

growth would be 5 percent [= $(\$210 \text{ billion} - \$200 \text{ billion})/\$200 \text{ billion}] \times 100$]. (**Key Question 2**)

Growth as a Goal

Growth is a widely held economic goal. The expansion of total output relative to population results in rising real wages and incomes and thus higher standards of living. An economy that is experiencing economic growth is better able to meet people's wants and resolve socioeconomic problems. Rising real wages and income provide richer opportunities to individuals and families—a vacation trip, a personal computer, a higher education—without sacrificing other opportunities and pleasures. A growing economy can undertake new programs to alleviate poverty and protect the environment without impairing existing levels of consumption, investment, and public goods production.

In short, *growth lessens the burden of scarcity*. A growing economy, unlike a static economy, can consume more today while increasing its capacity to produce more in the future. By easing the burden of scarcity—by relaxing society's constraints on production—economic growth enables a nation to attain its economic goals more readily and to undertake new endeavors that require goods and services to be accomplished.

Arithmetic of Growth

Why do economists pay so much attention to small changes in the rate of economic growth? Because those changes really matter! For the United States, with a current real GDP of about \$10 trillion, the difference between a 3 percent and a 4 percent rate of growth is about \$100 billion of output each year. For a poor country, a difference of one-half a percentage point in the rate of growth may mean the difference between starvation and mere hunger.

The mathematical approximation called the **rule of 70** provides a quantitative grasp of the effect of economic growth. It tells us that we can find the number of years it will take for some measure to double, given its annual percentage increase, by dividing that percentage increase into the number 70. So

$$\text{Approximate number of years required to double real GDP} = \frac{70}{\text{annual percentage rate of growth}}$$

Examples: A 3 percent annual rate of growth will double real GDP in about 23 ($= 70 \div 3$) years. Growth of 8 percent per year will double real GDP in about 9 ($= 70 \div 8$) years. The rule of 70 is generally applicable. For example, it works for estimating how long it will take the price level, or a savings account to double at various percentage rates of inflation or interest. When compounded over many years, an apparently small difference in the rate of growth thus becomes highly significant. Suppose Alta and Zorn have identical GDPs, but Alta grows at a 4 percent yearly rate, while Zorn grows at 2 percent. Alta's GDP would double in about 18 years, while Zorn's GDP would double in 35 years.

Main Sources of Growth

There are two fundamental ways society can increase its real output and income: (1) by increasing its inputs of resources, and (2) by increasing the productivity of those inputs. Other things equal, increases in land, labor, capital, and entrepreneurial resources yield additional output. But economic growth also occurs through increases in **productivity**—measured broadly as real output per unit of input. Productivity rises when the health, training, education, and motivation of workers are improved; when workers have more and better machinery and natural resources with which to work; when production is better organized and managed; and when labor is reallocated from less efficient industries to more efficient industries. About one-third of U.S. growth comes from more inputs. The remaining two-thirds results from improved productivity.

Growth in the United States

Table 8.1 gives an overview of economic growth in the United States over past periods. Column 2 reveals strong growth as measured by increases in real GDP. Note that between 1940 and 2000 real GDP increased about tenfold. But the U.S. population also increased. Nevertheless, in column 4 we find that real GDP per capita rose nearly fivefold over these years.

What has been the *rate* of U.S. growth? Real GDP grew at an annual rate of about 3.5 percent between 1950 and 2000. Real GDP per capita increased about 2.3 percent per year over that time. But we must qualify these raw numbers in several ways:

- **Improved products and services** Since the numbers in Table 8.1 do not fully account for

Table 8.1
Real GDP and Per Capita GDP, 1929–2000

(1) Year	(2) GDP, Billions of 1996 \$	(3) Population, Millions	(4) Per Capita GDP, 1996 \$ (2) ÷ (3)
1929	\$ 822	122	\$ 6,738
1933	603	126	4,786
1940	981	132	7,432
1945	1693	140	12,093
1950	1687	152	11,099
1955	2100	166	12,651
1960	2377	181	13,133
1965	3029	194	15,613
1970	3578	205	17,454
1975	4084	214	19,084
1980	4901	228	21,496
1985	5717	239	23,921
1990	6708	250	26,832
1995	7544	263	28,684
2000	9320	275	33,891

Source: Data are from the Bureau of Economic Analysis [www.bea.doc.gov] and the U.S. Census Bureau [www.census.gov].

the improvements in products and services, they understate the growth of economic well-being. Such purely quantitative data do not fully compare an era of iceboxes and LPs with an era of refrigerators and CDs.

- **Added leisure** The increases in real GDP and per capita GDP identified in Table 8.1 were accomplished despite large increases in leisure. The standard workweek, once 50 hours, is now about 40 hours. Again the raw growth numbers understate the gain in economic well-being.
- **Other impacts** These measures of growth do not account for any effects growth may have had on the environment and the quality of life. If growth debases the physical environment and creates a stressful work environment, the bare growth numbers will overstate the gains in well-being that result from growth. On the other hand, if growth leads to stronger environmental protections and greater human security, these numbers will understate the gains in well-being.

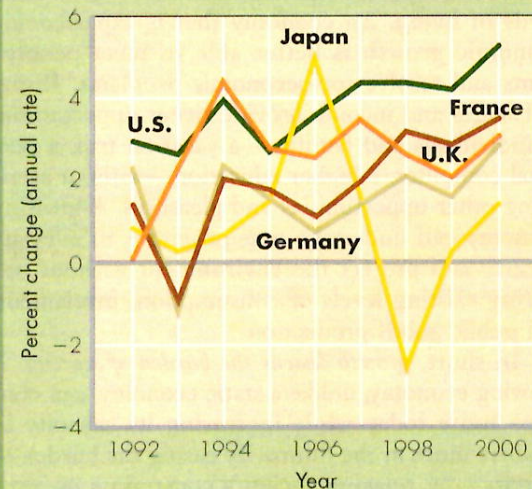
Relative Growth Rates

Viewed from the perspective of the last half-century, economic growth in the United States lagged behind that in Japan, Germany, Italy, Canada, and France.

GLOBAL PERSPECTIVE 8.1

Average Annual Growth Rates, 1992–2000, Selected Nations


Between 1992 and 2000 growth in the United States was stronger than it was in many of the other major countries, particularly toward the end of the decade.



Source: Economic Report of the President, 2001

Japan's annual growth rate, in fact, averaged twice that of the United States. But the 1990s were quite another matter. As shown in Global Perspective 8.1, the U.S. growth rate surged ahead of the rates of other industrial nations. (This fact has led some economists to conclude that the United States has achieved a "New Economy" of faster economic growth. We will examine that somewhat controversial viewpoint in detail in Chapter 17.)

The Business Cycle

Long-run economic growth in the United States has been interrupted by periods of economic instability. At various times, growth has given way to recession and depression—that is, to declines in real GDP and significant increases in unemployment. At other times, rapid economic growth has been marred by rapid inflation. Both unemployment and inflation often are associated with *business cycles*.  8.1

Phases of the Business Cycle

The term **business cycle** refers to alternating rises and declines in the level of economic activity, sometimes extending over several years. Individual cycles

(one “up” followed by one “down”) vary substantially in duration and intensity. Yet all display certain phases, to which economists have assigned various labels. Figure 8.1 shows the four phases of a generalized business cycle.

- **Peak** At a **peak**, such as the middle peak shown in Figure 8.1, business activity has reached a temporary maximum. Here the economy is at full employment and the level of real output is at or very close to the economy’s capacity. The price level is likely to rise during this phase.
- **Recession** A peak is followed by a **recession**—a period of decline in total output, income, employment, and trade. This downturn, which lasts 6 months or more, is marked by the widespread contraction of business activity in many sectors of the economy. But because many prices are downwardly inflexible, the price level is likely to fall only if the recession is severe and prolonged—that is, only if a depression occurs.
- **Trough** In the **trough** of the recession or depression, output and employment “bottom out” at their lowest levels. The trough phase may be either short-lived or quite long.
- **Recovery** In the expansion or **recovery** phase, output and employment rise toward full employment. As recovery intensifies, the price level may begin to rise before full employment and full-capacity production return.

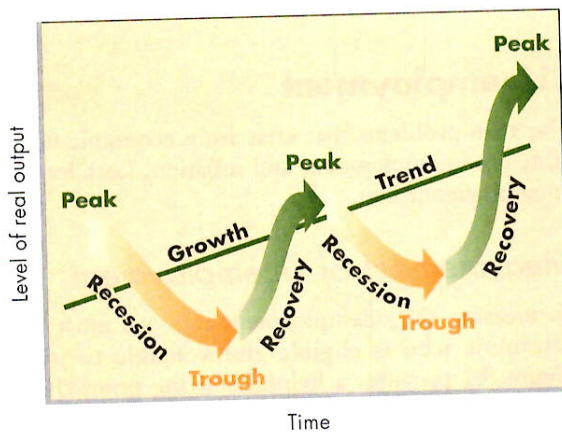


Figure 8.1

The business cycle. Economists distinguish four phases of the business cycle; the duration and strength of each phase may vary.

Table 8.2

U.S. Recessions since 1950

Period	Duration, Months	Depth (Decline in Real Output)
1953–54	10	–3.7%
1957–58	8	–3.9
1960–61	10	–1.6
1969–70	11	–1.0
1973–75	16	–4.9
1980	6	–2.3
1981–82	16	–3.3
1990–91	8	–1.8

Source: *Economic Report of the President, 1993*, updated.

Although business cycles all pass through the same phases, they vary greatly in duration and intensity. Many economists prefer to talk of business “fluctuations” rather than cycles because cycles imply regularity while fluctuations do not. The Great Depression of the 1930s resulted in a 40 percent decline in real GDP over a 3-year period in the United States and seriously impaired business activity for a decade. By comparison, more recent U.S. recessions, detailed in Table 8.2, were relatively mild in both intensity and duration.

Recessions, of course, occur in other countries, too. At one time or another during the 1990s Argentina, Brazil, Canada, Colombia, Japan, Indonesia, Mexico, and South Korea experienced recessions.

Causation: A First Glance

Economists have suggested many theories to explain fluctuations in business activity. Some say that momentous innovations, such as the railroad, the automobile, synthetic fibers, and microchips, have great impact on investment and consumption spending and therefore on output, employment, and the price level. Such major innovations occur irregularly and thus contribute to the variability of economic activity.

Some economists see major changes in productivity as causes of business cycles. When productivity expands, the economy booms; when productivity falls, the economy recedes. Still others view the business cycle as a purely monetary phenomenon. When government creates too much money, they say, an inflationary boom occurs. Too little money triggers

a decline in output and employment and, eventually, in the price level.

Most economists, however, believe that the immediate cause of cyclical changes in the levels of real output and employment is changes in the level of total spending. In a market economy, businesses produce goods or services only if they can sell them at a profit. If total spending sinks, many businesses find that it is no longer profitable to go on producing their current volume of goods and services. As a consequence, output, employment, and incomes all fall. When the level of spending rises, an increase in production becomes profitable, and output, employment, and incomes will rise accordingly. Once the economy nears full employment, however, further gains in real output become more difficult to achieve. Continued increases in spending may raise the price level as consumers bid for the limited amount of goods available.

We have seen that the long-run growth trend of the U.S. economy is one of expansion. Note that the stylized cycle in Figure 8.1 is drawn against a trend of economic growth.

Cyclical Impact: Durables and Nondurables

Although the business cycle is felt everywhere in the economy, it affects different segments in different ways and to different degrees.

Firms and industries producing *capital goods* (for example, housing, commercial buildings, heavy equipment, and farm implements) and *consumer durables* (for example, automobiles, personal computers, refrigerators) are affected most by the business cycle. Within limits, firms can postpone the purchase of capital goods. As the economy recedes, producers frequently delay the purchase of new equipment and the construction of new plants. The business outlook simply does not warrant increases in the stock of capital goods. In good times, capital goods are usually replaced before they depreciate completely. But when recession strikes, firms patch up their old equipment and make do. As a result, investment in capital goods declines sharply. Firms that have excess plant capacity may not even bother to replace all the capital that is depreciating. For them, net investment may be negative. The pattern is much the same for consumer durables such as automobiles and major appliances. When recession occurs and households must trim their budgets, purchases of these goods are often deferred. Families repair their old cars and appliances

rather than buy new ones, and the firms producing these products suffer. (Of course, producers of capital goods and consumer durables also benefit most from expansions.)

In contrast, *service* industries and industries that produce *nondurable consumer goods* are somewhat insulated from the most severe effects of recession. People find it difficult to cut back on needed medical and legal services, for example. And a recession actually helps some service firms, such as pawnbrokers and law firms that specialize in bankruptcies. Nor are the purchases of many nondurable goods such as food and clothing easy to postpone. The quantity and quality of purchases of nondurables will decline, but not so much as will purchases of capital goods and consumer durables. (**Key Question 4**)

QUICK REVIEW 8.1

- Economic growth can be measured as (a) an increase in real GDP over time or (b) an increase in real GDP per capita over time.
- Real GDP in the United States has grown at an average annual rate of about 3.5 percent since 1950; real GDP per capita has grown at roughly a 2.3 percent annual rate over that same period.
- The typical business cycle goes through four phases: peak, recession, trough, and recovery.
- During recession, industries that produce capital goods and consumer durables normally suffer greater output and employment declines than do service and nondurable consumer goods industries.

Unemployment

The twin problems that arise from economic instability are unemployment and inflation. Let's look at unemployment first.

Measurement of Unemployment

To measure the unemployment rate, we must first determine who is eligible and available to work. Figure 8.2 provides a helpful starting point. It divides the total U.S. population into three groups. One group is made up of people less than 16 years of age and people who are institutionalized, for example, in mental hospitals or correctional institutions. Such people are not considered potential members of the labor force.