

Households and firms interact in two types of markets. In the *markets for goods and services*, households are buyers, and firms are sellers. In particular, households buy the output of goods and services that firms produce. In the *markets for the factors of production*, households are sellers, and firms are buyers. In these markets, households provide the inputs that the firms use to produce goods and services. The circular-flow diagram offers a simple way of organizing all the economic transactions that occur between households and firms in the economy.

The inner loop of the circular-flow diagram represents the flows of inputs and outputs. The households sell the use of their labor, land, and capital to the firms in the markets for the factors of production. The firms then use these factors to produce goods and services, which in turn are sold to households in the markets for goods and services. Hence, the factors of production flow from households to firms, and goods and services flow from firms to households.

The outer loop of the circular-flow diagram represents the corresponding flow of dollars. The households spend money to buy goods and services from the firms. The firms use some of the revenue from these sales to pay for the factors of production, such as the wages of their workers. What's left is the profit of the firm owners, who themselves are members of households. Hence, spending on goods and services flows from households to firms, and income in the form of wages, rent, and profit flows from firms to households.

Let's take a tour of the circular flow by following a dollar bill as it makes its way from person to person through the economy. Imagine that the dollar begins at a household, sitting in, say, your wallet. If you want to buy a cup of coffee, you take the dollar to one of the economy's markets for goods and services, such as your local Starbucks coffee shop. There you spend it on your favorite drink. When the dollar moves into the Starbucks cash register, it becomes revenue for the firm. The dollar doesn't stay at Starbucks for long, however, because the firm uses it to buy inputs in the markets for the factors of production. For instance, Starbucks might use the dollar to pay rent to its landlord for the space it occupies or to pay the wages of its workers. In either case, the dollar enters the income of some household and, once again, is back in someone's wallet. At that point, the story of the economy's circular flow starts once again.

The circular-flow diagram in Figure 1 is one simple model of the economy. It dispenses with details that, for some purposes, are significant. A more complex and realistic circular-flow model would include, for instance, the roles of government and international trade. Yet these details are not crucial for a basic understanding of how the economy is organized. Because of its simplicity, this circular-flow diagram is useful to keep in mind when thinking about how the pieces of the economy fit together.

## Our Second Model: The Production Possibilities Frontier

Most economic models, unlike the circular-flow diagram, are built using the tools of mathematics. Here we consider one of the simplest such models, called the production possibilities frontier, and see how this model illustrates some basic economic ideas.

Although real economies produce thousands of goods and services, let's imagine an economy that produces only two goods—cars and computers. Together the car industry and the computer industry use all of the economy's factors of

production. The **production possibilities frontier** is a graph that shows the various combinations of output—in this case, cars and computers—that the economy can possibly produce given the available factors of production and the available production technology that firms can use to turn these factors into output.

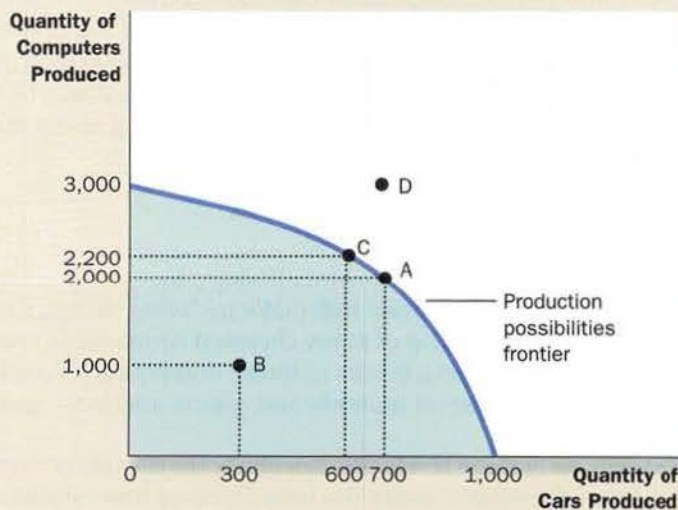
Figure 2 is an example of a production possibilities frontier. In this economy, if all resources were used in the car industry, the economy would produce 1,000 cars and no computers. If all resources were used in the computer industry, the economy would produce 3,000 computers and no cars. The two end points of the production possibilities frontier represent these extreme possibilities. If the economy were to divide its resources between the two industries, it could produce 700 cars and 2,000 computers, shown in the figure by point A. By contrast, the outcome at point D is not possible because resources are scarce: The economy does not have enough of the factors of production to support that level of output. In other words, the economy can produce at any point on or inside the production possibilities frontier, but it cannot produce at points outside the frontier.

An outcome is said to be *efficient* if the economy is getting all it can from the scarce resources it has available. Points on (rather than inside) the production possibilities frontier represent efficient levels of production. When the economy is producing at such a point, say point A, there is no way to produce more of one good without producing less of the other. Point B represents an *inefficient* outcome. For some reason, perhaps widespread unemployment, the economy is producing less than it could from the resources it has available: It is producing only 300 cars and 1,000 computers. If the source of the inefficiency were eliminated, the economy could move from point B to point A, increasing production of both cars (to 700) and computers (to 2,000).

### production possibilities frontier

a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology

FIGURE 2



### The Production Possibilities Frontier

The production possibilities frontier shows the combinations of output—in this case, cars and computers—that the economy can possibly produce. The economy can produce any combination on or inside the frontier. Points outside the frontier are not feasible given the economy's resources.



One of the *Ten Principles of Economics* discussed in Chapter 1 is that people face tradeoffs. The production possibilities frontier shows one tradeoff that society faces. Once we have reached the efficient points on the frontier, the only way of getting more of one good is to get less of the other. When the economy moves from point A to point C, for instance, society produces more computers but at the expense of producing fewer cars.



Another of the *Ten Principles of Economics* is that the cost of something is what you give up to get it. This is called the *opportunity cost*. The production possibilities frontier shows the opportunity cost of one good as measured in terms of the other good. When society reallocates some of the factors of production from the car industry to the computer industry, moving the economy from point A to point C, it gives up 100 cars to get 200 additional computers. In other words, when the economy is at point A, the opportunity cost of 200 computers is 100 cars.

Notice that the production possibilities frontier in Figure 2 is bowed outward. This means that the opportunity cost of cars in terms of computers depends on how much of each good the economy is producing. When the economy is using most of its resources to make cars, the production possibilities frontier is quite steep. Because even workers and machines best suited to making computers are being used to make cars, the economy gets a substantial increase in the number of computers for each car it gives up. By contrast, when the economy is using most of its resources to make computers, the production possibilities frontier is quite flat. In this case, the resources best suited to making computers are already in the computer industry, and each car the economy gives up yields only a small increase in the number of computers.

The production possibilities frontier shows the tradeoff between the production of different goods at a given time, but the tradeoff can change over time. For example, if a technological advance in the computer industry raises the number of computers that a worker can produce per week, the economy can make more computers for any given number of cars. As a result, the production possibilities frontier shifts outward, as in Figure 3. Because of this economic growth, society might move production from point A to point E, enjoying more computers and more cars.

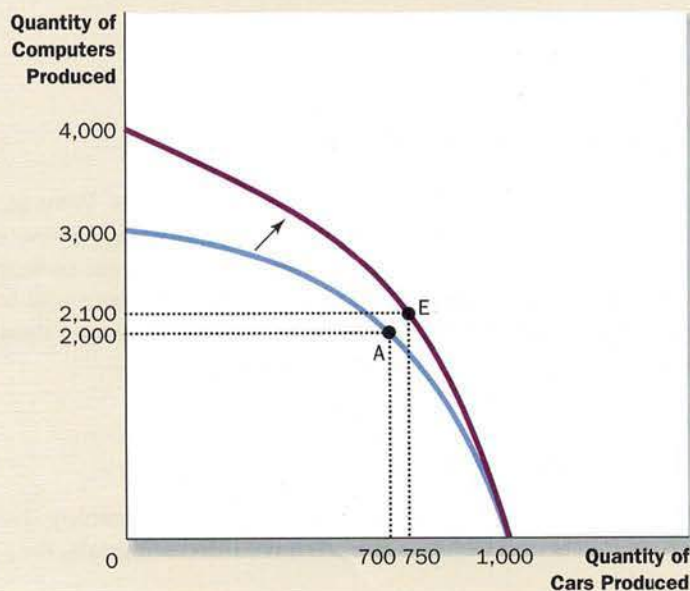
The production possibilities frontier simplifies a complex economy to highlight and clarify some basic ideas. We have used it to illustrate some of the concepts mentioned briefly in Chapter 1: scarcity, efficiency, tradeoffs, opportunity cost, and economic growth. As you study economics, these ideas will recur in various forms. The production possibilities frontier offers one simple way of thinking about them.

## Microeconomics and Macroeconomics

Many subjects are studied on various levels. Consider biology, for example. Molecular biologists study the chemical compounds that make up living things. Cellular biologists study cells, which are made up of many chemical compounds and, at the same time, are themselves the building blocks of living organisms. Evolutionary biologists study the many varieties of animals and plants and how species change gradually over the centuries.

Economics is also studied on various levels. We can study the decisions of individual households and firms. Or we can study the interaction of households and firms in markets for specific goods and services. Or we can study the operation of the economy as a whole, which is just the sum of the activities of all these decisionmakers in all these markets.

FIGURE 3



### A Shift in the Production Possibilities Frontier

*An economic advance in the computer industry shifts the production possibilities frontier outward, increasing the number of cars and computers the economy can produce.*

The field of economics is traditionally divided into two broad subfields. **Microeconomics** is the study of how households and firms make decisions and how they interact in specific markets. **Macroeconomics** is the study of economy-wide phenomena. A microeconomist might study the effects of rent control on housing in New York City, the impact of foreign competition on the U.S. auto industry, or the effects of compulsory school attendance on workers' earnings. A macroeconomist might study the effects of borrowing by the federal government, the changes over time in the economy's rate of unemployment, or alternative policies to raise growth in national living standards.

Microeconomics and macroeconomics are closely intertwined. Because changes in the overall economy arise from the decisions of millions of individuals, it is impossible to understand macroeconomic developments without considering the associated microeconomic decisions. For example, a macroeconomist might study the effect of a cut in the federal income tax on the overall production of goods and services. To analyze this issue, he or she must consider how the tax cut affects the decisions of households about how much to spend on goods and services.

Despite the inherent link between microeconomics and macroeconomics, the two fields are distinct. In economics, as in biology, it may seem natural to begin with the smallest unit and build up. Yet doing so is neither necessary nor always the best way to proceed. Evolutionary biology is, in a sense, built upon molecular biology, since species are made up of molecules. Yet molecular biology and evolutionary biology are separate fields, each with its own questions and its own methods. Similarly, because microeconomics and macroeconomics address different questions, they sometimes take quite different approaches and are often taught in separate courses.

#### microeconomics

the study of how households and firms make decisions and how they interact in markets

#### macroeconomics

the study of economy-wide phenomena, including inflation, unemployment, and economic growth

**QuickQuiz** In what sense is economics like a science? • Draw a production possibilities frontier for a society that produces food and clothing. Show an efficient point, an inefficient point, and an infeasible point. Show the effects of a drought. • Define *microeconomics* and *macroeconomics*.

## THE ECONOMIST AS POLICY ADVISER

Often economists are asked to explain the causes of economic events. Why, for example, is unemployment higher for teenagers than for older workers? Sometimes economists are asked to recommend policies to improve economic outcomes. What, for instance, should the government do to improve the economic well-being of teenagers? When economists are trying to explain the world, they are scientists. When they are trying to help improve it, they are policy advisers.

### Positive versus Normative Analysis

To help clarify the two roles that economists play, we begin by examining the use of language. Because scientists and policy advisers have different goals, they use language in different ways.

For example, suppose that two people are discussing minimum-wage laws. Here are two statements you might hear:

POLLY: Minimum-wage laws cause unemployment.

NORMA: The government should raise the minimum wage.

Ignoring for now whether you agree with these statements, notice that Polly and Norma differ in what they are trying to do. Polly is speaking like a scientist: She is making a claim about how the world works. Norma is speaking like a policy adviser: She is making a claim about how she would like to change the world.

In general, statements about the world are of two types. One type, such as Polly's, is positive. **Positive statements** are descriptive. They make a claim about how the world *is*. A second type of statement, such as Norma's, is normative. **Normative statements** are prescriptive. They make a claim about how the world *ought to be*.

A key difference between positive and normative statements is how we judge their validity. We can, in principle, confirm or refute positive statements by examining evidence. An economist might evaluate Polly's statement by analyzing data on changes in minimum wages and changes in unemployment over time. By contrast, evaluating normative statements involves values as well as facts. Norma's statement cannot be judged using data alone. Deciding what is good or bad policy is not merely a matter of science. It also involves our views on ethics, religion, and political philosophy.

Of course, positive and normative statements may be related. Our positive views about how the world works affect our normative views about what policies are desirable. Polly's claim that the minimum wage causes unemployment, if true, might lead us to reject Norma's conclusion that the government should raise the minimum wage. Yet our normative conclusions cannot come from positive analysis alone; they involve value judgments as well.

#### positive statements

claims that attempt to describe the world as it is

#### normative statements

claims that attempt to prescribe how the world should be