QUESTIONS FOR REVIEW

1. Explain why an economy's income must equal its expenditure.
2. Which contributes more to GDP—the production of an economy car or the production of a luxury car? Why?
3. A farmer sells wheat to a baker for $2. The baker uses the wheat to make bread, which is sold for $3. What is the total contribution of these transactions to GDP?
4. Many years ago, Peggy paid $500 to put together a record collection. Today, she sold her albums at a garage sale for $100. How does this sale affect current GDP?
5. List the four components of GDP. Give an example of each.
6. Why do economists use real GDP rather than nominal GDP to gauge economic well-being?
7. In the year 2010, the economy produces 100 loaves of bread that sell for $2 each. In the year 2011, the economy produces 200 loaves of bread that sell for $3 each. Calculate nominal GDP, real GDP, and the GDP deflator for each year. (Use 2010 as the base year.) By what percentage does each of these three statistics rise from one year to the next?
8. Why is it desirable for a country to have a large GDP? Give an example of something that would raise GDP and yet be undesirable.

Questions for Review:

1. An economy's income must equal its expenditure, because every transaction has a buyer and a seller. Thus, expenditure by buyers must equal income by sellers.

2. The production of a luxury car contributes more to GDP than the production of an economy car because the luxury car has a higher market value.

3. The contribution to GDP is $3, the market value of the bread, which is the final good that is sold.

4. The sale of used records does not affect GDP at all because it involves no current production.

5. The four components of GDP are consumption, such as the purchase of a music CD; investment, such as the purchase of a computer by a business; government purchases, such as an order for military aircraft; and net exports, such as the sale of American wheat to Russia. (Many other examples are possible.)

6. Economists use real GDP rather than nominal GDP to gauge economic well-being because real GDP is not affected by changes in prices, so it reflects only changes in the amounts being produced. You cannot determine if a rise in nominal GDP has been caused by increased production or higher prices.

7.

Year	Nominal GDP	Real GDP	GDP Deflator
2005	100 X $2 = $200	100 X $2 = $200	($200/$200) X 100 = 100
2006	200 X $3 = $600	200 X $2 = $400	($600/$400) X 100 = 150

The percentage change in nominal GDP is (600 − 200)/200 x 100 = 200%. The percentage change in real GDP is (400 − 200)/200 x 100 = 100%. The percentage change in the deflator is (150 − 100)/100 x 100 = 50%.

8. It is desirable for a country to have a large GDP because people could enjoy more goods and services. But GDP is not the only important measure of well-being. For example, laws that restrict pollution cause GDP to be lower. If laws against pollution were eliminated, GDP would be higher but the pollution might make us worse off. Or, for example, an earthquake would raise GDP, as expenditures on cleanup, repair, and rebuilding increase. But an earthquake is an undesirable event that lowers our welfare.

PROBLEMS AND APPLICATIONS

1. What components of GDP (if any) would each of the following transactions affect? Explain.
   a. A family buys a new refrigerator.
   b. Aunt Jane buys a new house.
   c. Ford sells a Mustang from its inventory.
   d. You buy a pizza.
   e. California repaves Highway 101.
   f. Your parents buy a bottle of French wine.
   g. Honda expands its factory in Marysville, Ohio.
2. The government purchases component of GDP does not include spending on transfer payments such as Social Security. Thinking about the definition of GDP, explain why transfer payments are excluded.
3. As the chapter states, GDP does not include the value of used goods that are resold. Why would including such transactions make GDP a less informative measure of economic well-being?
4. Below are some data from the land of milk and honey.

Year	Price of Milk	Quantity of Milk	Price of Honey	Quantity of Honey
2010	$1	100 quarts	$2	50 quarts
2011	$1	200	$2	100
2012	$2	200	$4	100

a. Compute nominal GDP, real GDP, and the GDP deflator for each year, using 2010 as the base year.
b. Compute the percentage change in nominal GDP, real GDP, and the GDP deflator in 2011 and 2012 from the preceding year. For each year, identify the variable that does not change. Explain in words why your answer makes sense.
c. Did economic well-being rise more in 2011 or 2012? Explain.

5. Consider an economy that produces only chocolate bars. In year 1, the quantity produced is 3 bars and the price is $4. In year 2, the quantity produced is 4 bars and the price is $5. In year 3, the quantity produced is 5 bars and the price is $6. Year 1 is the base year.
   a. What is nominal GDP for each of these three years?
   b. What is real GDP for each of these years?
   c. What is the GDP deflator for each of these years?
   d. What is the percentage growth rate of real GDP from year 2 to year 3?
   e. What is the inflation rate as measured by the GDP deflator from year 2 to year 3?
   f. In this one-good economy, how might you have answered parts (d) and (e) without first answering parts (b) and (c)?

6. Consider the following data on U.S. GDP:

Year	Nominal GDP (in billions of dollars)	GDP Deflator (base year 2005)
2009	14,256	109.8
1999	9,353	86.8

   a. What was the growth rate of nominal GDP between 1999 and 2009? (Hint: The growth rate of a variable X over a N-year period is calculated as $100 \times [(X_{final}/X_{initial})^{1/N} - 1]$.)
   b. What was the growth rate of the GDP deflator between 1999 and 2009?
   c. What was real GDP in 1999 measured in 2005 prices?
   d. What was real GDP in 2009 measured in 2005 prices?
   e. What was the growth rate of real GDP between 1999 and 2009?
   f. Was the growth rate of nominal GDP higher or lower than the growth rate of real GDP? Explain.

7. Revised estimates of U.S. GDP are usually released by the government near the end of each month. Find a newspaper article that reports on the most recent release, or read the news release yourself at http://www.bea.gov, the website of the U.S. Bureau of Economic Analysis. Discuss the recent changes in real and nominal GDP and in the components of GDP.

8. A farmer grows wheat, which he sells to a miller for $100. The miller turns the wheat into flour, which he sells to a baker for $150. The baker turns the wheat into bread, which he sells to consumers for $180. Consumers eat the bread.
   a. What is GDP in this economy? Explain.
   b. *Value added* is defined as the value of a producer's output minus the value of the intermediate goods that the producer buys to make the output. Assuming there are no intermediate goods beyond those described above, calculate the value added of each of the three producers.

9. Goods and services that are not sold in markets, such as food produced and consumed at home, are generally not included in GDP. Can you think of how this might cause the numbers in the second column of Table 3 to be misleading in a comparison of the economic well-being of the United States and India? Explain.
10. The participation of women in the U.S. labor force has risen dramatically since 1970.
    a. How do you think this rise affected GDP?
    b. Now imagine a measure of well-being that includes time spent working in the home and taking leisure. How would the change in this measure of well-being compare to the change in GDP?
    c. Can you think of other aspects of well-being that are associated with the rise in women's labor-force participation? Would it be practical to construct a measure of well-being that includes these aspects?

11. One day, Barry the Barber, Inc., collects $400 for haircuts. Over this day, his equipment depreciates in value by $50. Of the remaining $350, Barry sends $30 to the government in sales taxes, takes home $220 in wages, and retains $100 in his business to add new equipment in the future. From the $220 that Barry takes home, he pays $70 in income taxes. Based on this information, compute Barry's contribution to the following measures of income.
    a. gross domestic product
    b. net national product
    c. national income
    d. personal income
    e. disposable personal income

Problems and Applications

1. a. Consumption increases because a refrigerator is a good purchased by a household.
   b. Investment increases because a house is an investment good.
   c. Consumption increases because a car is a good purchased by a household, but investment decreases because the car in Ford's inventory had been counted as an investment good until it was sold.
   d. Consumption increases because pizza is a good purchased by a household.
   e. Government purchases increase because the government spent money to provide a good to the public.
   f. Consumption increases because the bottle is a good purchased by a household, but net exports decrease because the bottle was imported.
   g. Investment increases because new structures and equipment were built.

2. With transfer payments, nothing is produced, so there is no contribution to GDP.

3. If GDP included goods that are resold, it would be counting output of that particular year, plus sales of goods produced in a previous year. It would double-count goods that were sold more than once and would count goods in GDP for several years if they were produced in one year and resold in another.

4. a. Calculating nominal GDP:
2005: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200
2006: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400
2007: ($2 per qt. of milk × 200 qts. milk) + ($4 per qt. of honey × 100 qts. honey) = $800

Calculating real GDP (base year 2005):
2005: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200
2006: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400
2007: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

Calculating the GDP deflator:
2005: ($200/$200) × 100 = 100
2006: ($400/$400) × 100 = 100
2007: ($800/$400) × 100 = 200

b. Calculating the percentage change in nominal GDP:
Percentage change in nominal GDP in 2006 = [($400 − $200)/$200] × 100 = 100%.
Percentage change in nominal GDP in 2007 = [($800 − $400)/$400] × 100 = 100%.

Calculating the percentage change in real GDP:
Percentage change in real GDP in 2006 = [($400 − $200)/$200] × 100 = 100%.
Percentage change in real GDP in 2007 = [($400 − $400)/$400] × 100 = 0%.

Calculating the percentage change in GDP deflator:
Percentage change in the GDP deflator in 2006 = [(100 − 100)/100] × 100 = 0%.
Percentage change in the GDP deflator in 2007 = [(200 − 100)/100] × 100 = 100%.

Prices did not change from 2005 to 2006. Thus, the percentage change in the GDP deflator is zero. Likewise, output levels did not change from 2006 to 2007. This means that the percentage change in real GDP is zero.

c. Economic well-being rose more in 2006 than in 2007, since real GDP rose in 2006 but not in 2007. In 2006, real GDP rose but prices did not. In 2007, real GDP did not rise but prices did.

5.

Year	Nominal GDP (billions)	GDP Deflator (base year: 1996)
2000	$9,873	118
1999	$9,269	113

a. The growth rate of nominal GDP is ($9,873 − $9,269)/$9,269 × 100% = 6.5%.

b. The growth rate of the deflator is (118 − 113)/113 × 100% = 4.4%.

c. Real GDP in 1999 (in 1996 dollars) is $9,269/(113/100) = $8,203.

d. Real GDP in 2000 (in 1996 dollars) is \$9,873/(118/100) = \$8,367.

e. The growth rate of real GDP is (\$8,367 − \$8,203)/\$8,203 × 100% = 2.0%.

f. The growth rate of nominal GDP is higher than the growth rate of real GDP because of inflation.

6. Economists ignore the rise in people's incomes that is caused by higher prices because although incomes are higher, the prices of the goods and services that people buy are also higher. Therefore, they will not necessarily be able to purchase more goods and services. For this reason, economists prefer to look at real GDP instead of nominal GDP.

7. Many answers are possible.

8. a. GDP equals the dollar amount Barry collects, which is \$400.
b. NNP = GDP − depreciation = \$400 − \$50 = \$350.
c. National income = NNP − sales taxes = \$350 − \$30 = \$320.
d. Personal income = national income − retained earnings = \$320 − \$100 = \$220.
e. Disposable personal income = personal income − personal income tax = \$220 − \$70 = \$150.

9. a. GDP is the market value of the final good sold, \$180.

b. Value added for the farmer: \$100.
Value added for the miller: \$150 − \$100 = \$50.
Value added for the baker: \$180 − \$150 = \$30.

c. Together, the value added for the three producers is \$100 + \$50 + \$30 = \$180. This is the value of GDP.

10. In countries like India, people produce and consume a fair amount of food at home that is not included in GDP. So GDP per person in India and the United States will differ by more than their comparative economic well-being.

11. If the government cares about the total income of Americans, it will emphasize GNP, because that measure includes the incomes of Americans that is earned abroad and excludes the incomes of foreigners living in the United States. If the government cares about the total amount of economic activity occurring in the United States, it will emphasize GDP, which measures the level of production in the country, whether produced by domestic citizens or foreigners.

12. a. The increased labor-force participation of women has increased GDP in the United States, because it means more people are working and production has increased.

b. If our measure of well-being included time spent working in the home and taking leisure, it would not rise as much as GDP, because the rise in women's labor-force participation has reduced time spent working in the home and taking leisure.

c. Other aspects of well-being that are associated with the rise in women's increased labor-force participation include increased self-esteem and prestige for women in the workforce, especially at managerial levels, but decreased quality time spent with children, whose parents have less time to spend with them. Such aspects would be quite difficult to measure.