

## >> Taxes, Social Insurance, and Income Distribution

### A TAX RIOT

**O**N MARCH 31, 1990, HUNDREDS OF thousands of British citizens marched across London, protesting a new tax that had been introduced by Prime Minister Margaret Thatcher. As some protesters clashed with police, the initially peaceful demonstration turned into a riot, with hundreds injured. The violence came as a surprise, but maybe it shouldn't have: the tax had aroused angry opposition throughout Britain. Later that year, Mrs. Thatcher was forced to resign, and many observers believed that the tax controversy was the prime cause of her fall.

The tax at issue was officially known as the "Community Charge" but was popularly known as the "poll tax." Until 1989 local public services like street cleaning and trash collection had been financed with "the rates," a tax that depended on the value of people's homes. (Most local services in the United States are financed with similar

property-based taxes.) Mrs. Thatcher, however, replaced these property taxes with a payment from each individual over the age of 18. Although the tax varied from town to town, every adult in a town owed the same amount, regardless of income or value of his or her property.

Supporters of the poll tax argued that it was more efficient than the tax it replaced. Because the old tax depended on the value of property, it discouraged people both from buying more expensive homes and from improving the homes they had. Supporters also argued that the poll tax was fair, because the cost of providing local public services depended mainly on how many people lived in a town, not on how rich those people were.

But opponents argued that the poll tax was extremely unfair because it did not take into account differences in people's ability to pay—a single mother who worked as a

### What you will learn in this chapter:

- ▶ Why designing a tax system involves a **trade-off between equity and efficiency**
- ▶ Two concepts of fairness in taxation: the **benefits principle** and the **ability-to-pay principle**
- ▶ The different kinds of taxes and their effects on people's economic behavior at different levels of income
- ▶ The major types of government spending and how they are justified
- ▶ What income inequality is and why there is a policy debate about it



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Margaret Thatcher and these protesters differed sharply over the fairness of the poll tax.

waitress and a millionaire stockbroker owed the same amount if they lived in the same town.

One moral of the story is that making tax policy isn't easy—in fact, if you are a politician, it can be dangerous to your professional health. But the deeper moral is that making tax policy always involves

striking a balance between the pursuit of efficiency and the pursuit of perceived fairness. Or, as economists say, there is a *trade-off between equity and efficiency*. In this chapter we will show why this trade-off exists and how attempts to make the best of the trade-off influence the design of actual tax systems.

A tax system achieves **tax efficiency** when it minimizes the costs to the economy of tax collection.

A tax system achieves **tax fairness, or tax equity**, when the “right” people actually bear the burden of taxes.

## Principles of Tax Policy

Tax policy always has two goals. On the one hand, governments strive to achieve **tax efficiency**: they try to minimize the direct and indirect costs to the economy of tax collection. On the other hand, governments also seek **tax fairness, or tax equity**: they try to ensure that the “right” people actually bear the burden of taxes. The central dilemma in tax policy—the dilemma that led to London’s poll tax riot—is that an efficient tax may not seem fair, and a seemingly fair tax may not be efficient. So there is a fundamental trade-off between equity and efficiency.

## The Burden of Taxes: A Quick Review

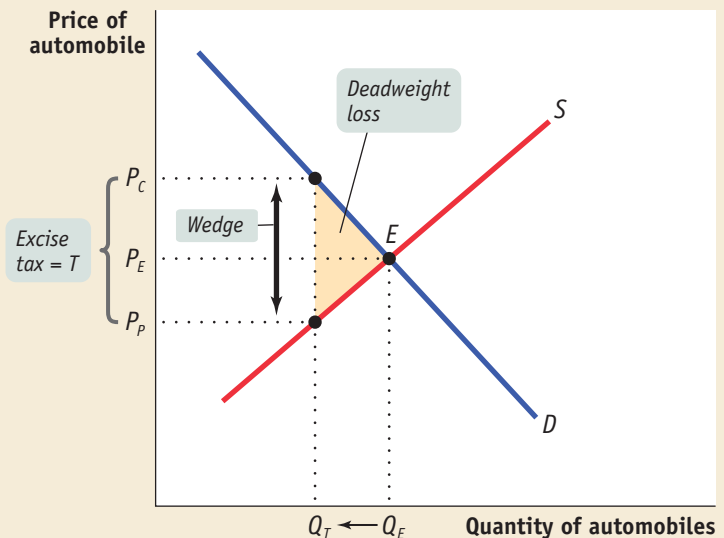
We analyzed some of the basic economics of taxation in Chapter 6. Here we briefly revisit the results of that analysis. Figure 21-1 shows the effects of an excise tax—a tax on sales—imposed on some good, in this case automobiles. Excise taxes are only one part of the U.S. tax system, but the principles suggested by this analysis apply to all taxes.

In the absence of a tax, the equilibrium price of autos would be  $P_E$  and the quantity bought and sold would be  $Q_E$ . Once a tax is imposed on the purchase or sale of an automobile, it *drives a wedge* between the price paid by consumers and that received by producers. In this case, a tax of  $\$T$  per unit is imposed. In the new equilibrium the price

Figure 21-1

### The Deadweight Loss of a Tax

Here an excise tax of the amount  $T = P_C - P_P$  is imposed per auto sold. The quantity transacted falls from  $Q_E$  to  $Q_T$ , and there is a deadweight loss equal to the shaded area. The tax creates a wedge between the price paid by consumers,  $P_C$ , and the price received by producers,  $P_P$ . As a result, incentives are distorted and inefficiency arises: consumers consume less than is efficient and producers produce less than is efficient.



paid by buyers rises to  $P_C$  and the price received by sellers falls to  $P_P$ . The difference,  $P_C - P_P$ , is equal to the tax. As a result of the tax, the quantity bought and sold falls from  $Q_E$  to  $Q_T$ . So the tax changes people's behavior: less of the good is bought and sold.

Our analysis in Chapter 6 revealed three key results:

1. Consumers are hurt by the tax to the extent that the price they pay rises, and producers are hurt to the extent that the price they receive falls. But how much  $P_C$  rises and how much  $P_P$  falls do not depend on who pays the tax to the government—in fact, in Figure 21-1 we have not even specified whether this is a tax on producers or on consumers. So the incidence of a tax—who actually bears the burden—cannot be determined simply by looking at who pays the money to the government.
2. The price elasticities of supply and demand determine the incidence of the tax. The higher the price elasticity of supply, the more the price paid by consumers rises as a result of the tax and the greater the tax burden on consumers. The higher the elasticity of demand, the more the price received by producers falls and the greater the tax burden on producers. The party with the lower elasticity (suppliers or demanders) will bear the greater burden of the tax. If demand is relatively inelastic compared with supply, then consumers will bear a greater tax burden because quantity demanded is relatively insensitive to an increase in the price paid. If supply is relatively inelastic compared with demand, then quantity supplied is relatively insensitive to the decrease in the price received.
3. The tax causes a loss in efficiency—a deadweight loss—by creating a wedge between the price paid by consumers and the price received by producers. At  $Q_T$  in Figure 21-1, the marginal value of an additional unit of consumption is greater than the marginal cost of producing that additional unit. This means that the economy loses the potential gain from greater production and consumption of the good. The total deadweight loss from the tax can be measured by the area of the shaded triangle. This deadweight loss represents the *excess burden* of the tax—the cost to producers and consumers over and above the revenue the government collects.

A tax system causes deadweight losses because taxes *distort incentives*: the incentives at the margin for producers to produce and consumers to consume are different from what they would have been without the tax, so people change their behavior. The most efficient tax will be the one that distorts incentives the least.

In considering the efficiency of a tax, we must also take into account something not shown in Figure 21-1: the resources actually used both to collect the tax and to pay it. These are called the **administrative costs** of the tax. The most familiar administrative cost of the U.S. tax system is the time individuals spend filling out their tax forms or the money they spend on accountants to do their taxes for them. (The costs of operating the Internal Revenue Service are actually quite small by comparison.)

If maximizing efficiency is the only goal, a tax system should be designed to minimize the sum of its excess burden and its administrative costs. But tax policy is not driven by efficiency alone, because the voters who must approve a tax system also care about fairness, or equity. As we will see, fairness in a tax system usually comes at the expense of efficiency.

## Tax Fairness

We have just seen how economic analysis can be used to determine who bears the burden of a tax. But who *should* bear the burden? Governments have wide discretion in choosing what to tax and how to tax it. How should they exercise this discretion?

One answer is that the tax system should be fair. But what exactly does fairness mean? We could say that fairness, like beauty, is often in the eyes of the beholder. However, most debates about taxes rely on one of two principles of tax fairness: the *benefits principle* and the *ability-to-pay principle*.

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The **administrative costs** of a tax are the resources used both to collect the tax and to pay it.

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According to the **benefits principle** of tax fairness, those who benefit from public spending should bear the burden of the tax that pays for that spending.

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According to the **ability-to-pay principle** of tax fairness, those with greater ability to pay a tax should pay more tax.

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A **lump-sum tax** is the same for everyone, regardless of any actions people take.

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In a well-defined tax system, there is a **trade-off between equity and efficiency**: the system can be made more efficient only by making it less fair, and vice versa.

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According to the **benefits principle**, those who benefit from public spending should bear the burden of the tax that pays for that spending. For example, those who benefit from a road should pay for that road's upkeep, those who fly on airplanes should pay for air traffic control, and so on. The benefits principle is the basis for some parts of the U.S. tax system. For example, revenue from the federal tax on gasoline is specifically reserved for the maintenance and improvement of federal roads, including the Interstate Highway System. In this way motorists, who benefit from the highway system, also pay for it.

The benefits principle is attractive from an economic point of view because it matches well with one of the major justifications for public spending—the theory of public goods. If government's role is to provide people with goods that could not otherwise be made available, it seems natural to charge someone in proportion to the benefits he or she get from those goods.

Practical considerations, however, make it impossible to base the entire tax system on the benefits principle. It would be too cumbersome to have a specific tax for each of the many distinct programs that the government offers. Also, attempts to base taxes on the benefits principle often conflict with the other major principle of tax fairness: the **ability-to-pay principle**, according to which those with greater ability to pay a tax should pay more.

The ability-to-pay principle is usually interpreted to mean that high-income individuals should pay more in taxes than low-income individuals. Often the ability-to-pay principle is used to argue not just that high-income individuals should pay more taxes but that they should pay a higher *percentage* of their income in taxes. We'll consider the issue of how taxes vary as a percentage of income later.

The London protest described at the beginning of this chapter was basically a protest against the failure of the poll tax to take the ability-to-pay principle into account. In some parts of Britain, the poll tax was as high as \$900 per adult per year. For highly paid executives or professionals, \$900 was not a lot of money. But for struggling British families, \$900 per year was a crushing burden. It's not surprising that many people were upset that the new tax completely disregarded the ability-to-pay principle.

## Equity versus efficiency

Margaret Thatcher's poll tax was an example of a **lump-sum tax**, a tax that is the same for everyone regardless of any actions people take. It was widely perceived as much less fair than the tax structure it replaced, in which local taxes were proportional to property values. Under the old system, the highest local taxes were paid by the people with the most expensive houses; because these people tended to be wealthy, they were also best able to bear the burden.

But the old system definitely distorted incentives. People who were considering home improvements knew that such improvements, by making their property more valuable, would increase their tax bills. The result, surely, was that some home improvements that would have taken place without the tax did not take place because of it.

In contrast, a lump-sum tax does not distort incentives. Because people have to pay the same tax regardless of their situation, it does not lead them to avoid doing things that would raise their taxes. So lump-sum taxes, although unfair, are better than other taxes at promoting economic efficiency.

The example of the poll tax debate illustrates a general point. Unless a tax system is badly designed, it can be made fairer only by sacrificing efficiency; conversely, it can be made more efficient only by making it less fair. So there is normally a **trade-off between equity and efficiency**.

Economic analysis cannot say how much weight a tax system should give to equity, how much to efficiency. That choice is a value judgment, one we make through the political process.

## FOR INQUIRING MINDS

## POLL TAXES AND REVOLTING PEASANTS

Perhaps Margaret Thatcher wouldn't have tried to impose a poll tax if she had remembered her English history. For it was the tripling of an existing poll tax that set off the great peasant rebellion of 1381.

In that rebellion, peasants under the leadership of Wat Tyler marched on London to demand a repeal of the tax. One of their slogans was "The first thing to do is to kill all the lawyers." (Lawyers at that time were responsible for enforcing the tax.) The rebels did kill quite a few lawyers and tax collectors; they also burned part of London and



A lesson from history: in 1381, English peasants revolted over unfair taxes.

HIP/Scala/Art Resource, NY

came close to taking King Richard II hostage. However, they dispersed after the king promised some concessions—a promise he promptly broke. After all, in 1381 promises to peasants didn't count: as the king declared before hanging Wat Tyler and the other leaders of the rebellion, "Villeins ye are, and villeins ye shall remain." (*Villein* is a fourteenth-century English term for a peasant.)

Nonetheless, the fact that the rebellion came so close to success struck terror into the hearts of the nobility, and it remained a cautionary tale for centuries.

## economics in action

### Federal Tax Philosophy

What is the principle underlying the federal tax system? (By federal, we mean taxes collected by Washington, as opposed to the taxes collected by state and local governments.) The answer is that it depends on the tax.

The best-known federal tax, accounting for about half of all federal revenue, is the income tax. The structure of the income tax reflects the ability-to-pay principle: families with low incomes pay little or no income tax. In fact, some families pay negative income tax: a program known as the Earned Income Tax Credit "tops up" or adds to the earnings of workers who receive low wages. Meanwhile, those with high incomes not only pay a lot of income tax but must pay a larger share of their income in taxes than the average family.

The second most important federal tax, however, is set up very differently. The payroll tax, a tax on an employee's paid earnings, was originally introduced in 1936 to pay for Social Security, a program that guarantees retirement income to older Americans and also provides benefits to workers who become disabled and to family members of workers who die. (Part of the payroll tax is now also used to pay for Medicare, a program that pays most medical bills of older Americans.) The Social Security system was set up to resemble a private insurance program: people pay into the system during their working years, then receive benefits based on their payments. And the tax more or less reflects the benefits principle: because the benefits of Social Security accrue mainly to lower- and middle-income families, the Social Security tax is levied only on incomes up to a maximum level—\$87,900 in 2004. (The Medicare portion of the payroll tax continues to be levied on incomes over \$87,900.) As a result, high-income families don't pay much more in payroll taxes than middle-income families, and the payroll tax is a substantially smaller fraction of their total income.

**TABLE 21-1**  
Share of Income and Taxes, 2001

Quintile	Percent of income	Percent of income tax	Percent of payroll tax
Lowest	4.2	-2.3	4.2
Second	9.2	0.3	10.3
Third	14.2	5.2	16.0
Fourth	20.7	14.3	25.6
Top	52.4	82.5	43.9

Source: Effective Federal Tax Rates: 1979–2001

Table 21-1 illustrates the difference in the two taxes, using data from a Congressional Budget Office study. The study divided American families into quintiles: the lowest quintile is the poorest 20 percent of families, the second quintile is the next poorest 20 percent, and so on. The second column shows the share of total U.S. pre-tax income received by each quintile. The third column shows the share of total federal income revenues tax paid by each quintile. As you can see, low-income families actually paid negative income tax, and even middle-income families paid a substantially smaller share of income taxes than their share of total income. In contrast, the top quintile, the richest 20 percent of families, pays a much higher share of income taxes compared with their share of total income. The fourth column shows the share of payroll tax paid by each quintile, and the results are very different: the share of payroll taxes paid by the top quintile is substantially less than their share of income. ■

**>> QUICK REVIEW**

- > Other things equal, government tax policy aims for **tax efficiency**. But it also tries to achieve **tax fairness**, or **tax equity**.
- > In addition to deadweight loss, taxes typically incur **administrative costs**.
- > There are two important principles of tax fairness: the **benefits principle** and the **ability-to-pay principle**.
- > A **lump-sum tax** is efficient because it does not distort incentives, but it is unfair. In any well-designed tax system, there is a **trade-off between equity and efficiency** in devising tax policy.

**>> CHECK YOUR UNDERSTANDING 21-1**

1. Assess each of the following taxes in terms of the benefits principle versus the ability-to-pay principle. What, if any, actions are distorted by the tax? Assume for simplicity in each case that the purchaser of the good bears 100% of the burden of the tax.
  - a. A federal tax of \$500 for each new car purchased that finances highway safety programs
  - b. A local tax of 20% on hotel rooms that finances local government expenditures
  - c. A local tax of 1% of the assessed value of homes that finances local schools
  - d. A 1% sales tax on food that pays for government food safety regulation and inspection programs

Solutions appear at back of book.

## Understanding the Tax System

An excise tax is the easiest tax to analyze, making it a good vehicle for understanding the general principles of tax analysis. However, in the United States today, excise taxes are actually a relatively minor source of government revenue. In this section, we develop a framework for understanding more general forms of taxation and look at some of the major taxes used in the United States.

### Tax Bases and Tax Rate Structure

Every tax consists of two pieces: a *base* and a *structure*. The **tax base** is the measure or value that determines how much tax an individual pays. It is usually a monetary measure, like income or property value. The **tax structure** specifies how the tax depends on the tax base. It is usually expressed in percentage terms; for example, homeowners in some area might pay taxes equal to 2 percent of the value of their homes.

The **tax base** is the measure or value, such as income or property value, that determines how much tax an individual pays.

The **tax structure** specifies how the tax depends on the tax base.

Some important taxes and their tax bases are as follows:

- **Income tax:** a tax that depends on the income of an individual or family from wages and investments
- **Payroll tax:** a tax that depends on the earnings an employer pays to an employee
- **Sales tax:** a tax that depends on the value of goods sold
- **Profits tax:** a tax that depends on a firm's profits
- **Property tax:** a tax that depends on the value of property, such as the value of a home
- **Wealth tax:** a tax that depends on an individual or family's wealth

Once the tax base has been defined, the next question is how the tax depends on the base. The simplest tax structure is a **proportional tax**, also sometimes called a *flat tax*, which is the same percentage of the base regardless of the taxpayer's income or wealth. For example, a property tax that is set at 2 percent of the value of the property, whether the property is worth \$10,000 or \$10,000,000, is a proportional tax. Many taxes, however, are not proportional. Instead, different people pay different percentages, usually because the tax law tries to take account either of the benefits principle or the ability-to-pay principle.

Because taxes are ultimately paid out of income, economists classify taxes according to how they vary with the income of individuals. A tax that rises *more* than in proportion to income, so that high-income taxpayers pay a larger percentage of their income than low-income taxpayers, is a **progressive tax**. A tax that rises *less* than in proportion to income, so that higher-income taxpayers pay a smaller percentage of their income than low-income taxpayers, is a **regressive tax**. A proportional tax on income would be neither progressive nor regressive.

Figure 21-2 illustrates the relationship between tax payment and income for proportional, progressive, and regressive taxes with three curves, one corresponding to each type of tax. In the case of a proportional tax, plotting the tax due against income yields a tax schedule a straight line from the origin. For a progressive tax, the curve gets steeper as income increases; for a regressive tax, the curve gets flatter as income increases.

The U.S. tax system contains a mixture of progressive and regressive taxes, though it is somewhat progressive overall.

An **income tax** is a tax on an individual's or family's income.

A **payroll tax** is a tax on the earnings an employer pays to an employee.

A **sales tax** is a tax on the value of goods sold.

A **profits tax** is a tax on a firm's profits.

A **property tax** is a tax on the value of property, such as the value of a home.

A **wealth tax** is a tax on an individual's wealth.

A **proportional tax** is the same percentage of the tax base regardless of the taxpayer's income or wealth.

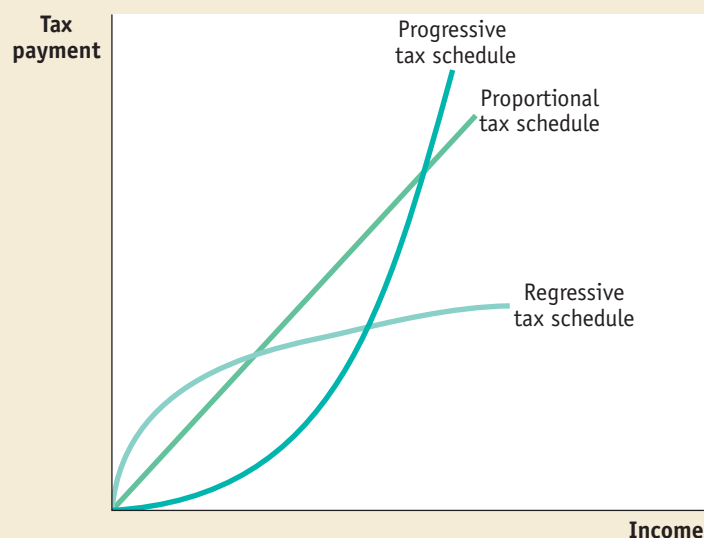
A **progressive tax** takes a larger share of the income of high-income taxpayers than of low-income taxpayers.

A **regressive tax** takes a smaller share of the income of high-income taxpayers than of low-income taxpayers.

Figure 21-2

### Proportional, Regressive, and Progressive Income Taxes

The curves show how tax payments vary as income changes. A proportional tax schedule is represented by a straight line because the percentage of income paid in taxes is constant. In a progressive tax, the percentage paid increases as income increases—high-income families pay a larger percentage of their income than low-income families. Hence, a progressive tax schedule has an increasing slope. In a regressive tax, the percentage paid increases as income decreases—low-income families pay a larger percentage of their income than high-income families. Therefore, a regressive tax schedule has a decreasing slope.



The **average tax rate on income** is the ratio of income taxes paid by an individual to his or her income.

The **marginal tax rate on income** is the additional tax an individual pays if his or her income goes up by \$1.

## Equity, Efficiency, and Progressive Taxation

Most, though not all, people view a progressive tax system as fairer than a regressive system. The reason is the ability-to-pay principle: a high-income family that pays 35 percent of its income in taxes is still left with a lot more money than a low-income family that pays only 15 percent in taxes. But attempts to make taxes strongly progressive run up against the trade-off between equity and efficiency.

Figure 21-3 shows once again a progressive tax on income, illustrated by the curve. Consider a particular individual whose income is  $N_0$ ; given that income, he will pay taxes equal to  $T_0$ . His **average tax rate on income** is the ratio of tax payment to income. At income  $N_0$ , it is equal to the slope of a line from the origin to point A, equal to  $T_0/N_0$ .

But what effect does the tax have on his incentive to earn income—say, by working longer hours, or by investing? The answer depends on his **marginal tax rate on income**, the additional tax he pays if his income goes up by \$1.

In Figure 21-3, the marginal tax rate of an individual with income  $N_0$  is the slope of a line tangent to the curve at point A. Clearly, in this example the marginal tax rate is higher than the average tax rate. This is always true in the case of a progressive tax: *when a tax is progressive, the marginal tax rate is higher than the average tax rate at every income level.*

To deepen our understanding of this point, let's consider a simplified tax system. Imagine that income taxes work as follows: families pay no tax on the first \$40,000 of income but pay a 50 percent tax rate on any income over \$40,000. This system would be strongly progressive: families with less than \$40,000 in income will pay no taxes, but families with high incomes will pay up to 50 percent of their income in taxes.

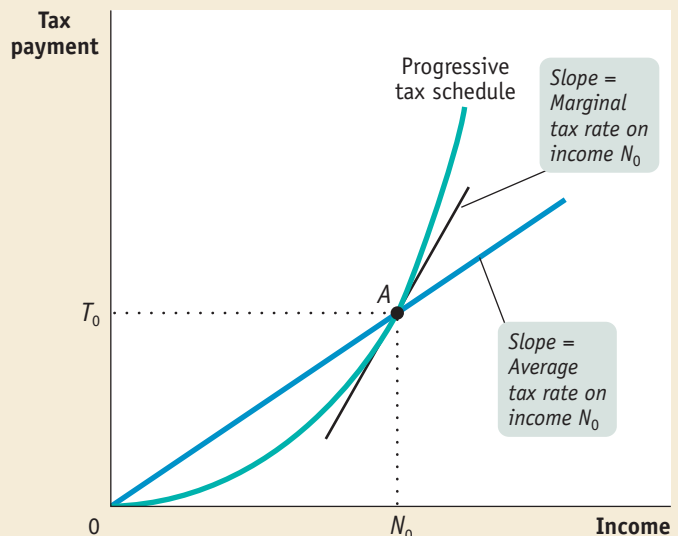
At the same time, this system will lead to a high marginal tax rate for many families, even if their *average* tax rates aren't very high. Consider a family with an income of \$50,000. It will pay taxes only on the last \$10,000 of that income, so its average tax rate will be \$5,000/\$50,000, or 10 percent. However, the family will pay \$0.50 in taxes for each additional \$1 it earns; its marginal tax rate is 50 percent.

In fact, the federal income tax works a lot like that. Family income below a certain amount (the amount depends on the size of the family and other criteria) isn't taxed.

Figure 21-3

### The Marginal Tax Rate versus the Average Tax Rate for a Progressive Tax

Under the progressive tax schedule shown here, a taxpayer at point A has income  $N_0$  and pays taxes of  $T_0$ . His average tax rate at income  $N_0$  is the total tax paid divided by the total income,  $T_0/N_0$ , which is equal to the slope of the line connecting the origin to A. His marginal tax rate at income  $N_0$  is the tax rate paid on an additional \$1 of income at point A. This is equal to the slope of the line tangent to the curve at A. As shown, for a progressive tax the marginal tax rate is greater than the average tax rate. As a result, progressive taxes result in reduced incentives for higher-income people to work and invest compared to a proportional tax or a regressive tax.



Income above that amount is taxed at a rate of 10 percent, up to another threshold at which the tax rate rises to 15 percent, and so on. In 2003 the average federal income tax rate was about 11 percent, but taxpayers faced marginal rates as high as 35 percent. In the past, marginal rates in the United States have been as high as 94 percent, and the highest marginal rate stayed above 50 percent until the 1980s.

The excess burden of a tax comes from its effect on marginal incentives. Suppose that a highly progressive tax system implied a marginal tax rate of 70 percent on successful businesspeople. An entrepreneur might look at that rate and decide that the risk and effort of expanding her business just wasn't worth it. So high marginal tax rates distort incentives, reducing the incentive to earn more income by working more or investing money rather than consuming it. In short, the ability-to-pay principle pushes governments toward a highly progressive tax system, but efficiency considerations push them the other way.

## Taxes in the United States

Table 21-2 shows the revenue raised by some major taxes in the United States in fiscal year 2002. (For reasons not worth going into, fiscal years start on October 1 of the preceding calendar year.) Some of the taxes are collected by the federal government, the others by state and local governments.

**TABLE 21-2**

**Revenue from Major Taxes in the United States, Fiscal Year 2002 (billions of dollars)**

Federal	State and local
Income tax: 858.3	Sales tax: 333.5
Profits tax: 148.0	Property tax: 267.8
Payroll tax: 700.8	Income tax: 200.7
	Profits tax: 33.5

Source: *Statistical Abstract of the United States, 2004.*

There is a major tax corresponding to five of the six tax bases we identified earlier. There are income taxes, profits taxes, payroll taxes, sales taxes, and property taxes, all playing an important role in the overall tax system. The only item missing is a wealth tax. In fact, the United States does have a wealth tax, the *estate tax*, which depends on the value of someone's estate after he or she dies. But at the time of writing, the current law phases out the estate tax over a few years, and in any case it raises much less money than the taxes shown in the table.

In addition to the taxes shown, state and local governments collect substantial revenue from other sources as varied as driver's license fees and sewer charges. These fees and charges are an important part of the burden of taxes but very difficult to summarize or analyze.

Are the taxes in Table 21-2 progressive or regressive? It depends on the tax. The personal income tax is strongly progressive. The payroll tax, which, except for the Medicare portion, is paid only on earnings up to a maximum level, is somewhat regressive. Sales taxes are generally regressive, because higher-income families save more of their income and thus spend a smaller share of it on taxable goods than do lower-income families. The taxes in that "other" category are probably highly regressive: it costs the same amount to get a new driver's license no matter what your income.

Overall, the taxes collected by the federal government are quite progressive. Table 21-3 on page 501 shows estimates by the Congressional Budget Office of the average federal tax rate families at different levels of income in 2001. These estimates don't just count the money families pay directly; they also attempt to estimate the incidence

TABLE 21-3

## Federal Taxes Paid as a Percentage of Income, by Quintile, 2001

Quintile	Average family income	Average tax rate (percent)
Lowest	\$14,900	5.4
Second	34,200	11.6
Third	51,500	15.2
Fourth	75,600	19.3
Top	182,700	26.8

Source: Congressional Budget Office.

of taxes directly paid by business, like the tax on corporate profits, which ultimately falls on individual shareholders. The table shows that the federal tax system is indeed progressive, with low-income families paying a relatively small share of federal taxes and high-income families paying the greater share collected.

Since 2000, the federal government has cut taxes for most families. The largest cuts, both as a share of income and as a share of federal taxes collected have gone to families with high income. As a result, the federal system is less progressive (at the time of this writing) than it was in 2000, and it will become even less progressive over the next few years, as some delayed pieces of the post-2000 tax cut legislation takes effect. However, even after those changes, the federal tax system will remain progressive.

As Table 21-4 shows, however, taxes at the state and local level are generally regressive. That's because the sales tax, the largest source of revenue for states, is somewhat regressive, and the items in the "other" category are strongly regressive.

TABLE 21-4

## State and Local Taxes as a Percentage of Income, by Income Category, 2002

Lowest quintile	11.4
Second quintile	10.4
Third quintile	9.9
Fourth quintile	9.4
Next 15 percent	8.9
Next 4 percent	8.1
Top 1 percent	7.3

Source: Institute for Taxation and Economic Policy.

## Different Taxes, Different Principles

Why are some taxes progressive but others regressive? Can't the government make up its mind?

There are two main reasons for the mixture of regressive and progressive taxes in the U.S. system: the difference between lower and upper levels of government, and the fact that different taxes are based on different principles.

### FOR INQUIRING MINDS

#### TAXING INCOME VERSUS TAXING CONSUMPTION

The federal government in the United States taxes people mainly on the money they *make*, not on the money they spend. Yet most tax experts argue that this distorts incentives. If someone earns income, then invests that income for the future, she gets taxed twice: once when she earns the original sum, and again on any earnings she makes on her investment. So a system that taxes income discourages people from saving and investing and provides them with an incentive to spend their income today.

Moving from a system that taxes income to one that taxes consumption would solve this

problem. In fact, the governments of many countries get much of their revenue from a value-added tax, or VAT, which acts like a national sales tax. In some countries VAT rates are very high; in Sweden, for example, the rate is 25 percent.

The United States does not have a value-added tax for two main reasons. One is that it is difficult, though not impossible, to make a consumption tax progressive. The other is that although VATs may not distort incentives as much as income taxes, they typically have quite high administrative costs.



## Understanding Government Spending

One way or another, governments in the United States collected 27 percent of total income in 2003. And that's actually low by international standards: Canada collects more than 35 percent, and European countries on average collect more than 40 percent. Where does all the money go?

It's easy to make fun of government spending; everyone has a favorite story of wasted money, and some of those stories are even true. But most government spending is done for reasons that seem sensible to a large fraction of the electorate. Let's take a look at the major types of spending in the United States.

### Types of Spending

Broadly speaking, governments spend money for three reasons: to provide *public goods*, to provide *social insurance*, and to engage in *redistribution*.

We defined public goods in Chapter 20. They are goods that are nonexcludable so that people cannot be forced to pay for consuming them and nonrival so that people *should* not have to pay. So many public goods are provided by the government. One public good in particular—national defense—has traditionally been the largest component of spending by the federal government, though this is no longer true.

Much modern government spending is not for public goods but for **social insurance**: programs intended to protect people against some of the financial risks in life. The clearest examples are government programs that pay for medical care. When someone needs expensive medical treatment, the cost can be a severe burden; indeed, sometimes people cannot afford the treatment at all. This is widely viewed as unfair—the ability-to-pay principle again. So many governments provide some kind of national health insurance that covers many medical bills. The United States offers extensive health insurance for people 65 and older, though not for younger people unless they are indigent.

The concept of social insurance can be extended more broadly to include items like unemployment insurance, which provides income to people who have lost their jobs, and programs that support people after retirement.

Finally, most governments also engage in **redistribution of income**: taking money via taxes from the relatively well-off and using it either to provide income for the poor or to provide the poor with benefits like housing and medical care. The case for redistribution can be made in a couple of different ways. One is to think of it as an extension of the ability-to-pay principle: the poor, you could argue, are not only less able to pay taxes than the affluent—they could actually use some help with other expenses.

Alternatively, you can think of poverty reduction as a sort of public good. Most of us prefer to live in a society where everyone has enough to eat, decent housing, and so on; these sentiments motivate us to give to charity. But each of us is tempted to free-ride on the positive effects of charitable giving by others. So just as most people agree that they should be taxed to provide for national defense, many agree that they should be taxed to provide aid to the poor.

This raises the question of what we mean by saying that people are “poor.” How do we define poverty? We'll discuss that question in the next section, where we also look at poverty trends in the United States.

How do we draw the line between social insurance and redistribution? Both typically involve **transfer payments**: money that an individual receives from the government for which no good or service is produced for the government in exchange. A transfer payment is the opposite of a tax. And don't social insurance programs often help the poor? Aren't programs for the poor a sort of social insurance for those of us who might end up poor one day?

The answer is that the line between social insurance and redistribution is a fuzzy one. However, one way economists often draw that line is by distinguishing between programs that are *means-tested* and those that are not. A **means-tested** program is

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**Social insurance** is government spending intended to protect people against financial risks.

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Governments engage in **redistribution of income** when they tax the well-off and use the money to support those less well off.

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A **transfer payment** is money that an individual receives from the government but for which no good or service is produced for the government in exchange.

**Means-tested** government programs are available only to those with sufficiently low income.

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available only to individuals who can show that they have a sufficiently low incomes to qualify; such programs clearly redistribute income. Programs that aren't means-tested are be viewed more as social insurance.

## Spending in the United States

Figure 21-4 shows the composition of federal spending in fiscal year 2002, the most recent year for which this breakdown was available. Let's talk about how the categories shown here fit into the categories of spending we have just described.

National defense is, of course, the budget of the U.S. military. It is clearly a public good: the government can't defend some people without defending others, and my security doesn't come at your expense.

The category labeled "nondefense discretionary" consists of everything from running the court system and medical research to highway construction and education. Broadly speaking, it also fits the definition of public goods.

Social Security and Medicare are the two major social insurance programs. Both benefit older Americans: Medicare covers most of their medical bills, and Social Security provides retirement income. In 2003, Congress added a significant new benefit to Medicare, so that from 2006 on the program will cover some of the cost of prescription drugs for older Americans. The category "other mandatory" includes unemployment insurance, pensions for federal workers, and a variety of other expenses; by and large they can be regarded as social insurance.

Finally, Medicaid is a means-tested program that provides health insurance for low-income families, and "other means-tested" spending includes such programs as food stamps and housing subsidies. These programs are best viewed as income redistribution.

## Comparisons Across Time and Space

Politicians invariably denounce "big government"—unless they are demanding more government spending on themselves or their constituents. Economic analysis cannot tell us whether the government spends too much or too little. But it is useful to have some sense both of how the level of government spending in the United States compares with its level in the past, and of how spending here compares with spending in other advanced nations.

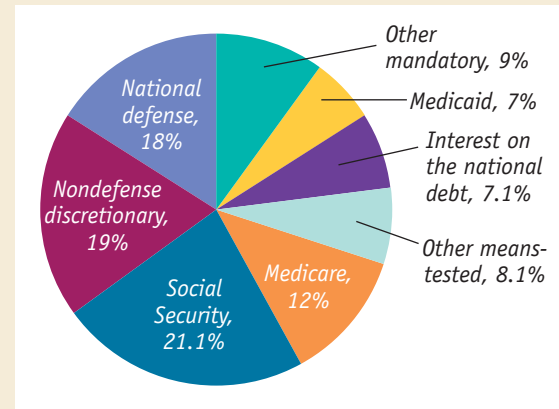
Figure 21-5 on page 506 shows federal spending as a percentage of *gross domestic product* (GDP) over the past four decades. GDP is a measure of all the income generated in the economy—the sum of payments to all factors of production like labor, land, and capital.

The basic message of Figure 21-5 is that the overall size of the federal government compared with the economy hasn't changed much for a long time. It has fluctuated, but the share of federal spending as a percentage of GDP was only slightly higher in 2003 than it was in the early 1960s. (State and local spending grew somewhat faster, from about 7 percent of GDP in the early 1960s to about 10 percent in 2003.)

Although federal spending has stayed roughly constant as a share of the economy, its composition has changed. Figure 21-5 also shows two components of Federal spending. One curve shows defense spending as a percentage of GDP. In the 1960s defense spending, at 9 percent of GDP, accounted for about half of federal spending. After the collapse of the Soviet Union in 1991, the huge military forces that the United States maintained to guard against the Soviet threat were downsized, and defense spending fell to only 3 percent of GDP. Since the terrorist attacks on

Figure 21-4

### Distribution of Federal Spending, Fiscal 2003



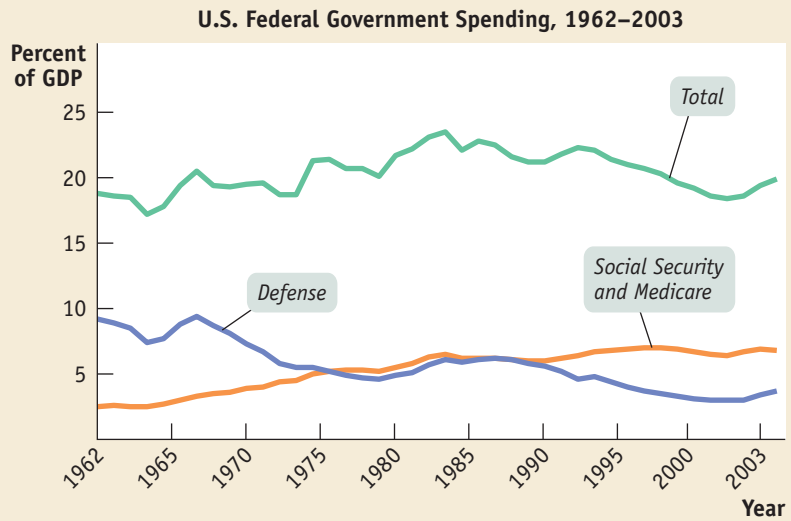
This pie chart shows how the federal government spent money in fiscal year 2003. National defense and "nondefense discretionary" can be considered spending on public goods. Social Security, Medicare, and "other mandatory" (which includes unemployment insurance) are social insurance programs. Medicaid, which provides medical insurance for people with low incomes, and "other means-tested" (which includes food stamps) are best viewed as income redistribution. Due to rounding error, percentages do not add up to 100%.

Source: Congressional Budget Office

**Figure 21-5**

**Total U.S. Federal Spending, Spending on Defense, and Spending on Social Security and Medicare**

This graph shows the percent of GDP devoted to total federal spending and the percent devoted to defense spending and to Social Security and Medicare from 1962 to 2003. Although the percent of GDP represented by total federal spending was roughly the same in 2003 as it was in the 1960s, the percent of GDP represented by defense spending has declined markedly over that period.



September 11, 2001, defense spending has risen rapidly, but it still plays a much smaller role in the federal budget than it did at the height of the Cold War.

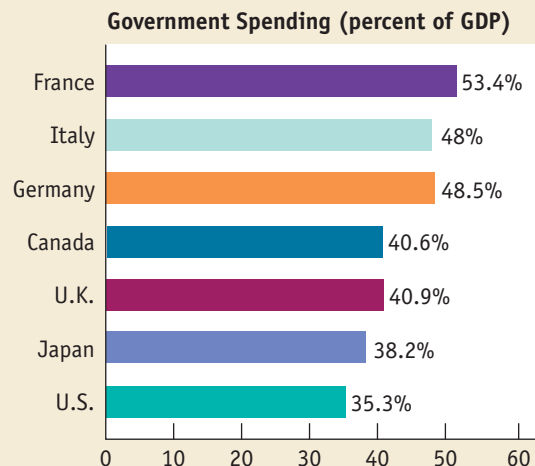
Given the decline in defense spending, why hasn't the share of government spending in the economy decreased? The answer is growth in social insurance spending, mainly on Social Security (established in 1935) and Medicare (established in 1965.) As the curve in Figure 21-5 shows, combined spending on Social Security and Medicare has risen steadily as a share of GDP. We have gone from a government that spent tax dollars mainly on public goods to one that now spends heavily on social insurance. In 2002 one senior official at the Treasury Department described the U.S. government as "a gigantic insurance company (with a sideline business in national defense and homeland security)."

However, the United States spends *less* on social insurance as a share of GDP than most other advanced nations. As a result, U.S. government spending actually makes up a smaller share of GDP than that of any other major economy. Figure 21-6 compares government spending (state and local as well as federal) as the share of GDP for the world's seven largest economies in 2002. The United States was at the bottom of the list.

**Figure 21-6**

**Government Spending as a Percent of GDP in 2002**

In 2002, France devoted the largest share of its GDP to government spending among the major industrial countries: 53.4%. The United States devoted the smallest share among these countries: 35.3%. Canada appears to have been around average, at about 40.6%.



## economics in action

### Greedy Geezers?

In 1998 *The New Republic* startled many readers with a cover bearing the slogan “greedy geezers.” Although the title was shocking, the story did draw attention to a substantive point: programs providing benefits to older Americans have become increasingly important as a share of both federal spending and the total economy. In 1970 Medicare and Social Security combined cost 3.6 percent of GDP, less than half as much as the defense budget. In 2003 the two programs combined cost 6.8 percent of GDP, almost twice the defense budget.

Why has spending on older Americans grown more rapidly than the economy or the overall budget? One reason is demographics: the percentage of Americans age 65 and over has steadily risen for the past 30 years. This demographic trend will become dramatic after 2011, when members of the baby-boom generation become old enough to receive Social Security and Medicare benefits.

The other main reason for rising spending on the elderly is that medical care has become much more expensive. Experts in health economics say that this is not mainly because the costs of medical care have risen. Instead, it is because progress in medicine has made it possible to do much more for the elderly. Many treatments that are now common, such as heart bypass surgery, were experimental, rare, or not yet developed 30 years ago. So Medicare now spends more because there are more useful ways to spend money on health care than ever before.

So should rising spending on the elderly be viewed as a burden on the budget or as a sign of progress? Probably both. ■



Jose Luis Pelaez, Inc.

Spending on older Americans has grown more rapidly than the economy or the overall budget. One of the main reasons for this: the rising cost of medical care.

### >> QUICK REVIEW

- There are three main types of government spending: spending on public goods, **social insurance**, and **redistribution of income**.
- Although the line between social insurance and redistribution is somewhat blurry, a program that is **means-tested** is usually considered redistribution and one that is not means-tested is considered social insurance.
- The U.S. government spends substantial sums on all three types of programs. Historically, spending on defense—a public good—was the main component of federal spending, but today spending on social insurance, especially for older Americans, is considerably larger.

### >> CHECK YOUR UNDERSTANDING 21-3

1. Unemployment insurance is financed by taxes on employed workers, who collect benefits if they become unemployed. Suppose that workers in Alaska are unemployed and workers in Florida are employed during even-numbered years, but the opposite is true during odd-numbered years. Explain why workers in these two states can benefit from an unemployment insurance program that covers both states.
2. Classify the following programs according to whether they are redistributive or provide social insurance.
  - a. Natural disaster emergency relief
  - b. Heating cost assistance for low-income families
  - c. Health care for people over 65
  - d. Aid grants to low income students

Solutions appear at back of book.

## Poverty and Public Aid

Public aid—government spending that is means-tested and is intended to reduce poverty—is a relatively small part of government spending compared with social insurance. But it is the subject of intense debate, not only about how much public aid should be given but about the criteria for aid and its effect on society. Let’s look at how poverty is defined, how it has changed over time, and how it is affected by public policy.

The **poverty line** is a minimum income that the government defines as adequate. Families whose income falls below the poverty line are considered poor.

The **poverty rate** is the percentage of the population living below the poverty line.

## Defining Poverty

What does it mean to be “poor”? Any definition is somewhat arbitrary. Since 1965, however, the U.S. government has maintained an official definition of the **poverty line**: a minimum annual income that is considered adequate. Families whose income falls below the poverty line are considered poor. The history of this official definition is described in For Inquiring Minds on page 509.

The poverty line depends on the size and composition of a family: in 2004 the poverty line for an adult living alone was \$9,310, whereas the poverty line for a family of 4 was \$18,850. Also, the official poverty line is adjusted each year to reflect changes in the cost of living. Contrary to some popular misconceptions, however, the poverty line has *not* been adjusted upwards over time to reflect the long-term rise in the average standard of living. This means that as the economy grows, and average incomes rise, you might expect the percentage of the population living below the poverty line to decline steadily. Has this actually happened?

## Trends in Poverty

Figure 21-7 shows the U.S. **poverty rate**—the percentage of the population living below the poverty line—since 1959. As you can see, the poverty rate fell steeply during the 1960s and early 1970s. But since then progress has been much more questionable. The poverty rate rose from 1973 until 1993, then fell in the boom economy of the 1990s. But even at the end of that boom, in 2001, the poverty rate was no lower than it had been almost 30 years earlier.

The failure of the country to make clear progress against poverty has led to widespread debate both about the causes of poverty and about the nature and effectiveness of public aid. We turn first to the question of who is poor.

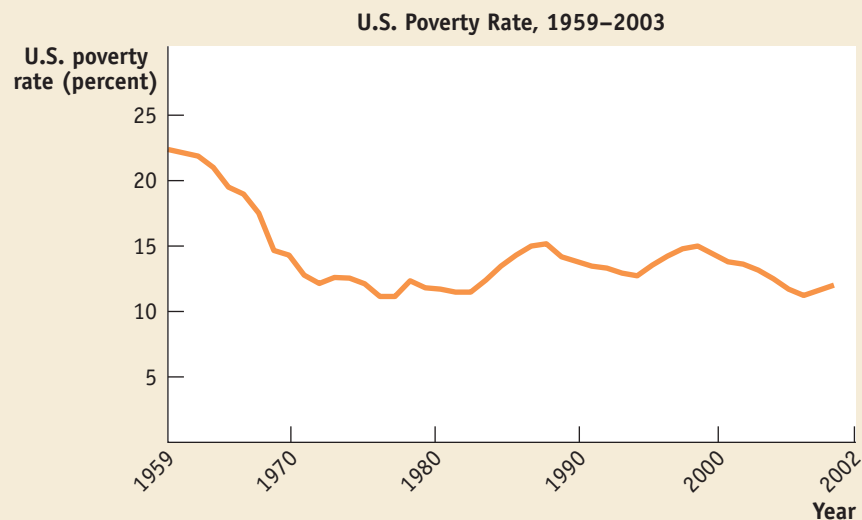
## A Portrait of the Poor

Many Americans probably have in their minds a stereotyped image of poverty: an African-American or Hispanic family with no husband present, and the female head of household unemployed at least part of the time. This picture isn’t completely off-base: poverty is disproportionately high among African-Americans and Hispanics as well as among female-headed households. But a majority of the poor don’t fit the stereotype.

Figure 21-7

### Trends in the Poverty Rate

Poverty fell sharply from the 1960s to the early 1970s but has not shown a clear downward trend since then.



## FOR INQUIRING MINDS

## WHO DEFINED POVERTY?

Who decided how much income an American family needs to escape poverty? Mollie Orshansky! Orshansky, a research analyst at the Social Security Administration, developed initial estimates of the poverty line in 1963–1964.

Orshansky started by estimating the cost of buying an inexpensive but nutritionally adequate diet. She then observed that families with children spent about one-third of their income on food; so she argued that any family earning less than three times the cost of purchasing an adequate diet did not have adequate income.

Was this the right measure of poverty? When it was created, Orshansky's calculation made a

lot of sense, and it has been the basis for U.S. poverty statistics ever since. But many experts now think that this measure of poverty is badly outdated because the composition of spending by low-income families has changed significantly since the 1960s. On average, the share of income expended on food has fallen to less than 20%, while the share spent on things such as housing, health care, transportation, and child care has risen. Many state governments have recognized this trend and now use an income benchmark of 150% to 200% of the poverty line to determine a family's eligibility for assistance programs (and some states use a benchmark as high as 275% to 300% of the poverty line).

In 2002, about 34.6 million Americans were in poverty—12.1 percent of the population. About one-quarter of the poor were African-American and a roughly equal number Hispanic. Among these two groups, poverty rates were well above the national average: 24 percent among blacks, 22 percent among Hispanics. But there was also widespread poverty among non-Hispanic whites, who had a poverty rate of 8 percent.

Female-headed families with no husband present had a very high poverty rate: 26.5 percent. Married couples were much less likely to be poor, with a poverty rate of only 5.3 percent; still, about 40 percent of poor families were married couples.

What really stands out from the data, however, is the association between poverty and lack of adequate employment. Adults who work full time are very unlikely to be poor (only 2.2 percent in 2002). Adults who work part time or have no work at all during the course of a year make up the great majority of the adult poor. Many industries, particularly in the retail and service sectors, now rely primarily on part-time workers. In addition to not providing benefits such as health plans, paid vacation days, and retirement benefits, most part-time work pays a lower hourly wage than comparable full-time work. As a result, many of the poor are *working poor*: workers whose income falls at or below the poverty line.

## The Origins and Consequences of Poverty

Educational attainment clearly has a strong effect on income level—those with higher education make, on average, more than those with less education. And those with less education have, as a group, seen their fortunes decline over time: the average young, male non-college-educated worker now earns 25 percent less than someone in a similar situation in 1973. For females, the comparable number is 13 percent.

Like lack of education, lack of proficiency in English can create a barrier to higher income. For example, Mexican-born workers in the United States—two-thirds of whom have not graduated from high school and many of whom have poor English skills—earn less than half of what native-born men earn.

Although discrimination is less pervasive today than it was 30 years ago, it still generates a formidable barrier to advancement for many Americans. Nonwhites with comparable levels of education earn less and are less likely to be working than whites.

Women with similar qualifications earn lower incomes than men. Studies find that African-American males suffer persistent discrimination by employers in favor of whites, African-American women, and Hispanic immigrants.

In addition, one important source of poverty that should not be overlooked is bad luck coupled with the lack of a safety net. Without adequate health care coverage or savings, many families find themselves impoverished when a wage-earner loses a job or a family member falls seriously ill.

The consequences of poverty are often severe, particularly for children. Nearly 17 percent of children in the United States live in poverty. For their families, health care is often erratic, leading to further health problems that erode the ability to work. Affordable housing is frequently a problem that leads poor families to move often, disrupting school and work schedules. Because parental income is the single most important factor influencing children's later socioeconomic attainment, children raised in poverty have a greater likelihood of living in poverty as adults than do those raised in nonpoor families. Low income is strongly correlated with a low level of preschool ability, and low preschool ability often leads to lower test scores in elementary school and higher high school dropout rates. Low-income children are at higher risk of mental health problems and behavioral disorders than the children of parents with higher income. And lower-income children are less likely to be covered by health insurance, leading to higher rates of illness and hospitalization. Poverty, in short, is not good for children.

## Antipoverty Programs

Aid to the poor takes three main forms: *welfare*, *in-kind transfers*, and *negative income tax*.

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**Welfare** is monetary aid to poor families.

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**Welfare** refers to monetary aid to poor families. The main welfare program in the United States is Temporary Assistance for Needy Families. This program does *not* aid anyone who is poor; it is available only to poor families with children.

Critics of welfare have long argued that it creates perverse incentives for the poor. First, they argue that it tends to encourage family breakup, because a family with both spouses present may not qualify for aid. Second, they argue that it encourages illegitimate births, because a single woman alone will not qualify for aid. These claims are hotly disputed by other analysts.

In any case, welfare is a generally unpopular program, and this has been reflected in public policy changes over time. Because payments to welfare recipients have not kept up with inflation, benefits are considerably less generous today than they were a generation ago. Also, welfare programs now contain time limits, so that welfare recipients—even single parents—must eventually seek work.

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**In-kind transfers** provide poor families with specific goods and services.

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**In-kind transfers** provide the poor not with cash but with specific goods and services. The most important in-kind transfers are *food stamps*, which can be used only to purchase food; *Medicaid*, which provides health insurance; and *housing subsidies*, which generally take the form of subsidies for rent.

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A **negative income tax** is a program that supplements the earnings of low-income families.

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Finally, economists use the term **negative income tax** for a program that supplements the earnings of low-income families. The United States has a program known as the Earned Income Tax Credit (EITC), which provides additional income to millions of workers. Only workers who earn income are eligible for the EITC, and over a certain range of incomes the amount of EITC a worker receives increases with his or her earnings. That is, for low-wage workers the EITC acts as a negative income tax.

In 2003, married couples with two children earning less than \$10,500 per year received payments from the government equal to 40 percent of their earnings. (Payments were slightly lower for single-parent families or workers without children.) At higher incomes the EITC is phased out, disappearing at an income of \$34,692.

Taken together, these three programs provide substantial aid to poor families. This does not mean that there is a consensus about the size and nature of antipoverty



## The Distribution of Income

A starting point for the big debate is to have a sense of how much families differ in their ability to pay—that is, of the distribution of income among families. Look back at Table 21-1: the second column summarizes the distribution of income among U.S. families in 2001. The numbers show a considerable amount of inequality: the poorest 20 percent of families received only 4.2 percent of the income, and the richest 20 percent received more than half the income. Recent estimates suggest that the top 1 percent of families receive about 18 percent of total income—that is, the average income among the top 1 percent is 18 times as high as the average and 90 times as high as that of the bottom fifth.

Economists are in general agreement that these numbers overstate the true degree of inequality in America, for several reasons. One is that the incomes of individual families fluctuate over time: those near the bottom in any given year are often having an unusually bad year and those at the top are often having an unusually good one. A table showing average incomes over, say, a 10-year period would not be quite as striking. Also, a family's income tends to vary over the life cycle: most people start off earning considerably less than they will later in life, then experience a considerable drop in income when they retire. The numbers in Table 21-1, which combine young workers, mature workers, and retirees all in the same pool, would therefore show considerable inequality even if all families had similar incomes at the same points in their lives.

Nonetheless, there is a considerable amount of genuine inequality in the United States. And for the last quarter-century the degree of inequality has been increasing. The causes of this increase in inequality are a subject of some controversy, but probably the most important cause is rapid technological change,

which has increased the demand for highly skilled or talented workers more rapidly than the demand for other workers. Growing international trade may have contributed to inequality by allowing the United States to import labor-intensive products from low-wage countries rather than making them for itself. This depresses the wages of domestic workers employed in industries that compete with imports. Rising immigration may also be a source of growing inequality. On average, immigrants have lower education levels than native-born workers and increase the supply of low-skilled labor while depressing their wages.

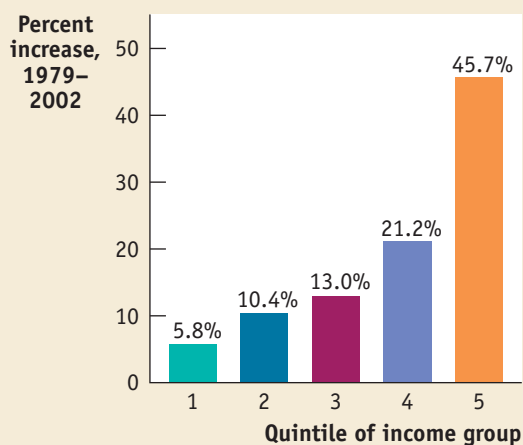
Figure 21-8 shows one indicator of growing inequality: the percentage *increase* in average income within each quintile between 1979 and 2002. The average income of the poorest fifth of families rose 5.8 percent; that of families in the middle fifth rose 13.0 percent; that of families in the top fifth rose 45.7 percent. Not shown in the figure: the income of families in the top 5 percent rose 70.3 percent. Clearly, the gap between the best-off and the worst-off families increased.

The fact that some people in the United States are extremely well-off—indeed, better off than ever before—but others remain quite poor leads advocates of redistribution to argue for higher taxes on those with high incomes and greater aid to those with low incomes. Let's look briefly at their argument and then at the arguments that others make against redistribution.

## The Case for Redistribution

Those who advocate strongly progressive taxes and redistribution of income to people in the lower part of the income distribution base their position on an extended version of the ability-to-pay

**Figure 21-8** Percentage Increases in Household Income by Income Group, 1979–2002



This graph shows that income inequality increased from 1979 to 2002: the incomes of higher-income families grew faster during this period than the incomes of lower-income families. The first quintile is the 20% of families with the lowest income, the second quintile the next poorest 20%, and so on. From 1979 to 2002, average income in the lowest quintile rose, but by only 5.8%. Meanwhile, income in the top quintile rose by 45.7%.

Source: U.S. Census Bureau.

principle. High-income families should pay high taxes, they argue, because they will still have after-tax income that is higher than average. Low-income families not only should not pay taxes, they should receive aid from the government, because even with that aid they will have incomes lower than average. So the redistribution is justified because the money transferred adds more to the welfare of the recipients than it subtracts from the welfare of the taxpayers.

Wouldn't the logical conclusion of this argument be that the government should tax away any income above the average and top up the income of anyone who makes less than the average? No, because even the most ardent advocates of progressive taxes and redistribution recognize that there is a trade-off between equity and efficiency—that the taxing and spending policies of the government must take care not to do too much damage to incentives. That brings us to the case, or rather cases, against redistribution.

## Arguments Against Redistribution

There are two different kinds of argument against redistribution. One is based on philosophical concerns about the proper role of government. Some political theorists believe that redistributing income is not a legitimate role of government—that government's role should be limited to maintaining the rule of law, providing public goods, and controlling externalities. We cannot go into this debate at length, but because it is an influential point of view, you should be aware that it exists.

The more conventional argument against taxing the rich and making transfers to the poor involves the trade-off between efficiency and equity. We've already seen part of this argument: a tax system that tries to put all of the burden on the very well off will have to be highly progressive. A highly progressive system implies high marginal tax rates, and high marginal tax rates reduce the incentive to work hard or otherwise increase a family's income.

A similar trade-off between equity and efficiency occurs as a result of programs that aid people with low incomes. Consider the following example: suppose there is some means-tested benefit, worth \$1,000 per year, that is available only to individuals with earnings of less than \$10,000 per year. Now suppose that an individual is currently earning \$9,800 per year and is deciding whether to take a new job that will raise his income to \$10,200. He will actually make himself worse off by taking the job because he will lose the \$1,000 government benefit.

This situation, in which earning more actually leaves an individual worse off, is known as a *notch*; it is a well-known problem with programs that aid the poor. Most programs are designed to avoid creating a notch. This is typically done by setting a sliding scale for benefits, so that they fall off gradually as the recipient's income rises rather than coming to an abrupt end. Even so, as Economics in Action on page 515 illustrates, means-tested programs often lead to high effective marginal tax rates for low-income workers.

## The Politics of Equity and Efficiency

In the real world, decisions about how much efficiency to trade off for equity and vice versa aren't based on philosophical discussions; they're the result of elections in which parties try to convince voters that their policies are in the voters' interests. But voters differ in their interests: a tax and spend policy that maximizes the welfare of a family earning \$15,000 per year will look very different from a policy that maximizes the welfare of a family earning \$1.5 million a year.

Generally speaking, voters toward the bottom of the income distribution favor highly progressive taxes and strong redistribution, with voters toward the top of the distribution favoring less progressive taxes and less generous redistribution. There are, of course, many exceptions—there are billionaires who, on principle, favor high taxes

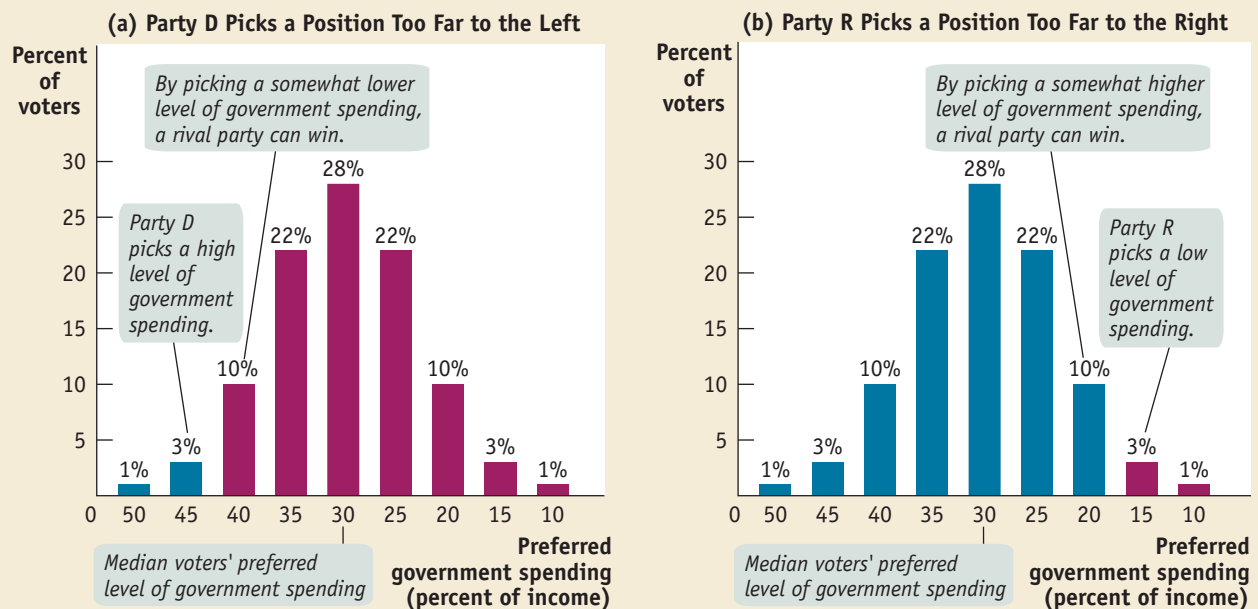
and generous poverty programs, and there are people with low income who strongly believe that redistribution undermines self-reliance. Still, there are clear differences in the interests of different voters. Whose interests prevail?

Let's suppose that voters can be lined up in order of the policy they prefer. In each panel of Figure 21-9, the horizontal axis shows the preferred share of government spending in national income; this share will be larger if the government engages in more redistribution and smaller if it engages in less redistribution. (We put higher government spending on the left of each panel, reflecting the long tradition under which politicians who favor redistribution are considered to the "left" of politicians who don't.) On the vertical axis are hypothetical percentages of voters who prefer any given level of government spending. For example, 1 percent of voters are willing to sacrifice a lot of efficiency in order to increase equity and favor government spending equal to 50 percent of income. Another 3 percent prefer spending of 45 percent of income, and so on. (Such preferences typically reflect voters' own financial position, but that's not necessary for the argument.) A famous result called the **median voter theorem** says that if voter preferences can be represented this way, and that if two parties compete for votes, actual policies will reflect the preferences of the *median voter*—the voter in the middle of our left-right lineup. In both panels of Figure 21-9, the median voter prefers government spending equal to 30 percent of income.

In an election by majority rule where voters decide how much of a given policy action should be taken, the **median voter theorem** says that actual policies will most clearly reflect the preferences of the median voter.

The two panels of Figure 21-9 illustrates how the median voter argument works. In panel (a), we suppose that party D stakes out a position that is well to the left of the median voter's preferences, advocating spending equal to 45 percent of income.

**Figure 21-9** The Median Voter Theory



In this hypothetical example, voters have preferences about the level of government spending as a share of income, measured from high levels on the left to low levels on the right. In both panels, the height of each bar represents the percent of voters who prefer a given level of spending. The median voter prefers spending equal to 30% of income. In panel (a), party D picks a position—spending equal to 45% of

income—that is well to the left of the median voter's preferences. A rival party can easily win by picking a policy that is closer to the center, leaving D with only voters represented by blue bars. In panel (b), party R picks a position that is well to the right of the median voter's preferences. Again, a rival party can win by picking a position closer to the center, leaving R with only the voters represented by red bars.

If a rival party, R, advocates a position slightly to D's right, it can get the votes of all those voters who prefer a smaller level of government spending. D will get only the voters indicated by the blue bars—4 percent of the electorate—and R will get the other 96 percent, indicated by the red bars. So party D, by choosing a position to the left of the median voter, makes it easy for R to win.

Panel (b) shows the opposite case: R stakes out a position well to the right of the median voter, advocating spending equal to only 15 percent of income. By choosing a position slightly to R's left, D can ensure that R gets only the voters indicated by the red bars—and win. We can summarize the result as follows: in an election by majority rule where voters decide how much of a given policy action should be taken, the median voter theorem says that actual policies will most closely reflect the preferences of the median voter.

Clearly, then, the only way parties can avoid giving their opponents an easy way to win elections is to pick positions close to the middle—positions that reflect the preferences of the median voter. But in practice, things are a bit more complicated. Politics isn't one-dimensional: parties can compete on other issues, such as foreign policy. Also, political activists and interest groups within each party tend to pull parties' political positions away from the center. In the United States, statistical studies by political scientists suggest that the two major parties held similar positions on economic issues a generation ago but have diverged since then: Republicans are currently well to the right of Democrats on economic policy. Still, the median voter theory is a useful model for understanding how democracies resolve the trade-off between equity and efficiency.

## economics in action

### Effective Marginal Tax Rates on the Poor

Because means-tested programs are available only to families with sufficiently low incomes, families that manage to increase their earnings find that they lose benefits. So in effect they face a high marginal tax rate on their earnings, although the stated marginal tax rate is quite low.

The importance of this effect was emphasized in a 2002 study by Laurence Kotlikoff, an economist at Boston University, and two of his students. This study tried to calculate how much hypothetical couples with different levels of income get to keep of an additional dollar of income once the whole range of tax and benefits policies are taken into account.

They found that almost all couples in the United States face an effective marginal tax rate of more than 50 percent. The highest rates—up to 70 percent—aren't at the top of the income distribution; they're toward the lower end, where families find that higher income leads to reductions in means-tested benefits. ■

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#### >>CHECK YOUR UNDERSTANDING 21-5

- Suppose that the government offered free health care to families with incomes of less than \$15,000 per year, but no health care assistance for families with incomes of \$15,000 per year or more.
  - What problem would this program create for incentives? Explain this problem in terms of a marginal tax rate.
  - How would you restructure the program to make the problem less severe? Again, explain in terms of a marginal tax rate.
- Describe the trade-off between equity and efficiency in the following programs:
  - A program that supplements the income of farmers during poor crop years
  - A program that pays rent for low-income families

#### >> QUICK REVIEW

- Income in the United States is quite unequally distributed among families, and this distribution has become more unequal in recent decades.
- The same reasoning that underlies the ability-to-pay principle on taxes can be used to argue for some redistribution of income, although not everyone agrees with this argument. Even those who favor redistribution recognize that, like progressive taxes, redistribution involves a trade-off between equity and efficiency.
- An implication of the *median voter theorem* is that parties that compete for votes on how much redistribution to undertake will choose positions close to the preferences of the median voter. But in practice, parties' positions have not obeyed that result.

## Economists and the Tax System

As the opening story of Britain's poll tax suggested, tempers often run high when it comes to tax policy; the same is true when it comes to government spending for social insurance or income redistribution. What makes these disputes especially hard to resolve is that there is *no right answer*: there is always a trade-off between equity and efficiency, and two people who agree about that trade-off can disagree about what weight to give to each goal.

What role can economics play in this eternal debate? First, the economist can try to keep the debate honest. Politics being politics, those who advocate policy changes that will increase equity are always tempted to deny that their proposals will come at the expense of efficiency, and vice versa. It is the job of economists to point out when a proposed change in taxes or spending is being offered under false pretenses.

The other job of economists is to point out opportunities for clear improvement. An ideal tax system would offer no way to improve efficiency without reducing equity; real tax systems probably can be made better, allowing progress toward both goals, and economic analysis should be used to show the way.

### • A LOOK AHEAD •

We have now almost completed our study of microeconomics. We've learned a lot about how the economy works and about the role of government policy.

But do the models we have studied—models that reflect a couple of centuries of economic analysis and observation—still apply? In recent years there have been dramatic changes on the economic scene, as information technology has transformed the way we live and work. Some people talk of a “new economy” whose rules differ drastically from those of the past. In the next chapter, we'll look at how technology changes microeconomics—and how it doesn't.

## SUMMARY

1. **Tax efficiency** is best achieved when the costs of a tax—the deadweight loss or excess burden due to distorted incentives, and the **administrative costs** of the tax—are minimized. However, **tax fairness**, or **tax equity**, ensuring that the right people pay taxes, is also a goal of tax policy.
2. There are two major principles of tax fairness, the **benefits principle** and the **ability-to-pay principle**. The most efficient tax, a **lump-sum tax**, does not distort incentives but performs badly in terms of fairness. The fairest taxes (in terms of the ability-to-pay principle), however, distort incentives the most and perform badly on efficiency grounds. So in a well-designed tax system, there is a **trade-off between equity and efficiency**.
3. Every tax consists of a **tax base**, which defines what is taxed, and a **tax structure**. Different measures are used as tax bases—the **income tax**, **payroll tax**, **sales tax**, **profits tax**, **property tax**, and **wealth tax**. A **proportional tax** is the same fraction of the tax base for all taxpayers.
4. A tax is **progressive** if higher-income people pay a higher percentage of their income in taxes and **regressive** if they pay a lower percentage. Progressive taxes are often justified by the ability-to-pay principle. However, a progressive tax on income can distort incentives to work and save and invest because the **marginal tax rate on income** is higher than the **average tax rate** on income.
5. Money raised in taxes is spent in three main ways: for **social insurance** and for **redistribution of income** (which are implemented through **transfer payments** to individuals) and for public goods. Defense spending, a public good, used to be the biggest item, but now social insurance, largely for older citizens, is the largest item.
6. The **poverty line** is an estimate of the minimum income needed to achieve an acceptable standard of living; the **poverty rate** is the fraction of the population with incomes below the poverty line. Despite rising average incomes, the poverty rate in the United States has shown no clear trend over the past 30 years.
7. The most important causes of poverty are lack of education, discrimination, and adverse events. The effects of poverty are often severe, particularly for children.
8. Aid to the poor takes three main forms: **welfare**, cash payments to the poor; **in-kind transfers** such as food stamps, Medicaid, and housing subsidies; and **negative income taxes**.
9. Redistribution is often justified by the inequality of income distribution. Like progressive taxation, redistribu-

tion forces a trade-off between equity and efficiency: **means-tested** programs in effect place a high marginal tax rate on low-income families.

10. According to the **median voter theorem**, in an election by majority rule where voters decide how much of a given

policy action to undertake, the outcome will most closely reflect the preferences of the median voter. Consequently, parties will choose positions close to the one preferred by the median voter. But for various reasons, this result has not happened in recent American politics.

## KEY TERMS

Tax efficiency, p. 494	Income tax, p. 499	Social insurance, p. 504
Tax fairness, p. 494	Payroll tax, p. 499	Redistribution of income, p. 504
Tax equity, p. 494	Sales tax, p. 499	Transfer payments, p. 504
Administrative costs, p. 495	Profits tax, p. 499	Means-tested, p. 504
Benefits principle, p. 496	Property tax, p. 499	Poverty line, p. 508
Ability-to-pay principle, p. 496	Wealth tax, p. 499	Poverty rate, p. 508
Lump-sum tax, p. 496	Proportional tax, p. 499	Welfare, p. 510
Trade-off between equity and efficiency, p. 496	Progressive tax, p. 499	In-kind transfers, p. 510
Tax base, p. 498	Regressive tax, p. 499	Negative income tax, p. 510
Tax structure, p. 498	Average tax rate on income, p. 500	Median voter theorem, p. 514
	Marginal tax rate on income, p. 500	

## PROBLEMS

- Assume that the demand for gasoline is inelastic. The government imposes an excise tax on gasoline. The tax revenue is used to fund research into clean fuel alternatives to gasoline, which will improve the air we breathe.
  - Who bears more of the excess burden of this tax: consumers or producers? Show in a diagram who bears how much of the excess burden.
  - Is this tax based on the benefits principle or the ability-to-pay principle? Explain.
- Assess the following three taxes in terms of the benefit principle versus the ability-to-pay principle.
  - A tax on gasoline that finances maintenance of state roads
  - An 8% sales tax on food that finances the local food stamp program
  - A property tax, assessed on the value of a person's house, that finances local schools
- Consider the following deductions, which reduce the amount of income tax an individual must pay. Can they be justified on the basis of the ability-to-pay principle?
  - Charitable contributions
  - Interest paid on a mortgage
  - Number of dependent children
- You are advising the government on how to pay for national defense. There are two proposals for a tax system to fund national defense. Under both proposals, the tax base is an individual's income. Under proposal A, all citizens pay exactly the same lump-sum tax, regardless of income. Under proposal B, individuals with higher income pay a greater proportion of their income in taxes.
  - Is the tax in proposal A progressive, proportional, or regressive? What about the tax in proposal B?
  - Is the tax in proposal A based on the ability-to-pay principle or on the benefits principle? What about the tax in proposal B?
  - In terms of efficiency, which tax is better? Explain.
- Each of the following tax proposals has income as the tax base. In a diagram with the tax base—income, ranging from \$0 to \$50,000—on the horizontal axis and the taxes paid on the vertical axis, draw the income tax for each of the following tax proposals. For an individual who earns \$25,000, what is the marginal tax rate under each proposal? What is the average tax rate for that individual? Is the marginal tax rate higher than, lower than, or equal to the average tax rate? Accordingly, classify the tax as being proportional, progressive, or regressive.
  - All income is taxed at 20%.
  - All income up to \$10,000 is tax-free. All income above \$10,000 is taxed at a constant rate of 20%.
  - All income between \$0 and \$10,000 is taxed at 10%. All income between \$10,000 and \$20,000 is taxed at 20%. All income higher than \$20,000 is taxed at 30%.
  - Each individual who earns more than \$10,000 pays a lump-sum tax of \$10,000. If the individual's income is less than \$10,000, that individual pays in tax exactly what his or her income is.
- In Transylvania the basic income tax system is fairly simple. The first 40,000 sylvers (the official currency of Transylvania) earned each year are free of income tax. Any additional income is taxed at a rate of 25%. In addition, every individual pays a

social security tax, which is calculated as follows: all income up to 80,000 sylvers is taxed at an additional 20%, but there is no additional social security tax on income above 80,000 sylvers.

- a. Calculate the average and the marginal tax rates for Transylvanians with the following levels of income: 20,000 sylvers, 40,000 sylvers, 80,000 sylvers, and 120,000 sylvers.
  - b. For each of the income levels in part (a), is the tax system progressive, regressive, or proportional?
7. You work for the Council of Economic Advisers, providing economic advice to the White House. The president wants to overhaul the income tax system and asks your advice. Suppose that the current income tax system consists of a proportional tax of 10% on all income and that the richest person in the country earns \$100 million. The president proposes a tax cut targeted at the very rich so that the new tax system would consist of a proportional tax of 10% on all income up to \$100 million and a marginal tax rate of 0% (no tax) on income above \$100 million. You are asked to evaluate this tax proposal.
- a. For incomes of \$100 million or less, is this tax system progressive, regressive, or proportional? For incomes of more than \$100 million? Explain.
  - b. Would this tax system create more or less tax revenue, other things equal? Is this tax system more or less efficient than the current tax system? Explain.
8. In the city of Metropolis, there are 100 citizens, each of whom lives until age 75. Citizens of Metropolis have the following incomes over their lifetime: Through age 14, they earn nothing. From age 15 until age 29, they earn 200 metros (the currency of Metropolis) per year. From age 30 to age 49, they earn 400 metros. From age 50 to age 64, they earn 300 metros. And finally at age 65 they retire and are paid a pension of 100 metros per year until they die at age 75. Everyone consumes each year whatever their income is that year (that is, there is no saving and no borrowing). Currently, 20 citizens are 10 years old, 20 citizens are 20 years old, 20 citizens are 40 years old, 20 citizens are 60 years old, and 20 citizens are 70 years old.
- a. Study the income distribution among all citizens of Metropolis. Split the population into quintiles according to their income. How much income does a citizen in the first quintile have? in the second, third, fourth, and fifth, quintiles? Which share of total income of all citizens goes to the citizens in each quintile? Construct a table showing with the share of total income that goes to each quintile. Does this income distribution show inequality?
  - b. Now look only at the 20 citizens of Metropolis who are currently 40 years old, and study the income distribution among only those citizens. Split those 20 citizens into quintiles according to their income. How much income does a citizen in the first quintile have? in the second, third, fourth, and fifth, quintiles? Which share of total income of all 40-year-olds goes to the citizens in each quintile? Does this income distribution show inequality?
  - c. What is the relevance of these examples for assessing data on the distribution of income in any country?
9. The country of Marxland has the following income tax and social insurance system. Each citizen's income is taxed at an average tax rate of 100%. A social insurance system then provides transfers to each citizen such that each citizen's after-tax income is exactly equal. That is, each citizen gets (through a government transfer payment) an equal share of the income tax revenue. What is the incentive for one individual citizen to work and earn income? What will the total tax revenue in Marxland be? What will be the after-tax income (including the transfer payment) for each citizen? Do you think such a tax system that creates perfect equality will work?
10. In the city of Nottingham, each worker is paid a wage rate of \$10 per hour. Nottingham administers its own unemployment benefit, which is structured as follows: If you are unemployed (that is, if you do not work at all), you get unemployment benefits (a transfer from the government) of \$50 per day. As soon as you work for only one hour, the unemployment benefit is completely withdrawn. That is, there is a "notch" in the benefit system.
- a. How much income does an unemployed person have per day? How much daily income does an individual have who works four hours per day? How many hours do you need to work to earn just the same as if you were unemployed?
  - b. Will anyone ever accept a part-time job that requires working four hours per day, rather than being unemployed?
  - c. Suppose that Nottingham now changes the way in which the unemployment benefit is withdrawn. For each additional dollar that an individual earns, \$0.50 of the unemployment benefit is withdrawn. How much daily income does an individual now have who works four hours per day? Is there an incentive now to work four hours per day rather than being unemployed?

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