

## **SOLUTIONS TO TEXT PROBLEMS:**

### **Quick Quizzes:**

1. Gross domestic product measures two things at once: (1) the total income of everyone in the economy; and (2) the total expenditure on the economy's output of goods and services. It can measure both of these things at once because income must equal expenditure for the economy as a whole.
2. The production of a pound of caviar contributes more to GDP than the production of a pound of hamburger because the contribution to GDP is measured by market value and the price of a pound of caviar is much higher than the price of a pound of hamburger.
3. The four components of expenditure are: (1) consumption; (2) investment; (3) government purchases; and (4) net exports. The largest component is consumption, which accounts for more than two-thirds of total expenditure.
4. Nominal GDP is the production of goods and services valued at current prices. Real GDP is the production of goods and services valued at constant prices. Real GDP is a better measure of economic well-being because it reflects the economy's ability to satisfy people's needs and desires. Thus a rise in real GDP means people have produced more goods and services, but a rise in nominal GDP could occur either because of increased production or because of higher prices.
5. Although GDP is not a perfect measure of well-being, policymakers should care about it because a larger GDP means that a nation can afford better health care, better educational systems, and more of the material necessities of life.

### **Questions for Review:**

1. An economy's income must equal its expenditure, since 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.
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. If nominal GDP rises, you do not know if that is because of increased production or higher prices.

7.

Year	Nominal GDP	Real GDP	GDP Deflator
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2001	$100 \times \$2 = \$200$	$100 \times \$2 = \$200$	$(\$200/\$200) \times 100 = 100$
2002	$200 \times \$3 = \$600$	$200 \times \$2 = \$400$	$(\$600/\$400) \times 100 = 150$

The percentage change in nominal GDP is  $(600-200)/200 \times 100 = 200\%$ . The percentage change in real GDP is  $(400-200)/200 \times 100 = 100\%$ . The percentage change in the deflator is  $(150-100)/100 \times 100 = 50\%$ .

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.
  - 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. Purchases of new housing are included in the investment portion of GDP because housing provides services for a long time. For the same reason, purchases of new cars could be thought of as investment, but by convention, they are not. The logic could apply to any durable good, such as household appliances.
4. 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.
5. a. Calculating nominal GDP:
  - 2001:  $(\$1 \text{ per qt. of milk} \times 100 \text{ qts. milk}) + (\$2 \text{ per qt. of honey} \times 50 \text{ qts. honey}) = \$200$
  - 2002:  $(\$1 \text{ per qt. of milk} \times 200 \text{ qts. milk}) + (\$2 \text{ per qt. of honey} \times 100 \text{ qts. honey}) = \$400$
  - 2003:  $(\$2 \text{ per qt. of milk} \times 200 \text{ qts. milk}) + (\$4 \text{ per qt. of honey} \times 100 \text{ qts. honey}) = \$800$

Calculating real GDP (base year 2001):

$$2001: (\$1 \text{ per qt. of milk} \times 100 \text{ qts. milk}) + (\$2 \text{ per qt. of honey} \times 50 \text{ qts. honey}) = \$200$$

$$2002: (\$1 \text{ per qt. of milk} \times 200 \text{ qts. milk}) + (\$2 \text{ per qt. of honey} \times 100 \text{ qts. honey}) = \$400$$

$$2003: (\$1 \text{ per qt. of milk} \times 200 \text{ qts. milk}) + (\$2 \text{ per qt. of honey} \times 100 \text{ qts. honey}) = \$400$$

Calculating the GDP deflator:

$$2001: (\$200/\$200) \times 100 = 100$$

$$2002: (\$400/\$400) \times 100 = 100$$

$$2003: (\$800/\$400) \times 100 = 200$$

b. Calculating the percentage change in nominal GDP:

$$\text{Percentage change in nominal GDP in 2002} = [(\$400 - \$200)/\$200] \times 100 = 100\%.$$

$$\text{Percentage change in nominal GDP in 2003} = [(\$800 - \$400)/\$400] \times 100 = 100\%.$$

Calculating the percentage change in real GDP:

$$\text{Percentage change in real GDP in 2002} = [(\$400 - \$200)/\$200] \times 100 = 100\%.$$

$$\text{Percentage change in real GDP in 2003} = [(\$400 - \$400)/\$400] \times 100 = 0\%.$$

Calculating the percentage change in GDP deflator:

$$\text{Percentage change in the GDP deflator in 2002} = [(100 - 100)/100] \times 100 = 0\%.$$

$$\text{Percentage change in the GDP deflator in 2003} = [(200 - 100)/100] \times 100 = 100\%.$$

Prices did not change from 2001 to 2002. Thus, the percentage change in the GDP deflator is zero. Likewise, output levels did not change from 2002 to 2003. This means that the percentage change in real GDP is zero.

- c. Economic well-being rose more in 2002 than in 2003, since real GDP rose in 2002 but not in 2003. In 2002, real GDP rose and prices didn't. In 2003, real GDP didn't rise and prices did.

6.

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  $(\$9,873 - \$9,269)/\$9,269 \times 100\% = 6.5\%$ .

- b. The growth rate of the deflator is  $(118 - 113)/113 \times 100\% = 4.4\%$ .

- 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  $(\$8,367 - \$8,203)/\$8,203 \times 100\% = 2.0\%$ .

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

7. 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.

8. Many answers are possible.
9.
  - a. GDP equals the dollar amount Barry collects, which is \$400.
  - b.  $NNP = GDP - \text{depreciation} = \$400 - \$50 = \$350$ .
  - c.  $\text{National income} = NNP - \text{sales taxes} = \$350 - \$30 = \$320$ .
  - d.  $\text{Personal income} = \text{national income} - \text{retained earnings} = \$320 - \$100 = \$220$ .
  - e.  $\text{Disposable personal income} = \text{personal income} - \text{personal income tax} = \$220 - \$70 = \$150$ .
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, since that measure includes the income of Americans that is earned abroad and excludes the income of foreigners. 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, since 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 wouldn't rise as much as GDP, since 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.