Measuring the Economy’s Performance

Learning Objectives

After you have studied this chapter, you should be able to

1. define total income, final goods and services, gross domestic product (GDP), intermediate goods, value added, expenditure approach, income approach, durable consumer goods, nondurable consumer goods, gross private domestic investment, producer durables or capital goods, fixed investment, inventory investment, depreciation or capital consumption allowance, net domestic product, net investment, indirect business taxes, nonincome expense items, national income, personal income, disposable personal income, nominal values, real values, constant dollars, purchasing power parity, and foreign exchange rate;

2. distinguish between flows and stocks, intermediate and final goods, durable and nondurable goods, nominal and real values, goods and services, and gross and net private domestic investment;

3. recognize whether a transaction is or is not included in gross domestic product;

4. recognize whether the inability to include an activity in gross domestic product causes our measure to overstate or understate output and/or economic welfare;

5. list the three general categories of purely financial transactions;

6. distinguish between the expenditure approach and the income approach to deriving gross domestic product;

7. recognize the major components of GDP, using the expenditure approach and using the income approach;

8. derive GDP, NDP, NI, PI, and DPI when given sufficient information;

9. convert nominal GDP into real GDP, given the GDP deflator; and

10. point out problems with measuring GDP and with making international comparisons of GDP.
### Outline

1. National income accounting is a measurement system used to estimate national income and its components.

2. In order to eliminate the effects of inflation and deflation, statisticians convert nominal GDP into real GDP by dividing the former by a price index.

3. Gross domestic product (GDP) is the market value of all the final goods and services produced by factors of production located within a nation’s borders.
   a. In order to avoid double counting, only final goods and services are counted in GDP determination.
   b. Because nonproductive transactions do not contribute to output or to economic welfare, they are excluded from GDP determination.
      i. Such financial transactions as (a) purchases and sales of securities and (b) private and public transfers are nonproductive activities. Hence, they are excluded from GDP determination.
      ii. The transfer of used goods is considered a nonproductive activity because by definition used goods are produced (and counted) in a previous period.
      iii. Other transactions excluded from GDP determination are homemaker activities, underground activities, most illegal activities, and do-it-yourself activities. In principle, most of these activities should be counted in GDP determination, but they are difficult to measure.

4. There are two basic approaches to measuring GDP: the expenditure approach and the income approach.

5. The expenditure approach measures GDP by summing the value of household consumption expenditures, gross private domestic investment, government expenditures, and net exports.
   a. Household consumption expenditures fall into three categories: durable goods, nondurable goods, and services.
   b. Gross private domestic investment equals the sum of fixed investment, inventory investment, and consumer expenditures on new residential structures.
   c. Government expenditures equal the cost of goods and services purchased by governments because such goods are usually provided at a zero price to users.
   d. Net exports equal the value of exports minus the value of imports.
   e. Net domestic product (NDP) equals gross domestic product minus depreciation.
   f. Indirect business taxes include the value of excise, sales, and property taxes.
   g. Depreciation is also referred to as capital consumption allowance. Indirect business taxes plus depreciation equal nonincome expense items.
6. Other components of national income accounting are national income (NI), personal income (PI), and disposable personal income (DPI).
   a. National income equals NDP minus indirect business taxes and transfers plus net U.S. earnings abroad and other business income adjustments. Using the income approach, NI equals the sum of all factor payments to resource owners.
   b. Personal income equals NI minus corporate taxes, Social Security contributions, and undistributed corporate profits, plus public transfer payments. Using the income approach, PI equals the amount of income that households actually receive before they pay their personal income taxes.
   c. Disposable personal income equals PI minus personal income taxes and nontax payments. DPI equals the income that households have to spend for consumption and saving.

7. Because we are really interested in variations in the real output of the economy, nominal GDP is divided by the GDP deflator in order to obtain real GDP.

8. Real GDP divided by population yields per capita real GDP. This latter statistic provides a better measure of a nation’s living standard.

9. The official GDP measure underestimates national output and economic welfare because it does not take into account do-it-yourself activities, homemakers’ services, some illegal activities, and underground economy activities. In general, an underground economy will be more important the higher are marginal tax rates on income and the higher are legally mandated benefits that employers must pay to workers.

10. Because GDP is difficult to measure, international GDP comparisons are very difficult. A recent improvement is the purchasing power parity concept, which takes into account the costs of goods and services that are not traded internationally—and therefore are not reflected in foreign exchange rates.

### Key Terms

- Disposable personal income (DPI)
- Durable consumer good
- Fixed investment
- Gross domestic income (GDI)
- Gross domestic product (GDP)
- Gross private domestic investment
- Indirect business taxes
- Inventory investment
- Investment
- National income (NI)
- Net domestic product (NDP)
- Net investment
- Nondurable consumer good
- Personal income (PI)
- Services
- Total income
Key Concepts

Capital consumption allowance
Constant dollars
Depreciation
Expenditure approach
Final goods and services
Foreign exchange rate

Income approach
Intermediate goods
National income accounting
Nominal values
Nonincome expense items

Producer durables, or capital goods
Purchasing power parity
Real values
Value added

Completion Questions

Fill in the blank, or circle the correct term.

1. Inflation causes us to (understate, overstate) the value of output and economic welfare, while deflation causes us to (understate, overstate) such values. For that reason, economists attempt to correct for price level changes. They attempt to convert the less accurate (nominal, real) values into the more accurate (nominal, real) values.

2. GDP represents the total market value of all (final, final and intermediate) goods and services produced during a year.

3. Values that are calculated at a moment in time are referred to as ______________________. Values that are calculated over a time interval are _______________ values. Examples of flows include income, consumption, and saving. Examples of stocks include _____________________ and ___________.

4. In order to avoid double counting, _______________ goods are not counted. Only final goods are included in national income accounting.

5. Nonproductive activities, such as financial transactions, (are, are not) counted in GDP determination. If you sell your four-year-old car to your friend, this activity (is, is not) counted in GDP determination.

6. When a person receives a Social Security payment, the value (is, is not) counted as a productive activity. Counting transfers as a productive activity would be an example of _______________ counting.

7. Do-it-yourself activities, homemakers’ activities, and (legal) underground economy activities (are, are not) productive activities. Such activities (are, are not) counted in the official GDP figures. For that reason, the GDP figures (overestimate, underestimate) national output and economic welfare.
8. The two basic methods of GDP determination are the ___________________ approach and the ___________________ approach. The expenditure approach to national income includes the sum of the values of ___________, ___________, ___________, and ___________. The income approach estimates national income by summing ___________, ___________, ___________, and ___________.

9. Because many government goods and services are provided to users free of charge, such items are valued at their ________________ of production.

10. Consumer durable goods are arbitrarily defined as items that last more than _______________ year(s).

11. Net investment equals gross private domestic investment minus ________________.

12. Net exports are identical to total exports (plus, minus) total imports.

13. Gross domestic product minus depreciation equals ________________. Nonincome expense items include indirect business taxes and _________________. National income equals NDP _________________. Personal income minus personal income taxes and nontax payments equals _________________.

14. When nominal GDP is divided by the ________________, real GDP is determined. When real GDP is divided by population, ________________ is determined.

15. GDP accounting has been criticized. GDP understates productive activities and economic welfare because it (includes, excludes) household production, do-it-yourself activities, and otherwise legal activities in the __________________ economy. Because various things such as pollution (are, are not) subtracted from GDP, GDP overstates economic welfare.

16. The purchasing power parity approach to making international comparisons of living standards (does, does not) consider relative costs of goods that are not traded internationally.

## True-False Questions

Circle the T if the statement is true, the F if it is false. Explain to yourself why a statement is false.

T F 1. Inflation causes us to overstate national income and output.

T F 2. Gross domestic product is a stock concept.

T F 3. Both final and intermediate goods are counted when measuring GDP.

T F 4. Homemakers’ activities are nonproductive transactions.

T F 5. When Ms. Dominguez purchases a share of stock, investment rises. Therefore GDP rises.

T F 6. Public transfers are counted in GDP, but private transfers are not.
T F 7. A nation’s underground economy becomes larger as marginal tax rates rise on income.

T F 8. Whether or not a good is durable is an arbitrary decision.

T F 9. In the expenditure approach, the value G equals the sum of all the receipts governments realize from the sale of their services, plus taxes.

T F 10. When a person purchases a new pair of socks, consumption takes place in the official GDP accounts.

T F 11. If net exports rise, other things being constant, then GDP rises.

T F 12. Corporate income taxes are a form of indirect business tax.

T F 13. The sum of household consumption plus household saving equals disposable personal income.

T F 14. GDP minus depreciation equals net private domestic investment.

T F 15. The dollar value of total output computed using the expenditure approach is identical to the dollar value of the total income measured by the income approach because of the way in which profit is defined.

**Multiple Choice Questions**

Circle the letter that corresponds to the best answer.

1. Concerning real versus nominal values,
   a. people respond to changes in real values.
   b. economists attempt to convert real into nominal values.
   c. current values are real values.
   d. nominal values have been adjusted for changes in the price level.

2. Gross domestic product includes
   a. only intermediate goods and services.
   b. only final goods and services.
   c. both intermediate and final goods.
   d. neither intermediate nor final goods.

3. In order to avoid overstating national output and income,
   a. intermediate goods are ignored.
   b. used good transactions between nonbusinesses are ignored.
   c. public and private transfers are ignored.
   d. All of the above.
4. Which one of the following is a nonproductive transaction?
   a. Mr. Gauss gives his niece $50 for her birthday.
   b. Mrs. Patullo cooks for her family.
   c. Mrs. Arianas is a waitress in the “underground” economy.
   d. All of the above.

5. Which one of the following activities is ignored in the official national income accounts?
   a. Mr. Stephenson gives his son $500 for Christmas.
   b. Mrs. Stephenson sells her used car to the Harrymans.
   c. Beth Stephenson paints her own house.
   d. All of the above.

6. *Analogy*: Consumption is to flow as __________ is to stock.
   a. inventory value
   b. GDP
   c. NDP
   d. saving

7. When Capra, who resides in the United States, purchases a bottle of French wine,
   a. U.S. consumption falls.
   b. U.S. investment rises by the purchase price.
   c. U.S. consumption rises by the purchase price.
   d. U.S. net exports fall.

8. Net investment equals
   a. GDP minus capital consumption allowance.
   b. gross private domestic investment plus depreciation.
   c. gross private domestic investment minus depreciation.
   d. planned saving minus net saving.

9. If total exports exceed total imports, other things being constant, then
   a. total expenditures fall.
   b. net exports are positive.
   c. GDP falls.
   d. investment rises.

10. GDP minus depreciation equals
    a. net investment.
    b. capital consumption allowance.
    c. NDP.
    d. NI.
11. Which one is not a component of indirect business taxes?
   a. sales taxes
   b. excise taxes
   c. corporate income taxes
   d. property taxes incurred by businesspersons

12. Which one of the following is a nonincome expense item?
   a. depreciation
   b. excise and sales taxes
   c. property taxes incurred by businesspersons
   d. All of the above are nonincome expense items.

13. National income
   a. minus depreciation equals NDP.
   b. plus depreciation plus indirect business taxes and transfers minus U.S. net earnings abroad and other business income adjustments equals GDP.
   c. minus inflation equals real GDP.
   d. plus transfer payments equals PI.

14. Which one of the following is not included in national income?
   a. corporate taxes
   b. Social Security taxes
   c. transfer payments
   d. undistributed corporate profits

15. Which one of the following is a transfer payment?
   a. Mr. Farano pays his son for painting the house.
   b. Mr. Scheifele gets paid for tending bar but does not declare his income.
   c. Mrs. Niemeck gets paid by a state government for teaching.

16. Which one of the following best represents a nation’s standard of living?
   a. nominal GDP
   b. real GDP
   c. per capita real GDP
   d. per capita nominal GDP

17. Which one of the following activities is not considered in GDP determination and therefore causes economic welfare to be overestimated?
   a. do-it-yourself activities
   b. pollution damage
   c. homemaker activities
   d. private and public transfers
18. Forecasters have difficulty in predicting economic recessions because
a. data from government agencies are often revised.
b. government price indices are unreliable.
c. it is difficult to measure recent technological improvements.
d. All of the above.

Matching
Choose the item in Column (2) that best matches an item in Column (1).

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) expenditure approach</td>
<td>(j) depreciation</td>
</tr>
<tr>
<td>(b) income approach</td>
<td>(k) NDP</td>
</tr>
<tr>
<td>(c) intermediate good</td>
<td>(l) $C + I + G + \text{net exports}$</td>
</tr>
<tr>
<td>(d) capital consumption allowance</td>
<td>(m) wages + rents + profits + interest payments</td>
</tr>
<tr>
<td>(e) GDP minus depreciation</td>
<td>(n) flour used by a baker</td>
</tr>
<tr>
<td>(f) nonincome expense item</td>
<td>(o) bread used by a family</td>
</tr>
<tr>
<td>(g) final good</td>
<td>(p) price-level adjusted GDP</td>
</tr>
<tr>
<td>(h) constant dollars</td>
<td>(q) capital good</td>
</tr>
<tr>
<td>(i) producer durable</td>
<td>(r) indirect business taxes</td>
</tr>
</tbody>
</table>

Problems
1. What happens to the official measure of GDP if
   a. a woman marries her butler?
   b. an addict marries his cocaine supplier?
   c. homemakers perform the same jobs but switch houses and charge each other for their services?

2. What happens to economic welfare in the three examples in Problem 1 above?

3. a. In the table below, calculate real GDP for each of the years indicated.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal GDP</th>
<th>GDP Deflator</th>
<th>Real GDP (2005 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>14,224.8</td>
<td>113.2</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>14,925.2</td>
<td>114.3</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>15,826.0</td>
<td>115.8</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>16,743.6</td>
<td>117.8</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>17,801.2</td>
<td>120.3</td>
<td></td>
</tr>
</tbody>
</table>

b. Interpret what a GDP deflator of 115.8 for the year 2013 means.
c. Determine whether or not inflation occurred over the 2011–2015 period.
4. Suppose you are given the following information about some hypothetical economy and its national income accounts. Use this information to answer the questions that follow. (Amounts are in billions of dollars.)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect business taxes and transfers</td>
<td>$156</td>
</tr>
<tr>
<td>Net U.S. income earned abroad</td>
<td>8</td>
</tr>
<tr>
<td>Corporate profits</td>
<td>101</td>
</tr>
<tr>
<td>Corporate income taxes</td>
<td>56</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>24</td>
</tr>
<tr>
<td>Proprietors’ income</td>
<td>73</td>
</tr>
<tr>
<td>Rents and interest earned ($R + I)</td>
<td>98</td>
</tr>
<tr>
<td>Exports</td>
<td>18</td>
</tr>
<tr>
<td>Imports</td>
<td>10</td>
</tr>
<tr>
<td>Net domestic product</td>
<td>1,436</td>
</tr>
<tr>
<td>Government expenditures on goods and services</td>
<td>323</td>
</tr>
<tr>
<td>Transfer payments</td>
<td>230</td>
</tr>
<tr>
<td>Social Security contributions</td>
<td>120</td>
</tr>
<tr>
<td>Consumption expenditures</td>
<td>1,055</td>
</tr>
<tr>
<td>Gross investment</td>
<td>220</td>
</tr>
<tr>
<td>Disposable personal income</td>
<td>1,123</td>
</tr>
</tbody>
</table>

a. Find GDP.
b. Find depreciation (capital consumption allowance).
c. Find national income.
d. Find wages and salaries.
e. Find personal income.
f. Find personal income taxes.
g. Find net exports.

5. Suppose you own a small skateboard factory that has sales, expenses, and profits as shown below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales</td>
<td>$25,000</td>
</tr>
<tr>
<td>Expenses</td>
<td></td>
</tr>
<tr>
<td>Wages and salaries</td>
<td>$9,000</td>
</tr>
<tr>
<td>Interest on loans</td>
<td>$800</td>
</tr>
<tr>
<td>Rent</td>
<td>$3,200</td>
</tr>
<tr>
<td>Raw materials</td>
<td>$7,000</td>
</tr>
<tr>
<td>Tools and equipment</td>
<td>$1,000</td>
</tr>
<tr>
<td>Profits</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

What is the value added to GDP of the productive activities of your firm?
Answers

Completion Questions

1. overstate; understate; nominal; real
2. final
3. stocks; flow; inventory value; bank accounts
4. intermediate
5. are not; is not
6. is not; double
7. are; are not; underestimate
8. expenditure; income; consumption; investment; government expenditures; net exports; wages; interest; rents; profits
9. cost
10. three
11. depreciation (or capital consumption allowance)
12. minus
13. NDP; depreciation; minus indirect business taxes and transfers plus net U.S. earnings abroad and other business income adjustments; disposable personal income
14. GDP deflator; per capita real GDP
15. excludes; underground; are not
16. does

True-False Questions

1. T
2. F GDP is measured per unit of time. Hence, it is a flow concept.
3. F Only final goods are counted, to avoid double counting.
4. F They are productive. If someone outside the family did them, you would probably have to pay for such services.
5. F Common stock purchases are simply financial transactions.
6. F Neither is counted, as should be the case.
7. T
8. T
9. F G equals the value (at cost) of government purchases of goods and services.
10. T
11. T
12. F They are direct taxes.
13. T
14. F It equals NDP.
15. T
Multiple Choice Questions

1. (a) 10. (c)
2. (b) 11. (c)
3. (d) 12. (d)
4. (a) 13. (b)
5. (d) 14. (c)
6. (a) 15. (d)
7. (d) 16. (c)
8. (c) 17. (b)
9. (b) 18. (d)

Matching

(a) and (l) (f) and (r)
(b) and (m) (g) and (o)
(c) and (n) (h) and (p)
(d) and (j) (i) and (q)
(e) and (k)

Problems

1. a. falls
   b. unaffected, because illegal activities are not counted anyway
   c. rises

2. a. remains constant
   b. difficult to tell. It depends on one’s value judgment.
   c. remains constant

3. a.

<table>
<thead>
<tr>
<th>Year</th>
<th>Real GDP (2005 dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>12,566.1</td>
</tr>
<tr>
<td>2012</td>
<td>13,057.9</td>
</tr>
<tr>
<td>2013</td>
<td>13,666.7</td>
</tr>
<tr>
<td>2014</td>
<td>14,213.6</td>
</tr>
<tr>
<td>2015</td>
<td>14,797.3</td>
</tr>
</tbody>
</table>

b. The overall price level in 2015 was about 6.3 percent higher than it was in 2011.

c. Inflation occurred in every year over that period because the GDP deflator went up every year.
4. a. To calculate GDP: \( C + I + G + X = 1,055 + 220 + 323 + 8 = 1,606 \)
   b. To calculate depreciation: \( GDP - NDP = 1,606 - 1,436 = 170 \)
   c. To calculate national income: \( NDP - \text{indirect business taxes and transfers} + \text{net U.S. income earned abroad} = 1,436 - 156 + 8 = 1,288 \)
   d. To calculate wages and salaries: \( \text{national income} - \text{corp. profits} - \text{prop. income} - R \& I \)
      \[ = 1,288 - 101 - 73 - 98 = 1,016 \]
   e. To calculate PI: \( \text{national income} - \text{corp. tax} - \text{soc. sec.} - \text{ret. earn.} + \text{trans. pay.} \)
      \[ = 1,288 - 56 - 120 - 24 + 230 = 1,318 \]
   f. To calculate personal income taxes: \( \text{PI} - DPI = 1,318 - 1,123 = 195 \)
   g. To calculate net exports: \( X = \text{exports} - \text{imports} = 18 - 10 = 8 \)

5. Value added is measured by the difference in the value of the intermediate goods (in this case raw materials) used to produce a product and the final value of that product. Thus,
   \[ \text{value added} = \text{total sales} - \text{cost of raw materials}, \text{or} \]
   \[ \text{value added} = $25,000 - $7,000 = $18,000. \]
Glossary

**Capital consumption allowance**  Another name for depreciation, the amount that businesses would have to save in order to take care of the deterioration of machines and other equipment.

**Constant dollars**  Dollars expressed in terms of real purchasing power using a particular year as the base or standard of comparison, in contrast to current dollars.

**Depreciation**  Reduction in the value of capital goods over a one-year period due to physical wear and tear and also to obsolescence; also called *capital consumption allowance*.

**Disposable personal income (DPI)**  Personal income after personal income taxes have been paid.

**Durable consumer goods**  Consumer goods that have a life span of more than three years.

**Expenditure approach**  Computing GDP by adding up the dollar value at current market prices of all final goods and services.

**Final goods and services**  Goods and services that are at their final stage of production and will not be transformed into yet other goods or services. For example, wheat is not ordinarily considered a final good because it is used to make a final good, bread.

**Fixed investment**  Purchases by businesses of newly produced producer durables, or capital goods, such as production machinery and office equipment.

**Foreign exchange rate**  The price of one currency in terms of another.

**Gross domestic income (GDI)**  The sum of all income—wages, interest, rent, and profits—paid to the four factors of production.

**Gross domestic product (GDP)**  The total market value of all final goods and services produced during a year by factors of production located within a nation’s borders.

**Gross private domestic investment**  The creation of capital goods, such as factories and machines, that can yield production and hence consumption in the future. Also included in this definition are changes in business inventories and repairs made to machines or buildings.

**Income approach**  Measuring GDP by adding up all components of national income, including wages, interest, rent, and profits.

**Indirect business taxes**  All business taxes except the tax on corporate profits. Indirect business taxes include sales and business property taxes.

**Intermediate goods**  Goods used up entirely in the production of final goods.

**Inventory investment**  Changes in the stocks of finished goods and goods in process, as well as changes in the raw materials that businesses keep on hand. Whenever inventories are decreasing, inventory investment is negative. Whenever they are increasing, inventory investment is positive.

**Investment**  Any use of today’s resources to expand tomorrow’s production or consumption.

**National income (NI)**  The total of all factor payments to resource owners. It can be obtained from net domestic product (NDP) by subtracting indirect business taxes and transfers and adding net U.S. income earned abroad and other business income adjustments.

**National income accounting**  A measurement system used to estimate national income and its components. One approach to measuring an economy’s aggregate performance.

**Net domestic product (NDP)**  GDP minus depreciation.
Net investment Gross private domestic investment minus an estimate of the wear and tear on the existing capital stock. Net investment therefore measures the change in the capital stock over a one-year period.

Nominal values The values of variables such as GDP and investment expressed in current dollars, also called money values; measurement in terms of actual market prices at which goods and services are sold.

Nondurable consumer goods Goods used by consumers that are used up within three years.

Nonincome expense items The total of indirect business taxes and depreciation.

Personal income (PI) The amount of income that households actually receive before they pay personal income taxes.

Producer durables, or capital goods Durable goods having an expected service life of more than three years that are used by businesses to produce other goods and services.

Purchasing power parity Adjustments in exchange rate conversions that take into account differences in the true cost of living across countries.

Real values Measurement of economic values after adjustments have been made for changes in the average of prices between years.

Services Mental or physical labor or assistance purchased by consumers. Examples are the assistance of physicians, lawyers, dentists, repair personnel, housecleaners, educators, retailers, and wholesalers; items purchased or used by consumers that do not have physical characteristics.

Total income The yearly amount earned by the nation’s resources (factors of production). Total income therefore includes wages, rent, interest payments, and profits that are received by workers, landowners, capital owners, and entrepreneurs, respectively.

Value added The dollar value of an industry’s sales minus the value of intermediate goods (for example, raw materials and parts) used in production.