UNIT 1: MEASURE OF ECONOMIC PERFORMANCE: 12-16% OF AP TEST

a. National income accounts
    a. Circular Flow
    b. Gross domestic product
    c. Components of GDP
    d. Real vs. Nominal GDP
b. Inflation measurement and adjustment
    a. Price indexes
    b. Nominal and real values
    c. Cost of inflation
c. Unemployment
    a. Definition and measurement
    b. Types of unemployment
    c. Natural rate of unemployment

CHAPTER 6

National Income Accounting

FUNDAMENTAL QUESTIONS

1. How is the total output of an economy measured?
2. Who produces the nation's goods and services?
3. Who purchases the goods and services produced?
4. Who receives the income from the production of goods and services?
5. What is the difference between nominal and real GDP?
6. What is a price index?

OVERVIEW AND OBJECTIVES

After reading and reviewing this chapter, the student should be able to:

1. Define national income accounting.
2. Calculate GDP as output, as expenditures, and as income.
2. Understand the difference between nominal and real GDP.

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3. Calculate a price index.
4. Name several types of price indexes.

KEY TERM REVIEW

national income accounting

gross domestic product (GDP)

intermediate good

value added

inventory

transfer payment

disposable personal income (DPI)

nominal GDP

real GDP

price index

base year

GDP price index

consumer price index (CPI)

cost of living adjustment (COLA)

producer price index (PPI)

1. Name items that would not count in the current year's GDP.
2. Construct your own market basket of goods based on the purchases you make. How does your market basket compare to that of your parents or of a senior citizen?
3. Is the GDP per capita a good measure of the society's welfare? Why or why not?

CHAPTER 8

Unemployment and Inflation

FUNDAMENTAL QUESTIONS

1. What is a business cycle?
2. How is the unemployment rate defined and measured?
3. What is the cost of unemployed resources?
4. What is inflation?
5. Why is inflation a problem?

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OVERVIEW AND OBJECTIVES

After reading and reviewing this chapter, the student should be able to:

1. Describe the business cycle.
2. Define recession and depression.
3. Provide examples of leading, coincident, and lagging indicators.
4. Define and calculate the unemployment rate.
5. Explain limitations of the unemployment rate calculation.
6. List and explain the four basic types of unemployment.
7. Define inflation and discuss the two types of inflation.
8. Explain the difference between nominal and real interest rates.

KEY TERM REVIEW

business cycle

recession

depression

leading indicator

coincident indicator

lagging indicator

unemployment rate

discouraged workers

underemployment

potential real GDP

natural rate of unemployment

inflation

nominal interest rate

real interest rate

hyperinflation

OPPORTUNITIES FOR DISCUSSION

1. Why do economists and policymakers care about the business cycle?
2. Why and how do economists and policymakers use cyclical indicators?
3. What would our economy be like if unemployment were zero?
4. What would our economy be like if inflation were reduced to a zero rate?
5. What are the social costs of unemployment?

Exercise Questions: 1-9, 12,13,14,16

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All About GDP

Part A
Is This Counted as Part of GDP?

Which of the following are *included* and which are *excluded* in calculating GDP? Explain your decisions.

1. A monthly check received by an economics student who has been granted a government scholarship

2. A farmer's purchase of a new tractor

3. A plumber's purchase of a two-year-old used truck

4. Cashing a U.S. government bond

5. The services of a mechanic in fixing the radiator on his own car

6. A Social Security check from the government to a retired store clerk

7. An increase in business inventories

8. The government's purchase of a new submarine for the Navy

9. A barber's income from cutting hair

10. Income received from the sale of Nike stock

Part A adapted from William B. Walstad, Michael W. Watts, Robert F. Smith and Campbell R. McConnell, *Instructor's Manual to Accompany Economics,* 10th ed. (New York: McGraw-Hill Book Co., 1987), p. 33. Parts B and C written by John Morton, National Council on Economic Education, New York, N.Y.

Part B
GDP: Is It Counted and Where?

For each of the following items, write one of the following in the space provided:

C if the item is counted as *consumption spending.*
I if the item is counted as *investment spending.*
G if the item is counted as *government spending.*
NX if the item is counted as *net exports.*
NC if the item is *not counted* in GDP.

____ 11. You spend $7.00 to attend a movie.

____ 12. A family pays a contractor $100,000 for a house he built for them this year.

____ 13. A family pays $75,000 for a house built three years ago.

____ 14. An accountant pays a tailor $175 to sew a suit for her.

____ 15. The government increases its defense expenditures by $1,000,000,000.

____ 16. The government makes a $300 Social Security payment to a retired person.

____ 17. You buy General Motors Corp. stock for $1,000 in the stock market.

____ 18. At the end of a year, a flour-milling firm finds that its inventories of grain and flour are $10,000 above the amounts of its inventories at the beginning of the year.

____ 19. A homemaker works hard caring for her spouse and two children.

____ 20. Ford Motor Co. buys new auto-making robots.

____ 21. You pay $300 a month to rent an apartment.

____ 22. Apple Computer Co. builds a new factory in the United States.

____ 23. R.J. Reynolds Co. buys control of Nabisco.

____ 24. You buy a new Toyota that was made in Japan.

____ 25. You pay tuition to attend college.

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Part C
Why Are Items Counted or Not Counted in GDP?

26. We count only the final retail price of a new good or service in GDP. Why?

27. A purely financial transaction will not be counted in GDP. Why?

28. When a homeowner does home-improvement work, the value of the labor is not counted in GDP. Why?

Unit 6, Lesson 33

Handout Material

Events Affecting Spending on Consumption, Investment, Government Spending, or Net Exports

Due to a tax cut, consumers decide to buy more new cars. 1	*Worried about an increasing budget deficit, the government decides to buy fewer military planes.* 2	*Increasing prices in the U.S. encourage Americans to buy more foreign goods.* 3
Due to a tax increase, consumers decrease purchases on vacation travel. 4	*Due to increased incomes, Europeans buy more U.S. goods and services.* 5	*A foreign government imposes a tariff that discourages its citizens from buying goods from the U.S.* 6
Businesses are optimistic about the future and increase construction of new factories. 7	*Many more Americans decide to buy Japanese cars rather than American cars.* 8	*Households worry about future unemployment and decide to spend less income.* 9
Because interest rates increased, businesses cut back on spending for new machinery. 10	*Consumers feel good about the future and take out loans to buy more durable goods such as washing machines.* 11	*Decreases in interest rates encourage businesses to take out loans to construct more buildings.* 12
To fight unemployment, the government decides to hire more people to work in national parks. 13	*Tax cuts to businesses give businesses incentives to buy more computers.* 14	*To stimulate the economy and provide jobs, the government builds more bridges in California.* 15

Types of Unemployment

There are three types of unemployment:

- *Frictional unemployment* includes people who are temporarily between jobs. They may have quit one job to find another, or they could be trying to find the best opportunity after graduating from high school or college.
- *Cyclical unemployment* includes people who are not working because firms do not need their labor due to a lack of demand or a downturn in the business cycle. For example, if people are not buying many goods and services, workers are laid off.
- *Structural unemployment* involves mismatches between job seekers and job openings. Unemployed people who lack skills or do not have sufficient education are structurally unemployed.

At full employment, we have frictional and structural unemployment, but cyclical unemployment would be zero. At full employment, the level of unemployment is called the *natural rate of unemployment.*

For each of the following situations, put the appropriate letter before the example.

F if it is an example of *frictional* unemployment.

C if it is an example of *cyclical* unemployment.

S if it is an example of *structural* unemployment.

___ 1. A computer programmer is laid off because of a recession.

___ 2. A literary editor leaves her job in New York to look for a new job in San Francisco.

___ 3. An unemployed college graduate is looking for his first job.

___ 4. Advances in technology make the assembly-line worker's job obsolete.

___ 5. Slumping sales lead to the cashier being laid off.

___ 6. An individual refuses to work for minimum wage.

___ 7. A high school graduate lacks the skills necessary for a particular job.

___ 8. Workers are laid off when the local manufacturing plant closes because the product made there isn't selling.

___ 9. A skilled glass blower becomes unemployed when a new machine does her job faster.

Activity written by John Morton, National Council on Economic Education, New York, N.Y., and James Spellicy, Lowell High School, San Francisco, Calif.

Measuring Broad Economic Goals

Overview

The 1930s were marked by periods of chronically high unemployment in the United States. After World War II, Congress passed the Employment Act of 1946, which stated that it was the policy and responsibility of the federal government to use all practical means to promote maximum employment, production and purchasing power. The Employment Act of 1946 established three important goals for the economy:

1. *Full employment* (also called the natural level of employment) exists when most individuals who are willing to work at the prevailing wages in the economy are employed and the average price level is stable. Even under conditions of full employment, there will be some temporary unemployment as workers change jobs and as new workers seek their first jobs (*frictional* unemployment). In addition, there will be some *structural* unemployment. Structural unemployment exists because there is a mismatch between the skills of the people seeking jobs and the skills required for available jobs.

2. *Price stability* exists when the average level of prices in the economy is neither increasing nor decreasing. The goal of price stability does not imply that prices of individual items should not change — only that the average level of prices should not. A sustained rise in the average level of prices is called *inflation*; a sustained decline is called *deflation*.

3. *Economic growth* exists when the economy produces increasing amounts of goods and services over the long term. If the increase is greater than the increase in population, the amount of goods and services available per person will rise, and thus the nation's standard of living will improve.

In 1978, Congress passed the Full Employment and Balanced Growth (Humphrey-Hawkins) Act establishing two additional goals: an unemployment rate of 4 percent with a zero-percent inflation rate.

Measuring the Achievement of Economic Goals

To determine how well we are achieving the economic goals, we must measure the levels of employment, prices and economic growth. We look at how such measurements are commonly made.

Part A
Measuring Employment

The civilian unemployment rate measures how well we are achieving the goal of full employment. The unemployment rate is derived from a national survey of about 60,000 households. Each month the federal government asks these households about the employment status of household members aged 16 and older (adult population). The survey puts each person in one of three categories: employed, unemployed or not in the labor force. People who are at work (the employed) plus those who are actively looking for work (the unemployed) make up the *labor force*. The labor force is much smaller than the total adult population because many individuals are too old to work, some people are unable to work and some choose not to work.

Adapted from *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 126.

The *unemployment rate* (UR) is defined as

$$UR = \frac{\text{number of unemployed}}{\text{labor force}} \times 100$$

The *labor force participation rate* (LFPR) is defined as:

$$LFPR = \frac{\text{number in labor force}}{\text{adult population}} \times 100$$

How well has the U.S. economy met the goal of full employment? Use the formulas just given to fill in the last three columns of Figure 11.1. All of the population and labor-force data are in millions.

Figure 11.1

Civilian Employment 1960 to 2000

Year	Civilian Noninstitutional Population Aged 16 and Over	Civilian Labor Force			Unemployment Rate	Labor Force Participation Rate
		Employed	Unemployed	Total		
1960	117	66	4			
1970	137	79	4			
1980	168	99	8			
1990	188	117	7			
2000	209	135	6			

1. In which year was the economy very close to full employment as indicated in the Humphrey-Hawkins Act?

2. Why has the labor force participation rate increased since the 1960s?

3. Do the data on the national unemployment rate in Figure 11.1 reflect the extent of unemployment among a particular group in our society, such as teenagers aged 16 to 19? Explain.

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Part B
Measuring Price Changes

Price indexes measure price changes in the economy. By using a price index, you can combine the prices of a number of goods and/or services and express in one number the average change for all the prices. The consumer price index, or CPI, is the measure of price changes that is probably most familiar to people. It measures changes in the prices of goods and services commonly bought by consumers. Items on which the average consumer spends a great deal of money — such as food — are given more weight (importance) in computing the index than items such as newspapers, magazines and books, on which the average consumer spends comparatively less.

The index itself is based on a market basket of approximately 400 goods and services weighted according to how much the average consumer spent in the base year. Other price indexes used in the United States include

- the producer price index, which measures changes in the prices of consumer goods before they reach the retail level, as well as the prices of supplies and equipment businesses buy, and
- the gross domestic product price deflator, or GDP price deflator, which is the most inclusive index available because it takes into account all goods and services produced.

To construct any price index, economists select a previous period, usually one year, to serve as the base period. The prices of any subsequent period are expressed as a percentage of the base period. For convenience, the base period of almost all indexes is set at 100.

For the consumer price index, the formula used to measure price change from the base period is

$$\text{Consumer price index} = \frac{\text{weighted cost of base-period items in current-year prices}}{\text{weighted cost of base-period items in base-year prices}} \times 100$$

We multiply by 100 to express the index relative to the figure of 100 for the base period.

To keep things simple, let's say an average consumer in our economy buys only three items, as described in Figure 11.2. First compute the cost of buying all the items in the base year:

30 x $5.00	=	$150
40 x $6.00	=	240
60 x $1.50	=	90
TOTAL	=	$480

To compute the consumer price index for Year 1 in Figure 11.2, find the cost of buying these same items in Year 1. Try this yourself. Your answer should be $530: the sum of (30 x $7) + (40 x $5) + (60 x $2). The consumer price index for Year 1 is then equal to ($530 / $480) x 100, which equals 110.4. This means that what we could have bought for $100 in the base year costs $110.40 in Year 1.

If we subtract the base year index of 100.0 from 110.4, we get the percentage change in prices from the base year. In this example, prices rose 10.4% from the base year to Year 1.

Remember that the weights used for the consumer price index are determined by what consumers bought in the base year; in the example we used base-year quantities to figure the expenditures in

Year 1 as well as in the base year. The rate of change in this index is determined by looking at the percentage change from one year to the next. If, for example, the consumer price index were 150 in one year and 165 the next, then the year-to-year percentage change is 10 percent. You can compute the change using this formula:

$$\text{Price change} = \frac{\text{change in CPI}}{\text{beginning CPI}} \times 100$$

Here's the calculation for the example above:

$$\text{Price change} = \frac{165 - 150}{150} \times 100 = 10\%$$

Fill in the blanks in Figure 11.2, and then use the data to answer the questions.

Figure 11.2

Prices of Three Goods Compared with Base-Year Price

	Quantity Bought in Base Year	Unit Price in Base Year	Spending in Base Year	Unit Price in Year 1	Spending in Year 1	Unit Price in Year 2	Spending in Year 2
Whole pizza	30	$5.00		$7.00		$9.00	
Prerecorded audio cassette	40	6.00		5.00		4.00	
Six-pack of soda	60	1.50		2.00		2.50	
Total	—	—		—		—	

4. What is the total cost of buying all the items in Year 2? ____________

5. What is the CPI for Year 2? ____________

6. What is the percentage increase in prices from the base year to Year 2? ____________

7. In August 2000 the CPI was 172.8, and in August 2001 the CPI was 177.50. What was the percentage change in prices for this 12-month period? ____________

Part C
Measuring Short-Run Economic Growth

To measure fluctuations in output (short-run economic growth), we measure increases in the quantity of goods and services produced in the economy from quarter to quarter or year to year. The *gross domestic product,* or GDP, is commonly used to measure economic growth. The GDP is the dollar value at market prices of all final goods and services produced in the economy during a stated period.

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Final goods are goods intended for the final user. For example, gasoline is a final good; but crude oil, from which gasoline and other products are derived, is not.

Before using GDP to measure output growth, we must first adjust GDP for price changes. Let's say GDP in Year 1 is $1,000 and in Year 2 it is $1,100. Does this mean the economy has grown 10 percent between Year 1 and Year 2? Not necessarily. If prices have risen, part of the increase in GDP in Year 2 will merely represent the increase in prices. We call GDP that has been adjusted for price changes *real* GDP. If it isn't adjusted for price changes, we call it *nominal* GDP.

To compute real GDP in a given year, use the following formula:

$$\text{Real GDP in Year 1} = (\text{nominal GDP} \times 100) / \text{price index}$$

To compute real output growth in GDP from one year to another, subtract real GDP for Year 2 from real GDP in Year 1. Divide the answer (the change in real GDP from the previous year) by real GDP in Year 1. The result, multiplied by 100, is the percentage growth in real GDP from Year 1 to Year 2. (If real GDP declines from Year 1 to Year 2, the answer will be a negative percentage.) Here's the formula:

$$\text{Output growth} = \frac{(\text{real GDP in Year 2} - \text{real GDP in Year 1})}{\text{real GDP in Year 1}} \times 100$$

For example, if real GDP in Year 1 = $1,000 and in Year 2 = $1,028, then the output growth rate from Year 1 to Year 2 is 2.8%: (1,028 – 1,000) / 1,000 = .028, which we multiply by 100 in order to express the result as a percentage.

To understand the impact of output changes, we usually look at real GDP per capita. To do so, we divide the real GDP of any period by a country's average population during the same period. This procedure enables us to determine how much of the output growth of a country simply went to supply the increase in population and how much of the growth represented improvements in the standard of living of the entire population. In our example, let's say the population in Year 1 was 100 and in Year 2 it was 110. What was real GDP per capita in Years 1 and 2?

Year 1

$$\text{Real GDP per capita} = \frac{\text{Year 1 real GDP}}{\text{population in Year 1}} = \frac{\$1{,}000}{100} = \$10$$

Year 2

$$\text{Real GDP per capita} = \frac{\$1{,}028}{110} = \$9.30$$

In this example, the average standard of living fell even though output growth was positive. Developing countries with positive output growth but high rates of population growth often experience this condition.

Now try these problems using the information in Figure 11.3.

Figure 11.3
Nominal and Real GDP

	Nominal GDP	Price Index	Population
Year 3	$5,000	125	11
Year 4	$6,600	150	12

8. What is the real GDP in Year 3? ____________

9. What is the real GDP in Year 4? ____________

10. What is the real GDP per capita in Year 3? ____________

11. What is the real GDP per capita in Year 4? ____________

12. What is the rate of real output growth between Years 3 and 4? ______________

13. What is the rate of real output growth per capita between Years 3 and 4? ______________
(Hint: Use per-capita data in the output growth rate formula.)

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Price Indexes

There is more than one method for constructing a price index. The easiest to understand is probably the *weighted-average* method explained in this activity. This method compares the total cost of a fixed market basket of goods in different years. The total cost is weighted by multiplying the price of each item in the basket by the number of units of the item in the basket and then adding up all the prices. The cost of the basic market basket in the current year is then expressed as a percentage of the cost of the basic market basket in the base year using this formula:

$$\text{index number} = \frac{\text{current-year cost}}{\text{base-year cost}} \times 100$$

Multiplying by 100 converts the number so it is comparable to the base-year number. The base year always has an index number of 100 since the current-year cost and the base-year cost of the market basket are the same in the base year.

Part A
Constructing a Price Index

Using this information, let us now construct a price index. Fill in the blanks in Figure 13.1.

Figure 13.1
Constructing a Price Index

		Year 1		Year 2		Year 3	
Basic Market Basket Item	No. of Units	Price Per Unit	Cost of Market Basket	Price Per Unit	Cost of Market Basket	Price Per Unit	Cost of Market Basket
Cheese	2 lbs.	$1.75	$3.50	$1.50	$3.00	$1.50	$3.00
Blue Jeans	2 pair	12.00	24.00	15.50		20.00	40.00
Gasoline	10 gals.	1.25	12.50	1.60	16.00	2.70	
Total Expenditure	—	—	$40.00	—	$50.00	—	

1. We now have the information needed to construct a price index. The first step is to pick a base year and apply the formula. If Year 1 is selected as the base year, the index number for Year 1 is ($40 / $40) x 100 = 100. The index number for Year 2 is ($50 / $40) x 100 = 125 and the index number for Year 3 is (__________ / $40) x 100 = _____________.

2. These index numbers indicate that there was a 25 percent increase in prices between Year 1 and Year 2.

   (A) What is the percentage increase between Year 1 and Year 3? _____________.

   (B) What is the percentage increase between Year 2 and Year 3? _____________.

Adapted from Phillip Saunders, *Introduction to Macroeconomics: Student Workbook*, 18th ed. (Bloomington, Ind., 1998). Copyright 1998 Phillip Saunders. All rights reserved.

Part B
Changing the Base Year

We need not have chosen Year 1 to be our base year. To determine if our choice of base year influenced the results, let's use Year 2 as our base year and recompute both the index numbers and the percentage changes between years. The first percentage change in prices has been done for you.

Figure 13.2
Changing the Base Year of a Price Index

Year	Index Numbers (Year 2 = Base)	Percentage Change in Prices (calculated by using changes in index numbers)	
Year 1	($40 / $50) x 100 = 80	Between Yr. 1 and Yr. 2	([100 − 80] / 80) x 100 = 25%
Year 2	($50 / $50) x 100 = 100	Between Yr. 2 and Yr. 3	
Year 3	($70 / $50) x 100 = 140	Between Yr. 1 and Yr. 3	

3. Do the index numbers change when the base year is changed from Year 1 to Year 2? ___________

4. Does the percentage change in prices between years change when the base year is changed from Year 1 to Year 2? ___________ Why or why not?

5. Would the price index numbers you have computed above change if a different set of expenditure patterns were selected for weighting? ___________ Why?

6. Under what conditions would each price index number computed above be a cost-of-living index?

7. Would each price index number computed above be accurate if the quality of the goods in the basic market basket changed? ___________ Explain why.

8. How do you know if the quality of a product changes for the better? For the worse?

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