Chapter 9: Unemployment and Inflation

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Learning Objectives

1. Measuring the Unemployment Rate, the Labor Force Participation Rate, and the Employment–Population Ratio.
2. Types of Unemployment.
3. Explain what factors determine the unemployment rate.
5. Using Price Indexes to Adjust for the Effects of Inflation.
6. Distinguish between the nominal interest rate and the real interest rate.
7. Does Inflation Impose Costs on the Economy?
DOL’s Bureau of Labor Statistics (BLS), Household Survey (60,000 households)

- Each month, the U.S. Bureau of the Census conducts the Current Population Survey to collect data needed to compute the unemployment rate.
- **Employed people**: If they worked during the week before the survey or if they were temporarily away from their job because they were ill, on vacation, on strike, or for other reasons.
- **Unemployed people**: If they did not work in the previous week, but were available for work and had actively looked for work at some time during the previous four weeks.
- **Labor force**: The sum of employed and unemployed workers in the economy.
- **Unemployment rate**: The percentage of the labor force that is unemployed.
- **Discouraged workers**: People who are available for work, but who have not looked for a job during the previous *four weeks* because they believe no jobs are available for them.
The Household Survey

- BLS classifies people who do not have a job and who are not actively looking for a job as not in the labor force.
- On a Friday early in each month the US DOL reports its estimate of the previous month’s unemployment rate. It will affect investors’ views on the health of the economy.
- The unemployment rate measures the percentage of the labor force that is unemployed:

\[
\text{Unemployment rate} = \frac{\text{Number of unemployed}}{\text{Labor force}}
\]  

(1)

- The labor force participation rate measures the percentage of the working-age population that is in the labor force:

\[
\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Working-age population}}
\]  

(2)
In September 2011, the working-age population of the United States was 240.1 million. The working-age population is divided into those in the labor force (154.0 million) and those not in the labor force (86.1 million). The labor force is divided into the employed (140.0 million) and the unemployed (14.0 million). Those not in the labor force are divided into those not available for work (79.9 million) and those available for work but not currently working (6.2 million). Finally, those available for work but not in the labor force are divided into discouraged workers (1.0 million) and those not currently looking for work for other reasons (5.2 million).
We can use the information in Figure 9.1 to calculate three important macroeconomic indicators:

- **The unemployment rate.** The percentage of the labor force that is unemployed:

\[
\frac{\text{Number of unemployed}}{\text{Labor force}} \times 100 = \text{Unemployment rate}
\]

Using the numbers from Figure 9.1, we can calculate the unemployment rate for September 2011:

\[
\frac{14.0 \text{ million}}{154.0 \text{ million}} \times 100 = 9.1\%
\]

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

\[
\frac{\text{Labor force}}{\text{Working-age population}} \times 100 = \text{Labor force participation rate}
\]
For September 2011, the labor force participation rate was

\[
\frac{154.0 \text{ million}}{240.1 \text{ million}} \times 100 = 64.1\%
\]

- **The employment–population ratio.** The percentage of the working-age population that is employed:

\[
\frac{\text{Employment}}{\text{Working-age population}} \times 100 = \text{Employment–population ratio}
\]

For September 2011, the employment–population ratio was

\[
\frac{140.0 \text{ million}}{240.1 \text{ million}} \times 100 = 58.3\%
\]
An example: What happens if you include the military?

- People on active military service are *not* included in the employment, labor force, or working-age population totals compiled in the BLS survey.
- Suppose now people in the military were included in these statistics, what happens to the unemployment rate and the labor participation rate?
- We can use expressions (1) and (2) to answer these questions.
Problems with measuring the unemployment rate

- Although the BLS reports the unemployment rate measured to the tenth of a percentage point, it is not a perfect measure of the current state of joblessness in the economy.
- **Understate** the degree of *jobless*: difficult to distinguish between the unemployed and people who are not in labor force. E.g., in recession an increase in *discouraged workers* is not counted as unemployed as more people stop actively looking for a job then; part-time workers who look for full-time are counted as employed.
- **Overstate**: BLS doesn’t verify the responses of interviewees. Some people who claim to be unemployed and actively looking for work may not be actively looking.
- The unemployment rate provides some useful information about the employment situation in the country, but it is far from an exact measure of joblessness in the economy.
The red line shows the usual measure of the unemployment rate. The blue line shows what it would be if the BLS had counted as unemployed all people who were available for work but not actively looking for jobs and all people who were in part-time jobs but wanted full-time jobs. The difference between the measures was particularly large during the 2007–2009 recession and the weak recovery that followed. Shaded areas indicate months of recession.
The labor force participation rate of adult men has declined gradually since 1948, but it has increased significantly for adult women, making the overall rate higher today than it was then.
The unemployment rate of African Americans is the highest of the four ethnic groups shown, while the unemployment rate of Asians is the lowest. High school dropouts have an unemployment rate that is triple the unemployment rate for college graduates.
How Long Are People Typically Unemployed?

- During the Great Depression of the 1930s, some people were unemployed for years at a time.
- In the modern U.S. economy, the typical unemployed person stays unemployed for a relatively brief period of time.
- In April 2007—which was during a period of economic expansion—82% of the people who were unemployed had been unemployed for less than six months.
- In September 2011, after the end of the 2007 – 2009 recession, but during a time when the economy was growing slowly, only 55% of the unemployed had been jobless for less than six months.
- The average period of unemployment was only 17 weeks in April 2007 but was 41 weeks in September 2011.
- The severity of unemployment during and after the 2007 – 2009 recession was a sharp break from the normal U.S. experience.
Making the Connection

How Unusual Was the Unemployment Situation Following the 2007–2009 Recession?

The average period of unemployment was twice as high following the 2007–2009 recession as following any other recession since the end of World War II.
How Unusual Was the Unemployment Situation Following the 2007–2009 Recession?

The fall of the employment–population ratio may give an even better indication of how weak the U.S. labor market was during and after the 2007–2009 recession.

MyEconLab Your Turn: Test your understanding by doing related problem 11.1 at the end of this chapter.
The Establishment Survey: Another Measure of Employment

In addition to the household survey, the BLS uses the establishment survey, sometimes called the payroll survey, to measure total employment in the economy.

The establishment survey provides information on the total number of persons who are employed and on a company payroll.

The establishment survey has the following four drawbacks:

1. It does not provide information on the number of self-employed persons because they are not on a company payroll.

2. It may fail to count some persons employed at newly opened firms that are not included in the survey.

3. It provides no information on unemployment.

4. Its initial employment values can be significantly revised as data from additional establishments become available.
Despite its drawbacks, the establishment survey has the advantage of being determined by actual payrolls rather than by unverified answers, as is the case with the household survey.

Table 9.1 Household and Establishment Survey Data for August and September 2011

<table>
<thead>
<tr>
<th></th>
<th>Household Survey</th>
<th>Establishment Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>August</td>
<td>September</td>
</tr>
<tr>
<td>Employed</td>
<td>139,627,000</td>
<td>140,025,000</td>
</tr>
<tr>
<td>Unemployed</td>
<td>13,967,000</td>
<td>13,992,000</td>
</tr>
<tr>
<td>Labor force</td>
<td>153,594,000</td>
<td>154,017,000</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>9.1%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>

*Note:* The sum of employed and unemployed may not equal the labor force due to rounding.

The discrepancy between the two surveys is partly due to the slightly different groups they cover and partly to inaccuracies.
Over time, the BLS revises its preliminary estimates of changes in employment. During the 2007–2009 recession, many more jobs were lost than the preliminary estimates showed. The green bars show months for which the BLS revised its preliminary estimates to show fewer jobs lost (or more jobs created), and the red bars show months for which the BLS revised its preliminary estimates to show more jobs lost (or fewer jobs created).
Job Creation and Job Destruction over Time

*When the BLS announces each month the increases or decreases in the number of persons employed and unemployed, these are net figures.*

The change in the number of persons employed is equal to the total number of jobs created minus the number of jobs eliminated.

| Table 9.2 Establishments Creating and Eliminating Jobs, September-December 2010 |
|-------------------------------------------------|------------------|------------------|
| **Establishments Creating Jobs**                | **Number of Establishments** | **Number of Jobs** |
| Existing establishments                          | 1,447,000         | 5,609,000        |
| New establishments                               | 382,000           | 1,345,000        |
| **Establishments Eliminating Jobs**             | **Number of Establishments** | **Number of Jobs** |
| Existing establishments                          | 1,418,000         | 5,162,000        |
| Closing establishments                            | 352,000           | 1,229,000        |
Most workers spend at least some time engaging in job search, just as most firms spend time searching for a new person to fill a job opening.

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

**Seasonal unemployment** refers to unemployment due to factors such as weather, variations in tourism, and other calendar-related events.

Because seasonal unemployment can make the unemployment rate seem artificially high during some months and artificially low during other months, the BLS reports two unemployment rates each month—one that is *seasonally adjusted* and one that is not.
- **Structural Unemployment**: Unemployment that arises from a persistent mismatch between the skills and attributes of workers and the requirements of jobs.

- **Cyclical Unemployment**: Unemployment caused by a business cycle recession.
  - When the economy moves into recession, many firms find their sales falling and cut back on production.
  - As production falls, they start laying off workers.
The unemployment rate rises during recessions and falls during expansion. Shaded areas indicate recessions.
**Natural rate of unemployment (NRU):** The normal rate of unemployment, consisting of *structural* unemployment plus *frictional* unemployment.

- In the US, most economists estimate the rate to be around 5%.
- The NRU is also sometimes called the full-employment rate of unemployment.

**Full employment:** When the only remaining unemployment is structural and frictional unemployment.

- The fluctuations around this normal rate are mainly due to the changes in the level of *cyclical* unemployment.
How Should We Categorize Unemployment at Bank of America?

Although the BLS does not classify its estimates of total unemployment into categories, we can roughly categorize the unemployment caused by the layoffs at Bank of America.

Some of the employees laid off by Bank of America were unlikely to find new jobs without leaving the financial sector, so they had become structurally unemployed.

Some of them were cyclically unemployed and could expect to find other jobs with financial firms after the economic recovery strengthened.

Others would be able to find jobs at competing banks after relatively brief job searches. These workers were frictionally unemployed.

MyEconLab Your Turn: Test your understanding by doing related problem 2.6 at the end of this chapter.
Government Policies and the Unemployment Rate

- Unemployment Insurance and Other Payments to the Unemployed: The opportunity cost of continuing to search for a job is the salary you are giving up at the job you could have taken.

- In the U.S. and most other industrial countries, the unemployed are eligible for unemployment insurance (UI) payments from the government, which help the unemployed maintain their income and spending, lessening the personal hardship of being unemployed and also helping to reduce the severity of recessions.

  - In the US, UI and other payments to the unemployed are equal to about *half of the average wage*. 
(conti.) UI helps the unemployed maintain their income and spending, which lessens the personal hardship of being unemployed and also helps reduce the severity of recessions.

Advantages: UI helps the unemployed maintain their income and spending, which lessens the personal impact of unemployment and also helps reduce the severity of recessions.

Disadvantages: The unemployed can spend more time searching for better jobs because they receive these UI payments and then increase the unemployment rate in the economy.
Minimum Wage Laws

- In 1938, the U.S. federal government enacted a national minimum wage law.
- The current level of MW in the U.S. is $7.25 per hour (At first, it is $0.25 per hour). In November 2010, legislators of the Hong Kong Government agreed to set a minimum wage level of HK$28 ($4.70).
- If the MW is set *above the market wage* determined by the demand and supply of labor, labor supply is greater than labor demand. Some unemployed workers would have been employed if there were no minimum wage. Consequently, the unemployment rate will be higher than it would be without a minimum wage.
- Economists agree that the current minimum wage is above the market wage for some workers, but they disagree on the amount of unemployment that has resulted.
Organizations of workers that bargain with employers for higher wages and better working conditions for their members.

In unionized industries (automobiles, steel, and telecom.), the wage is usually above what otherwise would be the market wage. This above-market wage leads to fewer workers hired in those industries.

But the effect of the overall unemployment rate is minor because only 9% of workers are unionized.
Efficiency Wages

- A higher-than-market wage paid by a firm to increase worker productivity.
- The reason is that in many business situations, it is difficult to monitor workers. (workers can hide their activities.) Hence, many firms must rely on workers being motivated enough to work hard.
- By paying a wage above the market wage, the firm raises the costs to workers of losing their jobs.
- Minimum wage laws, unions, and efficiency wages can cause economies to experience some unemployment even when cyclical unemployment is zero.
Measuring Inflation

- The prices of most goods and services rise over time. As a result, the cost of living rises. E.g., in 1914, Ford’s $5-a-day wage is extremely high, today it is only the level of minimum wage.

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

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

\[
\pi_{t+1} = \frac{p_{t+1} - p_t}{p_t},
\]

where \( p_t \) is the price level at time \( t \) and \( \pi_t \) is the inflation rate at time \( t \).
(Cont.) Measuring the price level: The GDP deflator is a broadest measure because it includes the price of every final good and service.

But it is too broad for some purposes. E.g., if we need to know the impact of inflation on the typical household, it is misleading.

The consumer price index (CPI) is a better measure for the cost of living of the typical urban family with four.
The Consumer Price Index (CPI)

- One year is chosen as the base year, and the value of the CPI is set to 100 for that year.
- In any other year, the CPI is equal to the ratio of the dollar amount necessary to buy the market basket of goods in that year divided by the dollar amount necessary to buy the same market basket in the based year, multiplied by 100.
- CPI is also called the cost-of-living index.
Notice that the quantities of the products purchased in 2006 and 07 are irrelevant in calculating CPI because we are assuming that households buy the same market basket of products.

CPI is intended to measure changes in the price level over time, but not the absolute sense how high the price level is, e.g., the inflation rate in 2007 is the percentage increase in CPI from one year to the next:

\[
\frac{122 - 120}{120} = 1.7\%.
\]
**Consumer price index (CPI)**  An average of the prices of the goods and services purchased by the typical urban family of four.

**Figure 9.7**

The CPI Market Basket, December 2010

The Bureau of Labor Statistics surveys 30,000 households on their spending habits. The results are used to construct a *market basket* of goods and services purchased by the typical urban family of four. The chart shows these goods and services, grouped into eight broad categories. The percentages represent the expenditure shares of the categories within the market basket. The categories of housing, transportation, and food make up about three-quarters of the market basket.
The value of the CPI is set equal to 100 for the base year. In any other year, it equals the ratio of the dollar amount necessary to buy the market basket of goods in that year divided by the dollar amount necessary to buy the market basket of goods in the base year, multiplied by 100.

Because the CPI measures the cost to the typical family to buy a representative basket of goods and services, it is sometimes referred to as the *cost-of-living index*.

The following table shows how the CPI is constructed, assuming that the market basket has only three products:

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
<th>Base Year (1999)</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>Price</td>
<td>Price (on base-year quantities)</td>
</tr>
<tr>
<td>Eye examinations</td>
<td>1</td>
<td>1 $50.00</td>
<td>$50.00</td>
<td>$100.00</td>
</tr>
<tr>
<td>Pizzas</td>
<td>20</td>
<td>20 10.00</td>
<td>200.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Books</td>
<td>20</td>
<td>20 25.00</td>
<td>500.00</td>
<td>25.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>$750.00</strong></td>
<td><strong>$900.00</strong></td>
<td><strong>$915.00</strong></td>
</tr>
</tbody>
</table>

*Assuming that households buy the same market basket of products each month,* the quantities of the products purchased in 2012 and 2013 are irrelevant in calculating the CPI. The numbers in the table can give us the CPI for those years.
The values of 120 and 122 are *index numbers*, which means they are not measured in dollars or any other units. *The CPI is intended to measure changes in the price level over time.* Thus, the inflation rate in 2013 would be the percentage change in the CPI from 2012 to 2013:

\[
\frac{122 - 120}{120} \times 100 = 1.7\%
\]

---

**Don’t Let This Happen to You**

**Don’t Miscalculate the Inflation Rate**

Suppose you are given the data in the following table and are asked to calculate the inflation rate for 2010:

<table>
<thead>
<tr>
<th>Year</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>216</td>
</tr>
<tr>
<td>2010</td>
<td>219</td>
</tr>
</tbody>
</table>

Because the inflation rate is the percentage increase in the price level from the previous year, and *not* the percentage increase from the base year, the correct calculation of the inflation rate for 2010 is:

\[
\frac{219 - 216}{216} \times 100 = 1.4\%
\]

**MyEconLab  Your Turn:** Test your understanding by doing related problem 4.5 at the end of this chapter.
Is the CPI Accurate?

- CPI is the most widely used measure of inflation, so it is important that it be as accurate as possible. 4 factors make it overstate the true inflation rate:

1. *Substitution bias:* In constructing the CPI, the BLS assumes that consumers purchase the same monthly amount of each product in the market basket, but consumers actually buy fewer of those products that increase most in price.

2. *Increase in quality bias:* Increases in the prices of the products partly reflect their improved quality and partly are pure inflation. It is difficult to separate the two factors.

3. *New product bias:* For many years, the BLS updated the market basket of goods used in computing the CPI only every 10 years, which excluded new products introduced between updates.

4. *Outlet bias:* Because the BLS continued to collect price statistics from traditional full-price retail stores, the CPI did not reflect the prices some consumers actually paid at discount stores and over the Internet.
By using the CPI, we can calculate what $20,000 in 1984 was equivalent to in terms of 2010 purchasing power.

The consumer price index is 104 for 1984 and 219 for 2010, so, on average, prices were \( \frac{219}{104} = 2.1 \) times higher in 2010 as in 1984:

\[
\text{Value in 2010 dollars} = \text{Value in 1984 dollars} \times \left( \frac{\text{CPI in 2010}}{\text{CPI in 1984}} \right)
\]

\[
= \$20,000 \times \left( \frac{219}{104} \right) = \$42,115
\]

Economic variables that are calculated in current-year prices are referred to as *nominal variables*.

For some purposes, we are interested in tracking changes in an economic variable over time rather than in seeing what its value would be in today’s dollars.

In that case, to correct for the effects of inflation, we can divide the nominal variable by a price index and multiply by 100 to obtain a *real variable*, measured in dollars of the base year (currently the average of prices in the years 1982 to 1984) for the price index.
## Solved Problem 9.5

### Calculating Real Average Hourly Earnings

In addition to data on employment, the BLS establishment survey gathers data on average hourly earnings of production workers—all workers, except for managers and professionals—which are a broad measure of the typical worker’s income. Use the information in the following table to calculate real average hourly earnings for each year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Average Hourly Earnings</th>
<th>CPI (1982–1984 = 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$21.62</td>
<td>216.2</td>
</tr>
<tr>
<td>2009</td>
<td>22.21</td>
<td>215.9</td>
</tr>
<tr>
<td>2010</td>
<td>22.59</td>
<td>218.6</td>
</tr>
</tbody>
</table>

What was the percentage change in real average hourly earnings between 2009 and 2010?

### Solving the Problem

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

**Step 2:** Calculate real average hourly earnings for each year.

To calculate real average hourly earnings for each year, divide nominal average hourly earnings by the CPI and multiply by 100.

For example, real average hourly earnings for 2008 are equal to

\[
\left( \frac{21.62}{216.2} \right) \times 100 = 10.00
\]
Solved Problem 9.5

Calculating Real Average Hourly Earnings

These are the results for all three years:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$21.62</td>
<td>216.2</td>
<td>$10.00</td>
</tr>
<tr>
<td>2009</td>
<td>22.21</td>
<td>215.9</td>
<td>10.29</td>
</tr>
<tr>
<td>2010</td>
<td>22.59</td>
<td>218.6</td>
<td>10.33</td>
</tr>
</tbody>
</table>

**Step 3:** Calculate the percentage change in real average earnings from 2009 to 2010. This percentage change is equal to

\[
\left( \frac{10.33 - 10.29}{10.29} \right) \times 100 = 0.4\% 
\]

We can conclude that real average hourly earnings increased slightly between 2009 and 2010.

For purposes of calculating the change in the value of real average hourly earnings over time, the base year of the price index doesn’t matter.

To prove it, try calculating real average hourly earnings for 2009 and 2010 in 2010 dollars, and then calculate the percentage change.

Unless you make an arithmetic error, you should find that the answer is still 0.4 percent.

**MyEconLab Your Turn:** For more practice, do related problems 5.3, 5.4, 5.5, and 5.6 at the end of this chapter.
The Producer Price Index (PPI)

- PPI: An average of the prices received by producers of G&S at all stages of the production process.
- The PPI includes the prices of intermediate goods such as cotton, steel, and raw materials.
- If the prices of these goods rise, the cost to firms of producing final products will rise, which may lead firms to increase the prices of products purchased by consumers.
- Changes in PPI can be used to predict future movements in the CPI.
Real versus Nominal Interest Rates

- **Nominal interest rate**: The stated interest rate on a loan.
- **Real interest rate**: The nominal interest rate minus the inflation rate. It provides a better measure of the *true cost* of borrowing and the true return to lending than does the nominal interest rate.
  - For low rates of inflation, a convenient approximation for the real interest rate is: Real interest rate = Nominal interest rate - Inflation rate
- **Deflation**: A decline in the price level, i.e., negative inflation.
(Cont.) Holding the nominal interest rate constant, the higher the inflation rate, the lower the real interest rate.

E.g., if both of you and the person to whom you lend $1000 expected the inflation rate to be 2%, you both expected the real interest rate to be 4% if the nominal interest rate is 6%. If the actual inflation rate turns out to be 4%, the real rate will be 2%: That’s good news for your borrower but bad news for you.
The real interest rate is equal to the nominal interest rate minus the inflation rate. The real interest rate provides a better measure of the true cost of borrowing and the true return on lending than does the nominal interest rate. The nominal interest rate in the figure is the interest rate on three-month U.S. Treasury bills. The inflation rate is measured by the percentage change in the CPI from the same quarter during the previous year.
Does Inflation Impose Costs on the Economy?

- Inflation Affects the Distribution of Income: Inflation does not reduce the affordability of goods and services to the average consumer because an expected inflation rate of 10% will raise the average price of goods and services by 10%, but it will also raise average incomes by 10%.

- However, it still imposes costs on the economy. The extent to which inflation redistributes income depends in part on whether the inflation is *anticipated*—in which case consumers, workers, and firms can see it coming and can prepare for it—or *unanticipated*—in which case they do not see it coming and do not prepare for it.
(Cont.) The problem with *anticipated* Inflation: Paper money loses some of its value so that anyone holding paper money will find that its purchasing power decreasing by the inflation rate. In addition, firms need to reprint their price catalog listing more frequently.

- Menu costs The costs to firms of changing prices.

The problem with *unanticipated* Inflation: When the actual inflation rate turns out to be very different from the expected inflation rate, some people gain, and other people lose. This outcome seems unfair to most people because they are either winning or losing only because something unanticipated has happened. This apparently unfair redistribution is a key reason why people dislike unanticipated inflation.
What’s so Bad about Deflation?

- What if an economy begins to experience falling prices – *deflation*?
- Should falling prices encourage consumers to increase their spending as G&S become less expensive? According to two important deflationary episodes: the U.S. during the 1930s and Japan during the 1990s, the answer is No. The main reason is that many consumers in the face of deflation were waiting for prices to go even lower.
- Waiting for falling prices was also a problem for the U.S. housing market in the late 2000s. When housing prices began to decline, many potential buyers postpone purchases in the expectation that prices would continue to fall.
What’s So Bad about Falling Prices?

The deflation of the 1930s hurt the U.S. economy because it may have led some consumers to postpone purchases and because it increased the burden on borrowers. The figure shows annual changes in the consumer price index.

Suppose that in 1929 you had borrowed money for five years at a nominal interest rate of 5 percent. The table below uses the actual deflation rate in each year to calculate the resulting real interest rates on your loan:

<table>
<thead>
<tr>
<th></th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal interest rate</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Change in the consumer price index</td>
<td>0</td>
<td>-2.3</td>
<td>-9.0</td>
<td>-9.9</td>
<td>-5.1</td>
</tr>
<tr>
<td>Real interest rate</td>
<td>5</td>
<td>7.30</td>
<td>14.00</td>
<td>14.90</td>
<td>10.10</td>
</tr>
</tbody>
</table>

MyEconLab Your Turn: Test your understanding by doing related problem 7.9 at the end of this chapter.
Should You Change Your Career Plans if You Graduate during a Recession?

At the beginning of this chapter, we asked whether layoffs in the banking industry should cause you to change your major and give up your plans to pursue a career in banking.

We have learned that unemployment rates are higher and layoffs are more common in a recession than in an economic expansion.

Because you are a sophomore, you will graduate a few years later, when the recession will likely have ended and the unemployment rate will have declined. You might also want to investigate whether the layoffs in the banking industry represent a permanent contraction in the size of the industry or whether they reflect a temporary decline due to the recession.

If the reduction of banking jobs is more likely to be permanent, then you might consider a career in another industry.

If the layoffs appear to be related to the current recession, then you probably do not need to change your career plans.
Key Terms in Chapter 8

- Unemployment rate; Labor force participation rate
- Cyclical unemployment; Frictional unemployment; Structural unemployment
- Natural rate of unemployment; Efficiency wage
- Price level; Inflation rate; Deflation
- Consumer price index (CPI); Producer price index (PPI)
- Menu costs
- Nominal interest rate; Real interest rate