

picture: telephone service that was extremely valuable and expensive in 1950, for example, would be valued according to the cheap modern prices.)

7. International comparisons of GDP involve two conversions. First, we need exchange rates to convert the measures into a common currency. Second, just as we need to use common prices to measure real GDP over time, we also need to use common prices to compare real GDP across countries.

### KEY CONCEPTS

capital	gross domestic product (GDP)	nominal versus real GDP
chain weighting	income	Paasche index
depreciation	inflation	production
economic profits	inflation rate	trade balance
exchange rate	labor's share of GDP	value added
expenditure	Laspeyres index	
GDP deflator	national income identity	

### REVIEW QUESTIONS

1. What is GDP, and why is it a useful measure? What are the most important components of GDP in the U.S. economy today?
2. What are net exports, and how is this concept related to the trade deficit?
3. What are some problems with using GDP as a measure of overall economic welfare?
4. What is the difference between real and nominal GDP? How do you compare GDPs over time within an economy? How do you compare GDPs across different economies?

### EXERCISES

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1. **What counts as GDP (I)?** By how much does GDP rise in each of the following scenarios? Explain.

- (a) You spend \$5,000 on college tuition this semester.
- (b) You buy a used car from a friend for \$2,500.
- (c) The government spends \$100 million to build a dam.
- (d) Foreign graduate students work as teaching assistants at the local university and earn \$5,000 each.

2. **What counts as GDP (II)?** By how much does GDP rise in each of the following scenarios? Explain.

- (a) A computer company buys parts from a local distributor for \$1 million, assembles the parts, and sells the resulting computers for \$2 million.

- (b) A real estate agent sells a house for \$200,000 that the previous owners had bought 10 years earlier for \$100,000. The agent earns a commission of \$6,000.
- (c) During a recession, the government raises unemployment benefits by \$100 million.
- (d) A new U.S. airline purchases and imports \$50 million worth of airplanes from the European company Airbus.
- (e) A new European airline purchases \$50 million worth of airplanes from the American company Boeing.
- (f) A store buys \$100,000 of chocolate from Belgium and sells it to consumers in the United States for \$125,000.
3. **National accounting over time (I):** Look back at Table 2.4. Some missing entries are labeled with question marks. Compute the values that belong in these positions.
4. **National accounting over time (II):** Consider an economy that produces oranges and boomerangs. The prices and quantities of these goods in two different years are reported in the table below. Fill in the missing entries.

	2016	2017	Percentage change 2016–2017
Quantity of oranges	100	105	?
Quantity of boomerangs	20	22	?
Price of oranges (dollars)	1	1.10	?
Price of boomerangs (dollars)	3	3.10	?
Nominal GDP	?	?	?
Real GDP in 2016 prices	?	?	?
Real GDP in 2017 prices	?	?	?
Real GDP in chained prices, benchmarked to 2017	?	?	?

5. **Inflation in the orange and boomerang economy:** Consider the economy from exercise 4. Calculate the inflation rate for the 2016–2017 period using the GDP deflator based on the Laspeyres, Paasche, and chain-weighted indexes of GDP.
6. **How large is the economy of India?** Indian GDP in 2010 was 78.9 trillion rupees, while U.S. GDP was \$14.5 trillion. The exchange rate in 2010 was 45.7 rupees per dollar. India turns out to have lower prices than the United States (this is true more generally for poor countries): the price level in India (converted to dollars) divided by the price level in the United States was 0.368 in 2010.
- (a) What is the ratio of Indian GDP to U.S. GDP if we don't take into account the differences in relative prices and simply use the exchange rate to make the conversion?
- (b) What is the ratio of real GDP in India to real GDP in the United States in common prices?
- (c) Why are these two numbers different?
7. **How large is the economy of Japan?** Japanese GDP in 2010 was 480 trillion yen (U.S. GDP, again, was \$14.5 trillion). The exchange rate in 2010 was

87.8 yen per dollar. Contrary to China and India, however, Japan had higher prices than the United States: the price level in Japan (converted to dollars) divided by the price level in the United States was 1.243 in 2010.

- (a) What is the ratio of Japanese GDP to U.S. GDP if we don't take into account the differences in relative prices and simply use the exchange rate to make the conversion?
  - (b) What is the ratio of GDP in Japan to real GDP in the United States in common prices?
  - (c) Why are these two numbers different?
8. **Earthquakes and GDP:** Suppose the rural part of a country is hit by a major earthquake that destroys 10 percent of the country's housing stock. The government and private sector respond with a major construction effort to help rebuild houses. Discuss how this episode is likely to affect (a) the economic well-being of the people in the country and (b) the economy's measured GDP.

**WORKED EXERCISE****1. What counts as GDP (I)?**

- (a) GDP rises by the \$5,000 amount of your tuition payment. This is the purchase of a service (education) that is produced this semester.
- (b) The purchase of used goods does not involve new production. This example is just the transfer of an existing good, so GDP is unchanged. If you bought the used car from a used-car dealer, the service of selling the car would represent new production—so something like \$200 of the \$2,500 might be included in GDP.
- (c) The new dam is new production, and the government spending of \$100 million is counted as GDP. Notice that if the spending were spread over several years, then the flow of new production (and GDP) would also be spread over time.
- (d) Foreign graduate students working in the United States contribute to production that occurs within the United States, and this is included in GDP. So GDP goes up by \$5,000 for each student.