CHAPTER 2

The Economizing Problem

YOU MAKE DECISIONS every day that capture the essence of economics. Suppose you have $40 and are deciding how to spend it. Should you buy a new pair of jeans? Two or three compact discs? A ticket for a concert? ■ Should you forgo work while you are attending college and concentrate solely on your coursework and grades? Is that an option for you, given the high cost of college? If you decide to work, should it be full-time or part-time? Should you work on campus at lower pay or off campus at higher pay? What are the implications of your employment for your course grades? ■ Money and time are both scarce, and making decisions in the context of scarcity always means there are costs. If you choose the jeans, the cost is the forgone CDs or concert. If you work full-time, the cost might be greater stress, poorer performance in your classes, or an extra year or two in college. ■ This chapter examines the fundamentals of economics—scarcity, choices, and costs. We first examine the *economizing problem*, focusing closely on *wants* and *resources*. Next, we develop two economic models: (1) a *production possibilities model* that incorporates and illustrates several key ideas, and (2) a simple *circular flow model* that identifies the major groups of decision makers and major markets in the economy.

The Foundation of Economics

Two fundamental facts together constitute the **economizing problem** and provide a foundation for economics:

- Society's economic wants—that is, the economic wants of its citizens and institutions—are virtually unlimited and insatiable.
- Economic resources—the means of producing goods and services—are limited or scarce.

All that follows depends directly on these two facts.

Unlimited Wants

What do we mean by "economic wants"? We mean, first, the desires of consumers to obtain and use various goods and services that provide **utility**—that is, pleasure or satisfaction. These wants extend over a wide range of products, from *necessities* (food, shelter, clothing) to *luxuries* (perfumes, yachts, race cars).

Some wants—basic food, clothing, and shelter—have biological roots. Other wants—for example, the specific kinds of food, clothing, and shelter we seek—are rooted in the conventions and customs of society.

Over time, wants change and tend to multiply, fueled by new products. Not long ago, we did not want personal computers, Internet service, digital recorders, lattes, or pagers because they simply did not exist. Also, the satisfaction of certain wants tends to trigger others: the acquisition of a Neon or Civic has been known to whet the appetite for a Porsche or a Mercedes.

Services, as well as products, satisfy our wants. Car repair work, the removal of an inflamed appendix, legal and accounting advice, and haircuts all satisfy human wants. Actually, we buy many goods, such as automobiles and washing machines, for the services they render. The differences between goods and services are often smaller than they appear to be.

Businesses and units of government also strive to satisfy economic goals. Businesses want factories, machinery, trucks, warehouses, and phone systems to help them achieve their production goals. Government, reflecting the collective wants of its citizens or goals of its own, seeks highways, schools, and military equipment.

All these wants are *insatiable*, or *unlimited*, meaning that our desires for goods and services cannot be completely satisfied. Our desires for a *particular* good or service can be satisfied; over a short period of time we can surely get enough toothpaste or pasta. And one appendectomy is plenty. But goods *in general* are another story. We do not, and presumably cannot, get enough. Suppose all members of society were asked to list the goods and services they would buy if they had unlimited income. That list would probably never end.

In short, individuals and institutions have innumerable unfilled wants. *The objective of all economic activity is to fulfill wants.* 2.1

Scarce Resources

The second fundamental fact is that *economic resources are limited or scarce.* By **economic resources** we mean all natural, human, and manufactured resources that go into the production of goods and services. That includes all the factory and farm buildings and all the equipment, tools, and machinery used to produce manufactured goods and agricultural products; all transportation and communication facilities; all types of labor; and land and mineral resources. Economists classify all these resources as either *property* resources—land, raw materials, and capital—or *human* resources—labor and entrepreneurial ability.

Resource Categories Let's look at four specific categories of economic resources.

Land **Land** means much more to the economist than it does to most people. To the economist land includes all natural resources—all "gifts of nature"—that are used in the production process, such as arable land, forests, mineral and oil deposits, and water resources.

Capital **Capital** (or *capital goods* or *investment goods*) includes all manufactured aids used in producing consumer goods and services—that is, all tools, machinery, equipment, factory, storage, transportation, and distribution facilities. The process of producing and purchasing capital goods is known as **investment.**

Capital goods differ from *consumer goods* in that consumer goods satisfy wants directly, while capital goods do so indirectly by aiding the production of consumer goods. Note that the term "capital" as used by economists refers *not* to money but to *real capital*—tools, machinery, and other productive equipment. Money produces nothing; it is *not* an economic resource. So-called money capital or financial capital is simply a means for purchasing real capital.

Labor **Labor** is a broad term for all the physical and mental talents of individuals available and usable in producing goods and services. The services of a logger, retail clerk, machinist, teacher, professional football player, and nuclear physicist all fall under the general heading "labor."

Entrepreneurial Ability Finally, there is the special human resource, distinct from labor, that we label **entrepreneurial ability.** The entrepreneur performs several functions:

- The entrepreneur *takes the initiative* in combining the resources of land, capital, and labor to produce a good or a service. Both a sparkplug and a catalyst, the entrepreneur is the driving force behind production and the agent who combines the other resources in what is hoped will be a successful business venture.
- The entrepreneur *makes basic business-policy decisions*—that is, the nonroutine decisions that set the course of a business enterprise.

- The entrepreneur is an *innovator*—the one who commercializes new products, new production techniques, or even new forms of business organization.
- The entrepreneur is a *risk bearer.* The entrepreneur in a market system has no guarantee of profit. The reward for the entrepreneur's time, efforts, and abilities may be profits *or* losses. The entrepreneur risks not only his or her invested funds but those of associates and stockholders as well.

Because these four resources—land, labor, capital, and entrepreneurial ability—are combined to *produce* goods and services, they are called the **factors of production.**

Resource Payments The income received from supplying raw materials and capital equipment (the property resources) is called *rental income* and *interest income*, respectively. The income accruing to those who supply labor is called *wages*, which include salaries and all wage and salary supplements such as bonuses, commissions, and royalties. Entrepreneurial income is called *profits*, which may be negative—that is, losses.

Relative Scarcity The four types of economic resources, or factors of production, or *inputs*, have one significant characteristic in common: *They are scarce or limited in supply.* Our planet contains only finite, and therefore limited, amounts of arable land, mineral deposits, capital equipment, and labor. Their scarcity constrains productive activity and output. In the United States, one of the most affluent nations, output per person was limited to roughly $34,000 in 2000. In the poorest nations, annual output per person may be as low as $300 or $400.

Economics: Employment and Efficiency

The economizing problem is at the heart of the definition of economics stated in Chapter 1: *Economics is the social science concerned with the problem of using scarce resources to attain the maximum fulfillment of society's unlimited wants.* Economics is concerned with "doing the best with what we have."

Economics is thus the social science that examines efficiency—the best use of scarce resources. Society wants to use its limited resources efficiently; it desires to produce as many goods and services as possible from its available resources, thereby maximizing total satisfaction.

Full Employment: Using Available Resources

To realize the best use of scarce resources, a society must achieve both full employment and full production. By **full employment** we mean the use of all available resources. No workers should be out of work if they are willing and able to work. Nor should capital equipment or arable land sit idle. But note that we say all *available* resources should be employed. Each society has certain customs and practices that determine what resources are available for employment and what resources are not. For example, in most countries legislation and custom provide that children and the very aged should not be employed. Similarly, to maintain productivity, farmland should be allowed to lie fallow periodically. And we should conserve some resources—fishing stocks and forest, for instance—for use by future generations.

Full Production: Using Resources Efficiently

The employment of all available resources is not enough to achieve efficiency, however. Full production must also be realized. By **full production** we mean that all employed resources should be used so that they provide the maximum possible satisfaction of our material wants. If we fail to realize full production, economists say our resources are *underemployed.*

Full production implies two kinds of efficiency—productive and allocative efficiency. **Productive efficiency** is the production of *any particular mix of goods and services in the least costly way.* When we produce, say, compact discs at the lowest achievable unit cost, we are expending the smallest amount of resources to produce CDs and are therefore making available the largest amount of resources to produce other desired products. Suppose society has only $100 worth of resources available. If we can produce a CD for only $5 of those resources, then $95 will be available to produce other goods. This is clearly better than producing the CD for $10 and having only $90 of resources available for alternative uses.

In contrast, **allocative efficiency** is the production of *that particular mix of goods and services most wanted by society.* For example, society wants resources allocated to compact discs, not to 45-rpm records. We want personal computers (PCs), not manual typewriters. Furthermore, we do not want to devote *all* our resources to producing CDs and PCs; we want to assign some of them to producing automobiles

and office buildings. Allocative efficiency requires that an economy produce the "right" mix of goods and services, with each item being produced at the lowest-possible unit cost. This means apportioning limited resources among firms and industries in such a way that society obtains the combination of goods and services it wants the most. **(Key Question 5)**

QUICK REVIEW 2.1

- People's economic wants are virtually unlimited.
- Economic resources—land, capital, labor, and entrepreneurial ability—are scarce.
- Economics is concerned with the efficient allocation of scarce resources to achieve the maximum fulfillment of society's economic wants.
- Economic efficiency embodies full employment and full production.
- Full production requires both productive and allocative efficiency.

Production Possibilities Table

Because resources are scarce, a full-employment, full-production economy cannot have an unlimited output of goods and services. Consequently, people must choose which goods and services to produce and which to forgo. The necessity and consequences of those choices can best be understood through a *production possibilities model.* We examine the model first as a table and then as a graph.

Assumptions

We begin our discussion of the production possibilities model with simplifying assumptions:

- ***Full employment and productive efficiency*** The economy is employing all its available resources (full employment) and is producing goods and services at least cost (productive efficiency).
- ***Fixed resources*** The available supplies of the factors of production are fixed in both quantity and quality. Nevertheless, they can be reallocated, within limits, among different uses; for example, land can be used either for factory sites or for food production.
- ***Fixed technology*** The state of technology—the methods used to produce output—does not change during our analysis. This assumption and the previous one imply that we are looking at an economy at a certain point in time or over a very short period of time.
- ***Two goods*** The economy is producing only two goods: pizzas and industrial robots. Pizzas symbolize **consumer goods,** products that satisfy our wants *directly;* industrial robots symbolize **capital goods,** products that satisfy our wants *indirectly* by making possible more efficient production of consumer goods.

The Need for Choice

Given our assumptions, we see that society must choose among alternatives. Fixed resources mean limited outputs of pizza and robots. And since all available resources are fully employed, to increase the production of robots we must shift resources away from the production of pizzas. The reverse is also true: To increase the production of pizzas, we must shift resources away from the production of robots. There is no such thing as a free pizza. This, recall, is the essence of the economizing problem.

A **production possibilities table** lists the different combinations of two products that can be produced with a specific set of resources (and with full employment *and* productive efficiency). Table 2.1 is such a table for a pizza-robot economy; the data are, of course, hypothetical. At alternative A, this economy would be devoting all its available resources to the production of robots (capital goods); at alternative E, all resources would go to pizza production (consumer goods). Those alternatives are unrealistic extremes; an economy typically produces both capital goods and consumer goods, as in B, C, and D. As we move from alternative A to E, we increase the production of pizza at the expense of robot production.

Because consumer goods satisfy our wants directly, any movement toward E looks tempting. In producing more pizzas, society increases the current satisfaction of its wants. But there is a cost: more pizzas mean fewer robots. This shift of resources to consumer goods catches up with society over time as the stock of capital goods dwindles—or at least

Table 2.1

Production Possibilities of Pizzas and Robots with Full Employment and Productive Efficiency

	Production Alternatives				
Type of Product	A	B	C	D	E
Pizzas (in hundred thousands)	0	1	2	3	4
Robots (in thousands)	10	9	7	4	0

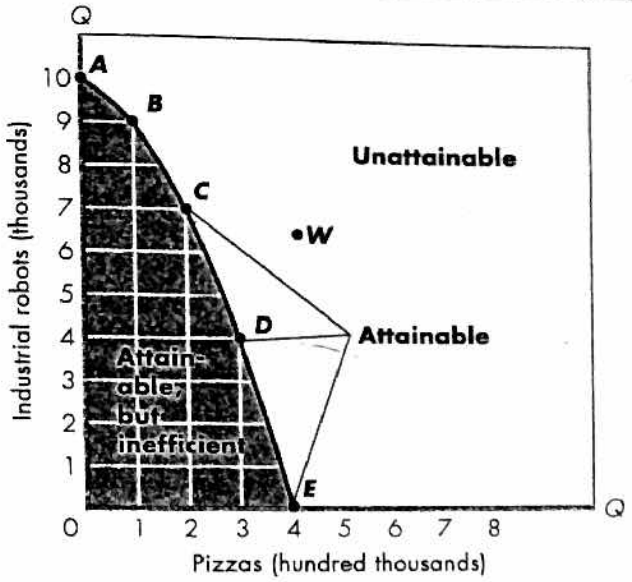


Figure 2.1

The production possibilities curve. Each point on the production possibilities curve represents some maximum combination of two products that can be produced if full employment and full production are achieved. When operating on the curve, more robots means fewer pizzas, and vice versa. Limited resources and a fixed technology make any combination of robots and pizzas lying outside the curve (such as at W) unattainable. Points inside the curve are attainable, but they indicate that full employment and productive efficiency are not being realized.

Quick Quiz 2.1

1. Production possibilities curve *ABCDE* is bowed out from the origin (concave to the origin) because:
- *a.* the marginal benefit of pizzas declines as more pizzas are consumed.
- *b.* the curve gets steeper as we move from *E* to *A*.
- *c.* it reflects the law of increasing opportunity costs.
- *d.* resources are scarce.

2. The marginal opportunity cost of the second unit of pizza is:
- *a.* 2 units of robots.
- *b.* 3 units of robots.
- *c.* 7 units of robots.
- *d.* 9 units of robots.

3. The total opportunity cost of 7 units of robots is:
- *a.* 1 unit of pizza.
- *b.* 2 units of pizza.
- *c.* 3 units of pizza.
- *d.* 4 units of pizza.

4. All points on this production possibilities curve necessarily represent:
- *a.* allocative efficiency.
- *b.* less than full use of resources.
- *c.* unattainable levels of output.
- *d.* productive efficiency.

Answers: 1. c; 2. a; 3. b; 4. d

ceases to expand at the current rate—with the result that some potential for greater future production is lost. By moving toward alternative E, society chooses "more now" at the expense of "much more later."

By moving toward A, society chooses to forgo current consumption, thereby freeing up resources that can be used to increase the production of capital goods. By building up its stock of capital this way, society will have greater future production and, therefore, greater future consumption. By moving toward A, society is choosing "more later" at the cost of "less now."

Generalization: *At any point in time, an economy achieving full employment and productive efficiency must sacrifice some of one good to obtain more of another good. Scarce resources prohibit such an economy from having more of both goods.*

Production Possibilities Curve

The data presented in a production possibilities table can also be shown graphically. We use a simple two-dimensional graph, arbitrarily representing the output of capital goods (here, robots) on the vertical axis and the output of consumer goods (here, pizzas) on the horizontal axis, as shown in **Figure 2.1 (Key Graph).** Following the procedure given in the appendix to Chapter 1, we can graph a **production possibilities curve.** ☑ 2.1

Each point on the production possibilities curve represents some maximum output of the two products. The curve is a production *frontier* because it shows the limit of attainable outputs. To obtain the various combinations of pizza and robots that fall *on* the production possibilities curve, society must achieve both full employment and productive efficiency. Points lying *inside* (to the left of) the curve are also attainable, but they reflect inefficiency and therefore are not as desirable as points on the curve. Points inside the curve imply that the economy could have more of both robots and pizzas if it achieved full employment and productive efficiency. Points lying *outside* (to the right of) the production possibilities curve, like point *W*, would represent a greater output than the output at any point on the curve. Such points, however, are unattainable with the current supplies of resources and technology.

Law of Increasing Opportunity Cost

Because resources are scarce relative to the virtually unlimited wants they can be used to satisfy, people must choose among alternatives. More pizzas mean fewer robots. The amount of other products that must be forgone or sacrificed to obtain 1 unit of a specific good is called the **opportunity cost** of that good. In our case, the number of robots that must be given up to get another unit of pizza is the *opportunity cost*, or simply the *cost*, of that unit of pizza. 2.2 2.1

In moving from alternative A to alternative B in Table 2.1, we find that the cost of 1 additional unit of pizza is 1 less unit of robots. But as we pursue the concept of cost through the additional production possibilities—B to C, C to D, and D to E—an important economic principle is revealed: The opportunity cost of each additional unit of pizza is greater than the opportunity cost of the preceding one. When we move from A to B, just 1 unit of robots is sacrificed for 1 more unit of pizza; but in going from B to C we sacrifice 2 additional units of robots for 1 more unit of pizza; then 3 more of robots for 1 more of pizza; and finally 4 for 1. Conversely, confirm that as we move from E to A, the cost of an additional robot is $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, and 1 unit of pizza, respectively, for the four successive moves.

Note these points about these opportunity costs:

- Here opportunity costs are being measured in *real* terms, that is, in actual goods rather than in money terms.
- We are discussing *marginal* (meaning "extra") opportunity costs, rather than cumulative or total opportunity costs. For example, the marginal opportunity cost of the third unit of pizza in Table 2.1 is 3 units of robots (=7 − 4). But the *total* opportunity cost of 3 units of pizza is 6 units of robots (=1 unit of robots for the first unit of pizza *plus* 2 units of robots for the second unit of pizza *plus* 3 units of robots for the third unit of pizza).

Our example illustrates the **law of increasing opportunity costs:** The more of a product that is produced, the greater is its opportunity cost ("marginal" being implied).

Shape of the Curve

The law of increasing opportunity costs is reflected in the shape of the production possibilities curve: The curve is bowed out from the origin of the graph. Figure 2.1 shows that when the economy moves from *A* to *E*, it must give up successively larger amounts of robots (1, 2, 3, and 4) to acquire equal increments of pizza (1, 1, 1, and 1). This is shown in the slope of the production possibilities curve, which becomes steeper as we move from *A* to *E*. A curve that gets steeper as we move down it is "concave to the origin."

Economic Rationale

What is the economic rationale for the law of increasing opportunity costs? Why does the sacrifice of robots increase as we produce more pizzas? The answer is that *economic resources are not completely adaptable to alternative uses.* Many resources are better at producing one good than at producing others. Fertile farmland is highly suited to producing the ingredients needed to make pizzas, while land rich in mineral deposits is highly suited to producing the materials needed to make robots. As we step up pizza production, resources that are less and less adaptable to making pizzas must be "pushed" into pizza production. If we start at *A* and move to *B*, we can shift the resources whose productivity of pizzas is greatest in relation to their productivity of robots. But as we move from *B* to *C*, *C* to *D*, and so on, resources highly productive of pizzas become increasingly scarce. To get more pizzas, resources whose productivity of robots is great in relation to their productivity of pizzas will be needed. It will take more and more of such resources, and hence greater sacrifices of robots, to achieve each increase of 1 unit in the production of pizzas. This lack of perfect flexibility, or interchangeability, on the part of resources is the cause of increasing opportunity costs. **(Key Question 6)**

Allocative Efficiency Revisited

So far, we have assumed full employment and productive efficiency, both of which are necessary to realize *any point* on an economy's production possibilities curve. We now turn to allocative efficiency, which requires that the economy produce at the most valued, or *optimal*, point on the production possibilities curve. Of all the attainable combinations of pizzas and robots on the curve in Figure 2.1, which is best? That is, what specific quantities of resources should be allocated to pizzas and what specific quantities to robots in order to maximize satisfaction?

Our discussion of the *economic perspective* in Chapter 1 puts us on the right track. Recall that economic decisions center on comparisons of marginal benefits and marginal costs. Any economic activity—for example, production or consumption—should be expanded as long as marginal benefit exceeds marginal cost and should be reduced if marginal cost exceeds marginal benefit. The optimal amount of the activity occurs where MB = MC.

Consider pizzas. We already know from the law of increasing opportunity costs that the marginal cost (MC) of additional units of pizzas will rise as more units are produced. This can be shown by an upsloping MC curve, as in Figure 2.2. We also know that we obtain extra or marginal benefits (MB) from additional units of pizzas. However, although material wants in the aggregate are insatiable, studies reveal that the second unit of a particular product yields less additional utility or benefit to a person than the first. And a third provides even less MB than the second. So it is for society as a whole. We therefore can portray the marginal benefits from pizzas with a downsloping MB curve, as in Figure 2.2. Although total benefits rise when society consumes more pizza, marginal benefits decline.

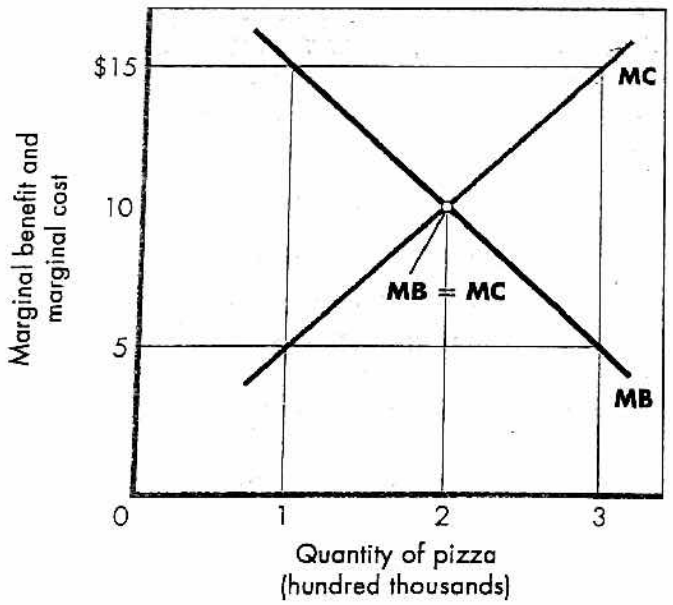


Figure 2.2

Allocative efficiency: MB = MC. Allocative efficiency requires the expansion of a good's output until its marginal benefit (MB) and marginal cost (MC) are equal. No resources beyond that point should get allocated to the product. Here, allocative efficiency occurs when 200,000 pizzas are produced.

The optimal quantity of pizza production is indicated by the intersection of the MB and MC curves: 200,000 units in Figure 2.2. Why is this the optimal quantity? If only 100,000 pizzas were produced, the marginal benefit of pizza would exceed its marginal cost. In money terms, MB might be $15, while MC is only $5. This suggests that society would be *underallocating* resources to pizza production and that more of it should be produced.

How do we know? Because society values an additional pizza as being worth $15, while the alternative products that those resources could produce are worth only $5. Society benefits—it is better off in the sense of having a higher-valued output to enjoy—whenever it can gain something worth $15 by forgoing something worth only $5. Society would use its resources more efficiently by allocating more resources to pizza. Each additional pizza up to 200,000 would provide such a gain, indicating that allocative efficiency would be improved by that production. But when MB = MC, the benefits of producing pizzas or alternative products with the available resources are equal. Allocative efficiency is achieved where MB = MC.

The production of 300,000 pizzas would represent an *overallocation* of resources to pizza production. Here the MC of pizza is $15 and its MB is only $5. This means that 1 unit of pizza is worth only $5 to society, while the alternative products that those resources could otherwise produce are valued at $15. By producing 1 less unit, society loses a pizza worth $5. But by reallocating the freed resources, it gains other products worth $15. When society gains something worth $15 by forgoing something worth only $5, it is better off. In Figure 2.2, such net gains can be realized until pizza production has been reduced to 200,000.

Generalization: *Resources are being efficiently allocated to any product when the marginal benefit and marginal cost of its output are equal (MB = MC).* Suppose that by applying the above analysis to robots, we find

their optimal (MB = MC) output is 7000. This would mean that alternative *C* on our production possibilities curve—200,000 pizzas and 7000 robots—would result in allocative efficiency for our hypothetical economy. **(Key Question 9)**

QUICK REVIEW 2.2

- The production possibilities curve illustrates four concepts: (a) *scarcity* of resources is implied by the area of unattainable combinations of output lying outside the production possibilities curve; (b) *choice* among outputs is reflected in the variety of attainable combinations of goods lying along the curve; (c) *opportunity cost* is illustrated by the downward slope of the curve; (d) the law of *increasing opportunity costs* is implied by the concavity of the curve.
- Full employment and productive efficiency must be realized in order for the economy to operate on its production possibilities curve.
- A comparison of marginal benefits and marginal costs is needed to determine allocative efficiency—the best or optimal output mix on the curve.

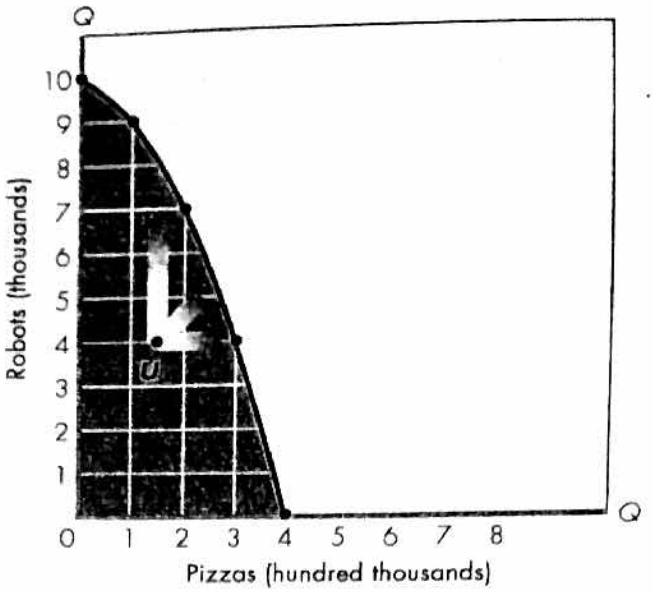


Figure 2.3

Unemployment, productive inefficiency, and the production possibilities curve. Any point inside the production possibilities curve, such as *U*, represents unemployment or a failure to achieve productive efficiency. The arrows indicate that, by realizing full employment and productive efficiency, the economy could operate on the curve. This means it could produce more of one or both products than it is producing at point *U*.

Unemployment, Growth, and the Future

Let's now discard the first three assumptions underlying the production possibilities curve and see what happens.

Unemployment and Productive Inefficiency

The first assumption was that our economy was achieving full employment and productive efficiency. Our analysis and conclusions change if some resources are idle (unemployment) or if least-cost production is not realized. The five alternatives in Table 2.1 represent maximum outputs; they illustrate the combinations of robots and pizzas that can be produced when the economy is operating at full capacity—with full employment and productive efficiency. With unemployment or inefficient production, the economy would produce less than each alternative shown in the table.

Graphically, we represent situations of unemployment or productive inefficiency by points *inside* the original production possibilities curve (reproduced in Figure 2.3). Point *U* is one such point. Here the economy is falling short of the various maximum combinations of pizzas and robots represented by the points *on* the production possibilities curve. The arrows in Figure 2.3 indicate three possible paths back to full-employment and least-cost production. A move toward full employment and productive efficiency would yield a greater output of one or both products.

A Growing Economy

When we drop the assumption that the quantity and quality of resources and technology are fixed, the production possibilities curve shifts positions—that is, the potential maximum output of the economy changes.

Increases in Resource Supplies Although resource supplies are fixed at any specific moment, they can and do change over time. For example, a nation's growing population will bring about increases in the supplies of labor and entrepreneurial ability. Also, labor quality usually improves over time. Historically, the economy's stock of capital has increased at a significant, though unsteady, rate. And although we are depleting some of our energy and mineral resources, new sources are being discovered.

The development of irrigation programs, for example, adds to the supply of arable land.

The net result of these increased supplies of the factors of production is the ability to produce more of both pizzas and robots. Thus 20 years from now, the production possibilities in Table 2.2 may supersede those shown in Table 2.1. The greater abundance of resources will result in a greater potential output of one or both products at each alternative. Society will have achieved economic growth in the form of expanded potential output.

But such a favorable change in the production possibilities data does not *guarantee* that the economy will actually operate at a point on its new production possibilities curve. Some 135 million jobs will give the United States full employment now, but 10 or 20 years from now its labor force will be larger, and 135 million jobs will not be sufficient for full employment. The production possibilities curve may shift, but at the future date the economy may fail to produce at a point on that new curve.

Advances in Technology Our second assumption is that we have constant, unchanging technology. In reality, though, technology has progressed dramatically over time. An advancing technology brings both new and better goods *and* improved ways of producing them. For now, let's think of technological advances as being only improvements in capital facilities—more efficient machinery and equipment. These advances alter our previous discussion of the economizing problem by improving productive efficiency, thereby allowing society to produce more goods with fixed resources. As with increases in resource supplies, technological advances make possible the production of more robots *and* more pizzas.

Thus, when either supplies of resources increase or an improvement in technology occurs, the production possibilities curve in Figure 2.3 shifts outward and to the right, as illustrated by curve A', B', C', D', E' in Figure 2.4. Such an outward shift of the production possibilities curve represents growth of economic capacity or, simply, **economic growth:** *the ability to produce a larger total output.* This growth is the result of (1) increases in supplies of resources, (2) improvements in resource quality, and (3) technological advances.

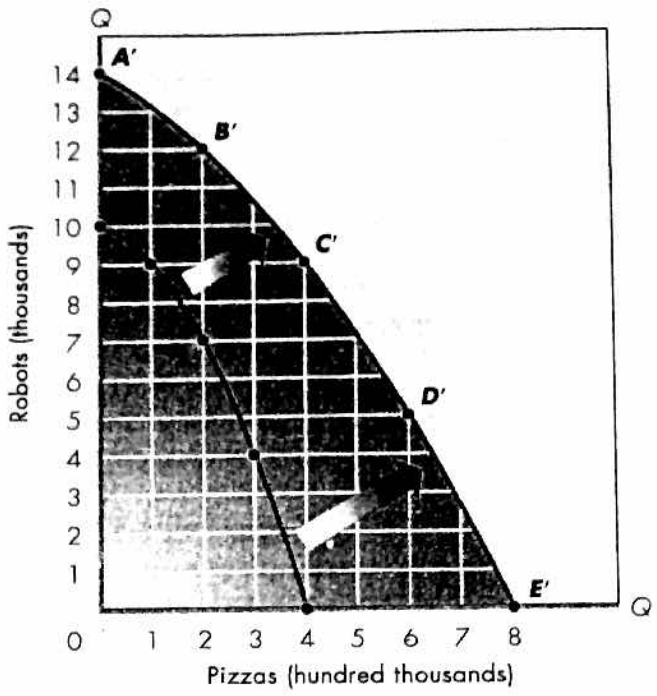


Figure 2.4

Economic growth and the production possibilities curve. The increase in supplies of resources, the improvements in resource quality, and the technological advances that occur in a dynamic economy move the production possibilities curve outward and to the right, allowing the economy to have larger quantities of both types of goods.

The consequence of growth is that our full-employment economy can enjoy a greater output of both robots and pizzas. *While a static, no-growth economy must sacrifice some of one product in order to get more of another, a dynamic, growing economy can have larger quantities of both products.*

Economic growth does not ordinarily mean proportionate increases in a nation's capacity to produce all its products. Note in Figure 2.4 that, at the maximums, the economy can produce twice as many pizzas as before but only 40 percent more robots. To reinforce your understanding of this concept, sketch in two new production possibilities curves: one show-

Table 2.2

Production Possibilities of Pizza and Robots with Full Employment and Productive Efficiency

	Production Alternatives				
Type of Product	A'	B'	C'	D'	E'
Pizzas (in hundred thousands)	0	2	4	6	8
Robots (in thousands)	14	12	9	5	0

ing the situation where a better technique for producing robots has been developed while the technology for producing pizzas is unchanged, and the other illustrating an improved technology for pizzas while the technology for producing robots remains constant.

Present Choices and Future Possibilities An economy's current choice of positions on its production possibilities curve is a basic determinant of the future location of that curve. Let's designate the two axes of the production possibilities curve as *goods for the future* and *goods for the present*, as in Figure 2.5. Goods for the future are such things as capital goods, research and education, and preventive medicine. They increase the quantity and quality of property resources, enlarge the stock of technological information, and improve the quality of human resources. As we have already seen, goods for the future, like industrial robots, are the ingredients of economic growth. Goods for the present are pure consumer goods, such as pizza, clothing, and soft drinks.

Now suppose there are two economies, Alta and Zorn, which are initially identical in every respect except one: Alta's current choice of positions on its production possibilities curve strongly favors present goods over future goods. Point *A* in Figure 2.5a indicates that choice. It is located quite far down the curve to the right, indicating a high priority for goods for the present, at the expense of fewer goods for the future. Zorn, in contrast, makes a current choice that stresses larger amounts of future goods and smaller amounts of present goods, as shown by point *Z* in Figure 2.5b.

Now, other things equal, we can expect the future production possibilities curve of Zorn to be farther to the right than Alta's curve. By currently choosing an output more favorable to technological advances and to increases in the quantity and quality of resources, Zorn will achieve greater economic growth than Alta. In terms of capital goods, Zorn is choosing to make larger current additions to its "national factory"—to invest more of its current output—than Alta. The payoff from this choice for Zorn is more rapid growth—greater future production capacity. The opportunity cost is fewer consumer goods in the present for Zorn to enjoy.

Is Zorn's choice thus "better" than Alta's? That, we cannot say. The different outcomes simply reflect different preferences and priorities in the two countries. **(Key Questions 10 and 11)** 2.2

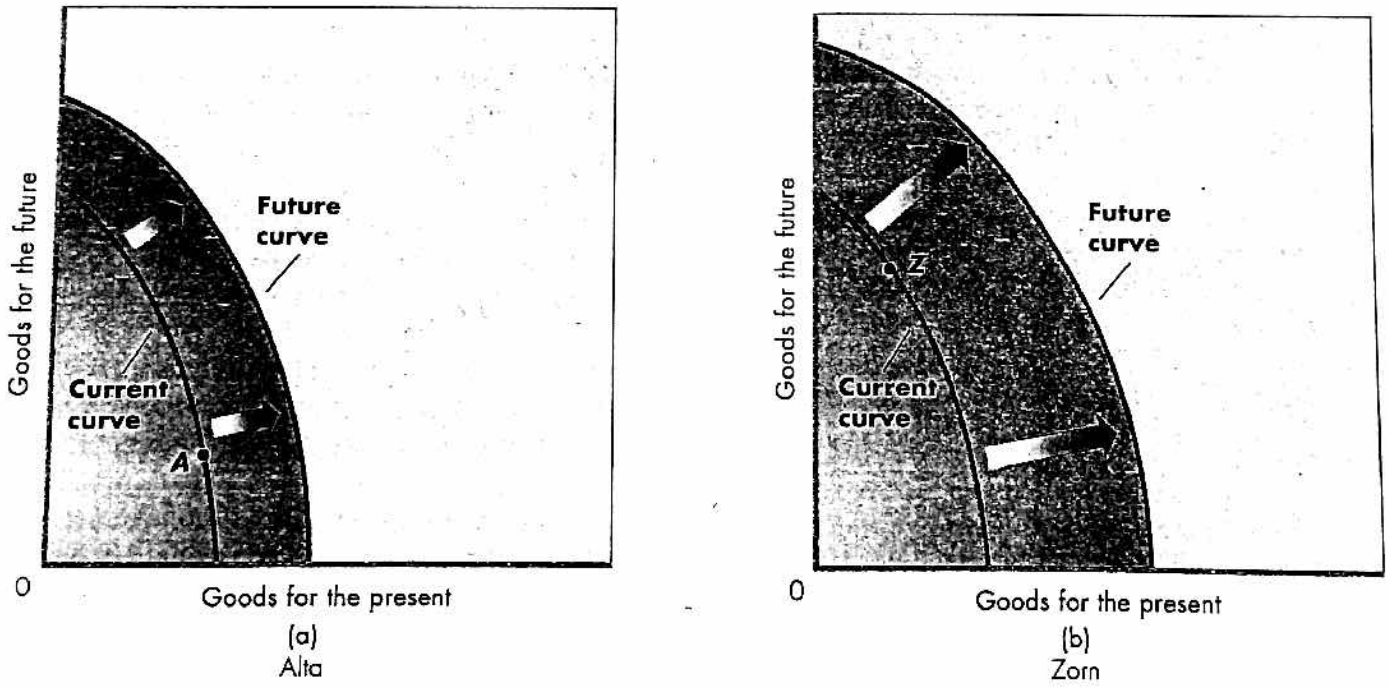


Figure 2.5

An economy's present choice of positions on its production possibilities curve helps determine the curve's future location. A nation's current choice favoring "present goods," as made by Alta in (a), will cause a modest outward shift of the curve in the future. A nation's current choice favoring "future goods," as made by Zorn in (b), will result in a greater outward shift of the curve in the future.

A Qualification: International Trade

Production possibilities analysis implies that an individual nation is limited to the combinations of output indicated by its production possibilities curve. *But we must modify this principle when international specialization and trade exist.*

You will see in later chapters that an economy can avoid, through international specialization and trade, the output limits imposed by its domestic production possibilities curve. *International specialization* means directing domestic resources to output that a nation is highly efficient at producing. *International trade* involves the exchange of these goods for goods produced abroad. Specialization and trade enable a nation to get more of a desired good at less sacrifice of some other good. Rather than sacrifice 3 robots to get a third unit of pizza, as in Table 2.1, a nation might be able to obtain the third unit of pizza by trading only 2 units of robots for it. Specialization and trade have the same effect as having more and better resources or discovering improved production techniques; both increase the quantities of capital and consumer goods available to society. The output gains from greater international specialization and trade are the equivalent of economic growth.

QUICK REVIEW 2.3

- Unemployment and the failure to achieve productive efficiency cause an economy to operate at a point inside its production possibilities curve.
- Increases in resource supplies, improvements in resource quality, and technological advance cause economic growth, which are depicted as an outward shift of the production possibilities curve.
- An economy's present choice of capital and consumer goods helps determine the future location of its production possibilities curve. (See Global Perspective 2.1.)
- International specialization and trade enable a nation to obtain more goods than its production possibilities curve indicates.

Examples and Applications

There are many possible applications and examples relating to the production possibilities model. We will discuss just a few of them.

Unemployment and Productive Inefficiency Almost all nations have at one point or another experienced widespread unemployment of resources. That is, they have operated inside of their production possibilities curves. In the depths of the Great Depression of the 1930s, one-quarter of U.S. workers were unemployed and one-third of U.S. production capacity was idle. In the last half of the 1990s, several countries (for example, Argentina, Japan, Mexico, and South Korea) operated inside their production possibilities curves, at least temporarily, because of substantial declines in economic activity.

Economies that experience substantial discrimination based on race, ethnicity, and gender do not achieve productive efficiency, and thus they operate inside their production possibilities curves. Because discrimination prevents those discriminated against from obtaining jobs that best use their skills, society has less output than otherwise. Eliminating discrimination would move such an economy from a point inside its production possibilities curve toward a point on its curve. Similarly, economies in which labor usage and production methods are based on custom, heredity, and caste, rather than on efficiency, operate well inside their production possibilities curves.

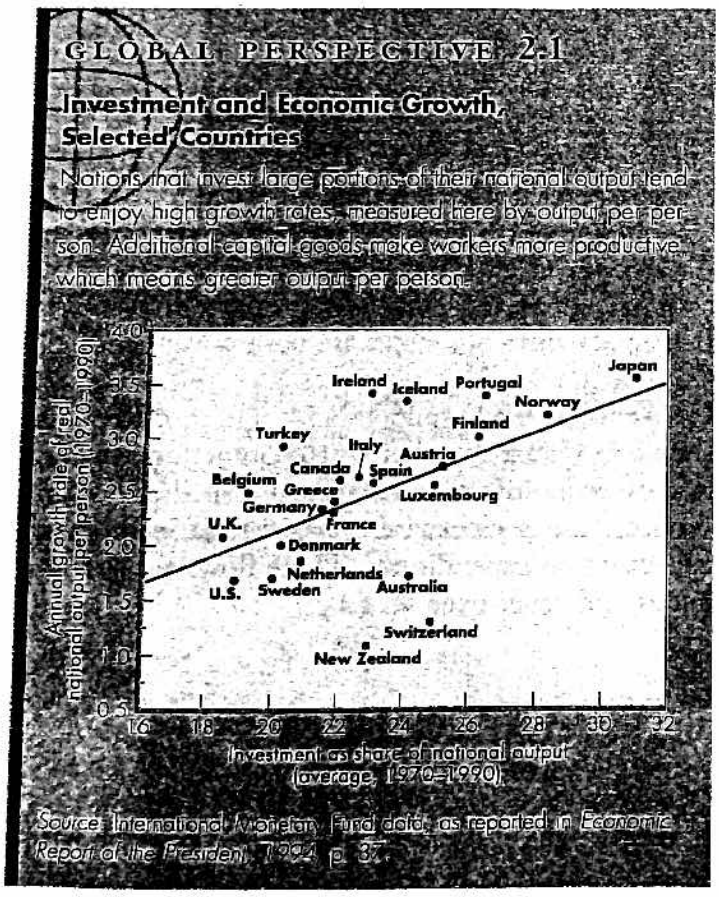
Tradeoffs and Opportunity Costs Many current controversies illustrate the tradeoffs and opportunity costs indicated by movements along a particular production possibilities curve. (Any two categories of "output" can be placed on the axes of production possibilities curves.) Should scenic land be used for logging and mining or be preserved as wilderness? If the land is used for logging and mining, the opportunity cost is the forgone benefits of wilderness. If the land is used for wilderness, the opportunity cost is the lost value of the wood and minerals that society forgoes.

Should society devote more resources to the criminal justice system (police, courts, and prisons) or to education (teachers, books, and schools)? If society devotes more resources to the criminal justice system, other things equal, the opportunity cost is forgone improvements in education. If more resources are allocated to education, the opportunity cost is the forgone benefits from an improved criminal justice system. If we decide to devote more resources to both, what other goods and services do we forgo? 2.2

Shifts in Production Possibilities Curves The United States has recently experienced a spurt of

new technologies relating to computers, communications, and biotechnology. Technological advances have dropped the prices of computers and greatly enhanced their speed. Cellular phones and the Internet have increased communications capacity, enhancing production and improving the efficiency of markets. Advances in biotechnology, specifically genetic engineering, have resulted in important agricultural and medical discoveries. Many economists believe these new technologies are so significant that they are contributing to faster-than-normal U.S. economic growth (faster rightward shifts of the nation's production possibilities curve).

In some circumstances a nation's production possibilities curve can collapse inward. For example, in the late 1990s Yugoslavian forces began to "ethnically cleanse" Kosovo by driving out its Muslim residents. A decisive military response by the United States and its allies eventually pushed Yugoslavia out of Kosovo. The military action also devastated Yugoslavia's economy. Allied bombing inflicted great physical damage on Yugoslavia's production facilities and its system of roads, bridges, and communications. Consequently, Yugoslavia's production possibilities curve shifted inward.



Economic Systems

Every society needs to develop an **economic system**—*a particular set of institutional arrangements and a coordinating mechanism*—to respond to the economizing problem. Economic systems differ as to (1) who owns the factors of production and (2) the method used to coordinate and direct economic activity. There are two general types of economic systems: the market system and the command system.

The Market System

The private ownership of resources and the use of markets and prices to coordinate and direct economic activity characterize the **market system,** or **capitalism.** In that system each participant acts in his or her own self-interest; each individual or business seeks to maximize its satisfaction or profit through its own decisions regarding consumption or production. The system allows for the private ownership of capital, communicates through prices, and coordinates economic activity through *markets*—places where buyers and sellers come together. Goods and services are produced and resources are supplied by whoever is willing and able to do so. The result is competition among independently acting buyers and sellers of each product and resource. Thus, economic decision making is widely dispersed.

In *pure* capitalism—or *laissez-faire* capitalism—government's role would be limited to protecting private property and establishing an environment appropriate to the operation of the market system. The term "laissez-faire" means "let it be," that is, keep government from interfering with the economy. The idea is that such interference will disturb the efficient working of the market system. 2.3

But in the capitalism practiced in the United States and most other countries, government plays a substantial role in the economy. It not only provides the rules for economic activity but also promotes economic stability and growth, provides certain goods and services that would otherwise be underproduced or not produced at all, and modifies the distribution of income. The government, however, is not the dominant economic force in deciding what to produce, how to produce it, and who will get it. That force is the market.

The Command System

The alternative to the market system is the **command system,** also known as *socialism* or *communism.* In that system, government owns most property resources and economic decision making occurs through a central economic plan. A central planning board appointed by the government makes nearly all the major decisions concerning the use of resources, the composition and distribution of output, and the organization of production. The government owns most of the business firms, which produce according to government directives. A central planning board determines production goals for each enterprise and specifies the amount of resources to be allocated to each enterprise so that it can reach its production goals. The division of output between capital and consumer goods is centrally decided, and capital goods are allocated among industries on the basis of the central planning board's long-term priorities.

A *pure* command economy would rely exclusively on a central plan to allocate the government-owned property resources. But, in reality, even the preeminent command economy—the Soviet Union—tolerated some private ownership and incorporated some markets before its demise in 1992. Recent reforms in Russia and most of the eastern European nations have to one degree or another transformed their command economies to capitalistic, market-oriented systems. China's reforms have not gone as far, but they have reduced the reliance on central planning. Although there is still extensive government ownership of resources and capital in China, the nation has increasingly relied on free markets to organize and coordinate its economy. North Korea and Cuba are the last remaining examples of largely centrally planned economies.

The Circular Flow Model

Because nearly all the major nations now use the market system, we need to gain a good understanding of how this system operates. Our goal in the remainder of this chapter is to identify the market economy's decision makers and major markets. In Chapter 3 we will explain how prices are established in individual markets. Then in Chapter 4 we will detail the characteristics of the market system and explain how the system addresses the economizing problem.

As shown in **Figure 2.6 (Key Graph),** the market economy has two groups of decision makers: *households* and *businesses.* (We will add government as a third decision maker in Chapter 5.) It also has two broad markets: the *resource market* and the *product market.*

The upper half of the diagram represents the **resource market:** *the place where resources or the services of resource suppliers are bought and sold.* In the resource market, households sell resources and businesses demand them. Households (that is, people) own all economic resources either directly as workers or entrepreneurs or indirectly through their ownership of business corporations. They sell their resources to businesses, which buy them because they are necessary for producing goods and services. The funds that businesses pay for resources are costs to businesses but are flows of wage, rent, interest, and profit income to the households. Resources therefore flow from households to businesses, and money flows from businesses to households.

Next consider the lower part of the diagram, which represents the **product market:** *the place where goods and services produced by businesses are bought and sold.* In the product market, businesses combine the resources they have obtained to produce and sell goods and services. Households use the income they have received from the sale of resources to buy goods and services. The monetary flow of consumer spending on goods and services yields sales revenues for businesses.

The **circular flow model** suggests a complex, interrelated web of decision making and economic activity involving businesses and households. Businesses and households are both buyers and sellers. Businesses buy resources and sell products. Households buy products and sell resources. As shown in Figure 2.6, there is a counterclockwise *real flow* of economic resources and finished goods and services, and a clockwise *money flow* of income and consumption expenditures. These flows are simultaneous and repetitive. 2.4

KEY GRAPH

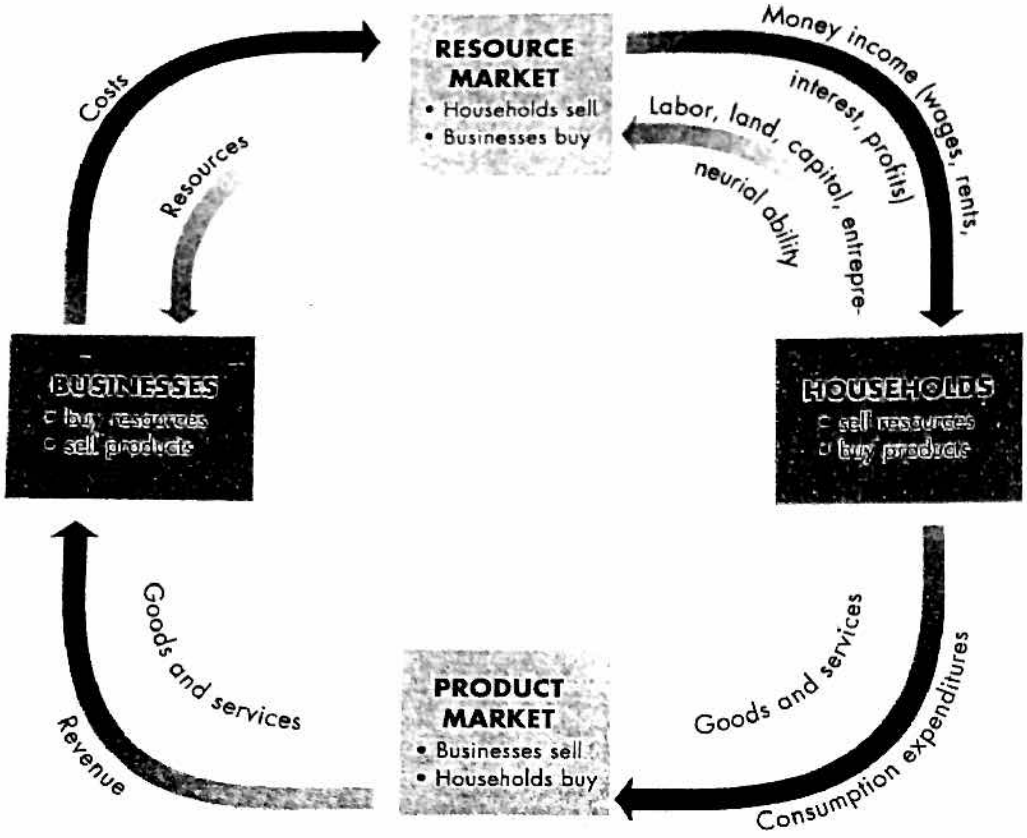


Figure 2.6
The circular flow diagram.
Resources flow from households to businesses through the resource market, and products flow from businesses to households through the product market. Opposite these real flows are monetary flows. Households receive income from businesses (their costs) through the resource market, and businesses receive revenue from households (their expenditures) through the product market.

Quick Quiz 2.6

1. The resource market is the place where:
- *a.* households sell products and businesses buy products.
- *b.* businesses sell resources and households sell products.
- *c.* households sell resources and businesses buy resources (or the services of resources).
- *d.* businesses sell resources and households buy resources (or the services of resources).

2. Which of the following would be determined in the product market?
- *a.* a manager's salary.
- *b.* the price of equipment used in a bottling plant.
- *c.* the price of 80 acres of farmland.
- *d.* the price of a new pair of athletic shoes.

3. In this circular flow diagram:
- *a.* money flows counterclockwise.
- *b.* resources flow counterclockwise.
- *c.* goods and services flow clockwise.
- *d.* households are on the selling side of the product market.

4. In this circular flow diagram:
- *a.* households spend income in the product market.
- *b.* firms sell resources to households.
- *c.* households receive income through the product market.
- *d.* households produce goods.

Answers: 1. c; 2. d; 3. b; 4. a

SUMMARY

1. Economics is grounded on two basic facts: (a) economic wants are virtually unlimited; (b) economic resources are scarce.
2. Economic resources may be classified as property resources—raw materials and capital—or as human resources—labor and entrepreneurial ability. These resources constitute the factors of production.
3. Economics is concerned with the problem of using or managing scarce resources to produce the goods and services that satisfy the material wants of society. Both full employment and the efficient use of available resources are essential to maximize want satisfaction.
4. Efficient use of resources consists of productive efficiency (producing all output combinations in the least costly way) and allocative efficiency (producing the specific output mix most desired by society).
5. An economy that is achieving full employment and productive efficiency—one that is operating on its production possibilities curve—must sacrifice the output of some types of goods and services in order to increase the production of others. Because resources are not equally productive in all possible uses, shifting resources from one use to another brings the law of increasing opportunity costs into play. The production of additional units of one product requires the sacrifice of *increasing* amounts of the other product.
6. Allocative efficiency means operating at the optimal point on the production possibilities curve. That point represents the highest-valued mix of goods and is determined by expanding the production of each good until its marginal benefit (MB) equals its marginal cost (MC).
7. Over time, technological advances and increases in the quantity and quality of resources enable the economy to produce more of all goods and services—that is, to experience economic growth. Society's choice as to the mix of consumer goods and capital goods in current output is a major determinant of the future location of the production possibilities curve and thus of economic growth.
8. The market system and the command system are the two broad types of economic systems used to address the economizing problem. In the market system (or capitalism) private individuals own most resources and markets coordinate most economic activity. In the command system (or socialism or communism), government owns most resources and central planners coordinate most economic activity.
9. The circular flow model locates the product and resource markets and shows the major real and money flows between businesses and households. Businesses are on the buying side of the resource market and the selling side of the product market. Households are on the selling side of the resource market and the buying side of the product market.

TERMS AND CONCEPTS

economizing problem
utility
economic resources
land
capital
investment
labor
entrepreneurial ability
factors of production
full employment
full production
productive efficiency
allocative efficiency
consumer goods
capital goods
production possibilities table
production possibilities curve
opportunity cost
law of increasing opportunity costs
economic growth
economic system
market system
capitalism
command system
resource market
product market
circular flow model

STUDY QUESTIONS

1. Explain this statement: "If resources were unlimited and were freely available, there would be no subject called *economics*."
2. Comment on the following statement from a newspaper article: "Our junior high school serves a splendid hot meal for $1 without costing the taxpayers anything, thanks in part to a government subsidy."
3. Critically analyze: "Wants aren't insatiable. I can prove it. I get all the coffee I want to drink every morning at breakfast." Explain: "Goods and services