Why It Matters

If you go to the doctor for a checkup, she will take your vital signs—your temperature, your blood pressure, and your pulse rate. When it comes to the economy, economists do much the same. This chapter discusses many of the measurements that economists make to determine the health of the economy.

First, economists want to measure the total output of the economy. They want to measure the total market value of all the goods and services produced annually in the United States. Think of it in this way: each year, people in the United States produce goods and services—cars, houses, computers, attorney services, and so on. Economists want to know the total dollar value of all these goods and services.

Another vital sign that economists want to monitor is prices. Are prices in the economy rising? If so, how fast are they rising? Are they rising by 1 percent, 3 percent, or 5 percent? Are prices falling? If so, how fast are they falling?

As you read this chapter, think of the economy as a patient in a doctor’s office. Instead of the doctor checking out the economy, an economist will take the economy’s “pulse,” “height and weight,” and other vital signs. In later chapters you will learn more about the remedies economists prescribe for an unhealthy economy.
The following events occurred one day in June.

1:13 P.M. Jones, the plumber, is just finishing up the job at Kevin’s apartment. Kevin asks Jones how much he owes him. Jones says, “$210.” “Okay,” says Kevin as he takes out his checkbook. “Oh, and by the way,” Jones adds, “could you pay me in cash?”

• Why does Jones want to be paid in cash?

1:34 P.M. The economics professor is telling her class that China has one of the highest gross domestic products of any country in the world. A student remarks, “But I thought China was a poor country. How can a poor country have a high gross domestic product?”

• How can a country have a high GDP and be poor too?

2:34 P.M. Beverlee Smith picks up the phone to call her parents, both of whom are retired. When her father answers the phone, Beverlee blurts out, “I got the job. And I got the salary I asked for—$60,000.” Her father replies, “That’s a great salary—you’re rich. After all, your mother and I lived comfortably on my first salary of $8,000.”

• What mistake is Beverlee’s father making in comparing his first salary (years ago) with her salary today?

8:00 P.M. Jimmy and Ellie are in their seats in the dark movie theater as the trailers play. They’re waiting for the start of the movie. Ads for the movie have been running on television for weeks. Jimmy turns to Ellie and whispers, “I heard that this movie might be the biggest box office hit of all time—even bigger than Titanic.”

• What’s the best way to compare the gross receipts of two movies?

11:03 P.M. Sam is watching a report on the 11 o’clock news about the growth rate in per capita real GDP in the United States over the last year. Sam is bored to tears. He says under his breath, “Who really cares about such things? That stuff doesn’t affect anyone.”

• Is Sam right that the growth rate in per capita real GDP doesn’t affect anyone?
What Is Gross Domestic Product?

A family has an income. For example, the annual income of the Smith family might be $90,000. A country has an income too, but we don’t call it an income. Instead, we call it gross domestic product. Gross domestic product (GDP) is the total market value of all final goods and services produced annually in a country. (Note: Sometimes GDP is referred to as nominal GDP. This is sometimes done to distinguish it from real GDP, which we will discuss later.)

Suppose in a tiny economy only three goods are produced in these quantities: 10 computers, 10 cars, and 10 watches. We’ll say that the price of a computer is $2,000, the price of a car is $20,000, and the price of a watch is $100. If we wanted to find the GDP of this small economy—that is, if we wanted to find the total market value of the goods produced during the year—we would multiply the price of each good times the quantity of the good produced and then add the dollar amounts. (See Exhibit 11-1.)

1. Find the market value for each good produced. Multiply the price of each good times the quantity of the good produced. For example, if 10 computers are produced and the price of each is $2,000, then the market value of computers is $20,000.

2. Sum the market values.

Here are the calculations:

- Market value of computers = $2,000 \times 10\text{ computers} = $20,000
- Market value of cars = $20,000 \times 10\text{ cars} = $200,000
- Market value of watches = $100 \times 10\text{ watches} = $1,000
- Gross domestic product = $20,000 + $200,000 + $1,000 = $221,000

This total, $221,000, is the gross domestic product, or GDP, of the tiny economy.

**Example:** A tiny economy has two goods, A and B. It produces 100 units of A and 200 units of B this year. The price of A is
$4 and the price of B is $6. It follows that its GDP is $1,600. We got this dollar figure by finding the market value of A ($4 per 100 units = $400), the market value of B ($6 per 200 units = $1,200), and then adding the two values. ♦

Why Count Only Final Goods?

The definition of GDP specifies “final goods and services”; GDP is the total market value of all final goods and services produced annually in a country. Economists often distinguish between a final good and an intermediate good.

A final good is a good sold to its final user. When you buy a hamburger at a fast-food restaurant, for example, the hamburger is a final good. You are the final user; no one uses (eats) the hamburger other than you.

An intermediate good, in contrast, has not reached its final user. For example, consider the bun that the restaurant buys and on which the hamburger is placed. The bun is an intermediate good at this stage, because it is not yet in the hands of the final user (the person who buys the hamburger). It is in the hands of the people who run the restaurant, who use the bun, along with other goods (lettuce, mustard, hamburger meat), to produce a hamburger for sale.

When computing GDP, economists count only final goods and services. If they counted both final and intermediate goods and services, they would be double counting, or counting a good more than once.

Suppose that a book is a final good and that paper and ink are intermediate goods used to produce the book. In a way, we can say that the book is paper and ink (book = paper + ink). If we were to calculate the GDP by adding together the value of the book, the paper, and the ink (book + paper + ink), we would, in effect, be counting the paper and ink twice. Because the book is paper and ink, once we count the book, we have automatically counted the paper and the ink. It is not necessary to count them again. ♦

EXAMPLE: A car is made up of many intermediate goods: tires, engine, steering wheel, radio, and so on. When computing GDP, we count only the market value of the car, not the market value of the car plus the market value of the tires, engine, and other intermediate goods. ♦

QUESTION: I assume that each country in the world computes its GDP. Why is GDP so important?

ANSWER: Countries are interested in computing their GDP for much the same reason that individuals are interested in knowing their income. Just as knowledge of your income from one year to the next lets you know “how you’re doing,” GDP does much the same for countries. Exhibit 11-2 on the next page shows the GDP for certain countries and for the world in 2004.
Does GDP Omit Anything?

Some exchanges that take place in an economy are omitted from the GDP measurement. The following are not included when calculating GDP.

Illegal Goods and Services

For something to be included in the calculation of GDP, that something has to be capable of being counted. Illegal trades are not capable of being counted, for obvious reasons. For example, when someone makes an illegal purchase, no record is made of the transaction. The criminals involved in the transaction do everything in their power to prevent anyone from knowing about the transaction.

**Example:** As you know, it is illegal in the United States to buy and sell drugs such as cocaine, heroin, and methamphetamine. Suppose a person pays $400 to buy some of an illegal drug. This $400 is not counted in GDP. If, however, the person spends $40 to buy a book, this $40 is counted in GDP. It is not illegal to buy a book.

Transactions of Legal Goods and Services with No Record

Suppose a gardener goes to someone’s house and offers to mow the lawn and prune the shrubbery for $35 a week. The person agrees. The gardener then asks that he be paid in cash instead of by check and that no written record of the transaction be made. The payment for these gardening services does not find its way into GDP. A cash payment and no sales receipt mean that no evidence shows that a transaction was ever made.

Some Nonmarket Goods and Services

Some goods and services are traded, but not in an official market setting. Let’s say that Eileen Montoya cooks, cleans, and takes
care of all financial matters in the Montoya household. She is not paid for doing these activities; she does not receive a weekly salary from the family. Because she is not paid, the value of the work she performs is not counted in GDP.

**Example:** Jayne has three young boys, ages 2 to 6. She cuts their hair every few weeks. The “market value” of these haircuts is not counted in GDP. However, if Jayne took her boys to a barber, and he cut their hair, what the barber charged for haircuts would be counted in GDP.

**Sales of Used Goods**

Suppose you buy a used car tomorrow. Will this purchase be recorded in this year’s GDP statistics? No, a used car does not enter into the current year’s statistics because the car was counted when it was originally produced.

**Example:** Mario just sold his 2002 Toyota to Jackson for $7,000. This $7,000 is not counted in GDP.

**Stock Transactions and Other Financial Transactions**

Suppose Elizabeth buys 500 shares of stock from Keesha for a price of $100 a share. The total price is $50,000. The transaction is not included in GDP, because GDP is a record of goods and services produced annually in an economy. A person who buys stock is not buying a product but rather an ownership right in the firm that originally issued the stock. For example, when a person buys Coca-Cola stock, he is becoming an owner of the Coca-Cola Corporation.

**Government Transfer Payments**

In everyday life, one person makes a payment to another usually in exchange for a good or service. For example, Enrique may pay Harriet $40 to buy her old CD player.

When the government makes a payment to someone, it often does not get a good or service in exchange. When this happens, the payment is said to be a government transfer payment. For example, the Social Security check that 67-year-old Frank Simmons receives is a government transfer payment. Simmons, who is retired, is not currently supplying a good or service to the government in exchange for the Social Security check. Because GDP accounts for only current goods and services produced, and a transfer payment has nothing to do with current goods and services produced, transfer payments are properly omitted from GDP statistics. See Exhibit 11-3 for a review of items omitted from GDP.

**Quite a bit of economic data can be found on the Web. Go to the Economic Statistics Briefing Room at www.emcp.net/employment and click on “Employment” if you want to find the current civilian labor force, number of persons unemployed, and unemployment rate. Click on “Prices” if you want to find the one-month change in the CPI. If you want to find the most current GDP figures, go to the Bureau of Economic Analysis at www.emcp.net/GDPfigures and click on “Frequently Requested NIPA Tables” and then “Gross Domestic Product.”**

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**Exhibit 11-3 What the GDP Omits**

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal goods and services</td>
<td>A person buys an illegal substance.</td>
</tr>
<tr>
<td>Legal goods and services with no record of the transaction</td>
<td>A gardener works for cash, and no sales receipt exists.</td>
</tr>
<tr>
<td>Some nonmarket goods and services</td>
<td>A family member cooks, cleans, and mows the lawn.</td>
</tr>
<tr>
<td>Sales of used goods</td>
<td>You buy a used car.</td>
</tr>
<tr>
<td>Stock transactions and other financial transactions</td>
<td>You buy 100 shares of stock in a company</td>
</tr>
<tr>
<td>Government transfer payments</td>
<td>Frank Simmons receives a Social Security check.</td>
</tr>
</tbody>
</table>
The Difference Between GDP and GNP

Economists, government officials, and members of the public talk about GDP when they want to discuss the overall performance of the economy. They might say, “GDP has been on the rise” or “GDP has been declining a bit.” It was not always GDP that these individuals talked about, though. They used to talk about GNP, the gross national product. (In some international publications, you will read about gross national income, or GNI, instead of gross national product, GNP.)

What is the difference between GDP and GNP? GNP measures the total market value of final goods and services produced by U.S. citizens, no matter where in the world they reside. GDP, in contrast, is the total market value of final goods and services produced within the borders of the United States, no matter who produces them.

Suppose a U.S. citizen owns a business in Japan. The value of the output she is producing in Japan is counted in GNP because she is a U.S. citizen, but it is not counted in GDP because it was not produced within the borders of the United States. Now suppose a Canadian citizen is producing goods in the United States. The value of his output is not counted in GNP because he is not a U.S. citizen, but it is counted in GDP because it was produced within the borders of the United States. (See Exhibit 11-4.)

EXAMPLE: José is a Mexican citizen working in the United States. The dollar value of what he produces is counted in the U.S. GDP. Sabrina is a U.S. citizen living and working in Brazil. The dollar value of what she produces (in Brazil) is counted in U.S. GNP.

Defining Terms
1. Define:
   a. gross domestic product (GDP)
   b. double counting

Reviewing Facts and Concepts
2. In a simple economy, three goods are produced during the year, in these quantities: 10 pens, 20 shirts, and 30 radios. The price of pens is $4 each, the price of shirts is $30 each, and the price of radios is $35 each. What is GDP for the economy?
3. Why are only final goods and services computed in GDP?
4. Which of the following are included in the calculation of this year’s GDP?
   a. Twelve-year-old Bobby mowing his family’s lawn
   b. Terry Yanemoto buying a used car
   c. Barbara Wilson buying 100 shares of Chrysler Corporation stock
   d. Stephen Sidwhali’s receipt of a Social Security check
   e. An illegal sale at the corner of Elm and Jefferson

Critical Thinking
5. What is the difference (for purposes of measuring GDP) between buying a new computer and buying 100 shares of stock?

Applying Economic Concepts
6. The government does not now include the housework that a person does for his or her family as part of GDP. Suppose the government were to include housework. How might it go about placing a dollar value on housework?
How Is GDP Measured?

The GDP of the United States today is more than $12 trillion. How did economists come up with this figure? What exactly did they do to get this dollar amount?

First, economists break the economy into four sectors: the household sector, the business sector, the government sector, and the foreign sector. Next, they state a simple fact: the people in each of these sectors buy goods and services—that is, they make expenditures.

Economists give names to the expenditures made by each of the four sectors. The expenditures made by the household sector (or by consumers) are called consumption. The expenditures made by the business sector are called investment, and expenditures made by the government sector are called government purchases. (Government purchases include purchases made by all three levels of government—local, state, and federal.) Finally, the expenditures made by the residents of other countries on goods produced in the United States are called export spending. Exhibit 11-5 on page 294 gives examples of goods purchased by households, businesses, government, and foreigners.

Consider all the goods and services produced in the U.S. economy in a year: houses, tractors, watches, restaurant meals, cars, computers, plasma television sets, DVDs, iPods, cell phones, and much, much more. Suppose someone from the household sector buys a DVD. This purchase falls into the category of consumption. When someone from the business sector buys a large machine to install in a factory, the purchase is considered an investment. If the U.S. government purchases a tank from a company that produces tanks, the purchase is considered a government purchase. If a person living in Sweden buys a U.S.-produced sweater, this purchase is considered spending on U.S. exports and therefore is registered as export spending.

All goods produced in the economy must be bought by someone in one of the four sectors of the economy. If economists simply sum the expenditures made by each sector—that is, if they sum consumption, investment, government purchases, and export spending—they will be close to computing the GDP.
They are only close, however; they still need to adjust for U.S. purchases of foreign-produced goods. For example, if Cynthia in Detroit purchases a Japanese-made television set for $500, this $500 TV purchase would not be included in GDP because GDP is a measure of goods and services produced annually in a country. Specifically, the U.S. GDP is a measure of goods and services produced annually in the territorial area we know as the United States. Cynthia’s TV was produced annually in the territorial area we consider as the United States. Cynthia’s TV was not produced in the United States, so it is not part of U.S. GDP. Spending by Americans for foreign-produced goods is called import spending.

To compute U.S. GDP, then, we need to sum consumption (C), investment (I), government purchases (G), and export spending (EX), and then subtract import spending (IM). We can now write GDP in symbol form:

\[ \text{GDP} = C + I + G + \text{EX} - \text{IM} \]

For example, in the first quarter of 2005, consumption in the United States was $8.534 trillion, \(^1\) investment was $2.085 trillion, government purchases were $2.260 trillion, export spending was $1.210 trillion, and import spending was $1.938 trillion. Thus we can calculate GDP to be $12.151 trillion (see Exhibit 11-6).

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\(^1\) These quarter figures for consumption, investment, and so on have been annualized. This means that for all practical purposes you can consider these quarter figures to be fairly representative of the relevant annual figures. Think of it this way. Suppose that in the first three months of the year (the first quarter of the year) you spend $400 on consumption goods. If you buy the same amount in the next three quarters, your annual expenditure on consumption goods will be $1,200. So, when we say that the quarter figures have been annualized, we are saying that instead of using the $400 figure, we are using the $1,200 figure.
Is Every Good That Is Produced Also Sold?

Our definition of GDP is the total market value of all final goods and services produced annually in an economy. However, we measured the GDP by finding out how much the four sectors of the economy spend on goods and services. Suppose something is produced but not purchased. Is it included in GDP or not? For example, a car company produces 10,000 new cars this year, but the household sector chooses to buy only 8,900 of the 10,000 cars. That means that some cars (1,100) were produced but not sold. Do these cars get counted in GDP?

The answer is yes, because the government statisticians who measure GDP assume that everything that is produced is purchased by someone. For purposes of calculating GDP, the government statisticians assume that the car company "purchased" the 1,100 cars that the car company did not sell.

The answer is yes, because the government statisticians who measure GDP assume that everything that is produced is purchased by someone. For purposes of calculating GDP, the government statisticians assume that the car company "purchased" the 1,100 cars that the car company did not sell.

**EXAMPLE:** Nigel owns his own sock factory. Last year he produced 100,000 pairs of socks. He sold 80,000 pairs to people. That left 20,000 pairs of socks produced but unsold (as far as Nigel is concerned). Government statisticians view these 20,000 pairs of socks as having been produced by Nigel and as having been "purchased" by Nigel. How many pairs of socks are counted in GDP: 80,000 or 100,000? Answer: 100,000.

**GDP Versus Quality of Life**

In 2004, the U.S. GDP was more than six times larger than the GDP of France. Does it follow that because Americans live in a country with a higher GDP than the French, Americans are better off than the French? If your answer is yes, then you have made the mistake of equating a higher GDP with being better off or having greater well-being. Greater production of goods and services is only one of the many factors that contribute to being better off or possessing greater well-being.
Look at the issue on an individual basis. Franklin has $1 million in the bank, owns a large home, drives a luxury car, and works 70 hours per week. He has little time to enjoy nature or his family. In contrast, Harris has $100 in the bank, owns a small home, drives an old car, and works 30 hours a week. He has much time to enjoy life. Who is better off—Franklin or Harris? In terms of expensive goods, Franklin certainly has more than Harris; in this one respect, Franklin benefits more than Harris. In terms of leisure time, though, Harris is better off than Franklin. In overall terms—taking everything into account—we cannot say who is better off.

Similarly, we simply cannot say whether Americans are better off than the French on the basis of their GDPs. All we can say for sure is that Americans live in a country in which greater production exists. Being better off takes into account much more than simply how much output is produced.

In assessing a country’s GDP, its population also must be considered. Suppose country X has double the GDP of country Y, but its population is three times as large. This would mean that on a per-person basis (the same as a per capita basis) each person has fewer goods and services (on average) in country X than in country Y. In short, a bigger country GDP does not necessarily mean a bigger per capita GDP.

Per capita GDP = GDP/Population

**A Student Asks**

**QUESTION:** What are some countries of the world that have a high per capita GDP?

**ANSWER:** In 2004, Luxembourg had the highest per capita GDP at $58,900. The United States was second at $40,100. Norway was fourth at $40,000, Switzerland was tenth at $33,800, and Canada was fifteenth at $31,500. The country with the lowest per capita GDP was East Timor at $400. To find the current rank ordering of countries according to per capita GDP, go to the CIA World Factbook at [www.emcp.net/GDPrank](http://www.emcp.net/GDPrank). (If you want to check a different year, simply change the year in the Web address.)
The Two Variables of GDP: P and Q

When we computed GDP in a simple, one-good economy, we multiplied two variables to find GDP: price (P) and quantity (Q). If either of the two variables rises and the other remains constant, GDP will rise.

To see how this relationship works, look at the following chart:

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10</td>
<td>2</td>
<td>$20</td>
</tr>
<tr>
<td>$15</td>
<td>2</td>
<td>$30</td>
</tr>
<tr>
<td>$10</td>
<td>3</td>
<td>$30</td>
</tr>
</tbody>
</table>

With a price of $10 and a quantity of 2, GDP is $20. When the price rises to $15 but the quantity is held constant at 2, GDP rises to $30. Finally, if the price is constant at $10 and the quantity increases to 3, GDP again is $30. Clearly, an increase in either price or quantity will raise GDP.

Suppose someone then told you that GDP was $20 one year and $30 the next year. You would have no way of knowing whether GDP increased because price increased, because quantity of output increased, or because both price and quantity increased. On the other hand, if price was held constant and GDP increased, would you know what caused the rise in GDP? If price is held constant, then any rise in GDP must be due to a rise in quantity, of course.

How can we keep price constant? Economists do it by computing GDP for each year—2003, 2004, 2005, and so on—using the prices that existed in one particular year in the past, called the base year, chosen as a point of reference for comparison. Economists who compute GDP this way are said to be computing real GDP (GDP measured in base-year, or constant, prices). GDP is equal to price in the current year times quantity in the current year, but real GDP is equal to price in the base year times quantity in the current year.

Let’s again assume that we have a simple, one-good economy that produces only watches. In Exhibit 11-7, on page 298, column 1 lists several years, column 2 gives the price of watches in these years, and column 3 gives the quantity of watches.

Focus Questions
- What two variables are involved in calculating GDP?
- If GDP is higher in one year than another, do we automatically know why it is higher?
- What is the difference between GDP and real GDP?
- How do economists go about computing real GDP?

Key Terms
- base year
- real GDP
Column 4 computes the GDP for a simple, one-good economy. The price in the current year is multiplied by the quantity produced in the current year. Column 5 computes real GDP by multiplying the price in 1987 (the base year for purposes here) by the quantity produced in the current year. Economists prefer working with real GDP to working with GDP because they know that if real GDP in one year is higher than real GDP in another year, output is greater in the year with the higher real GDP.

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of watches</th>
<th>Quantity of watches produced</th>
<th>GDP in current year</th>
<th>Real GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>$20</td>
<td>—</td>
<td>$20 × 1,900 = $38,000</td>
<td>$20 × 1,900 = $38,000</td>
</tr>
<tr>
<td>2003</td>
<td>$50</td>
<td>1,900</td>
<td>$50 × 1,900 = $95,000</td>
<td>$20 × 1,900 = $38,000</td>
</tr>
<tr>
<td>2004</td>
<td>$60</td>
<td>2,000</td>
<td>$60 × 2,000 = $120,000</td>
<td>$20 × 2,000 = $40,000</td>
</tr>
<tr>
<td>2005</td>
<td>$70</td>
<td>1,855</td>
<td>$70 × 1,855 = $129,850</td>
<td>$20 × 1,855 = $37,700</td>
</tr>
</tbody>
</table>

Between 1990 and 2003, prices increased about 43 percent. This increase doesn’t mean that the price of every single good or service went up 43 percent during this period. The prices of some goods went up more than the prices of other goods, and the prices of some goods actually fell. Here is the percentage increase or decrease in the prices of a few selected items during this time period. In particular, notice what happened to college tuition.

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and beverages</td>
<td>↑ 36%</td>
</tr>
<tr>
<td>New cars</td>
<td>↑ 10</td>
</tr>
<tr>
<td>Prescription drugs</td>
<td>↑ 80</td>
</tr>
<tr>
<td>Hospital services</td>
<td>↑ 121</td>
</tr>
<tr>
<td>Men’s clothes</td>
<td>↓ 1.6</td>
</tr>
<tr>
<td>Women’s clothes</td>
<td>↓ 7.4</td>
</tr>
<tr>
<td>Airline fares</td>
<td>↑ 56</td>
</tr>
<tr>
<td>Cable TV</td>
<td>↑ 95</td>
</tr>
<tr>
<td>College tuition</td>
<td>↑ 130</td>
</tr>
</tbody>
</table>

Real GDP is shown in column 5. To calculate it, we multiply the price of watches in our chosen base year of 1987 by the current-year quantity. For example, to get real GDP in 2003, we take the quantity of watches produced in 2003 and multiply it by the price of watches in 1987.

A quick look at real GDP figures tells us that because real GDP in 2004 ($40,000) is higher than that in 2003 ($38,000), the quantity of watches produced in 2004 must have been greater than the quantity of watches produced in 2003. A look at the quantities in column 3 confirms this assumption. Also, because the real GDP figure for 2005 ($37,100) is lower than that for 2004 ($40,000), the quantity of watches produced in 2005 must have been lower than the quantity of watches produced in 2005. Again, column 3 confirms this lower production.

Finally, in computing real GDP for 2003, 2004, and 2005 we multiplied the quantity of watches produced in each year times the price of watches in 1987, the base year. Thus, another way to define real GDP is GDP in base-year prices or, if 1987 is the base year, for example, GDP in 1987 prices.
Suppose you heard on the radio that per capita real GDP grew by 2.3 percent last year in the United States. Does this percentage matter to you? Life goes on pretty much the same way, right? You didn’t get a pay raise at your part-time job, nobody bought you a new car, you still have to go to school every day and do homework. So what does it matter?

Well, real GDP growth in one year may not matter much, but how much it grows over time should matter to you. How much per capita real GDP grows during your lifetime will greatly influence the kind of life you live.

You may be a bit skeptical about this, so let’s take a quick look at the history of real GDP. Little per capita real GDP growth occurred from the year A.D. 1 to about 1500. A person living in, say, 1300 didn’t have a much different standard of living from a person living in the year 70. It was fairly common during the years of little to no growth in per capita real GDP for a son or daughter to have the same standard of living as his or her great-great-great-grandmother or grandfather. Today, it’s different. For example, your standard of living is much higher than the standard of living of the people who lived in the United States during the Revolutionary War, Civil War, World War I, and World War II. And we are not just talking about the fact that you enjoy some goods today that people in the Revolutionary War did not (such as cell phones, computers, and so on).

Now let’s suppose that we look at the case for someone who is born today. If the annual growth rate of per capita real GDP is 1.1 percent, this person will be 65 years old before his or her standard of living (as measured by per capita real GDP) would have doubled. But if the annual growth rate of per capita real GDP is just 1 percent higher, at 2.1 percent, this person will only be 34 years old when his or her standard of living has doubled. If the person lives to 68 years old, this person will have seen his or her standard of living double twice.

Think of what this “doubling” means for you. You are, say, 17 years old. If you live to the age of 77, your standard of living will have doubled twice if the annual per capita real GDP growth rate is 2.1 percent, but it will have only doubled once if it is 1.1 percent. In other words, just a little more growth in per capita real GDP can make a huge difference in the life you live. As an aside, the per capita real GDP growth rate in the United States was 2 percent in 2003 and 3.3 percent in 2004. What will future growth rates be like? We don’t know, but we can say if the future is more like 2004 than 2003, we will double our standard of living 15 years earlier (by 2025 instead of 2040). The difference is going to matter to your standard of living when you retire.

A well-known economist once said that if he had to pick a country for his children to be born in, it would be a country with a high annual growth rate in per capita real GDP. What do you think about his statement?

---

**Is There Real GDP Growth in Your Future?**

**Growth in Material Wealth Across Centuries, 1000–2000**

<table>
<thead>
<tr>
<th>Century</th>
<th>Percent growth in GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>11th</td>
<td>0%</td>
</tr>
<tr>
<td>12th</td>
<td>0%</td>
</tr>
<tr>
<td>13th</td>
<td>0%</td>
</tr>
<tr>
<td>14th</td>
<td>0%</td>
</tr>
<tr>
<td>15th</td>
<td>0%</td>
</tr>
<tr>
<td>16th</td>
<td>0%</td>
</tr>
<tr>
<td>17th</td>
<td>0%</td>
</tr>
<tr>
<td>18th</td>
<td>0%</td>
</tr>
<tr>
<td>19th</td>
<td>0%</td>
</tr>
<tr>
<td>20th</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Figure courtesy of Brad de Long, University of California—Berkeley.
A country produces one good, X, which it sells for $4 in 1990, $8 in 1999, and $10 in 2005. It produces 40 units of X in 1990, 45 units in 1999, and 40 units in 2005. If 1990 is designated as the base year, what is the real GDP in each of the three years we designated: 1990, 1999, and 2005?

To find out, we simply multiplying the quantity of X the country produces in each year by the price it sells X for in the base year. For example, the real GDP in 1990 is $4 times 40 units, which equals $160. The real GDP in 1999 is $4 times 45 units, which equals $180. The real GDP in 2005 is equal to $4 times 40 units, which is $160. Notice that the real GDP is the same in both 1990 and 2005.

You may be wondering how economists decide what year will be the base year when calculating real GDP. Unfortunately, there is no easy answer to this question. The base year has to be a year in the past, but not too far in the past. For example, no economist would choose 1865 as a base year because that is too long ago. The economic world then was much different from today. Economists generally want the base year to be a year in the near past in which no major economic events were occurring. They try not to pick a year in which there were large increases in prices or high unemployment. Aside from those factors, however, choosing the base year is somewhat arbitrary. Several years in the immediate past might fit the bill, but one gets chosen over the others.

EXAMPLE: A country produces one good, X, which it sells for $4 in 1990, $8 in 1999, and $10 in 2005. It produces 40 units of X in 1990, 45 units in 1999, and 40 units in 2005. If 1990 is designated as the base year, what is the real GDP in each of the three years we designated: 1990, 1999, and 2005?

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ECONOMIC THINKING: If this were to continue, we could expect the GDP of these countries to decline, all other things being equal. If foreign countries started buying less from the United States, how would the U.S. GDP be affected?

EXPORTS AND GDP: In 2005, the countries of South Korea, Taiwan, and Japan each found that about 20 percent of their exports were going to China. How much a country exports affects a country’s GDP. We know that a country’s GDP is the sum of consumption, investment, government purchases, and exports minus imports. Thus, the higher exports are, the higher a country’s GDP. One of the things that worried South Korea, Taiwan, and Japan in 2005 was the fact that China’s importation of foreign goods was beginning to slow. In other words, China was starting to buy less from South Korea, Taiwan, and Japan.

DEFINING TERMS
1. Define:  
   a. base year  
   b. real GDP

REVIEWING FACTS AND CONCEPTS
2. Gross domestic product is $6,000 billion in one year and $6,500 billion the next year. Is output necessarily higher in the second year than in the first? Explain your answer.

CRITICAL THINKING
5. Can GDP go up at the same time that real GDP goes down? Explain your answer.

APPLYING ECONOMIC CONCEPTS
6. An economist wants to know whether the “average person” in country X has more goods and services to consume than the “average person” in country Y. Do you recommend that the economist look at per capita GDP or per capita real GDP? Explain your answer.
Calculating the Change in a Single Price

Suppose that in 2004 a Honda Accord was priced at $20,000, and in 2005 a Honda Accord was $21,500. By what percentage did the price of a Honda Accord increase? Here is the formula we use to determine the percentage change in price:

\[
\text{Percentage change in price} = \left( \frac{\text{Price in later year} - \text{Price in earlier year}}{\text{Price in earlier year}} \right) \times 100
\]

If we fill in the numbers, we get the following:

\[
\text{Percentage change in price} = \left( \frac{21,500 - 20,000}{20,000} \right) \times 100 = 7.5\%
\]

The Consumer Price Index

In the previous example, we found the percentage increase in a single price from one year to the next. Economists are much more interested, though, in what happens to prices in general than in what happens to a single price. Before they can calculate the change in prices from one year to the next, they need to compute a price index, the average price level. The most widely cited price index is the consumer price index (CPI). You might have heard a newscaster say, “Today it was reported in Washington that the consumer price index has risen 3.2 percent on an annual basis.” Let’s look at how the CPI is computed and what it means.

\[\text{EXAMPLE:}\] If you are reading this book, you were probably born around 1989. Let’s take the CPI in 1989, which was 121.1. Now let’s find the latest CPI data we can find (at the time of this writing). The CPI for April 2005 was 194.6. (If you want to find a more recent CPI, we will give you a Web address shortly.) Now let’s calculate how much prices (as measured by the CPI) went up between 1989 and April 2005. The calculation is \([(194.6 - 121.1)/121.1] \times 100\), which is 60.69 percent. This means what cost $1 when you were born would now cost (on average) about $1.61.
A Student Asks

QUESTION: If what cost $1 when I was born now costs $1.61, does that mean I am worse off today than someone in 1989? It would seem so—after all I have to pay $1.61 for the same thing that someone in 1989 paid $1 for.

ANSWER: Prices are higher today than they were in 1989, but incomes are higher too. Whether you are worse off than the person living in 1989 depends on how much incomes rose compared to how much prices rose.

Suppose a person earned $100 in 1989 and the average price was $1 per unit. That person could buy 100 units of a good. Now suppose a person earns $161 today and the average price of goods is $1.61. Well, then, the person can still buy 100 units of a good. In other words, a person whose income rises by the same rate as prices is no better and no worse off.

Again suppose a person earned $100 in 1989 and the average price of goods was $1. The person could buy 100 units of a good. Now suppose a person earns $150 today and the average price of goods is $1.61. Now the person can buy only 93 units of a good. A person who is able to buy less today than in 1989 is worse off. This situation happens when one’s income rises by less than prices rise.

The CPI is calculated by the U.S. Bureau of Labor Statistics. The bureau uses a sampling of thousands of households and determines what these consumers paid for a representative group of goods called the market basket. This amount is compared with what a typical “consumer unit” paid for the same market basket in 1982–1984. (A consumer unit is a household of related or unrelated individuals who pool their money. In the last survey, the average consumer unit was made up of 2.6 people.)

Calculating the CPI involves this process:

1. Calculate the total dollar expenditure on the market basket in the base year and the total dollar expenditure on the market basket in the current year.
2. Divide the total current-year expenditure by the total base-year expenditure, and multiply by 100.

Exhibit 11-8 provides an example. To simplify things, we'll say that the market basket in the base year was made up of 2.6 people.

### Exhbit 11-8 Calculating the Consumer Price Index

<table>
<thead>
<tr>
<th>Step 1: Calculate the total dollar expenditure on the market basket in the base year and the current year. These amounts are calculated in column 3 ($150) and column 5 ($180), respectively.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Goods in the market basket</td>
</tr>
<tr>
<td>10 CDs</td>
</tr>
<tr>
<td>5 T-shirts</td>
</tr>
<tr>
<td><strong>Total dollar expenditure on the market basket in the base year</strong></td>
</tr>
<tr>
<td><strong>Total dollar expenditure on the market basket in the current year</strong></td>
</tr>
</tbody>
</table>

**Step 2: Divide the total dollar expenditure on the market basket in the current year by the total dollar expenditure on the market basket in the base year, and then multiply by 100.**

\[
\text{CPI current year} = \frac{\text{Total dollar expenditure on the market basket in current year}}{\text{Total dollar expenditure on the market basket in base year}} \times 100
\]

\[
= \frac{180}{150} \times 100
\]

\[
= 120
\]
The CPI for the current year is 120.

Notice that the CPI is just a number. What does this number tell us? By itself, the CPI number tells us little. It is only when we compare one CPI number with another that we learn something. (See Exhibit 11-9.) For example, in the United States in 2003, the CPI was 184.0. One year later, in 2004, the CPI was 188.9. The two CPI numbers can be used to figure out the percentage by which prices increased between 2003 and 2004 in the same way we determined the percentage increase for a single price:

\[
\text{Percentage change in CPI} = \frac{\text{CPI}_{\text{later year}} - \text{CPI}_{\text{earlier year}}}{\text{CPI}_{\text{earlier year}}} \times 100
\]

If we fill in the numbers, we get the following:

\[
\frac{188.9 - 184.0}{184.0} \times 100 = 2.66\%
\]

Determining the Quantity of Goods and Services and the Price Level

Chapter 4 explained that the two sides to every market are a demand side and a supply side. We represent the demand in a market with a downward-sloping demand curve.

basket is made up of only two goods instead of the hundreds of items that it actually contains. Our market basket will contain 10 CDs and five T-shirts.

The total dollar expenditure on the market basket in the base year is found by multiplying the quantity of each good in the market basket (column 1) times the price of that good in the base year (column 2). A look at column 3 shows us that $130 was spent on CDs and $20 was spent on T-shirts, for a total dollar expenditure of $150.

Next, the total dollar expenditure on the market basket in the current year is found by multiplying the quantity of each good in the market basket (column 1) times the price of that good in the current year (column 4). A look at column 5 shows us that $150 was spent on CDs and $30 was spent on T-shirts, for a total dollar expenditure of $180.

Now, we divide the total current-year expenditure, $180, by the total base-year expenditure, $150, and then multiply by 100:

\[
\frac{180}{150} \times 100 = 120
\]

The CPI for the current year is 120.
Economics in the Real World

Did President Kennedy Earn More than Today’s President?

Today, the president of the United States earns an annual salary of $400,000. In 1962, when John F. Kennedy was president, he earned $100,000. Would you say that the president today is paid four times more than President Kennedy was paid?

At first glance, it may seem that today’s president is paid more than Kennedy. We need to keep in mind, however, that when Kennedy was president the prices of goods and services were much lower than today. In 1962, $100,000 would buy much more than $100,000 will buy today. The question is, would it buy four times as much in 1962 as it will buy today?

To get some idea of what a $100,000 salary in 1962 would equal in today’s dollars, economists use the following formula:

\[
\text{Salary in today’s dollars} = \text{Salary in earlier year} \times \left(\frac{\text{CPI}_{\text{today}}}{\text{CPI}_{1962}}\right)
\]

Suppose that by “today” we mean 2005. We want to find out what Kennedy’s 1962 salary is equal to in 2005 dollars. The CPI in April 2005 was 194.6, and the CPI in 1962 was about 30. Filling in the formula, we see that Kennedy’s salary in 1962 is equivalent to earning $648,667 in 2005.

\[
\text{Salary in today’s dollars} = \$100,000 \times \left(\frac{194.6}{30}\right) = \$648,667
\]

President Kennedy, in 1962, earned more than the president today earns, in terms of purchasing power. Kennedy earned the equivalent of $648,667 in today’s (2005) dollars, and the president today earns $400,000. In other words, Kennedy was paid the equivalent of $248,667 more than the president today is paid.

THINK ABOUT IT

Suppose a house cost $45,000 in 1970, and the CPI in 1970 was 37.8. What is the price of the house in 2005 dollars (CPI in 2005 = 194.6)?

aggregate demand curve
A curve that shows the quantity of goods and services that buyers are willing and able to buy at different price levels.

aggregate supply curve
A curve that shows the quantity of goods and services that producers are willing and able to supply at different price levels.

THINK ABOUT IT

Did President Kennedy Earn More than Today’s President?
11-10), come to exist over time. For example, at P1, the quantity demanded of goods and services (Q₁) is less than the quantity supplied of goods and services (Q₂), resulting in a surplus of goods and services. As a result, the price level drops. At a lower price level, people buy more goods and services, and producers produce less. The surplus begins to disappear because of these actions on the part of buyers and sellers. (Buyers are helping to eliminate the surplus by buying more, and sellers are helping to eliminate the surplus by producing less.)

At P₂, the quantity demanded of goods and services (Q₂) is greater than the quantity supplied (Q₁), which means a shortage of goods and services. Thus, the price level rises, people buy fewer goods and services, and producers produce more. The shortage begins to disappear because of the actions of buyers and sellers. (Buyers are helping to eliminate the shortage by buying less, and sellers are helping to eliminate the shortage by producing more.) Only at Pₑ is the quantity of goods and services supplied equal to the quantity of goods and services demanded; both are Qₑ.

Aggregate supply and demand are influenced by a number of factors and act as an influence on some other factors. One of the factors that aggregate supply and demand impact is unemployment, which we discuss next.
Who Are the Unemployed?

Look at Exhibit 11-11 on the next page, which shows the employment status of the entire United States population. Notice at the far left of the exhibit the total population, which is then divided into two broad groups. One group consists of persons under 16 years of age, in the armed forces, or in a mental or correctional facility. The other group, which consists of all others in the total population, is called the noninstitutional adult civilian population.

Civilian labor force = Unemployed persons + Employed persons

Now take the noninstitutional adult civilian population and divide it into two groups: persons not in the labor force and persons in the civilian labor force. The persons not in the labor force are those who are neither working nor looking for work. Retired persons fall into this category, as do those engaged in homemaking in their own homes and persons who choose not to work.

Finally, persons in the civilian labor force can be divided into two groups: they are either employed or unemployed.

Who Are the Unemployed?

Someone comes up to you and asks what is the top-grossing movie of all time in the United States. Do you know the answer? As of this writing, it is *Titanic*, which grossed $660 million in the United States and $1.8 billion worldwide. Some other movies that make the 10 top-grossing movies in the United States list include *Star Wars* (1977), *Shrek 2*, *E.T.*, and *Spider-Man*.

A slight problem arises when we realize that movies in the top 10 list were released in different years. For example, *Titanic* was released in 1997, *Star Wars* was released 20 years earlier in 1977, and *E.T.* was released in 1982. Now not only were ticket prices different in these different years, but the prices of almost all goods and services were different too. For example, the CPI in 1977 was 58.5, but it was 94.3 in 1982, and 160.5 in 1997.

If we simply compare the gross receipts for movies in different years—without taking into account that prices are different in different years—we are making an inaccurate comparison. It is like comparing apples with oranges. To make an accurate and reasonable comparison, we need to convert the gross receipts for all movies (no matter what year the movie was released) into today’s dollars. When we do, *Titanic* falls from the top of the list. In fact, it falls all the way to sixth place. The top-grossing movie of all time in the United States turns out to be *Gone with the Wind*, which was released in 1937. *Star Wars* (1977) comes in second and *The Sound of Music* comes in third.

**THINK ABOUT IT**

The list of the top 100 movies of all time is released periodically, but rarely is any attempt made to convert the gross receipts of each movie into today’s dollars. Why do you suppose they aren’t compared in terms of today’s dollars?
The Unemployment and Employment Rates

The unemployment rate is the percentage of the civilian labor force that is unemployed. It is equal to the number of unemployed persons divided by the civilian labor force.

Unemployment rate = Unemployed persons/Civilian labor force

For example, if the civilian labor force totals 10 million, and the number of persons unemployed is 1 million, then the unemployment rate is 10 percent. Exhibit R-14 in the Databank at the back of the book shows the unemployment rate in the United States in each year during the period 1980–2005.

The employment rate is the percentage of the noninstitutional adult civilian population that is employed. It is equal to the number of persons employed divided by the number of persons in the noninstitutional adult civilian population:

Employment rate = Employed persons/Noninstitutional adult civilian population

Defining Terms
1. Define:
   a. price index
   b. consumer price index
   c. aggregate demand curve
   d. aggregate supply curve
   e. unemployment rate
   f. employment rate

Reviewing Facts and Concepts
2. Suppose the CPI was 143 in year 1 and 132 in year 2. Did prices rise or fall between year 1 and year 2?

3. The noninstitutional adult civilian population is 120 million, the number of unemployed persons is 5 million, and the number of employed persons is 60 million. What is the unemployment rate?

Critical Thinking
4. What can cause the equilibrium price level to rise? What can cause the equilibrium quantity of goods and services (in the economy) to fall? (Hint: Look at Exhibit 11-10.)

Applying Economic Concepts
5. Smith earned $40,000 in 2003 and $50,000 in 2004. The CPI was 184.0 in 2003 and 188.9 in 2004. Using the data presented, how can Smith figure out whether his earnings went up by more than, less than, or equal to the change in prices?
Chapter Summary

Be sure you know and remember the following key points from the chapter sections.

Section 1

- Gross domestic product (GDP) is the total market value of all final goods and services produced annually in a country.
- Some exchanges, such as illegal transactions and those with no record, are omitted from the GDP measurement.

Section 2

- Economists break the economy into four sectors: household, business, government, and foreign.
- To compute U.S. GDP we need to sum consumption (C), investment (I), government purchases (G), and export spending (EX), and then subtract import spending (IM).
- Greater production of goods and services (higher GDP) is a factor that contributes to people being better off.

Section 3

- Real GDP is equal to price in the base year times quantity in the current year.
- Economists use a base year to analyze changes in production and prices.

Section 4

- To calculate the change in prices from one year to the next, economists compute a price index.
- The consumer price index (CPI) is calculated by sampling households to determine what consumers paid for a group of goods called the market basket.
- The unemployment rate equals the unemployed persons divided by the civilian labor force.

Economics Vocabulary

To reinforce your knowledge of the key terms in this chapter, fill in the following blanks on a separate piece of paper with the appropriate word or phrase.

1. The total market value of all final goods and services produced annually in an economy is called ______.
2. The total market value of all final goods and services produced annually by the citizens of a country, no matter where in the world they reside, is called ______.
3. Counting a good more than once in computing GDP is called ______.
4. The household sector makes expenditures called ______.
5. The business sector makes expenditures called ______.
6. Real GDP is measured in ______ prices.
7. The ______ shows the quantity of goods and services that buyers are willing and able to buy at different price levels.
8. ______ and ______ go together to determine the equilibrium price level and the equilibrium quantity of goods and services in an economy.
9. ______ is GDP that has been adjusted for price changes.
10. ______ refers to expenditures made by the government sector.
11. Expenditures made by the people in foreign countries who are buying U.S.-produced goods are called ______.
12. The ______ is the percentage of the noninstitutional adult civilian population that is employed.

Understanding the Main Ideas

Write answers to the following questions to review the main ideas in this chapter.

1. Why does the GDP omit government transfer payments?
2. What is the difference between GDP and GNP?
3. Why does GDP omit illegal transactions?
4. Why does GDP omit stock transactions?
5. What is the difference between an intermediate good and a final good?
6. Why does an economist prefer to work with real GDP figures over GDP figures?
7. Which spending component of GDP is the largest?
8. What happens to GDP if import spending rises and no other spending component of GDP changes?
9. What is the unemployment rate? The employment rate?
10. Is it possible for the unemployment rate to rise as the number of unemployed persons falls? Explain.

**Doing the Math**

Do the calculations necessary to solve the following problems.

1. Using the following data, compute the GDP: consumption = $3.2 trillion; government purchases = $1.2 trillion; export spending = $1.9 trillion; import spending = $1.5 trillion.
2. A tiny economy produces 10 units of good X and 15 units of good Y. Base-year prices for these goods are $1 and $2, respectively. Current-year prices for these goods are $2 and $3. What is the CPI?
3. Using the data in question 2, what does real GDP equal?
4. In Exhibit 11-8, change the prices in column 2 to $14 for CDs and $6 for T-shirts. Change the prices in column 4 to $17 for CDs and $8 for T-shirts. Now calculate the CPI.
5. The CPI is 143 in year 1 and 132 in year 2. By what percentage have prices fallen?
6. Total population = 145 million; noninstitutional adult civilian population = 135 million; persons not in the labor force = 10 million; unemployed persons = 7 million. Using these data, compute the following:
   a. The unemployment rate
   b. The employment rate
   c. The civilian labor force

**Solving Economic Problems**

1. **Cause and Effect.** Does a higher GDP cause higher prices, or do higher prices cause a higher GDP? Explain your answer.
2. **Writing.** Find a recent copy of the Economic Report of the President in your library or on the Web at [www.emcp.net/economicreport](http://www.emcp.net/economicreport). Click on “Downloadable Reports/Tables.” Next, click the most recent year under “Downloadable Entire Reports.” The report contains chapters on different economic topics. Choose one of the chapters to read; then write a two-page paper that briefly explains the content of the chapter.
3. **Economics in the Media.** Find a story or article in your local newspaper that addresses one of the following: GDP, real GDP, CPI, unemployment rate, consumption spending, investment spending, or government spending. Explain what was said in the story or article.

**EXHIBIT 11-12**

<table>
<thead>
<tr>
<th>Goods in market basket</th>
<th>Price in base year</th>
<th>Base-year expenditure</th>
<th>Price in current year</th>
<th>Current-year expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 X</td>
<td>$4</td>
<td>(b)</td>
<td>(c)</td>
<td>$50</td>
</tr>
<tr>
<td>12 Y</td>
<td>(a)</td>
<td>$120</td>
<td>$12</td>
<td>(d)</td>
</tr>
</tbody>
</table>

Total dollar expenditure on market basket in current year = (e)
Total dollar expenditure on market basket in base year = (f)