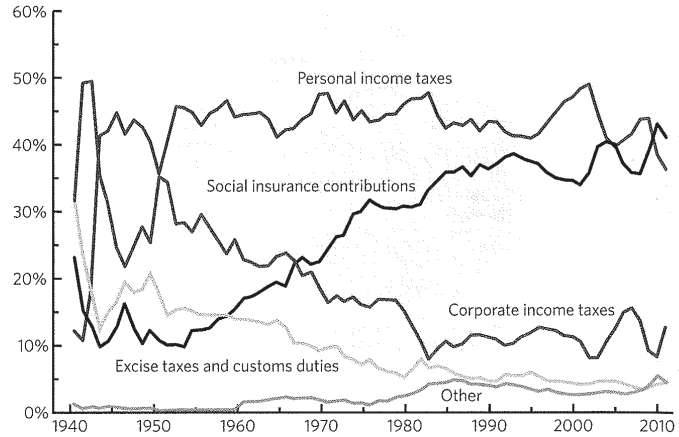
FIGURE 17.3

SOURCES OF FEDERAL REVENUE, 1940–2010

Customs and excise taxes, and the corporate income tax, have diminished in importance over time, whereas the dependence on payroll taxes for social insurance has grown.

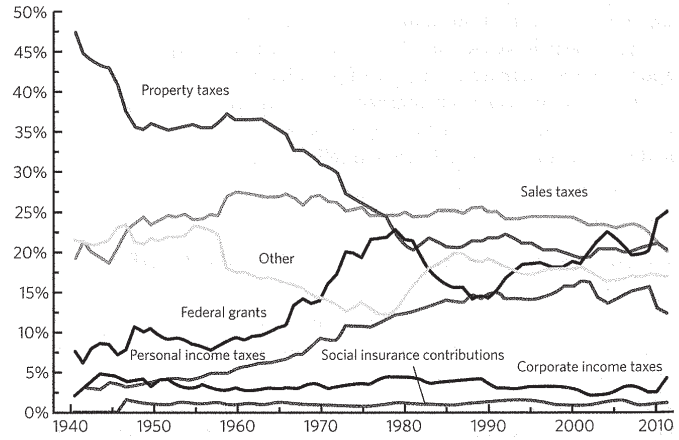


SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Table 3.2.

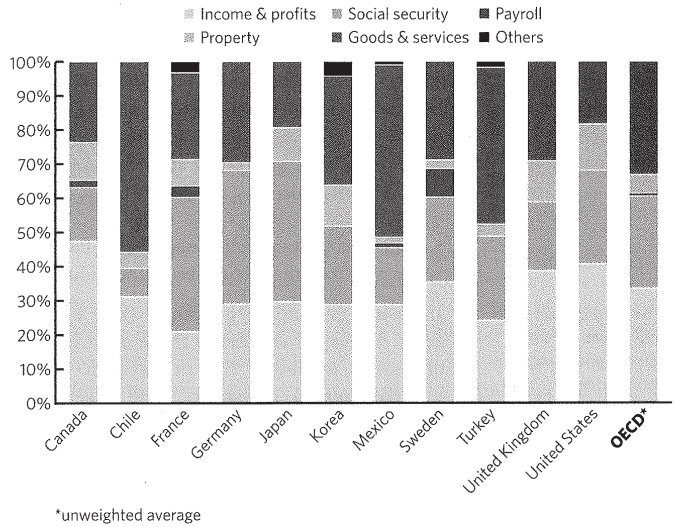
FIGURE 17.4

SOURCES OF STATE AND LOCAL REVENUES, 1940–2010

The contribution of property taxes to state and local revenues has fallen substantially over the past seventy years, whereas the importance of all other sources (particularly personal income taxes and federal grants) has grown.



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, Table 3.3.



*unweighted average

FIGURE 17.5

SOURCES OF REVENUE FOR SELECTED COUNTRIES, 2009

Taxes on income and profits are more important in the United States than in most other countries, where taxes on goods and services account for a larger share of total revenue.

SOURCE: Organization for Economic Cooperation and Development, Centre for Tax Policy and Administration, *Revenue Statistics 1965–2010* (Paris: OECD, 2011), Table 6.

THE FIVE DESIRABLE CHARACTERISTICS OF ANY TAX SYSTEM

Taxes are inevitably painful. Not surprisingly, designing tax systems has always been a subject of considerable controversy. To put it most simply, most people would like to see their own taxes reduced. Quite ingenious arguments can be devised for why others should pay more.

Governments, in deciding how best to raise the revenue they require, have looked for general principles. There are five accepted properties of a "good" tax system:

1. *Economic efficiency*: the tax system should not interfere with the efficient allocation of resources.

2. *Administrative simplicity*: the tax system ought to be easy and relatively inexpensive to administer. Good tax systems rely on self-compliance, so the system should be designed to make compliance easy and voluntary.

PRINCIPLES OF TAXATION

- *Efficiency*: the tax system should not be distortionary; if possible, it should be used to enhance economic efficiency.
- *Administrative simplicity*: the tax system should have low costs of administration and compliance.
- *Flexibility*: the tax system should allow easy adaptation to changed circumstances.
- *Political responsibility*: the tax system should be transparent.
- *Fairness*: the tax system should be, and should be seen to be, fair—treating those in similar circumstances similarly, and imposing higher taxes on those who can better bear the burden of taxation.

3. *Flexibility*: the tax system ought to be able to respond easily, in some cases, automatically, to changed economic circumstances.

4. *Transparent political responsibility*: the tax system should be designed so that individuals can ascertain what they are paying, and evaluate how accurately the system reflects their preferences.

5. *Fairness*: the tax system ought to be fair in its relative treatment of different individuals.

In many developing countries (and even in some developed countries) there is an important sixth attribute: the tax system should be "**corruption resistant**." (See case study, "Corruption-Resistant Tax Systems," which describes what this means.)

ECONOMIC EFFICIENCY

Recall that in the absence of market failures, the economy would automatically allocate resources efficiently. Information conveyed by market prices would lead to production, exchange, and product mix efficiency, and no one could be made better off without making anyone worse off. Most taxes change relative prices. As a result, the price signals are distorted, and the allocation of resources is altered.

A persistent concern is the extent to which the tax system discourages savings and work, and distorts other decisions relating to consumption and production. For instance, the large number of Arabian and other very expensive breeds of horses in the United States has been attributed to a peculiar loophole in the tax structure. The special treatment of gas and oil may have led to excessive drilling. Railroad boxcars were used for a while as a tax shelter, until a glut of these developed.

The history of taxation is dotted with other examples of distortionary effects. The result of the window tax imposed in Britain during the seventeenth century was that houses were constructed without windows. Modern England provides other examples. Three-wheeled vehicles, though perhaps slightly less safe and not much less costly than four-wheeled vehicles, were taxed more lightly than the latter. Hence many individuals chose them in preference to the more conventional four-wheeled vehicles. Vans (station wagons without windows) were taxed more lightly than station wagons with windows, and again, many individuals were motivated to purchase these vehicles, though not by a preference for darkness in the rear of their vehicle. In the United States, the favorable depreciation treatment for movable walls[2] has encouraged the building of commercial office buildings with movable walls—even if there is no intention of ever moving them. Although movable walls do provide greater flexibility, they typically provide less sound insulation. Thus, even though we no longer have a window tax, modern tax laws nonetheless do affect construction patterns.

BEHAVIORAL EFFECTS OF TAXATION Most of the efficiency effects of taxation are far more subtle and difficult to assess. Income taxation may affect the length of time an individual stays in school by affecting the after-tax return to education, the choice of jobs (because for some jobs a larger fraction of the return comes in untaxed "benefits"), whether an individual enters the labor force or stays at home to take care of children, the number of hours a taxpayer works (when he or she has discretion over that), whether he or she takes a second job and the effort put into the job, the amount that the individual saves and the form savings take (the choice between bank accounts and the stock market), the age at which an individual retires, and whether he or she works part-time beyond age 65.

The effects of taxation are not limited to decisions concerning work, savings, education, and consumption. Although the extent to which the tax system affects individuals' decisions to marry or divorce is open to question, there is little doubt that it affects the timing of these decisions. For instance, the U.S. tax code considers a couple married for the entire calendar year even if the wedding is held on December 31. Thus, two working people who earn similar incomes, choosing between a December and January wedding date, are strongly encouraged by the income tax to choose January. The reverse is true for divorce.[3] Taxation affects risk taking, the allocation of resources to research and development, and the long-run rate of growth of the economy. It affects not only the level of investment in firms but also the form of the investment, including the durability of machines. It affects the fraction of national savings that is allocated to housing, to other structures, and to equipment. It affects the rate at which our natural resources are depleted. There is hardly an important resource allocation decision in our economy that is unaffected in some way or another by taxation.

[2] Taxpayers are allowed to deduct from their income an amount that reflects the wearing out (or depreciation) of their plant or equipment. Movable walls are treated as equipment, and thus can be depreciated much more rapidly than fixed walls. As a result, the present discount value of the depreciation allowances is much higher.

[3] Married couples are taxed on the basis of their combined income. Because the income tax is progressive, the income of the lower-earning spouse is taxed at a higher rate than it would be if the individual were single. (See Chapter 22.)

With tax rates at current levels, tax considerations are often of primary concern; it may seem more advantageous to allocate one's effort to reducing one's taxes than to designing better projects or producing more.

FINANCIAL EFFECTS OF TAXATION Sometimes taxation affects a transaction's form more than its substance. For instance, apart from tax considerations, it may make little practical difference whether an employer gives an employee money to purchase a health insurance policy or purchases it for the employee. In tax terms, though, it makes a great deal of difference. In the former case, the individual receives "income" on which he or she is taxed; in the latter case, the "benefit" is not taxed. Similarly, in real terms, it makes little difference whether I save directly for my retirement or my employer takes some of my salary and invests it in a (fully funded) pension plan. However, the tax implications are quite different, and as a result, individuals are induced to save through the pension plan rather than directly. These financial effects may in turn, of course, have further real effects on the economy: employers, because of the restrictions imposed on pension plans, may invest their funds differently from the way an individual saving for retirement might invest them. Typically, they cannot, for instance, invest in highly risky "below investment grade" securities. Moreover, some individuals may be "forced" to save through their pension plans more than they would voluntarily save on their own.

Similarly, because dividends, capital gains (increases in the price of an asset), and interest are all treated differently, the tax structure may have a significant effect on the *financial* structure of U.S. corporations—for instance, on firms' decisions whether to finance additional investments by borrowing or by issuing new shares. These financial decisions, in turn, have real consequences. A firm with a heavy debt burden is likely to be less willing to undertake risky projects than a firm that has raised most of its funds by issuing stock, and, in the current economic downturn, it is now likely to go into bankruptcy.

ORGANIZATIONAL EFFECTS OF TAXATION Taxes affect the way our economy is organized. Many of these organizational effects have real consequences for how resources get allocated—for instance, for how much risk taking occurs. Our tax laws differentiate between corporations, which have limited liability, and individuals and partnerships, which do not. Because with unlimited liability the losses that an investor can incur from a $100 investment are far greater than just the $100 he or she has invested, without limited liability enterprises often have a difficult time raising capital, and managers of enterprises with unlimited liability may act in a far more risk-averse manner. By tilting the tax system either for or against corporations, the tax system can either encourage or discourage economic activity from taking place within corporations, thereby changing the degree and nature of risk taking in the economy.

Financial effects are often intertwined with organizational effects. The tax system may encourage or discourage banks relative to other financial institutions or arrangements; this may lead firms to raise more or less money through banks (rather than, say, on the stock or bond market). This can make a great deal of difference. Recent studies have shown, for instance, that firms that raise more of their money through banks exhibit less volatility in investment, partly because the bank is better able to monitor why the firm may be short of funds—whether, for instance, it is because of short-run cyclical effects or because of problems of mismanagement. Because banks can better identify the nature of the problem, they can respond effectively when there is a cyclical downturn, providing capital to good firms that are temporarily short of cash and withholding funds from firms that have more fundamental weaknesses. By contrast, firms that rely on capital markets (issuing bonds or new equities) to raise funds find life far more difficult in a downturn; they may find it virtually impossible or extremely expensive to raise funds at such times.

Another major economic organization within our society is the family. Tax laws affect both family formation and the distribution of well-being within a family. For instance, tax laws typically tax only payments from corporations to households (that is, to their employees). They do not tax consumption within corporations. Thus, tax laws encourage "inside the firm" consumption—large company cars, expensive company meals, and so forth. In those economies, such as the United States before World War II, where men typically worked outside the home and women within the home, such tax policies obviously had the effect of discriminating in favor of the spouse working outside the home.

GENERAL EQUILIBRIUM EFFECTS The imposition of a tax such as that on wages or on the return to capital alters the equilibrium of the economy. A tax on interest may reduce the supply of savings and, eventually, the stock of capital; this in turn may reduce the productivity of workers and their wages. We refer to these indirect repercussions of the tax as its **general equilibrium effects**.

General equilibrium effects have important distributional consequences, sometimes in a direction quite opposite to the intent of the legislation. A tax on capital may reduce the supply of capital, thereby increasing the return to capital; in some instances, the degree of inequality may actually be increased by such a tax.

ECONOMIC IMPACTS OF TAXATION

Behavioral effects
- Work, education, retirement
- Savings, investment, risk taking
- Energies devoted to avoiding taxes instead of creating wealth
- Marriage and divorce

Financial effects
- Fringe benefits
- Financial structure of firms

Organizational effects
- Corporations versus unincorporated enterprises
- Intertwined with financial effects (banks versus insurance versus other forms of finance)

General equilibrium effects
- Often important indirect effects, especially with broad-based taxes, such as on wages or interest

Announcement effects and capitalization
- Future taxes on an asset reflected ("capitalized") in the price of the asset at the time the tax is announced

ANNOUNCEMENT EFFECTS AND CAPITALIZATION The economy does not instantaneously adjust to a new tax. Often, the long-run distortions are much greater than the short-run distortions, as the economy is able to respond more fully to the new situation.

However, some effects of the tax may be felt even before it is imposed, simply upon its announcement. An announcement concerning the future tax treatment of an asset has an immediate impact on the value of the asset. For instance, if it is believed that a particular category of assets, say, housing, is about to be subjected to greater taxation (e.g., interest deduction on mortgages is about to be eliminated), then the price of that category of assets may fall markedly. Owners of those assets at the time the announcement is made will, perhaps unfairly, bear the major burden of the tax.

It is these **announcement effects**, or *impact effects*, which may be quite significant, that have given rise to the saying that "an old tax is a good tax." Not only may the announcement effect present serious equity problems, but anticipation of it can also affect the supply of assets. Discussions about eliminating the deduction of interest paid on home mortgages may lead individuals to anticipate significant capital loss were they to invest in housing, for instance, and hence the demand for new housing may be seriously reduced.

DISTORTIONARY AND NONDISTORTIONARY TAXATION Any tax system influences behavior. After all, the government is taking money away from an individual, and we would expect that individual to respond, in some way, to this lower income. When we say that we want the tax system to be nondistortionary, clearly we do not mean that we want the individual not to react at all.

A tax is **nondistortionary** if, and only if, there is nothing an individual or firm can do to alter the tax liability. Economists call taxes that are nondistortionary **lump-sum taxes**. Distortions are associated with the individual's or firm's attempt to lower the tax liability. Virtually all taxes imposed in the United States are, in this sense, distortionary. A *head tax*—a tax one has to pay regardless of income or wealth—is a lump-sum tax. A tax that depends on nonalterable characteristics, such as age or sex, is also a lump-sum tax.

Because individuals and firms cannot avoid them, lump-sum taxes do not lead to changes in behavior or the reallocation of resources, other than the income effect of reduced after-tax income.

Any tax on commodities is **distortionary**: an individual can change his or her tax liability simply by reducing purchases of the commodity. Any tax on income is also distortionary: an individual can reduce his or her tax liability simply by working less or by saving less.

In Chapter 19, we shall see that distortionary taxes are inefficient in the sense that if the government could replace them with a lump-sum tax, it could raise more revenue, with the same effect on the welfare of individuals; or equivalently, the government could raise the same revenue and increase the welfare of individuals.

TAXES AND ECONOMIC EFFICIENCY

- All taxes affect behavior (reduce spending power); *distortions* are associated with actions an individual takes to avoid taxes—for example, by working less, one's tax liability is reduced.
- Lump-sum taxes are taxes that are fixed and cannot be altered by any action that the individual can take.
- Corrective taxation, by imposing taxes on activities that generate negative externalities, such as pollution, simultaneously raises revenues and improves economic efficiency.

CORRECTIVE TAXATION So far, this discussion has emphasized the negative aspects of taxation: that a tax system should be designed so as not to interfere with economic efficiency. Recall, however, that in the presence of market failures, the allocation of resources will not, in general, be efficient. Taxation can sometimes be used in a positive way, to correct some market failure. As discussed in Chapter 6, taxation could sometimes be used to correct for externalities. **Corrective taxes** (as these taxes are called) both raise revenue and improve the efficiency of resource allocations. The United States has made limited use of corrective taxes. The tax imposed on the chemical industry to pay for the costs of cleaning up and disposing of toxic wastes can be thought of as a corrective tax. Those who view American energy consumption as excessive (because of the associated pollution) have argued for an energy tax, which would both raise revenue and reduce profligate energy consumption. These concerns have increased with the awareness of the dangers of global warming associated with the buildup of greenhouse gases (such as carbon dioxide) in the atmosphere, largely resulting from high energy usage.

ADMINISTRATIVE COSTS

Administering our tax system entails significant costs. There are direct costs—the cost of running the Internal Revenue Service—and indirect costs, borne by taxpayers. These indirect costs, called *compliance costs*,

CORRECTIVE TAXES AND THE DOUBLE DIVIDEND

Corrective taxes have gained increasing support in two areas. The first was smoking. The recognition that smokers impose costs on others, including higher health costs, underlay the idea that a tax on cigarettes should help finance health care reforms, such as the provision of health insurance for poor children.

The second has to do with air pollution. Greenhouse gases lead to global warming, and are generated by the burning of fossil fuels. A carbon tax would "correct" this externality. President Clinton proposed a modification of such a tax in his 1993 budget, called the BTU tax, because it was a tax based on the amount of energy in a fuel. (Australia adopted such a tax in 2011, but as this book goes to press, efforts are underway to repeal it by Australia's conservative Coalition government, Liberals and Nationals.) Some forms of energy like burning of coal give rise to far more greenhouse gases than others. (Hydroelectric power gives rise to none.) Hence, the BTU tax was only an imperfect substitute for a "carbon" tax. However, the industries that were high users of energy, as well as the oil, coal, and gas industries, mounted a successful campaign against the tax, and Congress passed instead a 4.3 cent increase in the gasoline tax. This, too, can be viewed as a corrective tax—it helps correct for the externalities associated with auto pollution and congestion.

There is still no nationwide carbon tax in the United States, although the tax has been introduced in a few subnational jurisdictions, such as the nine counties in the San Francisco Bay Area covered by the Bay Area Air Quality Management District. The EU has had similar problems introducing a comprehensive carbon tax, but several countries have imposed energy taxes based partly on carbon content.

Such taxes are attractive because they raise revenues at the same time that they correct a market failure. Thus, less revenues have to be raised through other, distortionary, methods. There is, accordingly, a "double dividend" associated with such a tax. The economy benefits from the reduced pollution *and* from the reduced reliance on taxes that distort production. The argument for corrective taxation is sometimes put another way: Why should society tax productive ("good") economic activities, such as savings and hard work, rather than bad economic activities, like pollution?

take on a variety of forms: the costs of time spent filling out tax forms, costs of record keeping, and the costs of services of accountants and tax lawyers. Joel Slemrod of the University of Michigan has estimated that the indirect costs are at least five times greater than the direct costs.

The administrative costs of running a tax system depend on a number of factors. First, they depend on what records would be kept in the absence of taxation. Businesses need to keep records for their own internal management purposes: the advent of high-speed computers has greatly reduced the costs of record keeping for large corporations. Thus, the tax system imposes a relatively small additional burden on large

corporations for reporting wage income of their employees. At the other extreme, many small businesses and most households that hire domestic help find the additional record keeping and filings required by the income tax very burdensome. In 1993, the government allowed those with household employees to file their tax reports on their employees with their own individual income tax, though they still have to make separate filings with the Social Security Administration for unemployment insurance, state income taxes, and sometimes local income taxes.

The record keeping required for capital gains taxation is particularly onerous because the records often have to be kept over a long period of time. Indeed, record keeping associated with taxation on owner-occupied housing was sufficiently onerous that few fully complied with the law; finally, in 1997, the tax laws were changed to exempt almost all capital gains from owner-occupied housing from taxation.

A second factor that determines the administrative costs of a tax system is its complexity. Much of the cost of administering the income tax system comes from special provisions. For instance, the deductibility of certain categories of expenditures (medical, charity, interest) requires that records be kept on these expenditures.

Differentiation of rates across individuals (with some individuals paying a much higher rate than others) and across categories of income gives rise to attempts to "shift" income to members of one's family with lower tax rates, or to categories of income that are more lightly taxed. Attempts to restrict this shifting also account for much of the complexity of the current tax structure.

Third, taxing some categories of income may be more expensive than taxing others. It is widely believed that the administrative costs associated with imposing taxes on capital are much larger than those associated with taxing labor, partly because of the difficulty of differentiating between income and the return of capital. For instance, payments to capital owners may be "income" (dividends) or "principal" (the repayment of previously invested funds); the dollars look the same. If the tax law treats these payments differently, taxpayers will be moved to characterize the dollars one way or the other. The government has had to write elaborate rules, which only partially address the problem.

Similarly, the administrative costs of raising taxes (per dollar of revenue raised) from small businesses may be much larger than those from large corporations. Thus, the administrative costs of the value-added tax, in which a large fraction of the revenue is raised from large corporations responsible for a significant fraction of the economy's value added, is lower than the administrative costs of a sales tax, which imposes taxes only at the final sale, in the myriad of retail outlets.

FLEXIBILITY

Changes in economic circumstances require changes in tax rates. For some tax structures, these adjustments are easy; for some, they require extensive political debate; still for others, they occur automatically.

AUTOMATIC STABILIZATION For instance, as the economy goes into a recession, a reduction in tax revenues may be extremely desirable, to provide needed stimulus for the economy. When prices are stable, a progressive tax structure will provide "automatic" stabilization. When incomes drop, as a result of a recession, the average tax rate is reduced—individuals face lower tax rates because their incomes are lower. On the other hand, when income increases, the average tax rate increases. However, before tax brackets were indexed (i.e., adjusted to take account of inflation) in 1981, during periods of *stagflation*—when the economy was in a recession but there was still inflation—the average tax rate increased, although a lower rate was needed to move the economy out of the recession. Indexing thus contributes to stabilization when prices rise during recessions. During periods of expansion and inflation, indexing reduces the built-in stabilizing effects of the income tax.

POLITICAL DIFFICULTIES OF ADJUSTING RATES When changing the tax rates is considered desirable, attempts to adjust the U.S. income tax often occasion intense political debate. Given the complexity of the tax code, which rates ought to be adjusted? Should all rates be increased proportionately, or are the rich or the poor already bearing a disproportionately large share of the tax burden, so that their taxes should be increased less than proportionately? Indeed, it is not even clear how to assess the fairness of a reform proposal. Is it fairer to reduce the taxes of individuals at different income levels by the same *dollar* amount, or by the same *percentage* amount? Should focus be on the average tax rates individuals pay, or on their marginal tax rates? Is a tax reform fair if it lowers the average rate faced by a one-earner family but increases the average rate on a two-earner family? Should the tax rate on capital be decreased, to encourage more savings, or increased, because capital owners are in a better position to bear the tax?

The political difficulty of adjusting the income tax rate should be contrasted, for instance, with that of the property tax. The property tax is beset by a number of administrative problems, not least of which is the difficulty of assessing the value of various pieces of property. Still, it has one advantage: adjustments in the tax rates are made annually in a simple manner as the revenues required for the provision of local public services change.

SPEED OF ADJUSTMENTS Finally, an important aspect of the "flexibility" of a tax system for purposes of stabilizing the economy is timing: the speed with which changes in the tax code (once enacted) can be implemented, and the lags in the collection of funds. If fluctuations in the economy are rapid, the lags may limit the efficacy of, say, the income tax, in stabilizing the economy. There is always the danger that with sufficiently long lags, taxes will be increased just when the economy needs a tax reduction, and vice versa.

TRANSPARENT POLITICAL RESPONSIBILITY

A widely embraced political value is that government should not try to take advantage of uninformed citizens. In the context of taxation, this view recommends taxes for which the burden of payment is clear. Such taxes are known as **transparent taxes**, and transparency has increasingly been recognized as an important characteristic of good government. Government policies are said to be *transparent*[4] when they are subject to daylight—when it is clear who is benefiting and who is paying. In this view, the individual income tax is a good tax.

Sometimes it seems as though the government deliberately misrepresents the true costs of the services it provides or who bears the costs. For instance, there is widespread agreement that there is no meaningful distinction between the part of the Social Security tax that is paid by the employer and the part paid by the employee. (According to law, half is paid by each.) The employer is concerned only with the total costs of the employee, the employee only with his or her take-home pay. No one's economic behavior should be affected if it were announced that the entire tax was to be borne by the employee, were employers to give an equivalent pay raise to their employees to cover the increased tax. Would workers' attitudes toward Social Security be altered if they thought they had to bear the entire costs?

In some cases there is an almost deliberate attempt to persuade individuals that the cost of government is less than it is. Just as businesses find that they can sell cars more easily if they describe the cost as "only $340 a month for a short 40 months" than if they describe it as "$13,600 paid over three and a half years," so, too, governments sometimes show a preference for tax systems in which individuals never fully reckon the cost of government. One of the arguments put forward for sales taxes is that they

[4] The term has taken on a particular meaning in some recent discussions. The nongovernmental organization (NGO) Transparency International focuses on identifying corrupt practices and governments. Its view is that it is lack of transparency that gives rise to much of the political corruption one sees.

are less noticed than other taxes, such as income taxes. Individuals never calculate the *total* amount they pay to the government—but the sales tax is at least usually listed separately on receipts in the United States, whereas the value-added tax in Europe is traditionally included in the purchase price, making the tax burden even less transparent.

Jean-Baptiste Colbert, a finance minister to Louis XIV, wrote: "The art of taxation consists in so plucking the goose as to obtain the largest amount of feathers with the least possible amount of hissing." From this perspective, the corporation tax may thus be viewed to be a good tax. Politicians can claim that it is anonymous corporations that pay it. From the perspective of transparency, though, the corporation tax is one of the worst, because who really pays the tax is not apparent. Taxes are paid by people, not by institutions: it is the shareholders, workers, and customers who ultimately bear the burden of the tax.

However, there is a good reason for levying the corporate income tax: in the absence of such a tax, the profits of a corporation would not be taxed until they were distributed. A corporation thus becomes like an individual retirement account (IRA)—a tax free way of accumulating savings. That is inequitable, and often leads to economic inefficiencies—inducing money to stay within the corporation, even if the managers of the corporation do not invest it as well as it could be. In some cases, this problem can be resolved by integrating the corporation and individual income tax: attributing the income of the corporation to the shareholders, and requiring them to pay a tax on the corporation's income as if it were distributed, whether it is or not.

In practice, as globalization has proceeded, corporations have become skilled at avoiding taxes; for instance, claiming that their profits are earned in low-taxed jurisdictions. As a result, there has been a steady erosion in the amounts raised by the corporation tax (see Figure 17.3). For example, from 2009 to 2012, Apple Operations International, registered in Cork, Ireland, generated $30 billion in overseas profits without paying any corporate income tax on this to the Irish, United States, or any other national government.

A politically responsible tax structure is also one in which changes in taxes come about as a result of legislation, and with which the government must repeatedly come back to the citizenry for an appraisal of whether it is spending too much or too little. Steeply progressive tax rates (rates that rise as incomes rise) combined with a tax system that does not adjust for inflation result in government's tax revenues in *real* terms (as a share of, say, national income) rising in inflationary times, as they did between 1975 and 1980. These increases in taxes were never directly legislated: indeed, many would argue that Congress would have been unlikely to impose

directly, say, a 10 percent increase in taxes in 1980, although inflation had exactly this effect.

FAIRNESS

Most criticisms of tax systems begin with their unfairness. However, as we shall see, it is difficult to define precisely what is or is not fair. There are two distinct concepts of fairness: horizontal equity and vertical equity.

HORIZONTAL EQUITY A tax system is said to be *horizontally equitable* if individuals who are the same in all relevant respects are treated the same. The principle of **horizontal equity** is so important that it is, in effect, enshrined in the Constitution as the Fourteenth Amendment (the Equal Protection Clause). Thus, a tax system that discriminates on the basis of race, color, or creed would, in the United States, generally be viewed to be horizontally inequitable (and unconstitutional). Although the underlying idea is clear enough, there are two fuzzy notions in our definition: What does it mean for two individuals to be identical in all relevant respects? And what does it mean for two individuals to be treated the same?

Consider twins who are identical in every respect except that one likes chocolate ice cream and only chocolate ice cream, while the other likes vanilla ice cream and only vanilla. For simplicity, we assume that chocolate and vanilla ice cream cost exactly the same amount. Is the tax system treating the two individuals in a horizontally equitable manner if it taxes vanilla and chocolate ice cream at different rates? One ends up paying more in taxes than the other, and in this sense, the tax system appears to be unfair. But the twins faced the same "opportunity set." The chocolate lover could have bought vanilla ice cream if he or she had wanted to (or vice versa). The tax system did not discriminate; it did not differentiate between individuals. This example is contrived so we could have two commodities that are "essentially" identical. In practice, though, there are many examples in which the tax system gives different treatment to individuals who differ in tastes—the higher taxes on hard liquor, for instance, discriminate against those who prefer scotch relative to those who prefer wine or beer. Individuals who prefer to spend their vacations in their own vacation homes are treated preferentially compared to those who prefer to travel during their vacation.

If we say that the differences in taste are an important economic difference that the tax system may well take into account, then we can say that the principle of horizontal equity does not apply here. The twins are not identical in all relevant respects. Carried to this extreme, the principle

soon becomes vacuous: no two individuals are ever identical. What are to be acceptable distinctions? Unfortunately, the principle of horizontal equity gives us little guidance on how to answer this question.

One's first intuition might be that all distinctions are inadmissible: age, sex, and marital status should all be irrelevant. In fact, at present we make distinctions on the basis of age (those over 65 are allowed an extra exemption) and marital status (two individuals with the same income who marry pay more in taxes than they did before marriage). Congress has felt that those distinctions are relevant.

Perhaps age and marital status are relevant because they affect individuals' ability to pay. If these are admissible bases for differentiation, however, are there others? For instance, does variation in the economic costs associated with taxing different groups provide legitimate grounds for differentiation? In a later chapter we shall see that the inefficiencies arising out of a tax system depend on the magnitude of the responses to the tax. In households with two workers, the worker with the lower wage displays much more sensitivity to the wage rate than the higher-earning worker: income taxes may have large effects on the secondary worker, although they have almost no effect on the amount of labor supplied by the primary worker. Thus, if the government were concerned with minimizing the inefficiencies arising out of the tax system, it would impose a lower tax on the secondary workers. Is this fair? Another example illustrating the difficulties is provided by health care expenditures. Should two individuals with the same income but different health care expenditures be treated the same? Does it make a difference whether the health care expenditures are "voluntary" (e.g., face lift) or "necessary" (e.g., heart bypass surgery)? Can the government tell which is which?

The following example illustrates the difficulty of even defining the meaning of equal treatment. Assume we could agree that a man and a woman who had received the same income over their working lives should be treated equally for purposes of Social Security. Should the total expected benefits be the same for the man as for the woman, or should the annual benefit be the same? On average, women live significantly longer than men, so these two rules give different results. If the woman receives the same annual benefit as the man (as is the case at present), the total expected value of her benefits will be much greater than the man's. Many would view this to be unfair.

VERTICAL EQUITY While the principle of horizontal equity says that individuals who are essentially identical should be treated the same, the principle of **vertical equity** says that some individuals are in a position to pay higher taxes than others, and that these individuals should do so.

There are three problems: (1) determining who, in principle, should pay at the higher rate; (2) implementing this principle—that is, writing tax rules corresponding to this principle; and (3) deciding, if someone is in a position to pay the higher rate, how much more that individual should pay than others.

INCOME AS A BASIS OF TAXATION Income is the most widely used basis of taxation; it is widely viewed by governments and policy makers as a good measure of ability to pay. Those who have a higher income have greater ability to pay and should therefore pay higher taxes. How much more is, as we have said, a more difficult question. There is a widely held view that those with a higher income not only should pay more taxes, but should also pay a higher fraction of their income in taxes—that is, taxes should be progressive. Note, however, that the rich can pay a smaller fraction of their income in taxes—taxes can be regressive—but still pay more in absolute terms.

Until the twentieth century, governments relied on indirect taxes—tariffs and customs duties and taxes on certain luxuries—to raise revenues. It was only when governments took on a wider role, with a greater need for income, they resorted to broad-based taxes, especially the income tax. In addition, the income tax seemed able to introduce a high degree of progressivity and to avoid the distortions associated with having a large number of taxes on different commodities. Today, in much of the world, the income tax has become a less important source of revenue. It has been replaced, or supplemented, by the value-added tax, which is designed to tax only consumption, not savings or investment, and which is typically not progressive.[5]

There is a further concern about taxing only consumption, even if one could impose a progressive consumption tax: much of consumption, especially of the very rich, would likely escape taxation, for instance, if the consumption occurs abroad.

CONSUMPTION AS A BASIS OF TAXATION One of the most forceful arguments against income as a fair basis of taxation is that income corresponds to the individual's contribution to society—the value of his or her economic output. Is it not fairer to tax individuals on the basis of what they take out of society rather than what they contribute—that is, on the basis of consumption, rather than income?

[5] Sometimes countries introduce some degree of progressivity by exempting, or taxing at lower rates, food and other commodities that play a larger role in the expenditure patterns of the poor; at the same time, some expenditures like foreign travel, which loom larger in the expenditures of the rich, escape taxation as well.

Income and consumption differ by savings.[6] That is, income (Y) is either consumed (C) or saved (S):

$$C + S = Y, \quad \text{or}$$
$$C = Y - S.$$

Thus, a major issue is whether savings ought to be exempt from taxation. It can be shown that this is equivalent to the question of whether the return to savings (interest, dividends, and capital gains) ought to be exempt from taxation. The following example illustrates again the conflicting views of equity.

Consider another pair of identical twins, to whom we shall refer as Prudence and Imprudence. They both earn the same wages during their lifetimes. Prudence, however, saves 20 percent of her wages during her lifetime, accumulating a sizable nest egg for her retirement. Imprudence, on the other hand, always spends what she receives and, when she reaches retirement, applies for welfare. Under the present tax system, Prudence pays considerably higher taxes than Imprudence (because Prudence must pay taxes on the interest that she earns on her savings), while she receives fewer government benefits.

Prudence views the present tax system as unfair, as their economic opportunity sets were, in fact, identical. Because their opportunity sets were identical, she believes they really have the same ability to pay, and should pay the same taxes. She asks, "Should the government force me to be my sister's keeper, if my sister does not choose to help herself?" Is it fair to punish Prudence with additional taxation and reward her high-living sister? Her sister replies that the past makes no difference: as they approach retirement, their incomes differ. The fact is that Prudence's income is considerably in excess of Imprudence's and Prudence is therefore better able to pay for the support of the government (and her sister).

LIFETIME INCOME AS THE BASIS OF TAXATION The contrast between consumption and income as a basis of taxation may not be as stark as it has sometimes been portrayed. The real issue may be the appropriate time unit to use as the basis of taxation. Under a view that is growing in support, the appropriate basis of taxation should be lifetime income, not income in one year. Lifetime income is defined as the *present discounted value* of the individual's wage income.

Recall from Chapter 11 the discussion of the problem of adding up the benefits (and costs) of a project that occurred at different dates. We argued there that \$1.00 in the next period was worth less than \$1.00 in this period. If we receive \$1.00 in this period, we could put it in the bank, and have $(1 + r)$ dollars in the next period, where r is the rate of interest. If r is 10 percent, we would have \$1.10 in the next period. Thus, we should be indifferent between receiving \$1.00 today or \$1.10 in the next period. We say that the present discounted value of \$1.10 in the next period is \$1.00. That is, we discount future receipts because they are less valuable. If an individual lives for two periods, and receives a wage of w_0 in the first period and w_1 in the second, the present discounted value of his or her income, Y^*, is

$$Y^* = w_0 + \frac{w_1}{1 + r}.$$

Of course, the present discounted value of an individual's consumption over his or her lifetime must be equal to the present discounted value of his or her income (ignoring inheritance and bequests). That is, if c_0 is the individual's consumption in the first period, and c_1 is the consumption in the second,[7]

$$Y^* = c_0 + \frac{c_1}{1 + r}.$$

It thus becomes clear that if we believe that the correct basis of taxation is the individual's lifetime income, this is equivalent to believing that the correct basis of taxation is the individual's lifetime consumption.[8]

To say that taxes should be based on lifetime income or consumption means that if two individuals have the same lifetime income or consumption, then they should pay the same (present discounted value of) tax, regardless of the pattern of that income or consumption over their lifetime. *When* they pay that tax depends on how the tax is implemented.[9]

[6] And by bequests and inheritances, which we could view as special forms of consumption and income.

[7] To confirm this, assume that the individual consumed an amount that is less than his or her wage income in the first period. This individual's savings would then be $(w_0 - c_0)$. In the next period, the individual would have his or her wage income plus savings to consume, that is,

$$c_1 = w_1 + (w_0 - c_0)(1 + r).$$

We can rearrange terms to write

$$c_1 + c_0(1 + r) = w_1 + w_0(1 + r).$$

Divide by $(1 + r)$ to obtain the desired result.

[8] There are a couple of qualifications to this analysis. First, with bequests and inheritances, the present discounted value of an individual's consumption may either exceed or be less than his or her lifetime income. Although, for most individuals, bequests and inheritances are relatively small—and thus could safely be ignored—for the very rich, they loom large. How they "should be" and are treated is discussed in Chapter 21.

This analysis also ignores uncertainty. Whereas by definition—ignoring bequests and inheritances—lifetime income equals lifetime consumption, an individual who faces larger uninsured risks, say, associated with a variable wage, is likely to be worse off than an individual with the same expected income but facing no risk; yet, under the consumption (or lifetime income) tax, they both pay the same taxes to the government. Is this fair? Is there any "fair" way to reflect such risks in the design of taxation? This issue has not received much attention so far.

[9] This is most easily seen in the case of proportional taxation. The tax can be imposed on wages, in which case it is paid as individuals earn their wage income, or on consumption, in which case it is paid as individuals consume goods.

The analysis has ignored the problems that arise if there is an imperfect capital market, such that there is no single interest rate at which individuals can borrow or lend.

Note the one, strong implication of using lifetime income as a basis of taxation: interest income should be exempt from taxation. A consumption tax is equivalent to a lifetime income tax, which in turn is equivalent to a tax on wages alone. Although many see the first two as plausible bases for taxes, they find the third hard to accept—even after they see its equivalence to the others. Why should those who earn interest income be exempt from taxation?[10]

CRITICISMS OF INCOME AS A BASIS OF TAXATION Some have criticized the use of income as a basis for taxation, believing that neither income—lifetime or annual—nor consumption provides a fair basis of taxation. Their reasoning is illustrated by the following example. Consider Joe Smith and his twin brother, Jim, who have identical abilities and education. Joe decides to take a job as a high school teacher of economics. He teaches six hours a day and the rest of the time he spends fishing, swimming, and sailing. He is very happy. Not surprisingly, his pay is very low. Jim becomes an economic consultant. He works seventy hours a week and has no time for fishing, swimming, or sailing. Their economic opportunity sets—what they could have done—are identical (i.e., Jim and Joe have the same earning ability), yet they have made different choices. One has a high income, one a low income. Is it fair that Jim should pay far higher taxes than Joe? Joe believes that it is not economic opportunities that provide the fair basis of taxation, but the extent to which individuals have seized advantage of whatever opportunities society has offered—in short, actual income provides the appropriate basis of taxation. Jim believes that it is not actual income that should be relevant, but earning ability.

The problem is that even if one accepted Jim's argument, the government has no way of accurately assessing the individual's opportunity set. Wage rates may provide a better indicator than income, but even wages are affected by individuals' choices (e.g., how hard to work or whether to accept a high-risk job). Moreover, in many jobs, wages are hard to measure and even harder to verify. We may know how much income an individual gets paid, but it is often difficult to know how many hours he or she has worked, especially in jobs where individuals do not punch a clock.

In practice, then, governments use income or consumption as the basis of taxation, even if they are flawed measures either of ability to pay or of an individual's well-being.

[10] We said that the equivalence held only if there are no inheritances (note 8). One might argue that interest received on inherited capital should receive different treatment. In fact, under current U.S. law, the return on a large fraction of an individual's savings over his or her lifetime—retirement savings, as well as investments in housing—are not taxed.

THE BENEFIT APPROACH We noted earlier that one argument for the use of consumption as the appropriate basis for taxation is that it seems fairer to tax individuals on the basis of what they take out of the economic system. Some economists have gone further and argued that individuals should contribute to the support of the government in proportion to the benefit they receive from public services. The principles of charging for public services should be analogous to those used for private services—and taxes can be viewed as simply the "charge" for the provision of public services.

In a few cases, the **benefit approach** is explicitly adopted: fees (taxes) are charged for the use of bridges and some toll roads. Financing roads with gasoline taxes can be thought of as a simple mechanism for relating benefits (road usage, as measured by gasoline consumption) to taxes.

For the most part, economists have not been attracted to the benefit approach to taxation, largely because it is impossible to identify the magnitude of the benefits received by different individuals. We all receive some benefit from defense expenditures, but how are the relative benefits to be apportioned among different individuals? For many categories of expenditures, assessment of benefits is essentially impossible. A second objection raised against benefit taxes when they are related to usage is that they are distortionary. Basing taxes on usage of a public facility (such as a bridge) may discourage its use and thus lead to an inefficient allocation of resources.

There are often equity–efficiency trade-offs involved in levying benefit taxes (when it is possible to do so). In the absence of benefit taxes, it is impossible to make those who benefit from a public facility such as a bridge bear the cost; if the bridge is financed out of general revenues, those who do not use the bridge (but contribute to it through taxes) are made worse off. It seems unfair to them that they should subsidize those who use the bridge.

ALTERNATIVE BASES OF TAXATION The principle of vertical equity says that those who are better off or have a greater ability to pay ought to contribute more to support the government than those less well off. The principle of horizontal equity says that those who are equally well off (who have equal ability to pay) should all contribute the same amount. Our discussion of both principles has focused on the difficulties of determining whether one individual is better off than another, or of determining whether one individual has a greater ability to pay than another. How should we adjust for the myriad differences in circumstances facing different individuals?

In each of the three following examples, present tax laws make some adjustments for differences in circumstances; there is, however, some controversy about whether the adjustments are appropriate.

The first example has to do with health. Clearly, an individual who is sick and has an income of $10,000 is different from an individual who is well and has the same income. Most of us would say that the individual who is sick is worse off (other things being equal) than the one who is well. Being sick or well, though, is not always readily observable. Accordingly, it is difficult for the tax code to make adjustments for health status. There is a surrogate, though: medical expenditures. Those who spend more on hospital bills are, on average, worse off than those who have no hospital bills. The current tax law does allow for the deduction of medical expenses in excess of 10 percent of the individual's income.

The second example has to do with marriage. Individuals who are married differ from those who are not. Surveys by sociologists indicate that married men, for instance, are happier than unmarried men. Whether or not much credence should be placed in such evidence, the fact is that married men do live longer and are, on average, in better health. This would suggest that a married man with a given income is better off than an unmarried man with the same income. Does the principle of vertical equity imply that the married man should pay higher taxes? The present tax structure does discriminate against married individuals when the husband and the wife have similar incomes (though probably not for the reasons just given), whereas marriage may reduce the taxes of a man and woman who have very different incomes.

The third example has to do with the tax treatment of children. Consider two married couples with identical incomes. Both couples would like to have two children. One of the couples is infertile, while the other is blessed with two children. Clearly, the couple with the two children is better off than the infertile couple. Even taking account of the extra costs of raising children, the fertile couple would not change places with the other. The principle that those who are better off should pay more taxes would suggest that this couple should pay more taxes;

FAIRNESS

Horizontal equity: Individuals who are identical (or in essentially similar economic circumstances) should be treated the same, and pay the same taxes.

Key question: What differences are relevant?

Vertical equity: Individuals who have greater ability to pay or who are better off or receive greater benefits from government services should pay more taxes.

Key questions:

What should be the basis of taxation?

How is "ability to pay" or "benefits received" or "economic welfare" to be measured?

How much more should those considered better off pay?

- Income is most often used as a basis of taxation, but it is an indirect and imperfect measure of both ability to pay and economic well-being.
- Consumption may be "fairer"—it measures what one takes out of society rather than what one contributes.
- Lifetime consumption is equivalent to lifetime income. Lifetime income is a fairer basis than annual income (a better measure of overall ability to pay, or welfare).
- Lifetime consumption/income is a flawed measure of ability to pay: it unfairly disadvantages individuals who choose to work hard rather than enjoy leisure, and it is not a real measure of one's opportunity set.
- Benefit taxation is hindered by difficulties of measuring benefits, especially for pure public goods.
- What are fair adjustments to income as the basis of taxation, taking into account differences in health, marital status, children?

CORRUPTION-RESISTANT TAX SYSTEMS

We have described several of the key criteria for evaluating alternative tax systems. In many developing countries trying to create an effective tax system, there is something else that is of concern: corruption.

This takes many forms. Government officials can be bribed, for instance, to categorize an imported good as belonging to a lower-taxed category, or to overlook certain income. Tax authorities can use their power to extort money from taxpayers, saying that unless they get a payoff they will claim that taxpayers have a higher income (perhaps even more than they really do). In the United States, corruption typically does not take the form of passing money in plain brown envelopes. It occurs in the legislative process, as lawmakers receive large campaign contributions in return for special legislation—SUVs may be treated as trucks, not cars; racetracks may get special benefits.

In recent years, economists have asked: Are there some tax systems that are more corruption resistant? Are there some that are more corruption prone?

A tax system that makes multiple distinctions—for instance, with different categories of goods (cars versus trucks) being treated differently—is more prone to corruption. A tax system in which the things being taxed are more easily observable, and verifiable by a third party, are more corruption resistant. A tax per car produced is more corruption resistant than a tax on the value of the car, since it is easy to count the number of cars produced but hard to check on the value of the car. Because most cars are purchased with a loan, the car company could sell the car at a cheaper price, but make up the difference with higher profits on the loan. Tax authorities must make judgments on whether there is cheating going on, and that opens up the door for corruption, which can take the form of campaign contributions to get the rules written in the right way. Tax rates are also important: a 50 percent tax on income or a 25 percent tax on sales increases the incentive to cheat—the gains might be worth the risk.

As these examples illustrate, there are often trade-offs. Complex, opaque tax systems that give tax officials considerable discretion and have high tax rates are incubators of corruption. Simple, transparent, rules-based tax systems with low tax rates are more corruption resistant, but may fall short on other objectives listed in the text.

Moreover, how tax laws are enforced can also affect the extent of corruption. Frequent rotation of tax agents from one task to another and one location to another makes it more difficult to form close links between particular taxpayers and particular government officials, so this has proven to be an effective tool for reducing corruption. The use of computer systems and related information technology makes it easier to monitor the behavior of taxpayers and tax officials and spot malfeasance. Requiring taxpayers to use the banking system to make their tax payments is another way to make a tax system more corruption resistant, as it prevents tax officials from handling cash payments from taxpayers. Adequate compensation for tax officials is a third antidote for corruption—it can help to limit systemic petty graft because tax officials are not compelled to supplement their income to support their families. However, the most powerful tax administration medicine for making a tax system corruption resistant is to offer taxpayers a balanced combination of a simple tax system well administered, so that it is easy to do the right thing, and a credible threat of sanctions if they do not comply with tax laws.

in fact, the tax law results in the couple with children paying lower taxes. The law seemingly looks not at their "well-being" but at their ability to pay, and recognizes that, having had the children, they face additional expenses that make them less able to pay taxes.

The analysis so far has shown that although the principles of vertical and horizontal equity seem, at first, to provide "reasonable" bases for designing a fair tax system, they are, in fact, of only limited help. The difficult questions are left unanswered: How can we tell which of two individuals is better off or which has a greater ability to pay? What do we mean by equality of treatment? Furthermore, the principle of vertical equity does not tell us how much more someone who is better off should contribute to the support of the government; all it tells us is that he or she should pay more.

Because of these difficulties, economists have looked for other principles by which to choose among alternative tax systems.

GENERAL FRAMEWORK FOR CHOOSING AMONG TAX SYSTEMS

The concerns of equity and efficiency that we have raised about different bases of taxation may be integrated into a general framework—essentially an application of standard welfare economics. We first look at efficiency (taking into account both the distortions and the resources used to implement a tax, the administrative and compliance costs). We identify **Pareto efficient tax systems**—tax structures such that, given the tools and information available to the government, no one can be made better off without making someone else worse off. Then we choose among the possible Pareto efficient tax structures using a social welfare function, which summarizes society's attitudes toward the welfare of different individuals.

The advantage of this approach is that it separates efficiency considerations from value judgments. Almost all would agree that if a tax structure could be found in which everyone was better off (or some better off and no one else worse off), it should be adopted. On the other hand, often none of the alternative tax systems available dominates the others. In one tax system the poor may be better off, the rich worse off; but are the gains to the poor sufficiently large to justify the losses to the rich? The answer depends on value judgments, over which reasonable people may differ.

Recall from Chapter 7 that economists have made use of two special social welfare functions: the utilitarian (social welfare equals the sum of all individuals' utilities) and the Rawlsian (social welfare equals the utility of the worst-off individual). Either social welfare function makes it possible to say not only by how much taxes should increase with income but also, for instance, whether and under what circumstances a deduction for medical expenses should be allowed.[11] We now explore briefly what each of these two social welfare functions implies for tax design.

UTILITARIANISM

Traditionally, utilitarianism was thought to provide a rationale for progressive taxation, the taxation of rich individuals at higher rates than poor individuals. Under utilitarianism, taxes should be such that the marginal utility of income—the loss in utility from taking a dollar away from an individual—should be the same for all individuals.[12] If the marginal utility of income of Jim exceeds that of Joe, reducing Jim's tax by a dollar and increasing Joe's by a dollar increases total utility (social welfare), as the gain in utility to Jim exceeds the loss to Joe. Because taking a dollar away from a rich person causes him or her less loss of welfare than taking a dollar away from a poor person, utilitarianism seemed to provide a basis for progressive taxation.

However, this argument fails to take into account that individuals' income depends on their work (effort), and that raising taxes on those earning higher incomes may lead to a reduction in their work (effort). It is thus possible that raising the tax rate actually reduces the government's tax revenue, or that the marginal utility loss to the individual per dollar raised by the government may be very large. The earlier argument assumed, in other words, that income would not be affected by the imposition of taxes; it is now widely assumed that it generally will be. When it is, utilitarianism requires that we compare the loss in utility from an increase in a tax with the gain in revenue. We require that

$$\frac{\text{change in utility}}{\text{change in revenue}}$$

be the same for all individuals. If some group of individuals has a very elastic labor supply (that is, as tax rates are increased they greatly reduce their labor supply), an increase in the income tax rate on that group will yield relatively little revenue, so they should not be taxed heavily.

[11] To make utilitarianism (or Rawlsianism) operational, one must make additional assumptions, as we noted in Chapter 7. It is conventionally assumed that all individuals have the same utility function—at each level of income, all individuals benefit equally from an extra dollar—and that they exhibit diminishing returns—an extra dollar is worth less at progressively higher levels of income.

[12] Thus, under utilitarianism, taxes are not *directly* related to the benefits one receives from spending financed by the tax, or to the level of economic welfare, but to the *marginal* benefit of a dollar of additional income.