UNIT 2

Economic Indicators

AP **12-17%**
AP EXAM WEIGHTING

THIS PAGE IS INTENTIONALLY LEFT BLANK.

2   ECONOMIC INDICATORS

M1: Measuring a Nation's Income

I. Review of the Definitions of Microeconomics and Macroeconomics

A. Definition of <u>microeconomics</u>: the study of how households and firms make decisions and how they interact in markets.

B. Definition of <u>macroeconomics</u>: the study of economy-wide phenomena including inflation, unemployment, and economic growth.

II. The Economy's Income and Expenditure

A. To judge whether or not an economy is doing well, it is useful to look at Gross Domestic Product (GDP).

1. GDP measures the total income of everyone in the economy.

2. GDP measures total expenditure on an economy's output of goods and services.

B. For an economy as a whole, total income must equal total expenditure.

1. If someone pays someone else $100 to mow a lawn, the expenditure on the lawn service ($100) is exactly equal to the income earned from the production of the lawn service ($100).

2. We can also use the circular-flow diagram from Unit 1 to show why total income and total expenditure must be equal.

Figure 1 The Circular Flow Diagram
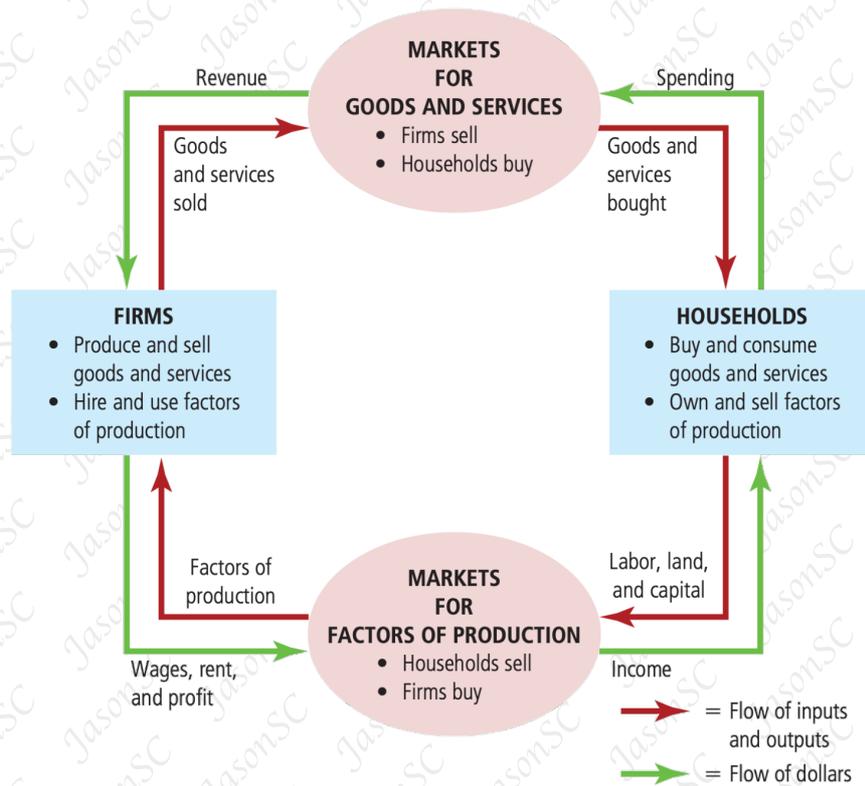
a. Households buy goods and services from firms; firms use this money to pay for resources purchased from households.

b. In the simple economy described by this circular-flow diagram, calculating GDP could be done by adding up the total purchases of households or summing total income paid by firms.

c. Note that this simple diagram is somewhat unrealistic as it omits saving, taxes, government purchases, and investment purchases by firms. However, because a transaction always has a buyer and a seller, total expenditure in the economy must be equal to total income.

III. The Measurement of Gross Domestic Product

A. Definition of gross domestic product (GDP): the market value of all final goods and services produced within a country in a given period of time.

B. "GDP Is the Market Value . . ."

1. To add together different items, market values are used.

2. Market values are calculated by using market prices.

C. ". . . Of All . . ."

1. GDP includes all items produced and sold legally in the economy.

2. The value of housing services is somewhat difficult to measure.

a. If housing is rented, the value of the rent is used to measure the value of the housing services.

b. For housing that is owned (or mortgaged), the government estimates the rental value and uses this figure to value the housing services.

3. GDP does not include illegal goods or services or items that are not sold in markets.

a. When you hire someone to mow your lawn, that production is included in GDP.

b. If you mow your own lawn, that production is not included in GDP.

D. ". . . Final . . ."

1. Intermediate goods are not included in GDP.

2. The value of intermediate goods is already included as part of the value of the final good.

3. Goods that are placed into inventory are considered to be "final" and included in GDP as a firm's inventory investment.

a. Goods that are sold out of inventory are counted as a decrease in inventory investment.

b. The goal is to count the production when the good is finished, which is not necessarily the same time that the product is sold.

E. ". . . Goods and Services . . ."

1. GDP includes both tangible goods and intangible services.

F. ". . . Produced . . ."

1. Only current production is counted.

2. Used goods that are sold do not count as part of GDP.

G. ". . . Within a Country . . ."

1. GDP measures the production that takes place within the geographical boundaries of a particular country.

2. If a Canadian citizen works temporarily in the United States, the value of her output is included in GDP for the United States. If an American owns a factory in Haiti, the value of the production of that factory is not included in U.S. GDP.

H. ". . . in a Given Period of Time."

1. The usual interval of time used to measure GDP is a year or a quarter (three months).

2. When the government reports GDP, the data are generally reported on an annual basis.

3. In addition, data are generally adjusted for regular seasonal changes (such as Christmas).

I. In addition to summing expenditure, the government also calculates GDP by adding up total income in the economy.

1. The two ways of calculating GDP almost exactly give the same answer.

2. The difference between the two calculations of GDP is called the statistical discrepancy.

IV. The Components of GDP

A. GDP (Y) can be divided into four components: consumption (C), investment (I), government purchases (G), and net exports (NX).

$$Y = C + I + G + NX$$

B. Definition of <u>consumption</u>: spending by households on goods and services, with the exception of purchases of new housing.

C. Definition of <u>investment</u>: spending on capital equipment, inventories, and structures, including household purchases of new housing.

1. GDP accounting uses the word "investment" differently from how we use the term in everyday conversation.

2. When a student hears the word "investment," she thinks of financial instruments such as stocks and bonds.

3. In GDP accounting, investment means purchases of investment goods such as capital equipment, inventories, or structures.

D. Definition of <u>government purchases</u>: spending on goods and services by local, state, and federal governments.

1. Salaries of government workers are counted as part of the government purchases component of GDP.

2. <u>Transfer payments</u> are not included as part of the government purchases component of GDP.

E. Definition of <u>net exports</u>: spending on domestically produced goods by foreigners (exports) minus spending on foreign goods by domestic residents (imports).

F. The Components of U.S. GDP

1. Table 1 shows these four components of GDP for 2015.

<u>Table 1 GDP and Its Components</u>

	Total (in billions of dollars)	Per Person (in dollars)	Percent of Total
Gross domestic product, Y	$17,938	$55,882	100%
Consumption, C	12,268	38,218	68
Investment, I	3,018	9,402	17
Government purchases, G	3,184	9,919	18
Net exports, NX	−532	−1,657	−3

Source: U.S. Department of Commerce. Parts may not sum to totals due to rounding.

2. The data for GDP come from the Bureau of Economic Analysis, which is part of the Department of Commerce.

V. Real Versus Nominal GDP

A. There are two possible reasons for total spending to rise from one year to the next.

1. The economy may be producing a larger output of goods and services.

2. Goods and services could be selling at higher prices.

B. When studying GDP over time, economists would like to know if output has changed (not prices).

C. Thus, economists measure real GDP by valuing output using a fixed set of prices.

D. A Numerical Example

Table 2 Real and Nominal GDP

1. Two goods are being produced: hot dogs and hamburgers.

Year	Price of Hot Dogs	Quantity of Hot Dogs	Price of Hamburgers	Quantity of Hamburgers
2016	$1	100	$2	50
2017	$2	150	$3	100
2018	$3	200	$4	150

2. Definition of <u>nominal GDP</u>: the production of goods and services valued at current prices.

Nominal GDP for 2016 = ($1 × 100) + ($2 × 50) = $200.
Nominal GDP for 2017 = ($2 × 150) + ($3 × 100) = $600.
Nominal GDP for 2018 = ($3 × 200) + ($4 × 150) = $1,200.

3. Definition of <u>real GDP</u>: the production of goods and services valued at constant prices.
   Let's assume that the **base year** is 2016.

Real GDP for 2016 = ($1 × 100) + ($2 × 50) = $200.
Real GDP for 2017 = ($1 × 150) + ($2 × 100) = $350.
Real GDP for 2018 = ($1 × 200) + ($2 × 150) = $500.

E. Because real GDP is unaffected by changes in prices over time, changes in real GDP reflect changes in the amount of goods and services produced.

F. The GDP Deflator

1. Definition of **GDP deflator**: a measure of the price level calculated as the ratio of nominal GDP to real GDP times 100.

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

2. Example Calculations

GDP Deflator for 2016 = ($200 / $200) × 100 = 100.
GDP Deflator for 2017 = ($600 / $350) × 100 = 171.
GDP Deflator for 2018 = ($1200 / $500) × 100 = 240.

3. Economists use the term **inflation** to describe a situation in which the economy's overall price level is rising. The inflation rate is the percentage change in some measure of the price level from one period to the next.

4. Using the GDP deflator, the inflation rate between two consecutive years is computed as follows:

$$\text{Inflation rate in year 2} = \frac{\text{GDP deflator in year 2} - \text{GDP deflator in year 1}}{\text{GDP deflator in year 1}} \times 100$$

Inflation rate in 2017 = 100 × (171-100)/100 = 71%
Inflation rate in 2018 = 100 × (240-171)/100 = 40%

VI. Is GDP a Good Measure of Economic Well-Being?

A. GDP measures both an economy's total income and its total expenditure on goods and services.

B. GDP per person tells us the income and expenditure level of the average person in the economy.

$$\text{GDP per Capita} = \frac{\text{GDP}}{\text{Population}}$$

C. GDP, however, may not be a very good measure of the economic well-being of an individual.

1. GDP omits important factors in the quality of life including leisure, the quality of the environment, and the value of goods produced but not sold in formal markets.

2. GDP also says nothing about the distribution of income.

3. However, a higher GDP does help us achieve a good life. Nations with larger GDP generally have better education and better health care.

VII. Other Measures of Income

A. **Gross National Product (GNP)** is the total income earned by a nation's permanent residents.

1. GNP includes income that American citizens earn abroad.

2. GNP excludes income that foreigners earn in the United States.

B. Net National Product (NNP) is the total income of a nation's residents (GNP) minus losses from depreciation (wear and tear on an economy's stock of equipment and structures).

C. National income is the total income earned by a nation's residents in the production of goods and services.

1. National income differs from NNP by excluding indirect business taxes and including business subsidies.

2. NNP and national income also differ due to "statistical discrepancy."

D. Personal income is the income that households and noncorporate businesses receive.

E. Disposable personal income is the income that households and noncorporate businesses have left after taxes and other obligations to the government.

M2: Measuring the Cost of Living

I. The Consumer Price Index

A. Definition of <u>consumer price index (CPI)</u>: a measure of the overall cost of the goods and services bought by a typical consumer.

B. How the Consumer Price Index Is Calculated

<u>Table 3 Calculating the Consumer Price Index and the Inflation Rate: An Example</u>

Step 1: Survey Consumers to Determine a Fixed Basket of Goods

Basket = 4 hot dogs, 2 hamburgers

Step 2: Find the Price of Each Good in Each Year

Year	Price of Hot Dogs	Price of Hamburgers
2016	$1	$2
2017	2	3
2018	3	4

Step 3: Compute the Cost of the Basket of Goods in Each Year

2016	($1 per hot dog × 4 hot dogs) + ($2 per hamburger × 2 hamburgers) = $8 per basket
2017	($2 per hot dog × 4 hot dogs) + ($3 per hamburger × 2 hamburgers) = $14 per basket
2018	($3 per hot dog × 4 hot dogs) + ($4 per hamburger × 2 hamburgers) = $20 per basket

Step 4: Choose One Year as a Base Year (2016) and Compute the CPI in Each Year

2016	($8/$8) × 100 = 100
2017	($14/$8) × 100 = 175
2018	($20/$8) × 100 = 250

Step 5: Use the CPI to Compute the Inflation Rate from Previous Year

2017	(175 − 100)/100 × 100 = 75%
2018	(250 − 175)/175 × 100 = 43%

1. Fix the basket.

   a. The Bureau of Labor Statistics uses surveys to determine a representative bundle of goods and services purchased by a typical consumer.

   b. Example: 4 hot dogs and 2 hamburgers.

2. Find the prices.

   a. Prices for each of the goods and services in the basket must be determined for each time period.

   b. Example:

Year	Price of Hot Dogs	Price of Hamburgers
2016	$1	$2
2017	$2	$3
2018	$3	$4

3. Compute the basket's cost.

   a. By keeping the basket the same, only prices are being allowed to change. This allows us to isolate the effects of price changes over time.

b. Example:

$$\text{Cost in 2016} = (\$1 \times 4) + (\$2 \times 2) = \$8.$$
$$\text{Cost in 2017} = (\$2 \times 4) + (\$3 \times 2) = \$14.$$
$$\text{Cost in 2018} = (\$3 \times 4) + (\$4 \times 2) = \$20.$$

4. Choose a base year and compute the index.

a. The base year is the benchmark against which other years are compared.

b. The formula for calculating the price index is:

$$\text{Consumer Price Index} = \frac{\text{Price of basket of goods and services in current year}}{\text{Price of basket in base year}} \times 100$$

c. Example (using 2016 as the base year):

$$\text{CPI for 2016} = (\$8)/(\$8) \times 100 = 100.$$
$$\text{CPI for 2017} = (\$14)/(\$8) \times 100 = 175.$$
$$\text{CPI for 2018} = (\$20)/(\$8) \times 100 = 250.$$

5. Compute the inflation rate.

a. Definition of <u>inflation</u>: a sustained rise in most prices in the economy.

b. Definition of <u>inflation rate</u>: the percentage change in the price index from the preceding period.

c. The formula used to calculate the inflation rate is:

$$\text{Inflation rate in year 2} = \frac{\text{CPI in year 2 - CPI in year 1}}{\text{CPI in year 1}} \times 100$$

d. Example:

$$\text{Inflation Rate for 2017} = (175 - 100)/100 \times 100 = 75\%.$$
$$\text{Inflation Rate for 2018} = (250 - 175)/175 \times 100 = 43\%.$$

C. The Producer Price Index

1. Definition of <u>producer price index (PPI)</u>: a measure of the cost of a basket of goods and services bought by firms.

2. Because firms eventually pass on higher costs to consumers in the form of higher prices on products, the producer price index is believed to be useful in predicting changes in the CPI.

D. Problems in Measuring the Cost of Living

1. Substitution Bias

a. When the price of one good changes, consumers often respond by substituting another good in its place.

b. The CPI does not allow for this substitution; it is calculated using a fixed basket of goods and services.

c. This implies that the CPI overstates the increase in the cost of living over time.

2. Introduction of New Goods

    a. When a new good is introduced, consumers have a wider variety of goods and services from which to choose.

    b. This makes every dollar more valuable, which lowers the cost of maintaining the same level of economic well-being.

    c. Because the market basket is not revised often enough, these new goods are left out of the bundle of goods and services included in the basket.

3. Unmeasured Quality Change

    a. If the quality of a good falls from one year to the next, the value of a dollar falls; if quality rises, the value of the dollar rises.

    b. Attempts are made to correct prices for changes in quality, but it is often difficult to do so because quality is hard to measure.

4. The size of these problems is also difficult to measure.

5. Many economists believe that the CPI overstates the rate of inflation by approximately one-half percentage point per year.

6. The issue is important because many government transfer programs (such as Social Security) are tied to increases in the CPI.

E. The GDP Deflator versus the Consumer Price Index

1. The GDP deflator reflects the prices of all goods produced domestically, while the CPI reflects the prices of all goods bought by consumers.

2. The CPI compares the prices of a fixed basket of goods over time, while the GDP deflator compares the prices of the goods currently produced to the prices of the goods produced in the base year. This means that the group of goods and services used to compute the GDP deflator changes automatically over time as output changes.

<u>Figure 2 Two Measures of Inflation</u>
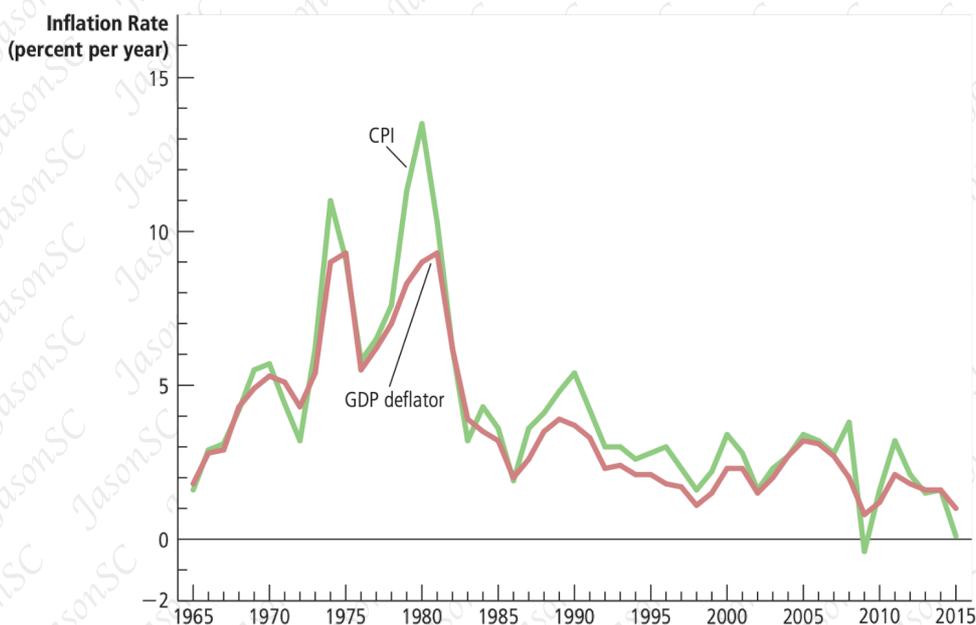
II. Correcting Economic Variables for the Effects of Inflation

A. Dollar Figures from Different Times

1. The formula for turning dollar figures from year T into today's dollars is the following:

$$\text{Amount in today's dollars} = \text{Amount in year T dollars} \times \frac{\text{Price level today}}{\text{Price level in year T}}$$

2. A price index such as the CPI measures the price level and thus determines the size of the inflation correction.

3. Example: Babe Ruth's 1931 salary in 2015 dollars:

$$\text{Salary in 2015 dollars} = \text{Salary in 1931 dollars} \times \frac{\text{Price level in 2015}}{\text{Price level in 1931}}$$

Salary in 2015 dollars = $80,000 × (229.5/15.2).
Salary in 2015 dollars = $1,207,894.

B. Real and Nominal Interest Rates

1. Example: Sally Saver deposits $1,000 into a bank account that pays an annual interest rate of 10%. A year later, she withdraws $1,100.

2. What matters to Sally is the purchasing power of her money.

    a. If there is zero inflation, her purchasing power has risen by 10%.

    b. If there is 6% inflation, her purchasing power has risen by about 4%.

    c. If there is 10% inflation, her purchasing power has remained the same.

    d. If there is 12% inflation, her purchasing power has declined by about 2%.

    e. If there is 2% deflation, her purchasing power has risen by about 12%.

3. Definition of <u>nominal interest rate</u>: the interest rate that measures the change in dollar amounts.

4. Definition of <u>real interest rate</u>: the interest rate corrected for inflation.

$$\text{real interest rate} = \text{nominal interest rate} - \text{inflation rate}$$

C. The Fisher Effect

1. Recall that the real interest rate is equal to the nominal interest rate minus the inflation rate.

2. This, of course, means that:

$$\text{nominal interest rate} = \text{real interest rate} + \text{inflation rate}$$

3. Definition of <u>Fisher effect</u>: the one-for-one adjustment of the nominal interest rate to the inflation rate.

III. Cost of Inflation

A. A Fall in Purchasing Power? The Inflation Fallacy

1. Most individuals believe that the major problem caused by inflation is that inflation lowers the purchasing power of a person's income.

2. However, as prices rise, so do incomes. Thus, inflation does not in itself reduce the purchasing power of incomes.

B. Shoeleather Costs

1. Because inflation erodes the value of money that you carry in your pocket, you can avoid this drop in value by holding less money.

2. However, holding less money generally means more trips to the bank.

3. Definition of <u>shoeleather costs</u>: **the resources wasted when inflation encourages people to reduce their money holdings.**

4. This cost can be considerable in countries experiencing hyperinflation.

C. Menu Costs

1. Definition of <u>menu costs</u>: **the costs of changing prices.**

2. During periods of inflation, firms must change their prices more often.

D. Relative-Price Variability and the Misallocation of Resources

1. Because prices of most goods change only once in a while (instead of constantly), inflation causes relative prices to vary more than they would otherwise.

2. When inflation distorts relative prices, consumer decisions are distorted and markets are less able to allocate resources to their best use.

E. Inflation-Induced Tax Distortions

1. Lawmakers fail to take inflation into account when they write tax laws.

2. The nominal values of interest income and capital gains are taxed (not the real values).

F. Confusion and Inconvenience

1. Money is the yardstick that we use to measure economic transactions.

2. When inflation occurs, the value of money falls. This alters the yardstick that we use to measure important variables like incomes and profit.
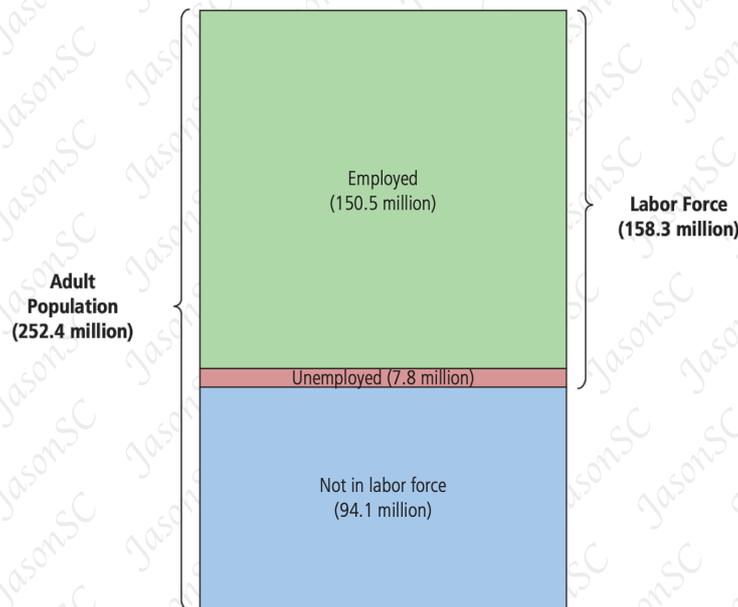
M3: Unemployment

I. Identifying Unemployment

A. How Is Unemployment Measured?

1. The Bureau of Labor Statistics (BLS) surveys about 60,000 households every month.

2. The BLS places each adult (age 16 or older) into one of three categories: **employed, unemployed, or not in the labor force.**

    a. <u>Employed</u>: This category includes those who worked as paid employees, worked in their own business, or worked as unpaid workers in a family member's business. Both full-time and part-time workers are counted. This category also includes those who were not working but who had jobs from which they were temporarily absent because of, for example, vacation, illness, or bad weather.

    b. <u>Unemployed</u>: This category includes those who were not employed, were available for work, and had tried to find employment during the previous four weeks. It also includes those waiting to be recalled to a job from which they had been laid off.

    c. <u>Not in the labor force</u>: This category includes those who fit neither of the first two categories, such as full-time students, homemakers, and retirees.

<u>Figure 3 The Breakdown of the Population in January 2016</u>

3. Definition of <u>labor force</u>: the total number of workers, including both the employed and the unemployed.

Labor force = Number of employed + Number of unemployed

4. Definition of <u>unemployment rate</u>: the percentage of the labor force that is unemployed.

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

5. Definition of <u>labor-force participation rate</u>: the percentage of the adult population that is in the labor force.

$$\text{Labor-force participation rate} = \frac{\text{Labor force}}{\text{Adult population}} \times 100$$

6. Example: Data from 2016. In that year, there were 150.5 million employed people and 7.8 million unemployed people.

   a. Labor Force = 150.5 + 7.8 = 158.3 million.

   b. Unemployment Rate = (7.8/158.3) × 100 = 4.9%.

   c. Because the adult population was 252.4 million, the labor-force participation rate was:

      Labor-Force Participation Rate = (158.3/252.4) × 100 = 62.7%.

B. Definition of <u>the natural rate of unemployment</u>: the normal rate of unemployment around which the unemployment rate fluctuates.

C. Definition of <u>cyclical unemployment</u>: the deviation of unemployment from its natural rate.

<u>Figure 4 Unemployment Rate since 1960</u>
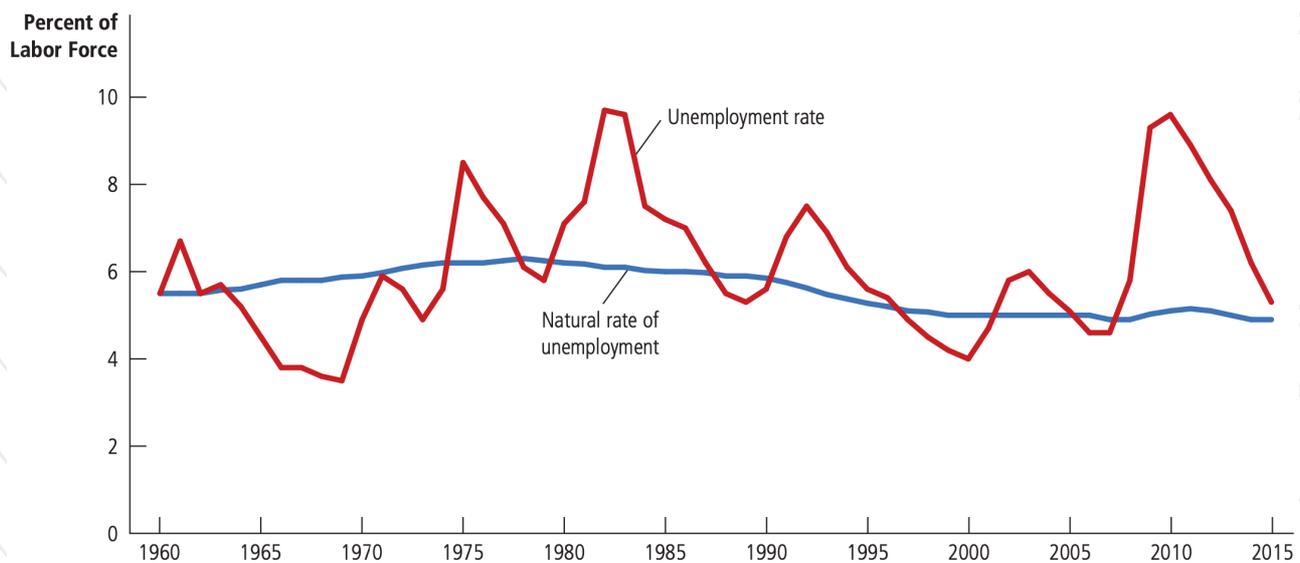
D. Does the Unemployment Rate Measure What We Want It To?

1. Measuring the unemployment rate is not as straightforward as it may seem.

2. There is a tremendous amount of movement into and out of the labor force.

   a. Many of the unemployed are new entrants or re-entrants looking for work.

   b. Many unemployment spells end with a person leaving the labor force as opposed to actually finding a job.

3. There may be individuals who are calling themselves unemployed to qualify for government assistance, yet they are not trying hard to find work. These individuals are more likely not a part of the true labor force, but they will be counted as unemployed.

4. Definition of <u>discouraged workers</u>: individuals who would like to work but have given up looking for a job.

    a. These individuals will not be counted as part of the labor force.

    b. Thus, while they are likely a part of the unemployed, they will not show up in the unemployment statistics.

E. Why Are There Always Some People Unemployed?

1. In an ideal labor market, wages would adjust so that the quantity of labor supplied and the quantity of labor demanded would be equal.

2. However, there is always unemployment even when the economy is doing well. The unemployment rate is never zero; it fluctuates around the natural rate.

    a. Definition of <u>frictional unemployment</u>: unemployment that results because it takes time for workers to search for the jobs that best suit their tastes and skills.

    b. Definition of <u>structural unemployment</u>: unemployment that results because the number of jobs available in some labor markets is insufficient to provide a job for everyone who wants one.

    c. Three possible reasons for structural unemployment are minimum-wage laws, unions, and efficiency wages.

II. Job Search

A. Definition of <u>job search</u>: the process by which workers find appropriate jobs given their tastes and skills.

B. Because workers differ from one another in terms of their skills and tastes and jobs differ in their attributes, it is often difficult for workers to match with the appropriate job.

C. Why Some Frictional Unemployment Is Inevitable

1. Frictional unemployment often occurs because of a change in the demand for labor among different firms.

    a. When consumers decide to stop buying a good produced by Firm A and instead start buying a good produced by Firm B, some workers at Firm A will likely lose their jobs.

    b. New jobs will be created at Firm B, but it will take some time to move the displaced workers from Firm A to Firm B.

   c. The result of this transition is a period of unemployment.

    d. The same situation can occur across industries and regions as well.

2. This implies that, because the economy is always changing, frictional unemployment is inevitable. Workers in declining industries will find themselves looking for new jobs, and firms in growing industries will be seeking new workers.

III. Minimum-Wage Laws

A. Unemployment can also occur because of minimum-wage laws.

Figure 5 Unemployment from a Wage above the Equilibrium Level
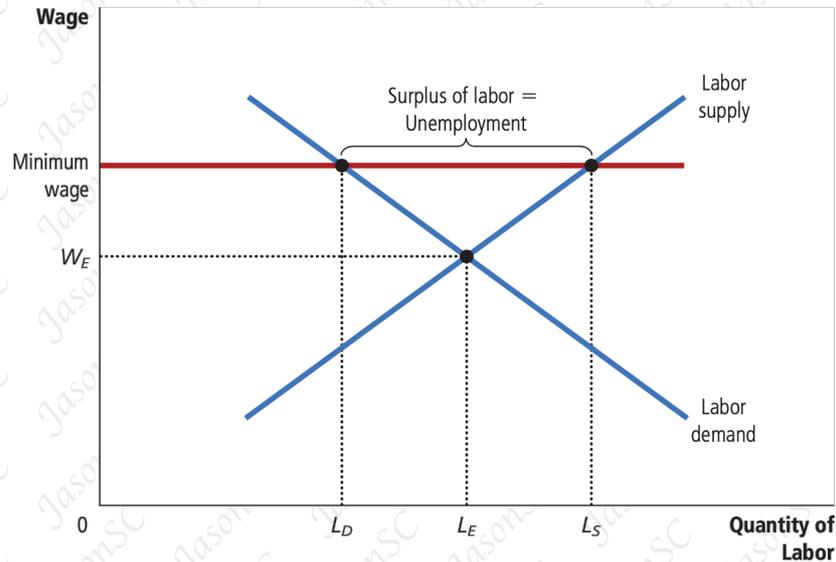
1. If the minimum wage is set above the equilibrium wage in the labor market, a surplus of labor will occur.

2. While minimum-wage laws are one reason unemployment exists in the U.S. economy, they do not affect everyone.

 a. The vast majority of workers in the economy have wages well above the legal minimum, so the law does not prevent most wages from adjusting to balance supply and demand.

 b. Minimum-wage laws therefore have the largest affect on the least skilled and least experienced members of the labor force, such as teenagers.

B. Anytime a wage is kept above the equilibrium level for any reason, the result is unemployment.

1. Other causes of this situation include unions and efficiency wages.

2. This situation is different from frictional unemployment where the search for the right job is the reason for unemployment.

IV. Unions and Collective Bargaining

A. Definition of <u>union</u>: a worker association that bargains with employers over wages and working conditions.

B. Unions play a smaller role in the U.S. economy today than they did in the past. However, unions continue to be prevalent in many European countries.

C. The Economics of Unions

1. Definition of <u>collective bargaining</u>: the process by which unions and firms agree on the terms of employment.

2. Unions try to negotiate for higher wages, better benefits, and better working conditions than the firm would offer if there were no union.

3. Definition of **strike**: the organized withdrawal of labor from a firm by a union.

4. Economists have found that union workers typically earn 10% to 20% more than similar workers who do not belong to unions.

5. This implies that unions raise the wage above the equilibrium wage, resulting in unemployment.

    a. Unions are often believed to cause conflict between insiders (who benefit from high union wages) and outsiders (who do not get the union jobs).

    b. Outsiders will either remain unemployed or find jobs in firms that are not unionized.

    c. The supply of workers in nonunion firms will increase, pushing wages at those firms down.

V. The Theory of Efficiency Wages

A. Definition of **efficiency wages**: above-equilibrium wages paid by firms in order to increase worker productivity.

B. Efficiency wages raise the wage above the market equilibrium wage, resulting in unemployment.

C. There are several reasons why a firm may pay efficiency wages.

1. Worker Health

    a. Better-paid workers can afford to eat better and can afford good medical care.

    b. This is more applicable in developing countries where inadequate nutrition can be a significant problem.

2. Worker Turnover

    a. A firm can reduce turnover by paying a wage greater than its workers could receive elsewhere.

    b. This is especially helpful for firms that face high hiring and training costs.

3. Worker Quality

    a. Offering higher wages attracts a better pool of applicants.

    b. This is especially helpful for firms that are not able to perfectly gauge the quality of job applicants.

4. Worker Effort

    a. Again, if a firm pays a worker more than he or she can receive elsewhere, the worker will be more likely to try to protect his or her job by working harder.

    b. This is especially helpful for firms that have difficulty monitoring their workers.