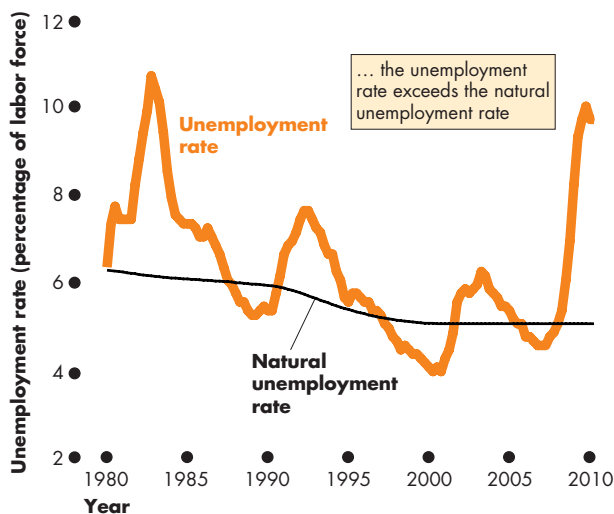
The structural unemployment rate remains high because job gains in new advanced-manufacturing firms are not yet enough to offset the job losses in the shrinking parts of manufacturing.



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 peaks 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.



Figure 22.5 illustrates these fluctuations in the United States between 1980 and 2010—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 4.8 percent by 2000. This estimate of the natural unemployment rate in the United States is one that many, but not all, economists agree with.

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?

You can work these questions in Study Plan 22.2 and get instant feedback.



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 parent's 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 parent's 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

Redistribution of 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.

Redistribution of 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 infla-

tion, 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 2010, the CPI was 218. 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 118 percent higher in 2010 than it was on the average during 1982–1984.

Constructing the CPI

Constructing the CPI involves three stages:

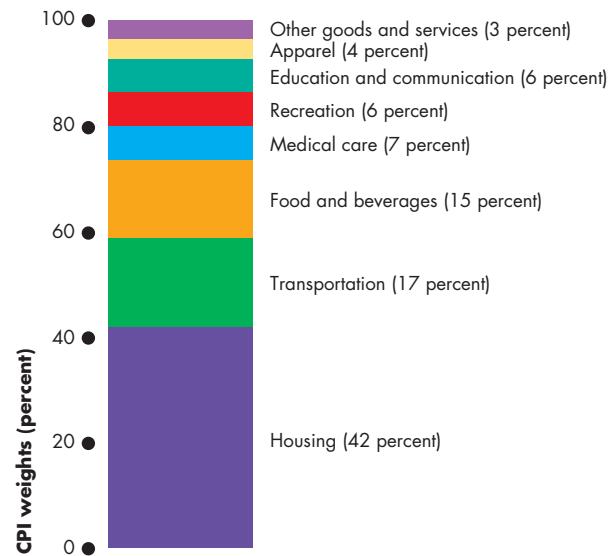
- Selecting the CPI basket
- Conducting the monthly price survey
- Calculating the CPI

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 2008.

Figure 22.6 shows the CPI basket in June 2010. As you look at the relative importance of the items in the CPI basket, remember that it applies to the *average* household. *Individual* household's 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 (42 percent), transportation (17 percent), and food and beverages (15 percent). All other items add up to 26 percent of the total.

Sources of data: United States Census Bureau and Bureau of Labor Statistics.

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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 (2010) and current period (2011).

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 total cost of the CPI basket in the base period of the CPI basket 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— $(\$2 \div \$1) \times 100 = 100$. The price of a haircut increased from \$8 to \$10, which is a 25 percent increase— $(\$2 \div \$8) \times 100 = 25$.

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, 2011, multiply the quantities in the basket by their 2011 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 2010 and 2011.

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 2010 (the base period), the cost of the CPI basket was \$50 and in 2011, it was \$70. If we use these numbers in the CPI formula, we can find the CPI for 2010 and 2011. For 2010, the CPI is

$$\text{CPI in 2010} = \frac{\$50}{\$50} \times 100 = 100.$$

For 2011, the CPI is

$$\text{CPI in 2011} = \frac{\$70}{\$50} \times 100 = 140.$$

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: 2010

CPI basket			Cost of CPI Basket
Item	Quantity	Price	
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: 2011

CPI basket			Cost of CPI Basket
Item	Quantity	Price	
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 2010. The CPI in June 2010 was 218.0, and the CPI in June 2009 was 215.7. So the inflation rate during the twelve months to June 2010 was

$$\text{Inflation rate} = \frac{(218.0 - 215.7)}{215.7} \times 100 = 1.1\%.$$

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 2010. 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

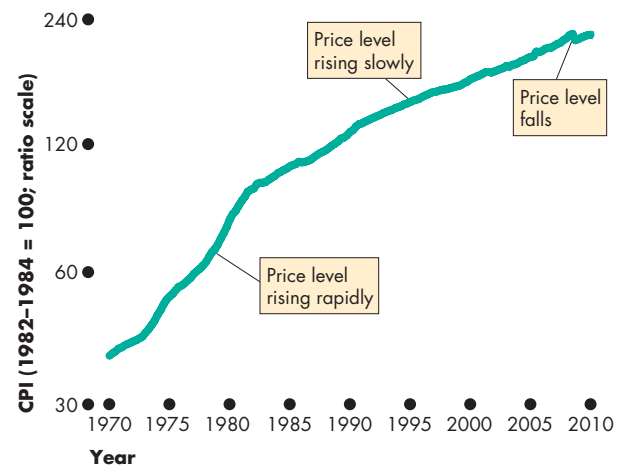
- New goods bias
- Quality change bias
- Commodity substitution bias
- Outlet substitution bias

New Goods Bias If you want to compare the price level in 2009 with that in 1969, you must somehow compare the price of a computer today with that of a typewriter in 1969. 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.

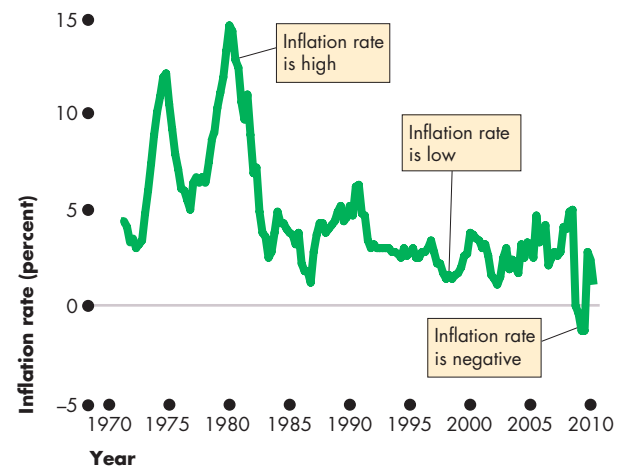
Quality Change Bias Cars, CD players, and many other items get better every year. Part of the rise in the prices of these items is a payment for improved quality and is not inflation. But the CPI counts the entire price rise as inflation and so overstates inflation.

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 protein and the same enjoyment as before and expenditure is the same as before. The price of protein has not changed. But because the CPI ignores the substitution of chicken for beef, it says the price of protein 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, and 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.

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. 504–505).

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 practical difference made by the chained CPI is small. This index has been calculated since 2000 and the average inflation rate since then as measured by the chained CPI is only 0.3 percentage points lower than the standard CPI—2.5 percent versus 2.8 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. 495 and more technically on pp. 504–505 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 2.4 percent per year, 0.4 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 2.6 percent per year, only 0.2 percentage points below the CPI inflation rate.

Core CPI Inflation

No matter whether we calculate the inflation rate using the CPI, the chained CPI, the personal consumption expenditure 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 CPI inflation rate**, which is the CPI inflation rate excluding volatile elements, attempts to do just that and reveal the underlying inflation trend.

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

While the core CPI 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 CPI 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 CPI inflation rate that was systematically below the CPI inflation rate. Figure 22.8 shows the two series since 2000. More refined measures of core inflation have been suggested that eliminate the bias.

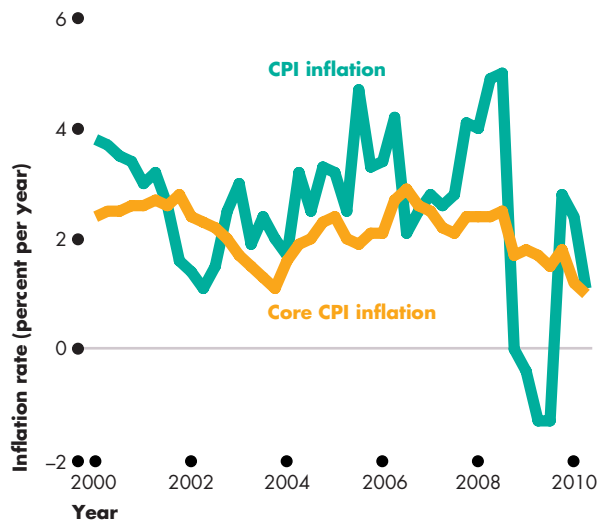
The Real Variables in Macroeconomics

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 CPI inflation rate excludes volatile price changes of food and fuel. Since 2003, the core CPI 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.

animation

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?

You can work these questions in Study Plan 22.3 and get instant feedback.

◆ 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 labor market in 2009 and 2010 in *Reading Between the Lines* on pp. 528–529.

Jobs Growth Lags Recovery

U.S. Labor Force Shrinks Amid Jobs Market Woes

<http://www.ft.com>

August 8, 2010

When the U.S. unemployment rate moved up from 9.7 percent to 9.9 percent in April, economists cheered it as an oddly encouraging sign.

The increase was largely the result of a massive influx of 805,000 workers into the labor force—Americans who were not even looking for a job during the recession and finally felt they had better chances to find employment.

However, over the past three months, that hope seems to have vanished. Since May, the size of the U.S. labor force has shrunk by 1.15m people, with 188,000 of those dropping out last month, according to data released by the U.S. government on Friday.

Although labor force participation data are notoriously volatile, the underlying trend is unmistakable: the majority of the 1.65m people who jumped back into the labor force in the first four months of the year are back on the sidelines, cowed by the sudden slowdown in the U.S. economy and the tepid pace of private-sector job creation. ...

Additionally, downward pressure on the size of the labor force could be exacerbated as Americans exhaust their unemployment benefits, which in some states last as long as 99 weeks. To receive jobless checks, workers have to prove that they are searching for a post, keeping them inside the labor force.

Indeed, in the latest government data, there were already signs of long-term unemployed Americans exiting the workforce in desperation after running out of benefits. In July, 179,000 people who had been unemployed for 27 weeks or longer left the labor force, accounting for most of the overall decline. ...

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ESSENCE OF THE STORY

- The U.S. unemployment rate increased from 9.7 percent to 9.9 percent in April 2010 mainly because 805,000 workers entered the labor force.
- In May, June, and July 2010, the U.S. labor force decreased by 1.15 million people.
- Monthly labor force participation data are volatile, but the underlying trend is downward and is being driven by slow economic growth and a slow pace of job creation in the private sector.
- To receive unemployment benefits, workers must search for work so that they are counted as unemployed and in the labor force.
- As benefits run out, a worker might stop looking for work and leave the labor force, which distorts the true change in unemployment.
- In July 2010, 179,000 people who had been unemployed for 27 weeks or longer left the labor force, accounting for most of the overall decline.

ECONOMIC ANALYSIS

- This news article reports and comments on some labor market data for April through July 2010.
- During 2010, the economy was expanding following a deep recession. Figure 1 shows real GDP bottomed in mid-2009.
- Despite the expanding economy, the labor force participation rate continued on a downward trend (as reported in the news article) and the unemployment rate continued to rise.
- Figure 2 shows that the unemployment rate continued to rise until October 2009 when it reached a peak.
- The tendency for the turning point in the unemployment rate to lag the turning point in real GDP by a few months is a normal feature of the business cycle.
- The unemployment path looks the same regardless of whether we use the official measure, U-3, or add in discouraged workers (U-4) or other marginally attached workers (U-5).
- Because all the unemployment rates move up and down together, we can conclude that the falling labor force participation rate is not being driven by a fall in the number of marginally attached workers.
- Rather, as the news article says, it is long-term unemployed who are withdrawing from the labor force.
- But as Fig. 3 shows, the percentage of the unemployed who are long-term unemployed (15 weeks or longer) continued to rise through mid-2010.
- The news article identifies one link between unemployment benefits and the unemployment rate—for those whose benefits run out, the incentive to remain unemployed weakens so these people are more likely to withdraw from the labor force.
- There is a second link between unemployment benefits and the unemployment rate: When benefits are extended (to 99 weeks in some states), for those who qualify, the incentive to remain unemployed and take longer to find a suitable job strengthens.
- The increase in the percentage of the unemployed who remain unemployed for 15 weeks or longer shown in Fig. 3 might be influenced by this effect.

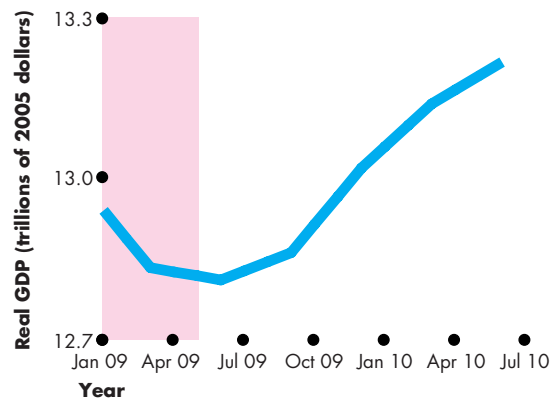


Figure 1 Real GDP

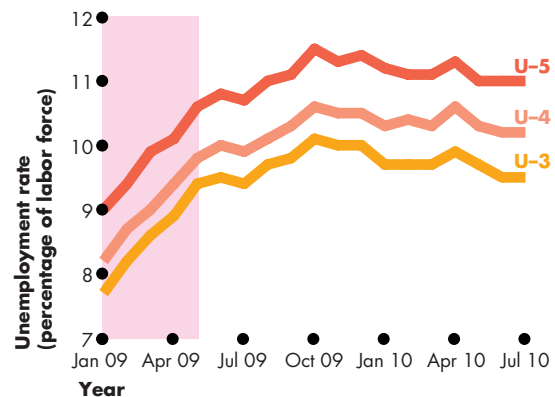


Figure 2 Unemployment

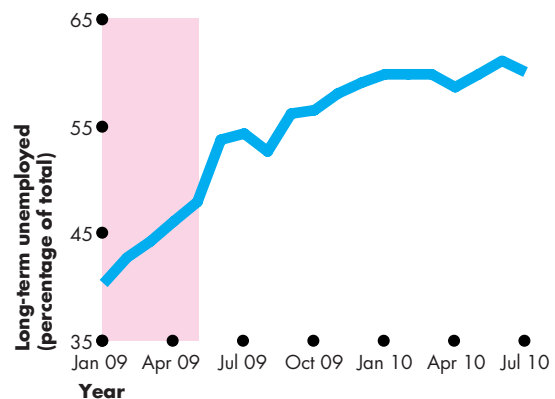


Figure 3 Long-term unemployment

SUMMARY

Key Points

Employment and Unemployment (pp. 514–518)

- 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 6.2 percent between 1980 and 2010. 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. 519–521)

- 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 borne, 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 to 11 will give you a better understanding of unemployment and full employment.

The Price Level, Inflation, and Deflation (pp. 522–527)

- 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 12 to 20 will give you a better understanding of the price level, inflation, and deflation.

Key Terms

Consumer Price Index (CPI), 523

Core CPI inflation rate, 527

Cyclical unemployment, 519

Deflation, 522

Discouraged worker, 517

Employment-to-population ratio, 516

Frictional unemployment, 519

Full employment, 519

Hyperinflation, 522

Inflation, 522

Labor force, 515

Labor force participation rate, 517

Marginally attached worker, 517

Natural unemployment rate, 519

Output gap, 520

Price level, 522

Structural unemployment, 519

Unemployment rate, 516

Working-age population, 515



STUDY PLAN PROBLEMS AND APPLICATIONS



You can work Problems 1 to 20 in MyEconLab Chapter 22 Study Plan and get instant feedback.

Employment and Unemployment (Study Plan 22.1)

- The Bureau of Labor Statistics reported the following data for 2008:
 - Labor force: 154,287,000
 - Employment: 145,362,000
 - Working-age population: 233,788,000
 Calculate the
 - Unemployment rate.
 - Labor force participation rate.
 - Employment-to-population ratio.
- In July 2009, 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 2009, 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 2009
 - The unemployment rate.
 - The employment-to-population ratio.
 And calculate for the end of August 2009
 - The number of people unemployed.
 - The number of people employed.
 - The unemployment rate.

Use the following information to work Problems 3 and 4.

In March 2007, the U.S. unemployment rate was 4.4 percent. In August 2008, the unemployment rate was 6.1 percent. Predict what happened to

- Unemployment between March 2007 and August 2008, assuming that the labor force was constant.
- The labor force between March 2007 and August 2008, assuming that unemployment was constant.
- 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 to 8.

Nation's Economic Pain Deepens

A spike in the unemployment rate—the biggest in more than two decades—raised new concerns that the economy is heading into a recession. The U.S. unemployment rate soared to 5.5% in May from 5% in April—much higher than forecasted. The surge marked the biggest one-month jump in unemployment since February 1986, and the 5.5% rate is the highest seen since October 2004.

Source: CNN, June 6, 2008

- How does the unemployment rate in May compare to the unemployment rate during the earlier recessions?
- Why might the unemployment rate tend to actually underestimate the unemployment problem, especially during a recession?
- How does the unemployment rate in May compare to the estimated natural unemployment rate? What does this imply about the relationship between real GDP and potential GDP at this time?

Use the following information to work Problems 9 and 10.

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 Labor Department data suggest 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 five 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

- If the labor market is working properly, why would there be any unemployment at all?
- 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 its cyclical unemployment?

11. Which of the following people are unemployed because of labor market mismatching?
- Michael has unemployment benefits of \$450 a week and he turned down a full-time job paying \$7.75 an hour.
 - Tory used to earn \$60,000 a year and he turned down a low-paid job to search for one that pays at least \$50,000 a year.
 - David turned down a temporary full-time job paying \$15 an hour because it was an hour's drive away and the gas cost would be high.

The Price Level, Inflation, and Deflation

(Study Plan 22.3)

Use the following information to work Problems 12 and 13.

The people on Coral Island buy only juice and cloth. The CPI basket contains the quantities bought in 2009. The average household spent \$60 on juice and \$30 on cloth in 2009 when the price of juice was \$2 a bottle and the price of cloth was \$5 a yard. In the current year, 2010, juice is \$4 a bottle and cloth is \$6 a yard.

12. Calculate the CPI basket and the percentage of the household's budget spent on juice in 2009.
13. Calculate the CPI and the inflation rate in 2010.

Use the following data to work Problems 14 to 16. The BLS reported the following CPI data:

June 2006	201.9
June 2007	207.2
June 2008	217.4

14. Calculate the inflation rates for the years ended June 2007 and June 2008. How did the inflation rate change in 2008?
15. Why might these CPI numbers be biased?
16. How do alternative price indexes help to avoid the bias in the CPI numbers?
17. **Inflation Can Act as a Safety Valve**

Workers will more readily accept a real wage cut that arises from an increase in the price level than a cut in their nominal wage rate.

Source: FT.com, May 28, 2009

Explain why inflation influences a worker's real wage rate. Why might this observation be true?

18. The IMF *World Economic Outlook* reported the following price level data (2000 = 100):

Region	2006	2007	2008
United States	117.1	120.4	124.0
Euro area	113.6	117.1	119.6
Japan	98.1	98.1	98.8

- a. In which region was the inflation rate highest in 2007 and in 2008?
- b. Describe the path of the price level in Japan.
19. **Inflation Getting "Uglier and Uglier"**

The Labor Department reported that the CPI rose 4.2% through the 12 months ending in May and 0.6% in May. Energy costs rose 4.4% in May, and surged 17.4% over the 12 months ending in May; transportation costs increased 2% in May, and jumped 8.1% over the 12 months ending in May. The price of food increased 0.3% in May, and jumped 5.1% during the 12 months ending in May. The price of milk increased 10.2% over the 12 months. The price of clothing fell 0.2% in May, and decreased 0.4% over the 12 months. The core CPI rose 0.2% in May and 2.3% during the 12 months ending in May.

Source: CNN, June 13, 2008

- a. Which components of the CPI basket experienced price increases (i) faster than the average and (ii) slower than the average?
- b. Distinguish between the CPI and the core CPI. Why might the core CPI be a useful measurement and why might it be misleading?
20. **Dress for Less**

Since 1998, the price of the Louis Vuitton "Speedy" handbag has more than doubled, to \$685, while the price of Joe Boxer's "licky face" underwear has dropped by nearly half, to \$8.99. As luxury fashion has become more expensive, mainstream apparel has become markedly less so. Clothing is one of the few categories in the CPI in which overall prices have declined—about 10 percent—since 1998.

Source: *The New York Times*, May 29, 2008

- a. What percentage of the CPI basket does apparel comprise?
- b. If luxury clothing prices have increased dramatically since the late 1990s, why has the clothing category of the CPI actually declined by about 10 percent?

ADDITIONAL PROBLEMS AND APPLICATIONS

 You can work these problems in MyEconLab if assigned by your instructor.

Employment and Unemployment

21. What is the unemployment rate supposed to measure and why is it an imperfect measure?
22. The Bureau of Labor Statistics reported the following data for 2005:
 - Labor force participation rate: 66 percent
 - Working-age population: 226 million
 - Employment-to-population ratio: 62.7
 Calculate the
 - a. Labor force.
 - b. Employment.
 - c. Unemployment rate.
23. In the New Orleans metropolitan area in August 2005, the labor force was 634,512 and 35,222 people were unemployed. In September 2005 following Hurricane Katrina, the labor force fell by 156,518 and the number employed fell by 206,024. Calculate the unemployment rate in August 2005 and in September 2005.
24. The BLS reported the following data: In July 2010, employment declined by 131,000 but the unemployment rate was unchanged at 9.5 percent. About 2.6 million persons were marginally attached to the labor force and among the marginally attached, 1.2 million workers were discouraged.
 - a. Calculate the change in unemployment in July 2010.
 - b. With 2.6 million marginally attached workers and 1.2 million of them discouraged workers, what are the characteristics of the other 1.4 million marginally attached workers?
25. A high unemployment rate tells us a large percentage of the labor force is unemployed, but it doesn't tell us why the unemployment rate is high. What measure of unemployment tells us if (i) people are taking longer than usual to find a job, (ii) more people are economic part-time workers, or (iii) more unemployed people are job losers?
26. **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. What has changed in the jobs market? 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

How will extending the period over which the government is willing to pay unemployment benefits to 99 weeks influence the cost of unemployment?

27. Why might the unemployment rate underestimate the underutilization of labor resources?

Unemployment and Full Employment

Use the following data to work Problems 28 and 29. The IMF *World Economic Outlook* reports the following unemployment rates:

Region	2007	2008
United States	4.6	5.4
Euro area	7.4	7.3
Japan	3.9	3.9

28. What do these numbers tell you about the phase of the business cycle in the United States, Euro area, and Japan in 2008?
29. What do these numbers tell us about the relative size of the natural unemployment rates in the United States, the Euro area, and Japan?
30. Do these numbers tell us anything about the relative size of the labor force participation rates and employment-to-population ratios in the three regions?
31. **A Half-Year of Job Losses**
 Employers trimmed jobs in June for the sixth straight month, with the total for the first six months at 438,000 jobs lost by the U.S. economy. 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?

32. Governor Plans to Boost Economy with Eco-friendly Jobs

Oregon's 5.6 percent unemployment rate hovers close to the national average of 5.5 percent. A few years ago, Oregon had one of the highest unemployment rates in the nation. To avoid rising unemployment, Oregon Governor Kulongoski introduced a plan that provides public schools and universities with enough state funds to meet growing demand for skilled workers. Also Kulongoski wants to use state and federal money for bridges, roads, and buildings to stimulate more construction jobs.

Source: *The Oregonian*, July 8, 2008

- What is the main type of unemployment that Governor Kulongoski is using policies to avoid? Explain.
- How might these policies impact Oregon's natural unemployment rate? Explain.

The Price Level, Inflation, and Deflation

33. A typical family on Sandy Island consumes only juice and cloth. Last year, which was the base year, the family spent \$40 on juice and \$25 on cloth. In the base year, juice was \$4 a bottle and cloth was \$5 a length. This year, juice is \$4 a bottle and cloth is \$6 a length. Calculate

- The CPI basket.
- The CPI in the current year.
- The inflation rate in the current year.

34. Amazon.com agreed to pay its workers \$20 an hour in 1999 and \$22 an hour in 2001. The price level for these years was 166 in 1999 and 180 in 2001. Calculate the real wage rate in each year. Did these workers really get a pay raise between 1999 and 2001?

35. News release

In June 2010, real personal consumption expenditure (PCE) was \$9,283.4 billion and the PCE deflator was 110.8. In July 2010, real personal consumption expenditure was \$9,301.3 billion and personal consumption expenditure was \$10,325.5 billion.

Source: Bureau of Economic Analysis, August 30, 2010

Calculate personal consumption expenditure in June 2010 and the PCE deflator in July 2010. Was the percentage increase in real personal consumption expenditure greater or smaller than that in personal consumption expenditure?

Economics in the News

36. After you have studied *Reading Between the Lines* on pp. 528–529 answer the following questions.
- When did the unemployment rate peak after the 2008–2009 recession?
 - What might we conclude from the three unemployment measures in Fig. 2 (p. 529)?
 - Why might unemployment benefits influence the unemployment rate?
 - Do unemployment benefits influence cyclical unemployment or natural unemployment? Explain.
 - Is the rise in unemployment after mid-2009 most likely cyclical, structural, or frictional? Explain.
 - Suggest some actions that the U.S. government might take to create more jobs.

37. Out of a Job and Out of Luck at 54

Too young to retire, too old to get a new job. That's how many older workers feel after getting the pink slip and spending time on the unemployment line. Many lack the skills to craft resumes and search online, experts say. Older workers took an average of 21.1 weeks to land a new job in 2007, about 5 weeks longer than younger people. "Older workers will be more adversely affected because of the time it takes to transition into another job," said Deborah Russell, AARP's director of workforce issues.

Source: CNN, May 21, 2008

- What type of unemployment might older workers be more prone to experience?
- Explain how the unemployment rate of older workers is influenced by the business cycle.
- Why might older unemployed workers become marginally attached or discouraged workers during a recession?

Data Graphing

Use the *Data Grapher* in MyEconLab to work Problems 38 to 40.

- In which country in 2009 was the unemployment rate highest and in which was it lowest: Canada, Japan, France, or the United States?
- In which country in 2009 was the inflation rate highest and in which was it lowest: Australia, United Kingdom, France, or the United States?
- Make a scatter diagram of U.S. inflation and unemployment. Describe the relationship.

MONITORING MACROECONOMIC PERFORMANCE

Macroeconomics is a large and controversial subject that is interlaced with political ideological disputes. And it is a field in which charlatans as well as serious thinkers have much to say.

You have just learned in Chapters 21 and 22 how we monitor and measure the main macroeconomic variables. We use real GDP to calculate the rate of economic growth and business cycle fluctuations. And we use the CPI and other measures of the price level to calculate the inflation rate and to “deflate” nominal values to find *real* values.

In the chapters that lie ahead, you will learn the theories that economists have developed to explain economic growth, fluctuations, and inflation.

First, in Chapters 23 through 26, you will study the long-term trends. This material is central to the oldest question in macroeconomics that Adam Smith tried to answer: What are the causes of the wealth of nations? You will also study three other old questions that Adam Smith’s contemporary and friend David Hume first addressed: What causes inflation? What causes international deficits and surpluses? And why do exchange rates fluctuate?

In Chapters 27 through 29, you will study macroeconomic fluctuations.

Finally, in Chapters 30 and 31, you will study the policies that the federal government and Federal Reserve might adopt to make the economy perform well.

David Hume, a Scot who lived from 1711 to 1776, did not call himself an economist. “Philosophy and general learning” is how he described the subject of his life’s work. Hume was an extraordinary thinker and writer. Published in 1742, his Essays, Moral and Political, range across economics, political science, moral philosophy, history, literature, ethics, and religion and explore such topics as love, marriage, divorce, suicide, death, and the immortality of the soul!

His economic essays provide astonishing insights into the forces that cause inflation, business cycle fluctuations, balance of payments deficits, and interest rate fluctuations; and they explain the effects of taxes and government deficits and debts.

Data were scarce in Hume’s day, so he was not able to draw on detailed evidence to support his analysis. But he was empirical. He repeatedly appealed to experience and evidence as the ultimate judge of the validity of an argument. Hume’s fundamentally empirical approach dominates macroeconomics today.

“... in every kingdom into which money begins to flow in greater abundance than formerly, everything takes a new face: labor and industry gain life; the merchant becomes more enterprising, the manufacturer more diligent and skillful, and even the farmer follows his plow with greater alacrity and attention.”

DAVID HUME
Essays, Moral and Political



Professor Clarida, why did you decide to become an economist and what drew you to macroeconomics?

I had the great fortune to have some excellent, inspiring economics professors in college (Fred Gotheil and Matt Canzoneri) and decided by my sophomore year to put myself on a path that would take me to Ph.D. work in economics. To me, there was (and still is!) enormous appeal and satisfaction from being able to distill the complexities of the economy, really the global economy, into the major fundamental forces that are driving the interactions that are of interest to people. I'm by nature

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a 'big picture' guy but require and respect rigor and robustness of analysis. In college and grad school, the rational expectations revolution was just emerging and so it was quite an exciting time to be jumping into macro.

When you consider the United States and global economies today, there are many topics that have made headlines, most notably, the state of our economy and the rise in power of developing countries. Let's start with the state of the U.S. economy. What brought the recession from which we're now slowly recovering?

The U.S. economy was hit in 2007 and 2008 by four significant, negative shocks: The bursting of the housing bubble, a major global dislocation in financial markets, a credit crunch as banks suffered losses and tightened lending standards, and record oil and gasoline prices.

The collapse of the housing market was a significant shock to aggregate demand. The dislocation in financial markets and the credit crunch were also negative shocks to aggregate demand. This is because tighter lending standards and higher credit spreads made it more expensive for firms and households to borrow for any given level of the interest rate set by the Fed. These three shocks shifted the aggregate demand curve to the left.

Higher oil and commodity prices were a negative supply shock, which shifted the aggregate supply curve to the left.



The combination of these shocks brought an unusually large decrease in real GDP and increase in unemployment. These shocks also severely disrupted international trade and financial markets and triggered the largest ever fiscal and monetary stimulus measures.

When did the recession begin and end and why is the recovery so painfully slow?

The National Bureau of Economic Research (with whom I am affiliated as a Research Associate) is the arbiter of when a recession begins and ends and the Bureau declared the recession began in December 2007 and ended in June 2009. So the U.S. economy is now in the second year of recovery from the worst recession in 75 years. But the recovery to date has been sluggish. Unemployment remains high and eco-

RICHARD H. CLARIDA is the C. Lowell Harriss Professor of Economics at Columbia University, where he has taught since 1988. He graduated with highest honors from the University of Illinois at Urbana in 1979 and received his masters and Ph.D. in Economics from Harvard University in 1983, writing his dissertation under the supervision of Benjamin Friedman.

Professor Clarida has taught at Yale University and held public service positions as Senior Staff Economist with the President's Council of Economic Advisers in President Ronald Reagan's Administration and most recently as Assistant Secretary of the Treasury for Economic Policy in the Administration of President George W. Bush. He has also been a visiting scholar at the International Monetary Fund and at many central banks around the world, including the Federal Reserve, the European Central Bank, the Bank of Canada, the Deutsche Bundesbank, the Bank of Italy, and the Bank of England.

Professor Clarida has published a large number of important articles in leading academic journals and books on monetary policy, exchange rates, interest rates, and international capital flows.

Michael Parkin talked with Richard Clarida about his research and some of the macroeconomic policy challenges facing the United States and the world today.

economic growth, while positive, has been much slower than in a typical recovery. This is because the U.S. economy continues to suffer the consequences of the significant negative shocks that caused the recession. The bursting of the housing bubble, the financial crisis, and the credit crunch continue to hamper bank lending.

The collapse of the housing market and the financial crisis have forced U.S. households to reduce borrowing and increase savings, which has brought a further negative shock to aggregate demand that fiscal and monetary policy have been unable to fully offset.

Research by the International Monetary Fund has found that recoveries from recessions associated with financial crises are usually sluggish, with slower growth and higher unemployment than recoveries

that are not associated with financial crises. In this case—I hope my forecast is wrong—it would seem that the United States runs the risk of going through a sustained period of slow growth.

As the recovery gains momentum, do you think we might have a period of stagflation like the 1970s?

Because of the recession, inflation in the United States was well below two percent, the level that the Fed and most central banks strive for. This is mostly due to the large output gap that opened up during the recession as well as surprisingly strong productivity growth. Despite these trends, measures of expected inflation remain well anchored at around 2 percent. Stagflation is not a near-term risk.

The Fed has an implicit target for inflation over a horizon of three years. It realizes that monetary policy operates with long lags, so it seeks to set a path for policy that it expects will bring inflation to two percent over several years.

If inflation expectations start to drift up, I am confident that the Fed will eventually do what it takes to keep inflation around the two percent level.

... measures of expected inflation remain well anchored at 2 percent.

Is the current account deficit sustainable? Do you see it correcting?

The U.S. current account deficit has been shrinking as a share of GDP for almost two years. In a growing global economy, with the dollar as reserve currency, the United States can run a sustainable current account deficit of two to three percent of GDP forever. Over time, as budget deficits fall and a more competitive dollar boosts exports, the current account deficit should stabilize at the high end of this range.

In the past, the dollar has been relatively strong when compared to the euro, the pound and the yen, but now we are experiencing a weaker dollar with drastically unfavorable exchange rates. Is the dollar going to continue to go down? Does it matter?

The dollar has been trending down for some time and I expect this to continue. The United States is

[The] United States is now lagging, not leading global growth, and the share of dollars in global portfolios will continue to trend down.

now lagging, not leading global growth, and the share of dollars in global portfolios will continue to trend down. I don't see a free fall or crash landing in the dollar, if only because the euro, at this time, is not a viable alternative.

Why isn't the euro a viable alternative to the dollar?

At this time there isn't an integrated financial market in Europe. There is a collection of a dozen markets. Also, with the privileges of being a global reserve currency come obligations. Global growth drives growing global demand for currency of the reserve country and this implies that the reserve currency country on average, runs a balance of payments deficit as Britain did until World War I and as the United States has since the 1960s.

Many central banks around the world, including those at which you've been a visiting scholar, have an explicit inflation target. Should the Fed target inflation like these other central banks do?

The Fed has a dual mandate to keep prices stable and the economy at full employment. I do not foresee the Fed changing this mandate. But through its communication strategy, the Fed has moved pretty close to an inflation forecast target.

With the deep and sustained recession and the record low interest rates, has fiscal policy been reinstated as a stabilization tool?

Given the huge impact that falling house prices had on wealth and the balance sheets of financial institutions, fiscal policy is proving to be a necessary tool in the cycle to complement monetary policy. However, the 'bang per buck', or multiplier from fiscal policy, was less than many expected. This was because the impairment of credit markets and a desire to rebuild savings offset much of the impact of fiscal policy.

The world economy has been getting much attention in the press, as many Asian countries are growing in global market share in emerging and established industries. Are China and India going to keep nudging double digit growth rates for the foreseeable future?

I am bullish on global growth prospects for the next five years for China, India, and the many other "emerging" economies that are benefiting from a combination of favorable fundamentals and globalization.

Is China's exchange rate policy a problem for the United States?

China is allowing its currency to appreciate versus the dollar and will continue to do so. This is in China's interest as much as it is in the United States' interest.

China in recent years has seen a sharp rise in inflation and a surge in capital inflows in anticipation that its currency will strengthen. China has and will continue to allow its currency to strengthen in order to reduce inflation and short term capital inflows.

China ... has seen a sharp rise in inflation and a surge in capital inflows in anticipation that its currency will strengthen.

What is your advice to a student who is just starting to study economics? Is it a good subject in which to major? What other subjects work well with it?

It won't surprise you to learn that I think economics is an excellent subject in which to major. In many colleges, including Columbia, it is among the most popular majors. My advice would be to take a broad range of electives and to avoid the temptation to specialize in one narrow area of economics. Also, do as much data, statistics, and presentation work as you can. You will learn the most when you have to explain yourself to others.