



WEB CHAPTER B

Income Inequality and Poverty

After reading this chapter, you should be able to:

1. Explain how income inequality in the United States is measured and described.
2. Discuss the extent and sources of income inequality.
3. Demonstrate how income inequality has changed since 1970.
4. Debate the economic arguments for and against income inequality.
5. Describe how poverty is measured and its incidence by age, gender, ethnicity, and other characteristics.
6. Identify the major components of the income-maintenance program in the United States.

Evidence that suggests wide income disparity in the United States is easy to find. In 2011 talk-show host Oprah Winfrey earned an estimated \$290 million, golfer Tiger Woods earned \$75 million, and singer Lady Gaga earned \$90 million. In contrast, the salary of the president of the United States is \$400,000, and the typical schoolteacher earns around \$56,000. A full-time minimum-wage worker at a fast-food restaurant makes about \$15,000. Cash welfare payments to a mother with two children average \$5000.

In 2010 about 46.2 million Americans—or 15.1 percent of the population—lived in poverty.

An estimated 643,000 people were homeless in 2009, with about 1.56 million spending at least one night in a shelter. In 2010 the richest fifth of American households received about 50.2 percent of total income, while the poorest fifth received about 3.3 percent.

What are the sources of income inequality? Is income inequality rising or falling? Is the United States making progress against poverty? What are the major income-maintenance programs in the United States? Is the current welfare system effective? These are some of the questions we will answer in this chapter.

Facts About Income Inequality

Median household income in the United States is among the highest in the world; in 2010 it was \$49,445 per household (one or more persons occupying a housing unit). But that median tells us nothing about income inequality. To learn about that, we must examine how income is distributed around the average.

Distribution by Income Category

income inequality

The unequal distribution of an economy's total income among households or families.

One way to measure **income inequality** is to look at the percentages of households in a series of income categories. Table B.1 shows that about 25 percent of all households had annual before-tax incomes of less than \$25,000 in 2009, while another 20.2 percent had annual incomes of \$100,000 or more. The data in the table suggest a wide dispersion of household income in the United States.

Distribution by Quintiles (Fifths)

A second way to measure income inequality is to divide the total number of individuals, households, or families (two or more persons related by birth, marriage, or adoption) into five numerically equal groups, or *quintiles*, and examine the percentage of total personal (before-tax) income received by each quintile. We do this for households in the table in Figure B.1, where we also provide the upper income limit for each quintile. Any amount of income greater than that listed in each row of column 3 would place a household into the next-higher quintile.

Lorenz curve

A curve that shows an economy's distribution of income by measuring the cumulated percentage of income receivers along the horizontal axis and the cumulated percentage of income they receive along the vertical axis.

The Lorenz Curve and Gini Ratio

We can display the quintile distribution of personal income through a **Lorenz curve**. In Figure B.1, we plot the cumulative percentage of households on the horizontal axis and the cumulative percentage of income they obtain on the vertical axis. The diagonal line *Oe* represents a *perfectly equal distribution of income* because each point along that line indicates that a particular percentage of households receive the same percentage of

TABLE B.1
The Distribution of U.S. Income by Households, 2009

(1) Personal Income Category	(2) Percentage of All Households in This Category
Under \$10,000	7.3
\$10,000–\$14,999	5.8
\$15,000–\$24,999	11.9
\$25,000–\$34,999	11.0
\$35,000–\$49,999	14.1
\$50,000–\$74,999	18.1
\$75,000–\$99,999	11.5
\$100,000 and above	20.2
	<hr/> 100.0

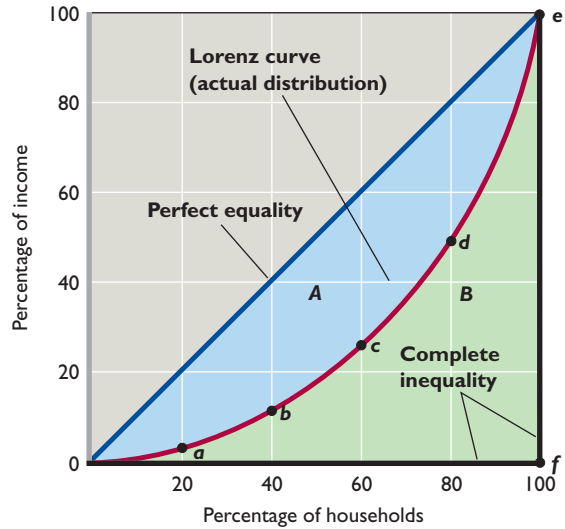
Source: Bureau of the Census, www.census.gov. Numbers do not add to 100 percent due to rounding.

FIGURE B.1

The Lorenz curve and Gini ratio. The Lorenz curve is a convenient way to show the degree of income inequality (here, household income by quintile in 2010). The area between the diagonal (the line of perfect equality) and the Lorenz curve represents the degree of inequality in the distribution of total income. This inequality is measured numerically by the Gini ratio—area A (shown in blue) divided by area A + B (the blue + green area). The Gini ratio for the distribution shown is 0.469.

(1) Quintile	(2) Percentage of Total Income	(3) Upper Income Limit
Lowest 20%	3.3	\$ 20,000
Second 20%	8.5	38,043
Third 20%	14.6	61,735
Fourth 20%	23.4	100,065
Highest 20%	50.2	No limit
Total	100.0	

Source: Bureau of the Census, www.census.gov.



income. In other words, points representing 20 percent of all households receiving 20 percent of total income, 40 percent receiving 40 percent, 60 percent receiving 60 percent, and so on, all lie on the diagonal line.

By plotting the quintile data from the table in Figure B.1, we obtain the Lorenz curve for 2010. Observe from point *a* that the bottom 20 percent of all households received 3.3 percent of the income; the bottom 40 percent received 11.8 percent (= 3.3 + 8.5), as shown by point *b*; and so forth. The blue area between the diagonal line and the Lorenz curve is determined by the extent that the Lorenz curve sags away from the diagonal and indicates the degree of income inequality. If the actual income distribution were perfectly equal, the Lorenz curve and the diagonal would coincide and the blue area would disappear.

WORKED PROBLEMS

WB.1
Lorenz curve

At the opposite extreme is complete inequality, where all households but one have zero income. In that case, the Lorenz curve would coincide with the horizontal axis from 0 to point *f* (at 0 percent of income) and then would move immediately up from *f* to point *e* along the vertical axis (indicating that a single household has 100 percent of the total income). The entire area below the diagonal line (triangle *0ef*) would indicate this extreme degree of inequality. So the farther the Lorenz curve sags away from the diagonal, the greater is the degree of income inequality.

We can easily transform the visual measurement of income inequality described by the Lorenz curve into the **Gini ratio**—a numerical measure of the overall dispersion of income:

$$\begin{aligned} \text{Gini ratio} &= \frac{\text{area between Lorenz curve and diagonal}}{\text{total area below the diagonal}} \\ &= \frac{A \text{ (blue area)}}{A + B \text{ (blue + green area)}} \end{aligned}$$

Gini ratio

A numerical measure of the overall dispersion of income among an economy's income receivers.

For the distribution of household income shown in Figure B.1, the Gini ratio is 0.469. As the area between the Lorenz curve and the diagonal gets larger, the Gini ratio rises to reflect greater inequality. (Test your understanding of this idea by confirming that the Gini ratio for complete income equality is zero and for complete inequality is 1.)

Because Gini ratios are numerical, they are easier to use than Lorenz curves for comparing the income distributions of different ethnic groups and countries. For example, in 2010 the Gini ratio of U.S. household income for African Americans was 0.486; for Asians, 0.455; for whites, 0.458; and for Hispanics, 0.458.¹ Gini ratios for various nations range from 0.230 (Sweden) to 0.707 (Namibia). Examples within this range include Denmark, 0.248; Italy, 0.320; Mexico, 0.517; and South Africa, 0.658.²

Income Mobility: The Time Dimension

The income data used so far have a major limitation: The income accounting period of 1 year is too short to be very meaningful. Because the Census Bureau data portray the distribution of income in only a single year, they may conceal a more equal distribution over a few years, a decade, or even a lifetime. If Brad earns \$1000 in year 1 and \$100,000 in year 2, while Jenny earns \$100,000 in year 1 and only \$1000 in year 2, do we have income inequality? The answer depends on the period of measurement. Annual data would reveal great income inequality, but there would be complete equality over the 2-year period.

This point is important because evidence suggests considerable “churning around” in the distribution of income over time. Such movement of individuals or households from one income quintile to another over time is called **income mobility**. For most income receivers, income starts at a relatively low level during youth, reaches a peak during middle age, and then declines. It follows that if all people receive exactly the same stream of income over their lifetimes, considerable income inequality would still exist in any specific year because of age differences. In any single year, the young and the old would receive low incomes while the middle-aged receive high incomes.

If we change from a “snapshot” view of income distribution in a single year to a “time exposure” portraying incomes over much longer periods, we find considerable movement of income receivers among income classes. For instance, one study showed that between 1996 and 2005, half of the individuals in the lowest quintile of the U.S. income distribution in 1996 were in a higher income quintile in 2005. Almost 25 percent made it to the middle fifth and 5 percent achieved the top quintile. The income mobility moved in both directions. About 57 percent of the top 1 percent of income receivers in 1996 had dropped out of that category by 2005. Overall, income mobility between 1996 and 2005 was the same as it was the previous 10 years. All this correctly suggests that income is more equally distributed over a 5-, 10-, or 20-year period than in any single year.³

In short, there is significant individual and household income mobility over time; for many people, “low income” and “high income” are not permanent conditions.

income mobility

The extent to which income receivers move from one part of the income distribution to another over some period of time.

¹ U.S. Census Bureau, *Historical Income Tables*, www.census.gov.

² *CIA World Factbook, 2011*, www.cia.gov.

³ U.S. Department of the Treasury, *Income Mobility in the U.S. from 1996–2005*, November 13, 2007, pp. 1–22.

Effect of Government Redistribution

The income data in the table in Figure B.1 include wages, salaries, dividends, and interest. They also include all cash transfer payments such as Social Security, unemployment compensation benefits, and welfare assistance to needy households. The data are before-tax data and therefore do not take into account the effects of personal income and payroll (Social Security) taxes that are levied directly on income receivers. Nor do they include government-provided in-kind or **noncash transfers**, which make available specific goods or services rather than cash. Noncash transfers include such things as medical care, housing subsidies, subsidized school lunches, and food stamps. Such transfers are much like income because they enable recipients to “purchase” goods and services.

noncash transfers
Government transfer payments in the form of goods and services (or vouchers to obtain them) rather than money.

One economic function of government is to redistribute income, if society so desires. Figure B.2 and its table reveal that government significantly redistributes income from higher- to lower-income households through taxes and transfers. Note that the U.S. distribution of household income before taxes and transfers are taken into account (dark red Lorenz curve) is substantially less equal than the distribution after taxes and transfers (light red Lorenz curve). Without government redistribution, the lowest 20 percent of households in 2008 would have received only 0.9 percent of total income. *With* redistribution, they received 4.2 percent, or 4.7 times as much.⁴

Which contributes more to redistribution, government taxes or government transfers? The answer is transfers. Because the U.S. tax system is only modestly progressive, nearly all of the reduction in income inequality is attributable to transfer payments. Together with job opportunities, transfer payments have been the most important means of alleviating poverty in the United States.

⁴ The data in this table are for 2008, whereas the data in Figure B.1 are for 2010. Even if contemporaneous, the “before” data would differ from the data in Figure B.1 because the latter include cash transfers. Also, the “after” data in Figure B.2 are based on a broader concept of income than are the data in Figure B.1.

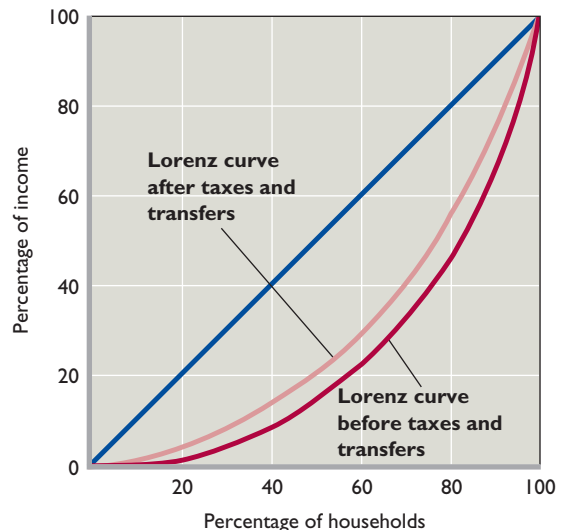
FIGURE B.2

The impact of taxes and transfers on U.S. income inequality. The distribution of income is significantly more equal after taxes and transfers are taken into account than before. Transfers account for most of the lessening of inequality and provide most of the income received by the lowest quintile of households.

Quintile	Percentage of Total Income Received, 2008*	
	(1) Before Taxes and Transfers	(2) After Taxes and Transfers
Lowest 20 percent	0.9	4.2
Second 20 percent	7.0	10.5
Third 20 percent	14.5	16.4
Fourth 20 percent	24.2	24.1
Highest 20 percent	53.5	44.8

*The data include all money income from private sources, including realized capital gains and employer-provided health insurance. The “after taxes and transfers” data include the value of noncash transfers as well as cash transfers. Numbers may not add to 100 percent due to rounding.

Source: Bureau of the Census, www.census.gov.



Causes of Income Inequality

There are several causes of income inequality in the United States. In general, the market system is permissive of a high degree of income inequality because it rewards individuals on the basis of the contributions that they, or the resources that they own, make in producing society's output.

More specifically, the factors that contribute to income inequality are the following.

Ability

People have different mental, physical, and aesthetic talents. Some have inherited the exceptional mental qualities that are essential to such high-paying occupations as medicine, corporate finance, and law. Others are blessed with the physical capacity and coordination to become highly paid professional athletes. A few have the talent to become great artists or musicians or have the beauty to become top fashion models. Others have very weak mental endowments and may work in low-paying occupations or may be incapable of earning any income at all. The intelligence and skills of most people fall somewhere in between.

Education and Training

Native ability alone rarely produces high income; people must develop and refine their capabilities through education and training. Individuals differ significantly in the amount of education and training they obtain and thus in their capacity to earn income. Such differences may be a matter of choice: Chin enters the labor force after graduating from high school, while Rodriguez takes a job only after earning a college degree. Other differences may be involuntary: Chin and her parents may simply be unable to finance a college education.

People also receive varying degrees of on-the-job training, which also contributes to income inequality. Some workers learn valuable new skills each year on the job and therefore experience significant income growth over time; others receive little or no on-the-job training and earn no more at age 50 than they did at age 30. Moreover, firms tend to select for advanced on-the-job training the workers who have the most formal education. That added training magnifies the education-based income differences between less-educated and better-educated individuals.

Discrimination

Discrimination in education, hiring, training, and promotion undoubtedly causes some income inequality. If discrimination confines certain racial, ethnic, or gender groups to lower-pay occupations, the supply of labor in those occupations will increase relative to demand and hourly wages and income in those lower-paying jobs will decline. Conversely, labor supply will be artificially reduced in the higher-pay occupations populated by “preferred” workers, raising their wage rates and income. In this way, discrimination can add to income inequality. In fact, economists cannot account for all racial, ethnic, and gender differences in work earnings on the basis of differences in years of education, quality of education, occupations, and annual hours of work. Many economists attribute the unexplained residual to discrimination.

Economists, however, do not see discrimination by race, gender, and ethnicity as a dominant factor explaining income inequality. The income distributions *within* racial or ethnic groups that historically have been targets of discrimination—for example,

African Americans—are similar to the income distribution for whites. Other factors besides discrimination are obviously at work. Nevertheless, discrimination is an important concern since it harms individuals and reduces society's overall output and income.

Preferences and Risks

Incomes also differ because of differences in preferences for market work relative to leisure, market work relative to work in the household, and types of occupations. People who choose to stay home with children, work part-time, or retire early usually have less income than those who make the opposite choices. Those who are willing to take arduous, unpleasant jobs (for example, underground mining or heavy construction), to work long hours with great intensity, or to “moonlight” will tend to earn more.

Individuals also differ in their willingness to assume risk. We refer here not only to the race-car driver or the professional boxer but also to the entrepreneur. Although many entrepreneurs fail, many of those who develop successful new products or services realize very substantial incomes. That contributes to income inequality.

Unequal Distribution of Wealth

Income is a *flow*; it represents a stream of wage and salary earnings, along with rent, interest, and profits, as depicted in Chapter 2's circular flow diagram. In contrast, wealth is a *stock*, reflecting at a particular moment the financial and real assets an individual has accumulated over time. A retired person may have very little income and yet own a home, mutual fund shares, and a pension plan that add up to considerable wealth. A new college graduate may be earning a substantial income as an accountant, middle manager, or engineer but have yet to accumulate significant wealth.

The ownership of wealth in the United States is more unequal than the distribution of income. According to the most recent (2004) Federal Reserve wealth data, the wealthiest 10 percent of families owned 70 percent of the total wealth and the top 1 percent owned 33 percent. The bottom 90 percent held only 30 percent of the total wealth. This wealth inequality leads to inequality in rent, interest, and dividends, which in turn contributes to income inequality. Those who own more machinery, real estate, farmland, and stocks and bonds and who have more money in savings accounts obviously receive greater income from that ownership than people with less or no such wealth.

Market Power

The ability to “rig the market” on one's own behalf also contributes to income inequality. For example, in *resource* markets, certain unions and professional groups have adopted policies that limit the supply of their services, thereby boosting the incomes of those “on the inside.” Also, legislation that requires occupational licensing for, say, doctors, dentists, and lawyers can bestow market power that favors the licensed groups. In *product* markets, “rigging the market” means gaining or enhancing monopoly power, which results in greater profit and thus greater income to the firms' owners.

Luck, Connections, and Misfortune

Other forces also play a role in producing income inequality. Luck and “being in the right place at the right time” have helped individuals stumble into fortunes. Discovering oil on a ranch, owning land along a major freeway interchange, and hiring the right press agent have accounted for some high incomes. Personal contacts and political connections are other potential routes to attaining high income.

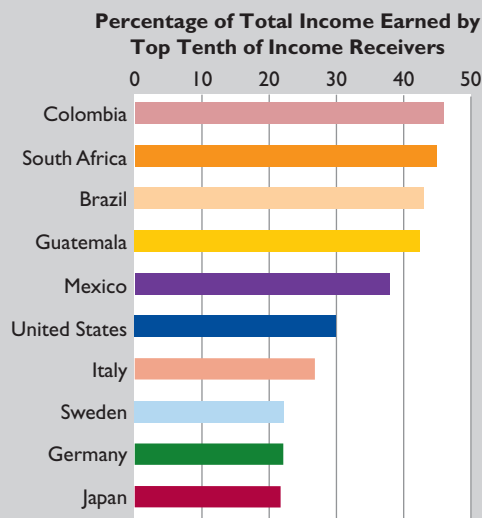
In contrast, economic misfortunes such as prolonged illness, serious accident, the death of the family breadwinner, or unemployment may plunge a family into the low range of income. The burden of such misfortune is borne very unevenly by the population and thus contributes to income inequality.

Income inequality of the magnitude we have described is not exclusively an American phenomenon. Global Snapshot B.1 compares income inequality in the United States (here by individuals, not by households) with that in several other nations. Income inequality tends to be greatest in South American nations, where land and capital resources are highly concentrated in the hands of very wealthy families.

Global Snapshot B.1

Percentage of Total Income Received by the Top One-Tenth of Income Receivers, Selected Nations

The share of income going to the highest 10 percent of income receivers varies among nations.



Source: United Nations Development Programme (UNDP), *Human Development Report 2009*, published 2009, reproduced with permission of Palgrave Macmillan.

Income Inequality over Time

Over a period of years, economic growth has raised incomes in the United States: In *absolute* dollar amounts, the entire distribution of income has been moving upward. But incomes may move up in *absolute* terms while leaving the *relative* distribution of income less equal, more equal, or unchanged. Table B.2 shows how the distribution of household income has changed since 1970. This income is “before tax” and includes cash transfers but not noncash transfers.

Rising Income Inequality since 1970

It is clear from Table B.2 that the distribution of income by quintiles has become more unequal since 1970. In 2010 the lowest 20 percent of households received

Quintile	1970	1975	1980	1985	1990	1995	2000	2010
Lowest 20%	4.1	4.4	4.3	4.0	3.9	3.7	3.6	3.3
Second 20%	10.8	10.5	10.3	9.7	9.6	9.1	8.9	8.5
Third 20%	17.4	17.1	16.9	16.3	15.9	15.2	14.8	14.6
Fourth 20%	24.5	24.8	24.9	24.6	24.0	23.3	23.0	23.4
Highest 20%	43.3	43.2	43.7	45.3	46.6	48.7	49.8	50.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Top 5%	16.6	15.9	15.8	17.0	18.6	21.0	22.1	21.3

TABLE B.2
Percentage of Total Before-Tax Income Received by Each One-Fifth and by the Top 5 percent of Households, Selected Years*

*Numbers may not add to 100 percent due to rounding.

Source: Bureau of the Census, www.census.gov.

3.3 percent of total before-tax income, compared with 4.1 in 1970. Meanwhile, the income share received by the highest 20 percent rose from 43.3 in 1970 to 50.2 percent in 2010. Also, the percentage of income received by the top 5 percent of households rose significantly over the 1970–2010 period.

Causes of Growing Inequality

Economists suggest several major explanations for the growing U.S. income inequality of the past several decades.

Greater Demand for Highly Skilled Workers Perhaps the most significant contributor to the growing income inequality has been an increasing demand by many firms for workers who are highly skilled and well educated. Moreover, several industries requiring highly skilled workers have either recently emerged or expanded greatly, such as the computer software, business consulting, biotechnology, health care, and Internet industries. Because highly skilled workers remain relatively scarce, their wages have been bid up. Consequently, the wage differences between them and less-skilled workers have increased. In fact, between 1980 and 2007, the wage difference between college graduates and high school graduates rose from 28 percent to 49 percent for women and from 22 percent to 44 percent for men.

The rising demand for skill also has shown up in rapidly rising pay for chief executive officers (CEOs), sizable increases in income from stock options, substantial increases in income for professional athletes and entertainers, and huge fortunes for successful entrepreneurs. This growth of “superstar” pay also has contributed to rising income inequality.

Demographic Changes The entrance of large numbers of less-experienced and less-skilled “baby boomers” into the labor force during the 1970s and 1980s may have contributed to greater income inequality in those two decades. Because younger workers tend to earn less income than older workers, their growing numbers contributed to income inequality. There also has been a growing tendency for men and women with high earnings potential to marry each other, thus increasing family income among the highest income quintiles. Finally, the number of households headed by single or divorced women has increased greatly. That trend has increased income inequality because such households lack a second major wage earner and also because the poverty rate for female-headed households is very high.

International Trade, Immigration, and Decline in Unionism Other factors are probably at work as well. Stronger international competition from imports has reduced the demand for and employment of less-skilled (but highly paid) workers in such industries as the automobile and steel industries. The decline in such jobs has reduced the average wage for less-skilled workers. It also has swelled the ranks of workers in already low-paying industries, placing further downward pressure on wages there.

Similarly, the transfer of jobs to lower-wage workers in developing countries has exerted downward wage pressure on less-skilled workers in the United States. Also, an upsurge in immigration of unskilled workers has increased the number of low-income households in the United States. Finally, the decline in unionism in the United States has undoubtedly contributed to wage inequality since unions tend to equalize pay within firms and industries.

Two cautions: First, when we note growing income inequality, we are not saying that the “rich are getting richer and the poor are getting poorer” in terms of absolute income. Both the rich and the poor are experiencing rises in real income. Rather, what has happened is that, while incomes have risen in all quintiles, income growth has been fastest in the top quintile. Second, increased income inequality is not solely a U.S. phenomenon. The recent rise of inequality also has occurred in several other industrially advanced nations.

The Lorenz curve can be used to contrast the distribution of income at different points in time. If we plotted Table B.2’s data as Lorenz curves, we would find that the curve shifted away from the diagonal between 1970 and 2010. The Gini ratio rose from 0.394 in 1970 to 0.469 in 2010.



Applying the Analysis

Laughing at Shrek

Some economists say that the distribution of annual *consumption* is more meaningful for examining inequality of well-being than is the distribution of annual *income*. In a given year, people’s consumption of goods and services may be above or below their income because they can save, draw down past savings, use credit cards, take out home mortgages, spend from inheritances, give money to charities, and so on. A recent study of the distribution of consumption finds that annual consumption inequality is less than income inequality. Moreover, consumption inequality has remained relatively constant over several decades, even though income inequality has increased.*

The Economist magazine extends the argument even further, pointing out that despite the recent increase in income inequality, the products consumed by the rich and the poor are far closer in functionality today than at any other time in history:

More than 70 percent of Americans under the official poverty line own at least one car. And the distance between driving a used Hyundai Elantra and new Jaguar XJ is well nigh undetectable compared with the difference between motoring and hiking through the muck . . . A wide screen plasma television is lovely, but you do not need one to laugh at “Shrek” . . .

Those intrepid souls who make vast fortunes turning out ever higher-quality goods at ever lower prices widen the income gap while reducing the differences that really matter.[†]

Economists generally agree that products and experiences once reserved exclusively for the rich in the United States have, in fact, become more commonplace for nearly all income classes. But skeptics argue that *The Economist's* argument is too simplistic. Even though both are water outings, there is a fundamental difference between yachting among the Greek isles on your private yacht and paddling on a local pond in your kayak.

Question:

How do the ideas of income inequality, consumption inequality, and wealth inequality differ?

[†]Dirk Krueger and Fabrizio Perri, "Does Income Inequality Lead to Consumption Inequality?" *Review of Economic Studies*, 2006, pp. 163–193.

[†]*The Economist*, "Economic Focus: The New (Improved) Gilded Age," December 22, 2007, p. 122. © The Economist Newspaper Limited, London.



© Royalty-Free/CORBIS



© Richard Bickel/CORBIS

Photo Op The Rich and the Poor in America

Wide disparities of income and wealth exist in the United States.

Equality versus Efficiency

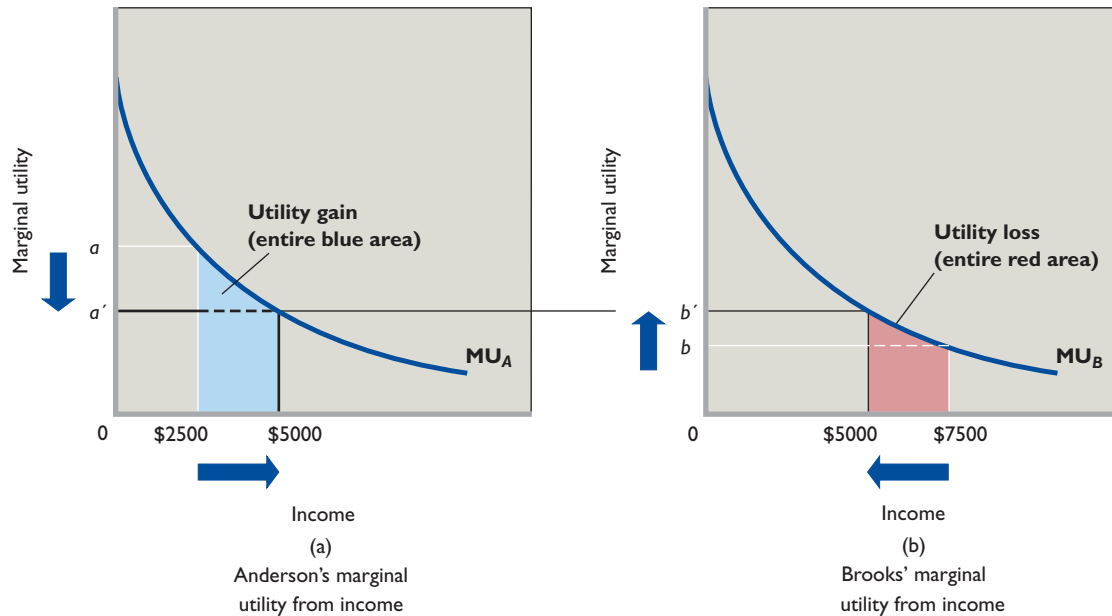
The main policy issue concerning income inequality is how much is necessary and justified. While there is no general agreement on the justifiable amount, we can gain insight by exploring the economic cases for and against greater equality.

The Case for Equality: Maximizing Total Utility

The basic economic argument for an equal distribution of income is that income equality maximizes the total consumer satisfaction (utility) from any particular level of output and income. The rationale for this argument is shown in Figure B.3, in which we assume that the money incomes of two individuals, Anderson and Brooks, are

FIGURE B.3

The utility-maximizing distribution of income. With identical marginal-utility-of-income curves MU_A and MU_B , Anderson and Brooks will maximize their combined utility when any amount of income (say, \$10,000) is equally distributed. If income is unequally distributed (say, \$2500 to Anderson and \$7500 to Brooks), the marginal utility derived from the last dollar will be greater for Anderson than for Brooks, and a redistribution toward equality will result in a net increase in total utility. The utility gained by equalizing income at \$5000 each, shown by the blue area below curve MU_A in panel (a), exceeds the utility lost, indicated by the red area below curve MU_B in (b).

**law of diminishing marginal utility**

The principle that the amount of extra satisfaction (marginal utility) from consuming a product declines as more of it is consumed.

subject to the **law of diminishing marginal utility**. In any time period, income receivers spend the first dollars received on the products they value most—products whose marginal utility (extra satisfaction) is high. As a consumer's most-pressing wants become satisfied, he or she then spends additional dollars of income on less-important, lower-marginal-utility goods. So marginal-utility-from-income curves slope downward, as in Figure B.3. The identical diminishing curves (MU_A and MU_B) reflect the assumption that Anderson and Brooks have the same capacity to derive utility from income. Each point on one of the curves measures the marginal utility of the last dollar of a particular level of income.

Now suppose that there is \$10,000 worth of income (output) to be distributed between Anderson and Brooks. According to proponents of income equality, the optimal distribution is an equal distribution, which causes the marginal utility of the last dollar spent to be the same for both persons. We can confirm this by demonstrating that if the income distribution is initially unequal, then distributing income more equally can increase the combined utility of the two individuals.

Suppose that the \$10,000 of income initially is distributed such that Anderson gets \$2500 and Brooks \$7500. The marginal utility, a , from the last dollar received by Anderson is high and the marginal utility, b , from Brooks' last dollar of income is low. If a single dollar of income is shifted from Brooks to Anderson—that is, toward greater equality—then Anderson's utility increases by a and Brooks' utility decreases by b . The combined utility then increases by a minus b (Anderson's large gain minus Brooks' small loss). The transfer of another dollar from Brooks to Anderson again increases their combined utility, this time by a slightly smaller amount. Continued transfer of

dollars from Brooks to Anderson increases their combined utility until the income is evenly distributed and both receive \$5000. At that time their marginal utilities from the last dollar of income are equal (at a' and b'), and any further income redistribution beyond the \$2500 already transferred would begin to create inequality and decrease their combined utility.

The area under the MU curve and to the left of the individual's particular level of income represents the total utility (the sum of the marginal utilities) of that income. Therefore, as a result of the transfer of the \$2500, Anderson has gained utility represented by the blue area below curve MU_A and Brooks has lost utility represented by the red area below curve MU_B . The blue area exceeds the red area, so income equality yields greater combined total utility than does the initial income inequality.

The Case for Inequality: Incentives and Efficiency

Although the logic of the argument for equality is sound, critics attack its fundamental assumption that there is some fixed amount of output produced and therefore income to be distributed. Critics of income equality argue that the way in which income is distributed is an important determinant of the amount of output or income that is produced and is available for distribution.

Suppose once again in Figure B.3 that Anderson earns \$2500 and Brooks earns \$7500. In moving toward equality, society (the government) must tax away some of Brooks' income and transfer it to Anderson. This tax and transfer process diminishes the income rewards of high-income Brooks and raises the income rewards of low-income Anderson; in so doing, it reduces the incentives of both to earn high incomes. Why should high-income Brooks work hard, save and invest, or undertake entrepreneurial risks when the rewards from such activities will be reduced by taxation? And why should low-income Anderson be motivated to increase his income through market activities when the government stands ready to transfer income to him? Taxes are a reduction in the rewards from increased productive effort; redistribution through transfers is a reward for diminished effort.

In the extreme, imagine a situation in which the government levies a 100 percent tax on income and distributes the tax revenue equally to its citizenry. Why would anyone work hard? Why would anyone work at all? Why would anyone assume business risk? Or why would anyone save (forgo current consumption) in order to invest? The economic incentives to "get ahead" will have been removed, greatly reducing society's total production and income. That is, the way income is distributed affects the size of that income. The basic argument for income inequality is that inequality is an unavoidable consequence of maintaining the incentives needed to motivate people to produce output and income year after year.

The Equality-Efficiency Trade-Off

At the essence of the income equality-inequality debate is a fundamental trade-off between equality and efficiency. In this **equality-efficiency trade-off**, greater income equality (achieved through redistribution of income) comes at the opportunity cost of reduced production and income. And greater production and income (through reduced redistribution) come at the expense of less equality of income. The trade-off obligates society to choose how much redistribution it wants, in view of the costs. If society decides it wants to redistribute income, it needs to determine methods that minimize the adverse effects on economic efficiency.

equality-efficiency trade-off

The decrease in economic efficiency that may accompany an increase in income equality.


 Illustrating the Idea

Slicing the Pizza

The equality-efficiency trade-off might better be understood through an analogy. Assume that society's income is a huge pizza, baked year after year, *with the sizes of the pieces going to people on the basis of their contribution to making it*. Now suppose that, for fairness reasons, society decides some people are getting pieces that are too large and others are getting pieces too small. But when society redistributes the pizza to make the sizes more equal, they discover the result is a smaller pizza than before. Why participate in making the pizza if you get a decent-size piece without contributing?

The shrinkage of the pizza represents the efficiency loss—the loss of output and income—caused by the harmful effects of the redistribution on incentives to work, to save and invest, and to accept entrepreneurial risk. The shrinkage also reflects the resources that society must divert to the bureaucracies that administer the redistribution system.

How much pizza shrinkage will society accept while continuing to agree to the redistribution? If redistributing pizza to make it less unequal reduces the size of the pizza, what amount of pizza loss will society tolerate? Is a loss of 10 percent acceptable? 25 percent? 75 percent? This is the basic question in any debate over the ideal size of a nation's income redistribution program.

Question:

Why might “equality of opportunity” be a more realistic and efficient goal than “equality of income outcome”?



The Economics of Poverty

We now turn from the broader issue of income distribution to the more specific issue of very low income, or “poverty.” A society with a high degree of income inequality can have a high, moderate, or low amount of poverty. In fact, it could have no poverty at all. We therefore need a separate examination of poverty.

Definition of Poverty

Poverty is a condition in which a person or family does not have the means to satisfy basic needs for food, clothing, shelter, and transportation. The means include currently earned income, transfer payments, past savings, and property owned. The basic needs have many determinants, including family size and the health and age of its members.

The federal government has established minimum income thresholds below which a person or a family is “in poverty.” In 2010 an unattached individual receiving less than \$11,139 per year was said to be living in poverty. For a family of four, the poverty line was \$22,314; for a family of six, it was \$29,897. Based on these thresholds, in 2010 about 46.2 million Americans lived in poverty. In 2010 the **poverty rate**—the percentage of the population living in poverty—was 15.1 percent.

poverty rate

The percentage of the population with incomes below the official poverty income levels established by the federal government.

Incidence of Poverty

The poor are heterogeneous: They can be found in all parts of the nation; they are whites and nonwhites, rural and urban, young and old. But as Figure B.4 indicates, poverty is far from randomly distributed. For example, the poverty rate for African

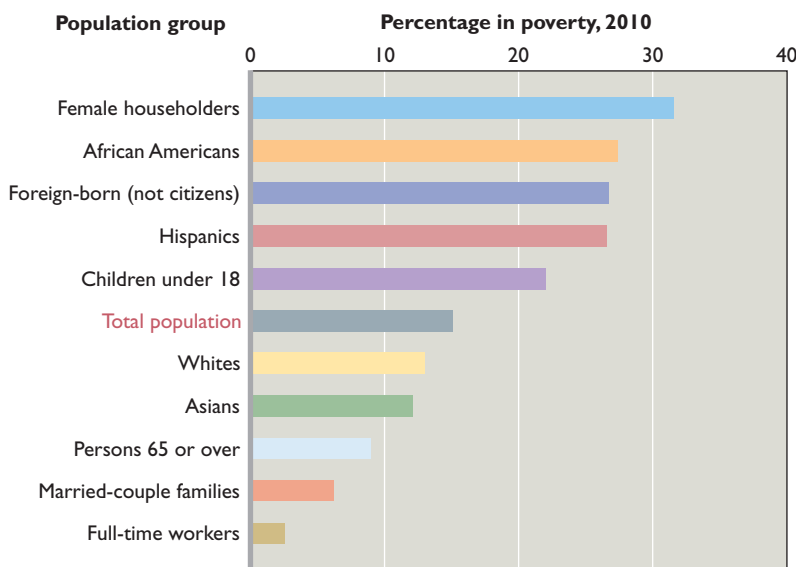


FIGURE B.4
Poverty rates among selected population groups, 2010. Poverty is disproportionately borne by African Americans, Hispanics, children, foreign-born residents who are not citizens, and families headed by women. People who are employed full-time or are married tend to have low poverty rates.
 Source: Bureau of the Census.

Americans is above the national average, as is the rate for Hispanics, while the rate for whites and Asians is below the average. In 2010 the poverty rates for African Americans and Hispanics were 27.4 and 26.6 percent, respectively; the rates for whites and Asians were 13.0 and 12.1 percent, respectively.

Figure B.4 shows that female-headed households, foreign-born noncitizens, and children under 18 years of age have very high incidences of poverty. Marriage and full-time, year-round work are associated with low poverty rates, and, because of the Social Security system, the incidence of poverty among the elderly is less than that for the population as a whole.

The high poverty rate for children is especially disturbing because poverty tends to breed poverty. Poor children are at greater risk for a range of long-term problems, including poor health and inadequate education, crime, drug use, and teenage pregnancy. Many of today's impoverished children will reach adulthood unhealthy and illiterate and unable to earn above-poverty incomes.

As many as half of people in poverty are poor for only 1 or 2 years before climbing out of poverty. But poverty is much more long-lasting among some groups than among others. In particular, African-American and Hispanic families, families headed by women, persons with little education and few labor market skills, and people who are dysfunctional because of drug use, alcoholism, or mental illness are more likely than others to remain in poverty. Also, long-lasting poverty is heavily present in depressed areas of cities, parts of the Deep South, and some Native American reservations.

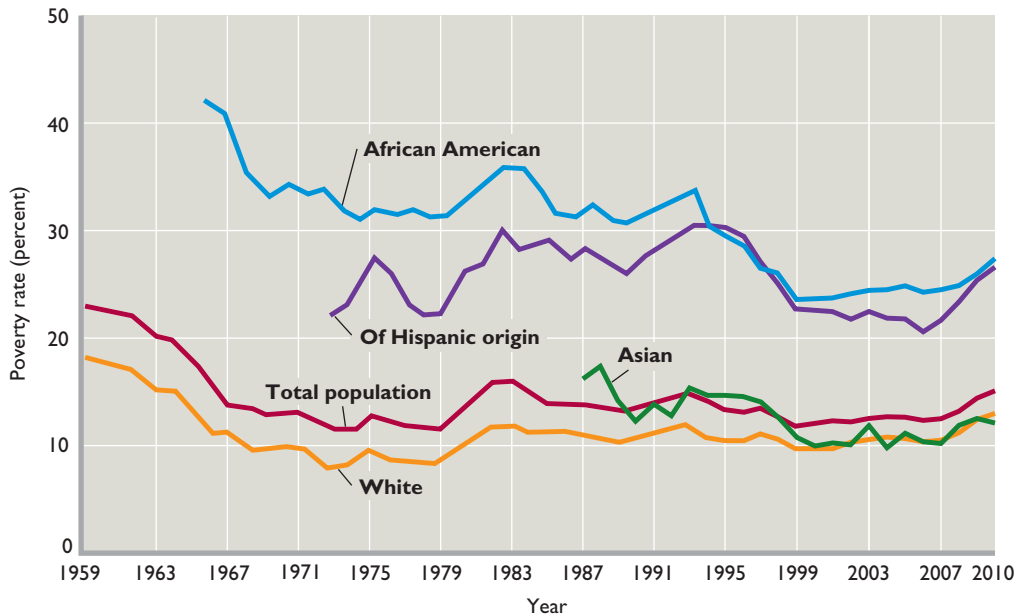
Poverty Trends

As Figure B.5 shows, the total poverty rate fell significantly between 1959 and 1969, stabilized at 11 to 13 percent over the next decade, and then rose in the early 1980s. In 1993 the rate was 15.1 percent, the highest since 1983. Between 1993 and 2000 the rate turned downward, falling to 11.3 percent in 2000. Because of recession and slow recovery, the rate rose to 11.7 percent in 2001, 12.1 percent in 2002, and 12.7 percent

FIGURE B.5

Poverty-rate trends, 1959–2010. Although the national poverty rate declined sharply between 1959 and 1969, it stabilized in the 1970s only to increase significantly in the early 1980s. Between 1993 and 2000 it substantially declined, before rising slightly again in the immediate years following the 2001 recession. Although poverty rates for African Americans and Hispanics are much higher than the average, they significantly declined during the 1990s. Poverty rates rose in 2008 through 2010 in response to the recession that began in December 2007.

Source: Bureau of the Census, www.census.gov.



in 2004. During the second half of the 1990s, poverty rates plunged for African Americans, Hispanics, and Asians. Nevertheless, in 2006 African Americans and Hispanics still had poverty rates that were roughly double the rates for whites.

The recession that began in December 2007 increased poverty rates for all groups with, for instance, the Asian poverty rate rising from 10.2 percent in 2007 to 12.4 percent in 2009. As data become available for 2011 and 2012, many economists expect to see poverty rates rise further in response to the widespread and lingering unemployment caused by the so-called Great Recession.

Measurement Issues

The poverty rates and trends in Figures B.4 and B.5 need to be interpreted cautiously. The official income thresholds for defining poverty are necessarily arbitrary and therefore may inadequately measure the true extent of poverty in the United States.

Some observers say that the high cost of living in major metropolitan areas means that the official poverty thresholds exclude millions of families whose income is slightly above the poverty level but clearly inadequate to meet basic needs for food, housing, and medical care. These observers use city-by-city studies on “minimal income needs” to show there is much more poverty in the United States than is officially measured and reported.

In contrast, some economists point out that using income to measure poverty understates the standard of living of many of the people who are officially poor. When individual, household, or family *consumption* is considered rather than family *income*,

some of the poverty in the United States disappears. Some low-income families maintain their consumption by drawing down past savings, borrowing against future income, or selling homes. Moreover, many poverty families receive substantial noncash benefits such as food stamps and rent subsidies that boost their living standards. Such “in-kind” benefits are not included in determining a family’s official poverty status.

The U.S. Income-Maintenance System

Regardless of how poverty is measured, economists agree that considerable poverty exists in the United States. Helping those who have very low income is a widely accepted goal of public policy. A wide array of antipoverty programs, including education and training programs, subsidized employment, minimum-wage laws, and antidiscrimination policies, are designed to increase the earnings of the poor. In addition, there are a number of income-maintenance programs devised to reduce poverty, the most important of which are listed in Table B.3. These programs involve large expenditures and numerous beneficiaries.

TABLE B.3
Characteristics of Major Income-Maintenance Programs

Program	Basis of Eligibility	Source of Funds	Form of Aid	Expenditures, [*] Billions	Beneficiaries, Millions
Social Insurance Programs					
Social Security	Age, disability, or death of parent or spouse; lifetime work earnings	Federal payroll tax on employers and employees	Cash	\$702	54
Medicare	Age or disability	Federal payroll tax on employers and employees	Subsidized health insurance	\$516	48
Unemployment compensation	Unemployment	State and federal payroll taxes on employers	Cash	\$80	14
Public Assistance Programs					
Supplemental Security Income (SSI)	Age or disability; income	Federal revenues	Cash	\$48	9
Temporary Assistance for Needy Families (TANF)	Certain families with children; income	Federal-state-local revenues	Cash and services	\$12	4
Supplemental Nutrition Assistance Program (SNAP)	Income	Federal revenues	Cash via EBT cards	\$72	45
Medicaid	Persons eligible for TANF or SSI and medically indigent	Federal-state-local revenues	Subsidized medical services	\$321	62
Earned-income tax credit (EITC)	Low-wage working families	Federal revenues	Refundable tax credit, cash	\$59	26

*Expenditures by federal, state, and local governments; excludes administrative expenses.

Source: Social Security Administration, *Annual Statistical Supplement, 2011*, www.socialsecurity.gov; U.S. Department of Agriculture, www.fns.usda.gov; Internal Revenue Service, www.irs.gov/taxstats; and other government sources. Latest data.

entitlement programs

Government programs that guarantee particular levels of transfer payments or noncash benefits to all who fit the programs' criteria.

The U.S. income-maintenance system consists of two kinds of programs: (1) social insurance and (2) public assistance or “welfare.” Both are known as **entitlement programs** because all eligible persons are legally entitled to receive the benefits set forth in the programs.

Social Insurance Programs

Social insurance programs partially replace earnings that have been lost due to retirement, disability, or temporary unemployment; they also provide health insurance for the elderly. The main social insurance programs are Social Security, unemployment compensation, and Medicare. Benefits are viewed as earned rights and do not carry the stigma of public charity. These programs are financed primarily out of federal payroll taxes. In these programs the entire population shares the risk of an individual's losing income because of retirement, unemployment, disability, or illness. Workers (and employers) pay a part of their wages to the government while they are working. The workers then receive benefits when they retire or face specified misfortunes.

Social Security

A federal pension program (financed by payroll taxes on employers and employees) that replaces part of the earnings lost when workers retire, become disabled, or die.

Social Security and Medicare The major social insurance program known as **Social Security** replaces earnings lost when workers retire, become disabled, or die. This gigantic program (\$702 billion in 2010) is financed by compulsory payroll taxes levied on both employers and employees. Workers currently may retire at age 65 and receive full retirement benefits or retire early at age 62 with reduced benefits. When a worker dies, benefits accrue to his or her family survivors. Special provisions provide benefits for disabled workers.

Social Security covers over 90 percent of the workforce; some 54 million people receive Social Security benefits averaging about \$1185 per month. In 2012, those benefits were financed with a combined Social Security and Medicare payroll tax of 15.3 percent, with the worker and the employer each paying 7.65 percent on the worker's first \$110,100 of earnings. The 7.65 percent taxes comprise 6.2 percent for Social Security and 1.45 percent for Medicare. Self-employed workers pay the full 15.3 percent.

Medicare

A federal insurance program (financed by payroll taxes on employers and employees) that provides health insurance benefits to those 65 or older.

Medicare provides hospital insurance for the elderly and disabled and is financed out of the payroll tax. This overall 2.9 percent tax is paid on all work income, not just on the first \$110,100. Medicare also makes available a supplementary low-cost insurance program that helps pay doctor fees.

The number of retirees drawing Social Security and Medicare benefits is rapidly rising relative to the number of workers paying payroll taxes. As a result, Social Security and Medicare face serious long-term funding problems. These fiscal imbalances have spawned calls to reform the programs.

unemployment compensation

A federal-state social insurance program (financed by payroll taxes on employers) that makes income available to workers who are unemployed.

Unemployment Compensation All 50 states sponsor unemployment insurance programs called **unemployment compensation**, a federal-state program that makes income available to unemployed workers. This insurance is financed by a relatively small payroll tax, paid by employers, that varies by state and by the size of the firm's payroll. After a short waiting period, eligible wage and salary workers who become unemployed can receive benefit payments. The size of the payments varies from state to state. Generally, benefits approximate 33 percent of a worker's wages up to a certain maximum weekly payment, and last for a maximum of 26 weeks. In 2010 benefits averaged about \$310 weekly. During recessions—when unemployment soars—Congress often provides supplemental funds to the states to extend the benefits for additional weeks.

Public Assistance Programs

Public assistance programs (welfare) provide benefits for those who are unable to earn income because of permanent disabilities or have no or very low income and also have dependent children. These programs are financed out of general tax revenues and are regarded as public charity. They include “means tests,” which require that individuals and families demonstrate low incomes in order to qualify for aid. The federal government finances about two-thirds of the welfare program expenditures, and the rest is paid for by the states.

Many needy persons who do not qualify for social insurance programs are assisted through the federal government’s **Supplemental Security Income (SSI)** program. The purpose of SSI is to establish a uniform, nationwide minimum income for the aged, blind, and disabled who are unable to work and who do not qualify for Social Security aid. Over half the states provide additional income supplements to the aged, blind, and disabled.

The **Temporary Assistance for Needy Families (TANF)** is the basic welfare program for low-income families in the United States. The program is financed through general federal tax revenues and consists of lump-sum payments of federal money to states to operate their own welfare and work programs. These lump-sum payments are called TANF funds, and in 2011 about 4.4 million people (including children) received TANF assistance. TANF expenditures in 2011 were about \$12 billion.

In 1996 TANF replaced the six-decade-old Aid for Families with Dependent Children (AFDC) program. Unlike that welfare program, TANF established work requirements and placed limits on the length of time a family can receive welfare payments. Specifically, the TANF program

- Set a lifetime limit of 5 years on receiving TANF benefits and required able-bodied adults to work after receiving assistance for 2 years.
- Ended food-stamp eligibility for able-bodied persons age 18 to 50 (with no dependent children) who are not working or engaged in job-training programs.
- Tightened the definition of “disabled children” as it applies for eligibility of low-income families for SSI assistance.
- Established a 5-year waiting period on public assistance for new legal immigrants who have not become citizens.

In 1996 about 12.6 million people were welfare recipients, including children, or 4.8 percent of the U.S. population. By the middle of 2007, those totals had declined to 4.5 million and 2 percent of the population. The recession that began in December 2007 pushed the number of welfare recipients up to about 4.4 million by December 2009. These recipients accounted for about 1.4 percent of the population in December 2009.

The welfare program has greatly increased the employment rate (= employment/population) for single mothers with children under age 6—a group particularly prone to welfare dependency. Today, that rate is about 13 percentage points higher than it was in 1996.

The **Supplemental Nutrition Assistance Program (SNAP)** was formerly known as the food-stamp program. SNAP is designed to provide all low-income Americans with a “nutritionally adequate diet.” Under the program, eligible households receive monthly deposits of spendable electronic money on specialized debit cards known as Electronic Benefit Transfer (EBT) cards. The EBT cards are designed so that the deposits can only be spent on food. The amount deposited onto a family’s EBT card varies inversely with the family’s earned income.

Supplemental Security Income (SSI)

A federal program (financed by general tax revenues) that provides a uniform nationwide minimum income for the aged, blind, and disabled who do not qualify for benefits under the Social Security program in the United States.

Temporary Assistance for Needy Families (TANF)

The basic welfare program (financed through general tax revenues) for low-income families in the United States.

Supplemental Nutrition Assistance Program (SNAP)

A government program that provides food money to low-income recipients by depositing electronic money onto special debit cards.

Medicaid

A federal program (financed by general tax revenues) that provides medical benefits to people covered by the Supplemental Security Income (SSI) and Temporary Assistance for Needy Families (TANF) programs.

earned-income tax credit (EITC)

A refundable federal tax credit provided to low-income wage earners to supplement their families' incomes and encourage work.

Medicaid helps finance the medical expenses of individuals participating in the SSI and the TANF programs.

The **earned-income tax credit (EITC)** is a tax credit for low-income working families, with or without children. The credit reduces the federal income taxes that such families owe or provides them with cash payments if the credit exceeds their tax liabilities. The purpose of the credit is to offset Social Security taxes paid by low-wage earners and thus keep the federal government from “taxing families into poverty.” In essence, EITC is a wage subsidy from the federal government that works out to be as much as \$2 per hour for the lowest-paid workers with families. Under the program, many people owe no income tax and receive direct checks from the federal government once a year. According to the Internal Revenue Service, 26 million taxpayers received \$59 billion in payments from the EITC in 2010.

Several other welfare programs are not listed in Table B.3. Most provide help in the form of noncash transfers. Head Start provides education, nutrition, and social services to economically disadvantaged 3- and 4-year-olds. Housing assistance in the form of rent subsidies and funds for construction is available to low-income families. Pell grants provide assistance to college students from low-income families.



© Royalty-Free/CORBIS



© Jack Star/PhotoLink/Getty Images

Photo Op Social Insurance versus Public Assistance Programs

Beneficiaries of social insurance programs such as Social Security have typically paid for at least a portion of that insurance through payroll taxes. Food stamps and other public assistance are funded from general tax revenue and are generally seen as public charity.

Summary

1. The distribution of income in the United States reflects considerable inequality. The richest 20 percent of families receive 50.2 percent of total income, while the poorest 20 percent receive 3.3 percent.
2. The Lorenz curve shows the percentage of total income received by each percentage of households. The extent of the gap between the Lorenz curve and a line of total equality illustrates the degree of income inequality.

- The Gini ratio measures the overall dispersion of the income distribution and is found by dividing the area between the diagonal and the Lorenz curve by the entire area below the diagonal. The Gini ratio ranges from zero to 1; higher ratios signify greater degrees of income inequality.
- Recognizing that the positions of individual families in the distribution of income change over time and incorporating the effects of noncash transfers and taxes would reveal less income inequality than do standard census data. Government transfers (cash and noncash) greatly lessen the degree of income inequality; taxes also reduce inequality, but not by nearly as much as transfers.
- Causes of income inequality include differences in abilities, in education and training, and in job tastes, along with discrimination, inequality in the distribution of wealth, and an unequal distribution of market power.
- Census data show that income inequality has increased significantly since 1970. The major cause of recent increases in income inequality is a rising demand for highly skilled workers, which has boosted their earnings significantly.
- The basic argument for income equality is that it maximizes consumer satisfaction (total utility) from a particular level of total income. The main argument for income inequality is that it provides the incentives to work, invest, and assume risk and is necessary for the production of output, which, in turn, creates income that is then available for distribution.
- Current statistics reveal that 15.1 percent of the U.S. population lived in poverty in 2010. Poverty rates are particularly high for female-headed families, young children, African Americans, and Hispanics.
- The present income-maintenance program in the United States consists of social insurance programs (Social Security, Medicare, and unemployment compensation) and public assistance programs (SSI, TANF, SNAP, Medicaid, and earned-income tax credit).
- In 1996 Congress established the Temporary Assistance for Needy Families (TANF) program, which shifted responsibility for welfare from the federal government to the states. Among its provisions are work requirements for adults receiving welfare and a 5-year lifelong limit on welfare benefits.
- A generally strong economy and TANF have reduced the U.S. welfare rolls by more than one-half since 1996.

Terms and Concepts

income inequality	equality-efficiency trade-off	Supplemental Security Income (SSI)
Lorenz curve	poverty rate	Temporary Assistance for Needy Families (TANF)
Gini ratio	entitlement programs	Supplemental Nutrition Assistance Program (SNAP)
income mobility	Social Security	Medicaid
noncash transfers	Medicare	earned-income tax credit (EITC)
law of diminishing marginal utility	unemployment compensation	

Questions

- Use quintiles to briefly summarize the degree of income inequality in the United States. How and to what extent does government reduce income inequality? **LO1**
- Assume that Al, Beth, Carol, David, and Ed receive incomes of \$500, \$250, \$125, \$75, and \$50, respectively. Construct and interpret a Lorenz curve for this five-person economy. What percentages of total income are received by the richest quintile and by the poorest quintile? **LO1**
- How does the Gini ratio relate to the Lorenz curve? Why can't the Gini ratio exceed 1? What is implied about the direction of income inequality if the Gini ratio declines from 0.42 to 0.35? How would one show that change of inequality in the Lorenz diagram? **LO1**
- Why is the lifetime distribution of income more equal than the distribution in any specific year? **LO2**
- Briefly discuss the major causes of income inequality. What factors have contributed to greater income inequality since 1970? **LO2, LO3**
- Should a nation's income be distributed to its members according to their contributions to the production of that total income or according to the members' needs? Should society attempt to equalize income or economic

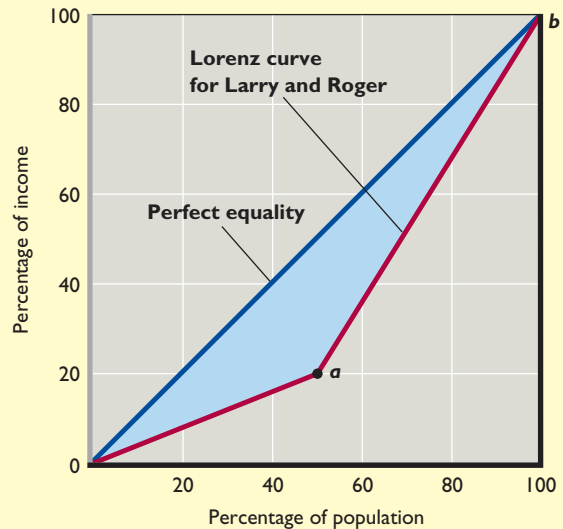
opportunities? Are the issues of equity and equality in the distribution of income synonymous? To what degree, if any, is income inequality equitable? **LO4**

7. Comment on or explain: **LO4**
 - a. Endowing everyone with equal income will make for very unequal enjoyment and satisfaction.
 - b. Equality is a “superior good”; the richer we become, the more of it we can afford.
 - c. The mob goes in search of bread, and the means it employs is generally to wreck the bakeries.
 - d. Some freedoms may be more important in the long run than freedom from want on the part of every individual.
 - e. Capitalism and democracy are really a most improbable mixture. Maybe that is why they need each other—to put some rationality into equality and some humanity into efficiency.
 - f. The incentives created by the attempt to bring about a more equal distribution of income are in conflict with the incentives needed to generate increased income.

8. How do government statisticians determine the poverty rate? How could the poverty rate fall while the number of people in poverty rises? Which group in each of the following pairs has the higher poverty rate: (a) children or people age 65 or over? (b) African Americans or foreign-born noncitizens? (c) Asians or Hispanics? **LO5**
9. What are the essential differences between social insurance and public assistance programs? Why is Medicare a social insurance program whereas Medicaid is a public assistance program? Why is the earned-income tax credit considered to be a public assistance program? **LO6**
10. Prior to the implementation of welfare reforms through the Temporary Assistance for Needy Families (TANF) program, the old system (AFDC) was believed to be creating dependency, robbing individuals and family members of motivation and dignity. How did this reform (TANF) try to address those criticisms? Do you agree with the general thrust of the reform and with its emphasis on work requirements and time limits on welfare benefits? Has the reform reduced U.S. welfare rolls or increased them? **LO6**

Problems

1. In 2010 *Forbes* magazine listed Bill Gates, the founder of Microsoft, as the richest person in the United States. His personal wealth was estimated to be \$53 billion. Given that there were about 309 million people living in the United States that year, how much could each person have received if Gates’ wealth had been divided equally among the population of the United States? (Hint: A billion is a 1 followed by 9 zeros, while a million is a 1 followed by six zeros.) **LO1**
2. Imagine an economy with only two people. Larry earns \$20,000 per year, while Roger earns \$80,000 per year. As shown in the following figure, the Lorenz curve for this two-person economy consists of two line segments. The first runs from the origin to point *a*, while the second runs from point *a* to point *b*. **LO1**
 - a. Calculate the Gini ratio for this two-person economy using the geometric formulas for the area of a triangle ($= \frac{1}{2} \times \text{base} \times \text{height}$) and the area of a rectangle ($= \text{base} \times \text{height}$). (Hint: The area under the line segment from point *a* to point *b* can be thought of as the sum of the area of a particular triangle and the area of a particular rectangle.)
 - b. What would the Gini ratio be if the government taxed \$20,000 away from Roger and gave it to Larry? (Hint: The figure will change.)
 - c. Start again with Larry earning \$20,000 per year and Roger earning \$80,000 per year. What would the Gini ratio be if both their incomes doubled?



How much has the Gini ratio changed from before the doubling in incomes to after the doubling in incomes?

3. In 2010, many unskilled workers in the United States earned the federal minimum wage of \$7.25 per hour. By contrast, average earnings in 2010 were about \$22 per hour, and certain highly skilled professionals,

such as doctors and lawyers, earned \$100 or more per hour. **LO6**

- a. If we assume that wage differences are caused solely by differences in productivity, how many times more productive was the average worker than a worker being paid the federal minimum wage? How many times more productive was a \$100-per-hour lawyer compared to a worker earning minimum wage?
- b. Assume that there are 20 minimum-wage workers in the economy for each \$100-per-hour lawyer. Also assume that both lawyers and minimum-wage workers work the same number of hours per week. If everyone works 40 hours per week, how much does a \$100-per-hour lawyer earn a week? How much does a minimum-wage worker earn a week?
- c. Suppose that the government pairs each \$100-per-hour lawyer with 20 nearby minimum-wage workers. If the government taxes 25 percent of each lawyer's income each week and distributes it equally among the 20 minimum-wage workers with whom each lawyer is paired, how much will each of those minimum-wage workers receive each week? If we divide by the number of hours worked each week, how much does each minimum-wage worker's weekly transfer amount to on an hourly basis?
- d. What if instead the government taxed each lawyer 100 percent before dividing the money equally among the 20 minimum-wage workers with whom each lawyer is paired—how much per week will each minimum-wage worker receive? And how much is that on an hourly basis?

FURTHER TEST YOUR KNOWLEDGE AT www.brue3e.com

At the text's Online Learning Center, www.brue3e.com, you will find one or more web-based questions that require information from the Internet to answer. We urge you to check them out, since they will familiarize you with websites that may be helpful in other courses and perhaps even in your career. The OLC also features multiple-choice quizzes that give instant feedback and provides other helpful ways to further test your knowledge of the chapter.