**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 final goods and services. It can measure both of these things at once because all expenditure in the economy ends up as someone’s income.

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 nearly 70 percent of total expenditure.

4. Real GDP is the production of goods and services valued at constant prices. Nominal GDP is the production of goods and services valued at current prices. Real GDP is a better measure of economic well-being because changes in real GDP reflect changes in the amount of output being produced. 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 healthcare, better educational systems, and more of the material necessities of life.

**Chapter Quick Quiz**

1. b

2. c

3. d

4. c

5. a

6. b

# **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 to 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 DVD; 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. A rise in nominal GDP can be been caused by increased production, higher prices, or both.

7.

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| --- | --- | --- | --- |
| **Year** | **Nominal GDP** | **Real GDP** | **GDP Deflator** |
| 2017 | 100 X $2 = $200 | 100 X $2 = $200 | ($200/$200) X 100 = 100 |
| 2018 | 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. a. Consumption increases because a refrigerator is a good purchased by a household.

b. Investment increases because a house is an investment good.

c. GDP is not affected because nothing new is produced.

d. Consumption increases because a haircut is a service purchased by a household.

e. 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.

f. Investment increases because a car is an investment good to the car rental company.

g. Government purchases increase because the government spent money to provide a good to the public.

h. GDP is not affected because a Social Security check is a transfer payment, not a government purchase.

i. Consumption increases because the bottle is a good purchased by a household, but net exports decrease because the bottle was imported.

j. Investment increases because new structures and equipment were built.

1. See completed table below with answers in bold.

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| --- | --- | --- | --- |
| Year | Real GDP  (in 2000 dollars) | Nominal GDP  (in current dollars) | GDP deflator  base year 2000 |
| 1970 | 3,000 | 1,200 | **40** |
| 1980 | 5,000 | **3,000** | 60 |
| 1990 | **6,000** | 6,000 | 100 |
| 2000 | **8,000** | 8,000 | **100** |
| 2010 | **7,500** | 15,000 | 200 |
| 2020 | 10,000 | **30,000** | 300 |
| 2030 | 20,000 | 50,000 | **250** |

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

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. This double-counting would make GDP a less informative measure of economic well-being because it would overstate the value of production.

5. a. Calculating nominal GDP:

2016: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200

2017: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

2018: ($2 per qt. of milk × 200 qts. milk) + ($4 per qt. of honey × 100 qts. honey) = $800

Calculating real GDP (base year 2016):

2016: ($1 per qt. of milk × 100 qts. milk) + ($2 per qt. of honey × 50 qts. honey) = $200

2017: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

2018: ($1 per qt. of milk × 200 qts. milk) + ($2 per qt. of honey × 100 qts. honey) = $400

Calculating the GDP deflator:

2016: ($200/$200) × 100 = 100

2017: ($400/$400) × 100 = 100

2018: ($800/$400) × 100 = 200

b. Calculating the percentage change in nominal GDP:

Percentage change in nominal GDP in 2017 = [($400 – $200)/$200] × 100 = 100%.

Percentage change in nominal GDP in 2018 = [($800 – $400)/$400] × 100 = 100%.

Calculating the percentage change in real GDP:

Percentage change in real GDP in 2017 = [($400 – $200)/$200] × 100 = 100%.

Percentage change in real GDP in 2018 = [($400 – $400)/$400] × 100 = 0%.

Calculating the percentage change in GDP deflator:

Percentage change in the GDP deflator in 2017 = [(100 – 100)/100] × 100 = 0%.

Percentage change in the GDP deflator in 2018 = [(200 – 100)/100] × 100 = 100%.

Prices did not change from 2016 to 2017. Thus, the percentage change in the GDP deflator is zero. Likewise, output levels did not change from 2017 to 2018. This means that the percentage change in real GDP is zero.

c. Economic well-being rose more in 2017 than in 2018, since real GDP rose in 2017 but not in 2018. In 2017, real GDP rose but prices did not. In 2018, real GDP did not rise but prices did.

6. a. Calculating Nominal GDP:

Year 1: (3 bars × $4) = $12

Year 2: (4 bars × $5) = $20

Year 3: (5 bars × $6) = $30

b. Calculating Real GDP:

Year 1: (3 bars × $4) = $12

Year 2: (4 bars × $4) = $16

Year 3: (5 bars × $4) = $20

c. Calculating the GDP deflator:

Year 1: $12/$12 × 100 = 100

Year 2: $20/$16 × 100 = 125

Year 3: $30/$20 × 100 = 150

d. The growth rate of real GDP from Year 2 to Year 3 = (20 – 16)/16 × 100 = 25%

e. The inflation rate from Year 2 to Year 3 = (150 – 125)/125 × 100 = 20%.

f. To calculate the growth rate of real GDP, we could simply calculate the percentage change in the quantity of bars. To calculate the inflation rate, we could measure the percentage change in the price of bars.

7.

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| **Year** | **Nominal GDP (billions)** | **GDP Deflator (base year: 2009)** |
| 2014 | $17,419 | 108.3 |
| 1994 | $ 7,309 | 73.8 |

a. The growth rate of nominal GDP = 100 × [($17,419/$7,309)0.05 – 1] = 4.4%

b. The growth rate of the deflator = 100 × [(108.3/73.8)0.05 – 1] = 1.9%

c. Real GDP in 1994 (in 2009 prices) is $7,309/(73.8/100) = $9,903.79.

d. Real GDP in 2014 (in 2009 prices) is $17,419/(108.3/100) = $16,084.03.

e. The growth rate of real GDP = 100 × [($16,084.03/$9,903.79)0.05 – 1] = 2.5%

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

8. Many answers are possible.

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. This example suggests that GDP could be calculated as the sum of the value added by all producers.

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

11. 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.

12. a. GDP equals the dollar amount Barry collects, which is $400.

b. NNP = GDP – depreciation = $400 – $50 = $350.

c. National income = NNP = $350.

d. Personal income = national income – retained earnings – indirect business taxes = $350 – $100 – $30 = $220.

e. Disposable personal income = personal income – personal income tax = $220 – $70 = $150.