

The Uses and Limitations of Real GDP

Economists use estimates of real GDP for two main purposes:

- To compare the standard of living over time
- To compare the standard of living across countries

The Standard of Living Over Time

One method of comparing the standard of living over time is to calculate real GDP per person in different years. **Real GDP per person** is real GDP divided by the population. Real GDP per person tells us the value of goods and services that the average person can enjoy. By using *real* GDP, we remove any influence that rising prices and a rising cost of living might have had on our comparison.

We're interested in both the long-term trends and the shorter-term cycles in the standard of living.

Long-Term Trend A handy way of comparing real GDP per person over time is to express it as a ratio of some reference year. For example, in 1960, real GDP per person was \$15,850 and in 2010, it was \$42,800. So real GDP per person in 2010 was 2.7 times its 1960 level—that is, $\$42,800 \div \$15,850 = 2.7$. To the extent that real GDP per person measures the standard of living, people were 2.7 times as well off in 2010 as their grandparents had been in 1960.

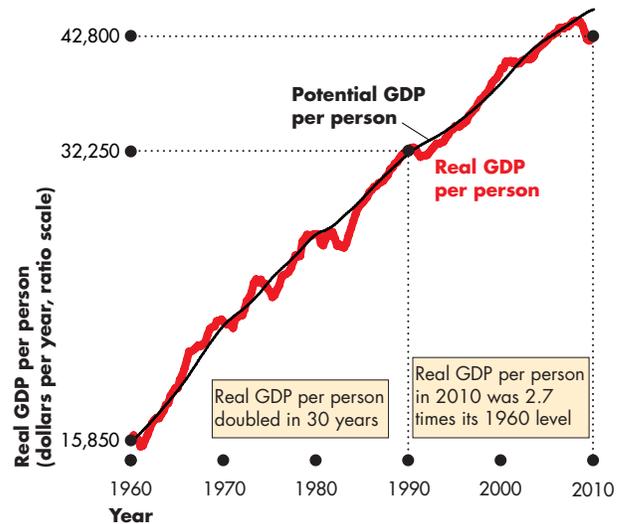
Figure 21.2 shows the path of U.S. real GDP per person for the 50 years from 1960 to 2010 and highlights two features of our expanding living standard:

- The growth of potential GDP per person
- Fluctuations of real GDP per person

The Growth of Potential GDP **Potential GDP** is the maximum level of real GDP that can be produced while avoiding shortages of labor, capital, land, and entrepreneurial ability that would bring rising inflation. Potential GDP per person, the smoother black line in Fig. 21.2, grows at a steady pace because the quantities of the factors of production and their productivities grow at a steady pace.

But potential GDP per person doesn't grow at a *constant* pace. During the 1960s, it grew at 2.8 percent per year but slowed to only 2.3 percent per year during the 1970s. This slowdown might seem small, but it had big consequences, as you'll soon see.

FIGURE 21.2 Rising Standard of Living in the United States



Real GDP per person in the United States doubled between 1960 and 1990. In 2010, real GDP per person was 2.7 times its 1960 level. Real GDP per person, the red line, fluctuates around potential GDP per person, the black line. (The y-axis is a ratio scale—see the Appendix, pp. 504–505.)

Sources of data: U.S. Department of Commerce, Bureau of Economic Analysis and Congressional Budget Office.

animation

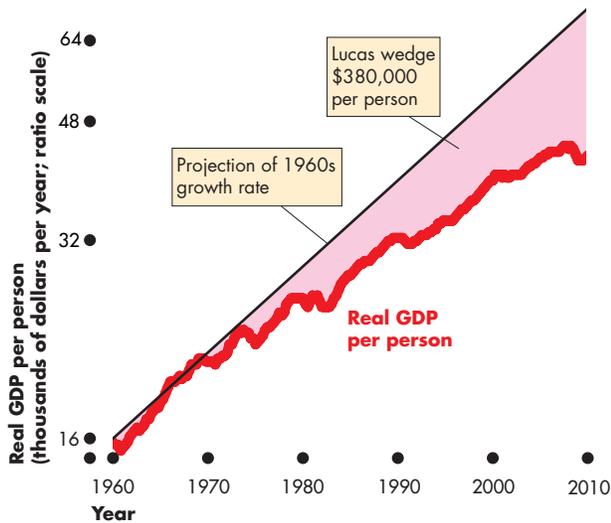
Fluctuations of Real GDP You can see that real GDP shown by the red line in Fig. 21.2 fluctuates around potential GDP, and sometimes real GDP shrinks.

Let's take a closer look at the two features of our expanding living standard that we've just outlined.

Productivity Growth Slowdown How costly was the slowdown in productivity growth after 1970? The answer is provided by the *Lucas wedge*, which is the dollar value of the accumulated gap between what real GDP per person would have been if the 1960s growth rate had persisted and what real GDP per person turned out to be. (Nobel Laureate Robert E. Lucas Jr. drew attention to this gap.)

Figure 21.3 illustrates the Lucas wedge. The wedge started out small during the 1970s, but by 2010 real GDP per person was \$28,400 per year lower than it would have been with no growth slowdown, and the accumulated gap was an astonishing \$380,000 per person.

FIGURE 21.3 The Cost of Slower Growth: The Lucas Wedge



The black line projects the 1960s growth rate of real GDP per person to 2010. The Lucas wedge arises from the slow-down of productivity growth that began during the 1970s. The cost of the slowdown is \$380,000 per person.

Sources of data: U.S. Department of Commerce Bureau of Economic Analysis, Congressional Budget Office, and author’s calculations.



Real GDP Fluctuations—The Business Cycle We call the fluctuations in the pace of expansion of real GDP the business cycle. The **business cycle** is a periodic but irregular up-and-down movement of total production and other measures of economic activity. The business cycle isn’t a regular predictable cycle like the phases of the moon, but every cycle has two phases:

1. Expansion
2. Recession

and two turning points:

1. Peak
2. Trough

Figure 21.4 shows these features of the most recent U.S. business cycle.

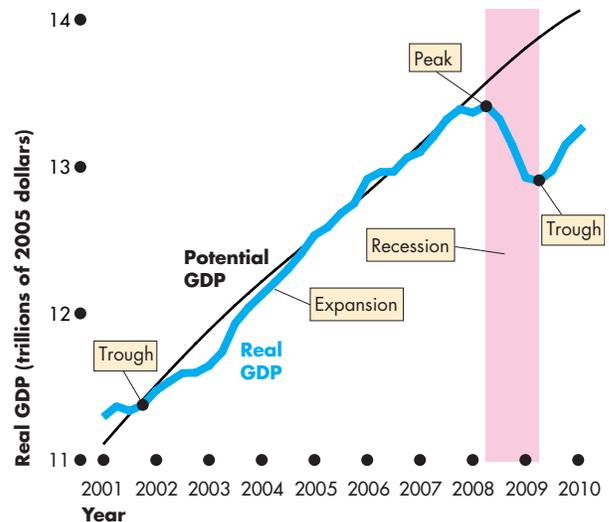
An **expansion** is a period during which real GDP increases. In the early stage of an expansion real GDP returns to potential GDP and as the expansion progresses, potential GDP grows and real GDP eventually exceeds potential GDP.

A common definition of **recession** is a period during which real GDP decreases—its growth rate is negative—for at least two successive quarters. The definition used by the National Bureau of Economic Research, which dates the U.S. business cycle phases and turning points, is “a period of significant decline in total output, income, employment, and trade, usually lasting from six months to a year, and marked by contractions in many sectors of the economy.”

An expansion ends and recession begins at a business cycle *peak*, which is the highest level that real GDP has attained up to that time. A recession ends at a *trough*, when real GDP reaches a temporary low point and from which the next expansion begins.

In 2008, the U.S. economy went into an unusually severe recession. Starting from a long way below potential GDP, a new expansion began in mid-2009. But the outlook for the expansion in 2011 and beyond was very uncertain (see *Reading Between the Lines* on pp. 502–503).

FIGURE 21.4 The Most Recent U.S. Business Cycle



A business cycle expansion began from a trough in the fourth quarter of 2001 and ended at a peak in the second quarter of 2008. A deep and long recession followed the 2008 peak.

Sources of data: U.S. Department of Commerce Bureau of Economic Analysis, Congressional Budget Office, and National Bureau of Economic Research.



The Standard of Living Across Countries

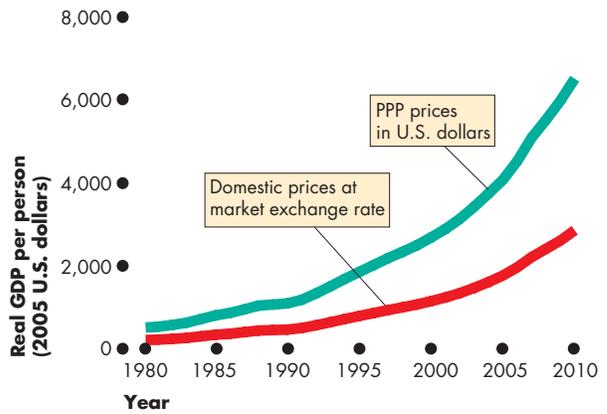
Two problems arise in using real GDP to compare living standards across countries. First, the real GDP of one country must be converted into the same currency units as the real GDP of the other country. Second, the goods and services in both countries must be valued at the same prices. Comparing the United States and China provides a striking example of these two problems.

China and the United States in U.S. Dollars In 2010, real GDP per person in the United States was \$42,800 and in China it was 23,400 yuan. The yuan is the currency of China and the price at which the dollar and the yuan exchanged, the *market exchange rate*, was 8.2 yuan per \$1 U.S. Using this exchange rate, 23,400 yuan converts to \$2,850. On these numbers, real GDP per person in the United States was 15 times that in China.

The red line in Fig. 21.5 shows real GDP per person in China from 1980 to 2010 when the market exchange rate is used to convert yuan to U.S. dollars.

China and the United States at PPP Figure 21.5 shows a second estimate of China’s real GDP per person that values China’s production on the same terms as U.S. production. It uses *purchasing power parity* or *PPP* prices, which are the *same prices* for both countries.

FIGURE 21.5 Two Views of Real GDP in China



Real GDP per person in China has grown rapidly. But how rapidly it has grown and to what level depends on how real GDP is valued. When GDP in 2010 is valued at the market exchange rate, U.S. income per person is 15 times that in China. China looks like a poor developing country. But the comparison is misleading. When GDP is valued at purchasing power parity prices, U.S. income per person is only 6.5 times that in China.

Source of data: International Monetary Fund, *World Economic Outlook* database, April 2010.

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A Big Mac costs \$3.75 in Chicago and 13.25 yuan or \$1.62 in Shanghai. To compare real GDP in China and the United States, we must value China’s Big Macs at the \$3.75 U.S. price—the PPP price.

The prices of some goods are higher in the United States than in China, so these items get a smaller weight in China’s real GDP than they get in U.S. real GDP. An example is a Big Mac that costs \$3.75 in Chicago. In Shanghai, a Big Mac costs 13.25 yuan which is the equivalent of \$1.62. So in China’s real GDP, a Big Mac gets less than half the weight that it gets in U.S. real GDP.

Some prices in China are higher than in the United States but more prices are lower, so Chinese prices put a lower value on China’s production than do U.S. prices.

According to the PPP comparisons, real GDP per person in the United States in 2010 was 6.5 times that of China, not 15 times.

You’ve seen how real GDP is used to make standard of living comparisons over time and across countries. But real GDP isn’t a perfect measure of the standard of living and we’ll now examine its limitations.

Limitations of Real GDP

Real GDP measures the value of goods and services that are bought in markets. Some of the factors that influence the standard of living and that are not part of GDP are

- Household production
- Underground economic activity
- Health and life expectancy
- Leisure time
- Environmental quality
- Political freedom and social justice

Household Production An enormous amount of production takes place every day in our homes. Preparing meals, cleaning the kitchen, changing a light bulb, cutting grass, washing a car, and caring for a child are all examples of household production. Because these productive activities are not traded in markets, they are not included in GDP.

The omission of household production from GDP means that GDP *underestimates* total production. But it also means that the growth rate of GDP *overestimates* the growth rate of total production. The reason is that some of the growth rate of market production (included in GDP) is a replacement for home production. So part of the increase in GDP arises from a decrease in home production.

Two trends point in this direction. One is the number of women who have jobs, which increased from 38 percent in 1960 to 58 percent in 2010. The other is the trend in the market purchase of traditionally home-produced goods and services. For example, more

and more families now eat in restaurants—one of the fastest-growing industries in the United States—and use day-care services. This trend means that an increasing proportion of food preparation and child care that were part of household production are now measured as part of GDP. So real GDP grows more rapidly than does real GDP plus home production.

Underground Economic Activity The *underground economy* is the part of the economy that is purposely hidden from the view of the government to avoid taxes and regulations or because the goods and services being produced are illegal. Because underground economic activity is unreported, it is omitted from GDP.

The underground economy is easy to describe, even if it is hard to measure. It includes the production and distribution of illegal drugs, production that uses illegal labor that is paid less than the minimum wage, and jobs done for cash to avoid paying income taxes. This last category might be quite large and includes tips earned by cab drivers, hairdressers, and hotel and restaurant workers.

Estimates of the scale of the underground economy in the United States range between 9 and 30 percent of GDP (\$1,300 billion to \$4,333 billion).

Provided that the underground economy is a stable proportion of the total economy, the growth rate of real GDP still gives a useful estimate of changes in economic well-being and the standard of living. But sometimes production shifts from the underground economy to the rest of the economy, and sometimes it shifts the other way. The underground economy expands relative to the rest of the economy if taxes



Whose production is more valuable: the chef's whose work gets counted in GDP ...



... or the busy mother's whose dinner preparation and child minding don't get counted?