# Chapter 5(16)

## By the Numbers: Assessing Your Data Literacy

**1.** In which years did the size of the economy contract (exhibit negative real GDP growth)?

**Answer:** The size of the economy contracted in 2008 (0.3%) and in 2009 (2.8%).

**2.** Describe what happened to real GDP growth and the unemployment rate during the economic recession of 2007–2009.

**Answer:** During the recession of 2007 to 2009, real GDP growth dropped significantly while the unemployment rate rose from 4.6% to 9.3%.

**3.** Describe how real GDP growth and the unemployment rate changed during the period of recovery and expansion from 2010 to 2018.

**Answer:** In the recovery and expansion from 2010 to 2018, real GDP growth hovered mostly between 2% and 3%. Meanwhile, the unemployment rate showed consistent improvement throughout the recovery, from an average of 9.6% in 2010 to 3.9% in 2018.

## Check Your Understanding

**1.** How are business cycles defined? Describe the four phases of business cycles.

**Answer:** Business cycles are alternating increases and decreases in economic activity. Business cycles include a peak at the top of the cycle, then a downturn (or recession) as the economy cools off. Eventually the economy reaches the bottom of the cycle, or the trough, followed by a recovery as business picks up and the economy heads toward another peak.

**2.** Explain the a key problem with the way the NBER dates recessions and recoveries?

**Answer:** A key problem is that the dating of recessions and recoveries is done after the events have already started. Therefore, it describes what has already happened and does not help to predict when future recessions will occur or when they will end.

**3.** Describe the circular flow diagram. Why must all income equal spending in the economy?

**Answer:** The circular flow diagram shows how the product and factor markets interact to produce goods and services and pay the factors of production. Ignoring some of the statistical measurement difficulties, when goods or services are produced and sold, that spending must somehow be split among the factors of production (and payments to): labor (wages), land (rent), capital (interest), and entrepreneurial activity (profits).

**4.** Why does GDP accounting include only the final value of goods and services produced? What would be the problem if intermediate products were included?

**Answer:** GDP accounting adds up only the final value of goods and services to avoid “double counting.” When a car is sold, the final price on the lot includes the sum of the costs of the individual parts, and to count them again would be to count them twice. For example, a $28,000 Toyota Prius has tires that Toyota paid $240 for, plus other parts that add up to, say, $15,000. We would not want to increase GDP by $43,240 ($28,000 + $15,000 + $240) when the car is sold; that $15,240 in parts is already included in the $28,000 retail price.

**5.** Explain why GDP can be computed using either the expenditures or income approach.

**Answer:** All spending in the economy necessarily equals payments to all of the factors of production. A dollar spent adds up to a dollar in wages, interest, rents, or profits.

**6.** What does GDP per capita measure? Why is it not a precise measure of a typical person’s standard of living in a country?

**Answer:** GDP per capita measures the total output of an economy divided by its population. Although GDP per capita provides a general indication of the standard of living of a country, it is not a precise measure because it does not take into account differences in income distribution. Therefore, a rich country in terms of GDP per capita can have many poor citizens.

## Apply the Concepts

**7.** Explain how it is possible for an economy in the recovery phase of the business cycle to have a lower GDP and a higher unemployment rate than when it was in the recession phase of the business cycle.

**Answer:** An economy in a recovery phase is one that has reached its low point (trough) when GDP has decreased and unemployment has increased. Therefore, in the early part of the recovery phase, an economy might not have had enough time to increase its GDP or reduce its unemployment. In this case, GDP and unemployment may appear worse during the recovery than during the recession.

**8.** As a percentage of GDP, government spending tends to increase during recessions and decrease during times of economic expansion. Explain why government spending tends to change depending on the phase of the business cycle and how that affects spending as a percentage of GDP.

**Answer:** During a recession, GDP falls while government spending tends to increase as more people seek government assistance, such as unemployment benefits, Medicaid, and other income assistance programs. The increase in government spending and the decrease in GDP increase government spending as a percent of GDP. The opposite occurs during an expansion of the economy, when GDP rises and fewer people seek government benefits, allowing government spending as a percent of GDP to fall.

**9.** Critics of the way GDP is measured argue that it fails to fully account for “intangibles” in knowledge-based goods. For example, the value of books are counted in the year they were produced, but when those books are lent out in a library or resold in the used book market, it does not add to GDP despite the benefits and knowledge that the books provide to readers. What might be some problems associated with trying to include intangibles in GDP?

**Answer:** Including the intangible value of knowledge-based goods such as books may be a good idea in terms of measuring the impact of such goods in our economy, but implementing such a measurement is problematic. First, there is an issue of timing. When should the value of the book be counted—when it was written and produced or when it was read? Also, the value that knowledge contributes to society is very subjective—unlike the price of a book, there is no definitive value from the knowledge gained from the book. These and other reasons explain why intangibles are not included in GDP and why only the price of the book when it was initially sold is counted.

**10.** GDP and GNP are two different measures of the overall value of production in an economy. Suppose that a country’s GDP is much greater than its GNP. What does that mean in terms of investment in and out of the country?

**Answer:** If a country’s GDP is significantly greater than its GNP, this means that the country has many foreign companies producing goods and services within its border compared to its companies producing outside its border. One reason for this may be favorable tax laws that attract foreign companies into a country. For example, Ireland has many multinational corporations operating within its borders, and its GDP is about 25% higher than its GNP.

**11.** Among the major spending categories that make up GDP, why is gross private domestic investment (GPDI) much more volatile than personal consumption expenditures over the business cycle? In your response, provide two examples of an investment purchase that may be put on hold during a recession that may explain this volatility.

**Answer:** GDPI is much more volatile because businesses are less likely to expand their production during recessions. For example, a restaurant chain is less likely to open a new franchise and a factory is less likely to buy new equipment when sales are down. Similarly, individuals are less likely to purchase new homes (which also count toward GDPI) when the economy is performing poorly. Because these items are major expenses (unlike most personal consumption expenditures, which consist of items individuals buy each day), when businesses or potential homeowners delay these purchases until the economy improves, GDPI will decrease significantly during recessions but increase during recoveries and expansions.

**12.** Suppose that a new method of calculating GDP allows for reductions in GDP as a result of the severity of environmental degradation in a country. If this method is used, which of the following countries might experience the greatest adjustment to their GDP calculation: India, Germany, or Iceland?

**Answer:** If the severity of environmental degradation is factored into the calculation of GDP, countries with greater environmental degradation, such as India, would experience a greater adjustment (reduction) in their GDP calculation.

## In the News

**13.** For much of the last 20 years, China’s GDP has grown around 10% per year but in recent years has fallen to around 6% per year, which is still much higher than the average U.S. growth rate in recent years of about 2% per year. Why would a slowdown in China’s GDP growth be a significant concern to the U.S. macroeconomy? If prices of goods and services fall in China due to slower growth, does this help or hurt U.S. GDP? Explain.

**Answer:** The U.S. economy depends a lot on the health of other economies. China is an important trading partner, and if China’s economy slows down, Chinese consumers will reduce purchases of all goods, including American exports, which will hurt U.S. GDP. Further, if prices fall in China, imports of Chinese goods will fall in price, encouraging American consumers to buy more imported goods than domestic goods, which will further reduce U.S. GDP.

**14.** According to the CIA’s *World Factbook*, in 2018 the tiny country of Equatorial Guinea had the highest GDP per capita in Africa (over $30,000 per year), even higher than more developed countries, such as Morocco, Egypt, or South Africa. But despite the significant overall income from the sale of its natural resources, Equatorial Guinea has extreme poverty, with half of the population lacking clean drinking water and one of the highest infant mortality rates in the world. How can a country that looks so good on paper (in terms of GDP per capita) be one of the least desirable places to live on the planet for the average citizen?

**Answer:** Although Equatorial Guinea has a very high GDP per capita, that income is not spread evenly across the population. In fact, the country is one of the most corrupt nations in the world according to the UN Human Development Index. Much of the nation’s wealth is controlled by the ruling elite, while the majority of its citizens are forced to live in poverty. Even worse, the government does not adequately provide for basic needs, such as health care and education, making life very miserable for the majority of its citizens. These sorts of injustices are not reflected in GDP statistics because GDP does not take into account how income is distributed across the population.

## Solving Problems

**15.** The following table lists gross domestic product (*GDP*), consumption (*C*), gross private domestic investment (*I*), government spending (*G*), and net exports (*X* **–** *M*). Compute each as a percent of GDP for the six years presented.

| **Year** | ***GDP*** | ***C*** | ***I*** | ***G*** | ***X – M*** | ***C* (%)** | ***I* (%)** | ***G* (%)** | ***X – M* (%)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1965 | 719.1 | 443.8 | 118.2 | 151.5 | 5.6 |  |  |  |  |
| 1975 | 1,638.3 | 1,034.4 | 230.2 | 357.7 | 16 |  |  |  |  |
| 1985 | 4,220.3 | 2,720.3 | 736.2 | 879 | 115.2 |  |  |  |  |
| 1995 | 7,397.7 | 4,975.8 | 1,144 | 1,369.2 | –91.4 |  |  |  |  |
| 2005 | 12,455.8 | 8,742.4 | 2,057.4 | 2,372.8 | –716.7 |  |  |  |  |
| 2015 | 18,128.2 | 12,429.0 | 3,019.2 | 3,206.5 | –526.5 |  |  |  |  |

**a.** Which category (or categories) has increased as a percent of GDP from 1965 to 2015? Which category (or categories) has decreased? And which category (or categories) has not changed much from 1965 to 2015?

**b.** Which category has been the most volatile in terms of changes in the percent of GDP?

**c.** Ignoring net exports, which component has grown the fastest as a percent of GDP since 1965?

## Answer:

| **Year** | ***GDP*** | ***C*** | ***I*** | ***G*** | ***X – M*** | ***C* (%)** | ***I* (%)** | ***G* (%)** | ***X – M* (%)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1965 | 719.1 | 443.8 | 118.2 | 151.5 | 5.6 | 61.72 | 16.44 | 21.07 | 0.78 |
| 1975 | 1,638.3 | 1,034.4 | 230.2 | 357.7 | 16 | 63.14 | 14.05 | 21.83 | 0.98 |
| 1985 | 4,220.3 | 2,720.3 | 736.2 | 879 | –115.2 | 64.46 | 17.44 | 20.83 | –2.73 |
| 1995 | 7,397.7 | 4,975.8 | 1,144 | 1,369.2 | –91.4 | 67.26 | 15.46 | 18.51 | –1.24 |
| 2005 | 12,455.8 | 8,742.4 | 2,057.4 | 2,372.8 | –716.7 | 70.19 | 16.52 | 19.05 | –5.75 |
| 2015 | 18,128.2 | 12,429.0 | 3,019.2 | 3,206.5 | –526.5 | 68.56 | 16.65 | 17.69 | –2.90 |

**a.** Consumption has increased as a percent of GDP, government spending and net exports have decreased as a percent of GDP, and gross private domestic investment has not changed much from 1965 to 2015.

**b.** Net exports is the most volatile.

**c.** Consumption increased from 61.72% to 68.56%.

**16.** Use the following list of GDP components and data (given in millions of $U.S.) to answer the following questions.

Corporate profits 1,300

Gross private domestic investment 2,800

Consumption of nondurable goods 3,100

Exports 1,400

Proprietors’ income 1,000

Net income payments to rest of world 700

Consumption of services 4,300

Net interest 500

Compensation of employees 8,000

Imports 1,900

Rental income 400

Government spending 2,100

Consumption of durable goods 1,300

Capital consumption allowance 1,400

**a.** Indicate whether each component is part of the expenditures approach to calculating GDP (put an “E” next to the component) or the income approach to calculating GDP (put an “I” next to the component).

**b.** Compute the GDP using both expenditures and income approaches. What factor explains the difference between these measures?

**c.** Calculate the value of national income. Which category (categories) is (are) not included in national income, but are included in the calculation of GDP using the income approach?

**Answer:**

**a.** Corporate profits 1,300 \_\_I\_\_

Gross private domestic investment 2,800\_\_E\_\_

Consumption of nondurable goods 3,100\_\_E\_\_

Exports 1,400\_\_E\_\_

Proprietors’ income 1,000\_\_I\_\_

Miscellaneous adjustments 700\_\_I\_\_

Consumption of services 4,300\_\_E\_\_

Net interest 500\_\_I\_\_

Compensation of employees 8,000\_\_I\_\_

Imports 1,900\_\_E\_\_

Rental income 400\_\_I\_\_

Government spending 2,100\_\_E\_\_

Consumption of durable goods 1,300\_\_E\_\_

Capital consumption allowance 1,400\_\_I\_\_

**b.** GDP using the expenditures approach is consumption (3,100 + 4,300 + 1,300) + gross private domestic investment (2,800) + government spending (2,100) + exports (1,400) – imports

(1,900) = 13,100 (or $13.1 billion). GDP using the income approach is compensation of employees (8,000) + proprietors’ income (1,000) + corporate profits (1,300) + rental income (400) + net interest (500) + consumption of fixed capital (1,400) + net income payments to rest of world (700) = 13,300 (or $13.3 billion). The difference between the expenditures approach and the income approach is due to a statistical discrepancy of –$200 in the income approach.

**c.** Consumption of fixed capital, net income payments to rest of world, and the statistical discrepancy are not included in the measurement of national income. Removing these, national income equals 11,200 (or $11.2 billion).