

Economic Decision Making

2.1 Introduction

In 2004, a music magazine compiled a list titled the “500 Greatest Songs of All Time.” The song chosen as the 100th greatest begins with a choir singing something economists have been saying for years:

*And you can't always get what you want,
 Honey, you can't always get what you want
 You can't always get what you want
 But if you try sometime, yeah,
 You just might find you get what you need!*
 —Mick Jagger and Keith Richards, “You Can’t Always Get What You Want,” 1969

As simple as it sounds, this chorus explains why everyone has to make choices—even Mick Jagger, Keith Richards, and the other members of the self-styled “Greatest Rock and Roll Band in the World.”

What you may not know about Michael Philip Jagger is that he was once a student of economics. Born into a middle-class family in Dartford, England, Jagger was raised to be a teacher like his father, earning high enough marks in school to win a scholarship to the prestigious London School of Economics.

Jagger was studying accounting and finance in 1961 when a chance meeting with a boyhood friend named Keith Richards changed his life. “So I get on the train to London one morning, and there’s Jagger and under his arm he has four or five albums,” Richards later recalled. “He’s got Chuck Berry and Little

The Rolling Stones, like the musicians who inspired them, had to make important decisions about their careers.

Speaking of Economics

goods

Physical articles that have been produced for sale or use. Three examples are food, clothing, and cars.

services

Work done by someone else for which a consumer, business, or government is willing to pay. Three examples are teaching, gardening, and childcare.

factors of production

The resources used to produce goods and services. Economists define these resources as land, labor, and capital.

entrepreneurship

The willingness and ability to take the risks involved in starting and managing a business.

capital

The tools, machines, and buildings used to produce goods and services.

productivity

A measure of the efficiency with which goods and services are produced. Productivity is often stated as the quantity produced per person per hour.

opportunity cost

The value of the next best alternative that is given up when making a choice. This is the measure of what you must give up to get what you most want.

production possibilities frontier (PPF)

A simple model of an economy that shows all the combinations of two goods that can be produced with the resources and technology currently available.

Mick Jagger's decision to choose music worked out far better than he or his parents could ever have imagined. Since 1963, the Rolling Stones have sold more than 200 million albums. In late 2007, it was announced that the band had earned a record-breaking \$437 million on its just-completed "A Bigger Bang" tour. This was enough to earn the Rolling Stones a spot in the next edition of *Guinness World Records*.



Walter, Muddy Waters." Fans of American rhythm and blues music were few and far between in England at that time. Finding another one was like coming across a long-lost brother.

Jagger invited Richards to join a few of his friends who played music together for fun. Once Richards did so, life began to change. "You could feel something holding the band together," a friend observed. "Keith sounded great." This worried Jagger's mother, who had noticed that after teaming up with Richards her son had begun to think of music as more than just a hobby.

A year after this meeting, a new R&B band billing itself as the Rolling Stones began to appear at London clubs. Then, in 1963, the Stones released their first record. Jagger now faced a difficult choice: finish his degree or drop out of college to pursue a career in music. He later said of his decision,

It was very, very difficult because my parents obviously didn't want me to do it. My father was furious with me, absolutely furious. I'm sure he wouldn't have been so mad if I'd have volunteered to join the army. Anything but this. He couldn't believe it. I agree with him: It wasn't a viable career opportunity.

Despite his parents' misgivings, Jagger chose music—and the rest, as they say, is history.

This chapter is about the choices and decisions we all face in our lives. It explores why, as the song says, we can't always get what we want. And it looks at how we can use the economic way of thinking to decide what we want most and what we are willing to give up to get it.

■ 2.2 Why Is What We Want Scarce?

Every time we go shopping, most of us come up against the hard truth of the Rolling Stones song "You Can't Always Get What You Want." Difficult as it may be to believe, even a person as successful as Mick Jagger can't have everything. Even he has to make choices sometimes. But why is this so? Why do any of us have to choose at all?

Our Wants Always Exceed Our Resources

The simple answer to that question is that our wants—our desire for things that meet our needs or make us happy—are unlimited, while our means of fulfilling those desires are not. Some of our wants are necessary for survival. Each of us, for example, needs food, water, and shelter to survive from day to day. But beyond those basics, what we desire to have or experience is limited only by our imaginations.

Although our wants may be unlimited, our ability to satisfy them is not. We have only limited amounts of resources to use in fulfilling even our fondest desires. Time, for example, is a limited resource. Whether rich or poor, a person has only 24 hours each day to use in work or play. Money is also limited. Even the very rich can't afford an endless supply of everything. They, like the rest of us, experience scarcity, a situation in which the supply of something is not sufficient to satisfy their wants.

With Resources Limited, Scarcity Is Everywhere

It is hard for most people to see scarcity the way economists do. You shop in stores that are overflowing with **goods**, or physical objects produced for sale. You look around your classroom and see that nearly everyone has paper and pencils. Many of your classmates probably have cell phones. How can these goods be scarce if everyone seems to have them?

Similarly, most of us have access to a multitude of **services**, or activities done for us by others. Teachers, doctors, hair stylists, bus drivers, plumbers, nurses, and police officers all provide services we take for granted. Some are even offered to us without charge. So how can economists see these services as scarce?

And yet, goods and services *are* scarce. They are scarce because the resources needed to produce them—

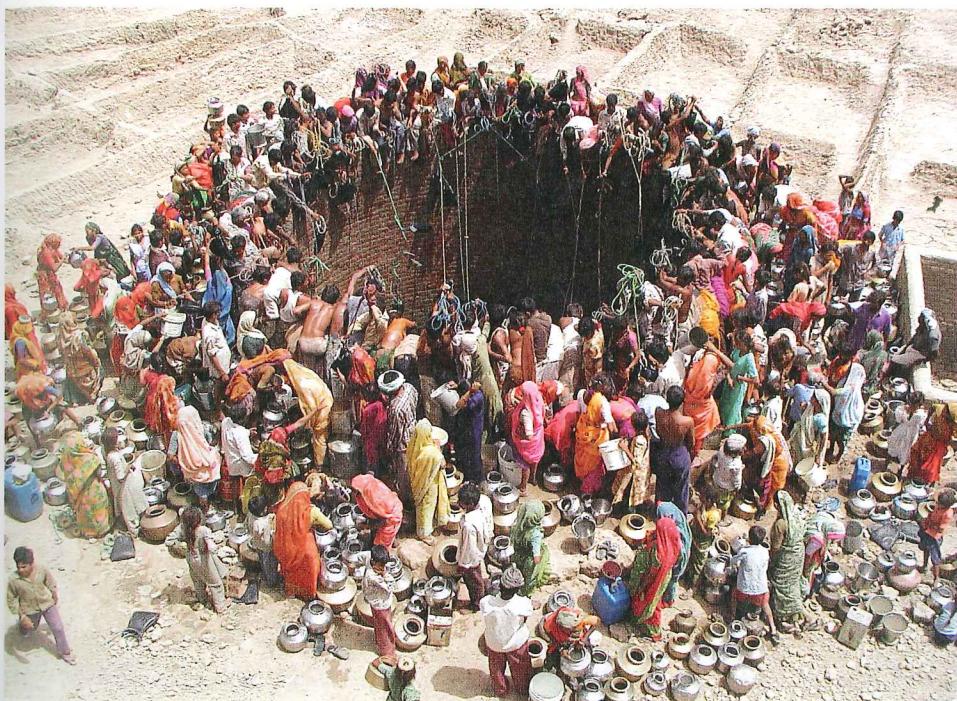
land, labor, materials, and machines—are scarce. Should you doubt that this is true, try asking someone who owns one of these resources to turn it over to you for free. The answer will almost surely be no.

Scarcity would exist even if everyone in the world were suddenly as rich as Mick Jagger. Suppose every new multimillionaire wanted to build an elegant mansion to live in. Could they all do so? Probably not. While one essential resource for such a project (money) is now less scarce, other essential resources (land, lumber, concrete, glass, skilled workers, and time, to name just a few) are still just as scarce.

Shortages Are Temporary, While Scarcity Is Forever

While scarcity may seem like an abstract idea, most of us have experienced a shortage. A **shortage** is a lack of something that is desired, a condition that occurs when there is less of a good or service available than people want at the current price. When a record store runs out of Rolling Stones CDs while the band is performing live in that city, the result is a shortage.

Shortages occur for many reasons. A fashion fad can cause a shortage by suddenly increasing the number of people who want to buy the trendy item. The shortage lasts until either enough items are produced for everyone who wants them or the fad ends.



The women in India who walk miles each day to draw water from this well understand very well that water is a scarce resource. For them, scarcity is a visible and inescapable fact of life.

Wars and natural disasters can cause shortages by disrupting the production or movement of goods. Katrina, the Category 5 hurricane that ravaged the Gulf Coast in 2005, shut down major oil refineries, leading to gasoline shortages across the nation. In addition, customers at a national restaurant chain could not get their favorite Cajun side dishes, of gumbo and red beans and rice because supplies from New Orleans had been cut off.

As annoying as shortages may be, they are usually a temporary condition. A shortage ends once production is resumed or new sources of supply are found. In contrast, scarcity is forever. No matter how well people use their limited resources, there will never be enough of everything to satisfy all of their wants.

2.3 How Do We Satisfy Economic Wants?

Take a quick break from reading this book, and let your eyes wander around wherever you happen to be just now. What do you see? Walls, windows, furniture, books, paper, pens, pencils . . . the list could likely go on and on. None of these goods magically appeared at this moment for your comfort and convenience. All of them were produced to satisfy somebody's wants. The question is, how is this done?

Inputs, Outputs, and the Production Equation

Economists answer this question by looking at the inputs and outputs of the production process. **Inputs** are the scarce resources that go into the process. Economists call these productive resources the **factors of production** and divide them into three basic categories: land, labor, and capital. **Outputs** are the goods and services produced using these resources.

Economists use the production equation to represent the process of combining resources (inputs) to produce goods and services (outputs). In its simplest form, the **production equation** looks like this:

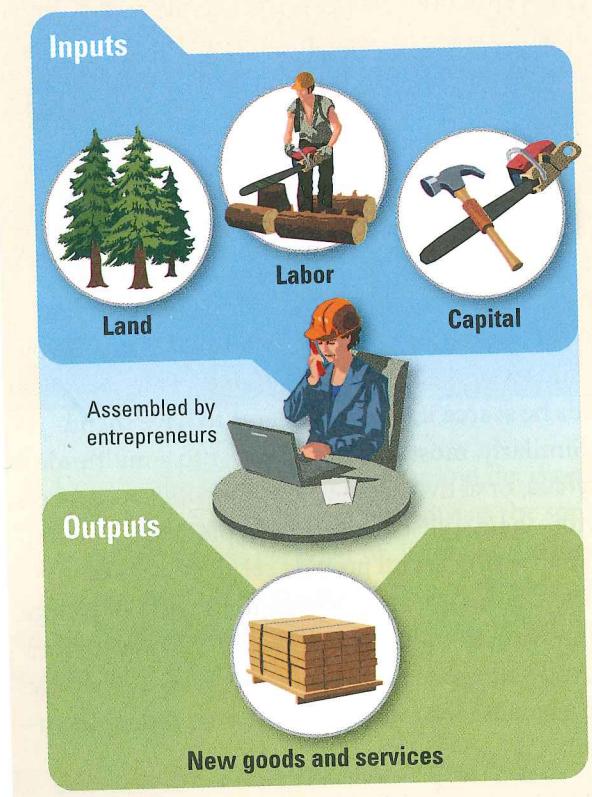
$$\text{land} + \text{labor} + \text{capital} = \text{goods and services}$$

Some economists consider **entrepreneurship**—the willingness to take the risks involved in starting a business—to be a fourth factor of production.

Key Concept

The Production Equation

The production equation shows how land (natural resources), labor (work for wages), and capital (tools and machines) are assembled by entrepreneurs to produce goods and services.



Entrepreneurs assemble the other inputs to create new goods and services.

Land Resources: The "Gifts of Nature"

As seen by economists, **land** is far more than real estate. It means all of the "gifts of nature" that are used to produce goods and services. These gifts include such familiar natural resources as air, soil, minerals, water, forests, plants, animals, birds, and fish. Others are less obvious, such as solar energy, wind, geothermal energy, and the electromagnetic spectrum used to transmit communication signals.

Natural resources vary in their abundance and availability. A few, such as sunlight and wind, are **perpetual resources** that are both widely available and in no danger of being used up. Others, including



The company that owns this oil field is harvesting both nonrenewable and renewable energy resources. The oil being pumped out of the ground cannot be replaced. In contrast, the wind driving the turbines that generate electricity will never be used up.

forests, fresh water, and fish, are **renewable resources** that, with careful planning, can be replaced as they are used. A few resources, mostly metals, can be recycled for use again and again. Still others, especially fossil fuels like oil, coal, and natural gas, are **nonrenewable resources**. Once they are used, they are gone forever.

The value of natural resources depends on someone knowing how to plug them into the production process. Vast pools of oil have lain under the surface of Earth for millions of years. But until someone developed the tools and technology needed to extract that oil from deep under the ground and turn it into a useful fuel, it had little value.

Figure 2.3A

Identifying Nature's Gifts in a Pencil

The common pencil is produced by assembling natural resources from many parts of the world. The resources that come from plants are renewable. The mineral resources—zinc, copper, pumice, clay, and graphite—are not.

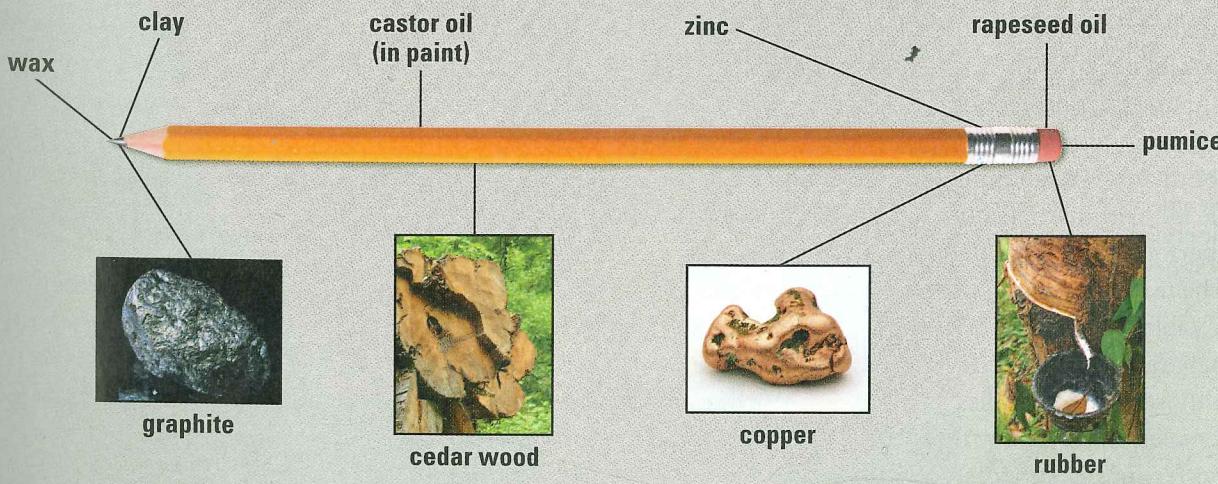
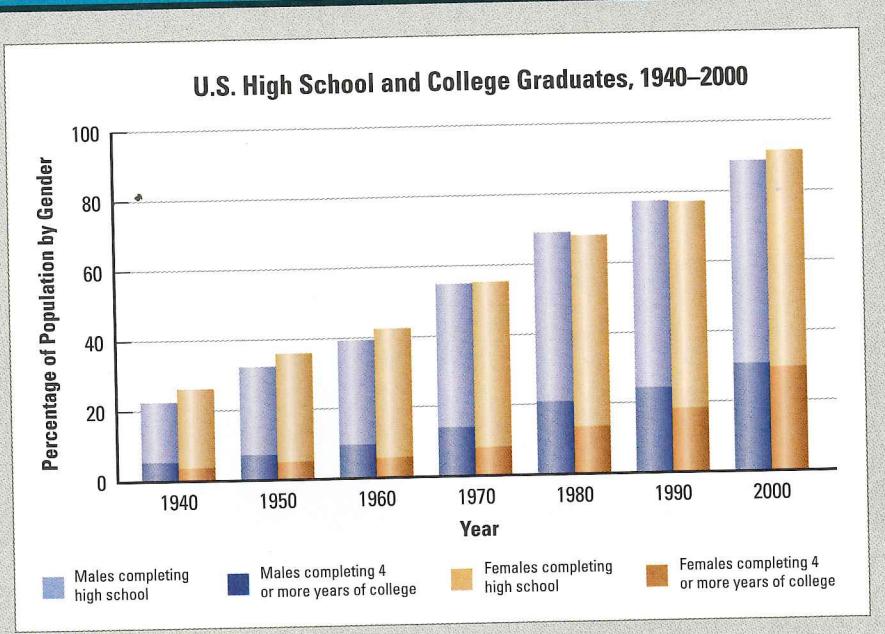


Figure 2.3B

Assessing America's Human Capital

Since 1940, this country's human capital—as measured by formal schooling—has increased steadily. Americans with college degrees can expect to earn at least one million dollars more over their lifetimes than high school graduates.

Sources: Susan B. Carter et al., eds., *Historical Statistics of the United States, Millennial Ed.*, Vol. 2. New York: Cambridge University Press, 2006. Eva E. Jacobs, ed., *Handbook of U.S. Labor Statistics*, 9th ed., Lanham, MD: Bernan Press, 2006.



Labor Resources: Putting Human Capital to Work

The time and effort people devote to producing goods and services in exchange for wages is called **labor**. This includes both physical labor, such as planting crops and building houses, and mental activity, such as writing legal briefs and programming video games.

The quantity of labor available in a country depends on the size of its population and people's willingness to work. The quality of that labor depends on how skilled these workers are, or what economists refer to as human capital. **Human capital** is the knowledge and skill that people gain from education, on-the-job training, and other experiences. "It is what you would be left with if someone stripped away all of your assets," says economist Charles Wheelan, "and left you on a street corner with only the clothes on your back." What human capital would Mick Jagger be left with in that situation? He could still write and perform songs that people want to hear.

The importance of human capital is almost impossible to overstate. Workers with high human capital are more productive and earn more money than those with few skills. This is why an airline pilot makes more money than a taxi driver, although they offer similar services. Airline pilots are not only more highly trained, but they also move far more people many more miles in a day than do cabbies.

There is a strong **correlation**, or relationship, between a country's level of human capital and its standard of living. In contrast, the correlation between a country's natural resources and living standards is weak. This explains why a country like Japan, which is poor in resources but rich in human capital, is among the world's wealthiest nations, while Nigeria, which is rich in oil but poor in human capital, is among the poorest.

Economist Gary Becker, who won a Nobel Prize for his work in human capital, estimates that about 75 percent of the wealth of a modern economy consists of the education, training, and skills of its people. "We really should call our economy a 'human capitalist economy,' for that is what it mainly is," he says. "Indeed, in a modern economy, human capital is by far the most important form of capital in creating wealth and growth."

Capital Resources: Tools, Machines, and Buildings

When most Americans use the word *capital*, they are thinking about money that they could invest in stocks, bonds, real estate, or businesses to produce future wealth. Economists sometimes refer to money used in this way as **financial capital**.

To an economist, however, money by itself does not produce anything. What matters in the

production process are the tools, machines, and factory buildings that money can buy. To avoid confusion, these concrete productive resources are sometimes called **physical capital** or **capital goods**.

Looked at this way, **capital** consists of the tools, machines, and buildings used in the production of other goods and services. That last part—used in the production of other goods and services—matters. If you buy a car to drive to school and social events, it is a consumer good. If you buy a car to deliver pizzas for a restaurant, it is a capital good.

Capital takes a surprising number of forms. It includes tools as simple as a screwdriver and machines as complicated as a supercomputer. Factories, office towers, warehouses, bakeries, airports, and power plants are forms of capital. So are roads, electrical grids, sewer systems, and the Internet.

Since the beginning of the Industrial Revolution, capital has replaced labor in one area after another. This process began in the textile industry in England, where water-powered spinning machines and mechanical looms replaced spinners and weavers in the production of cloth. More recently, automated teller machines have taken over many services once handled by bank tellers. Robots have replaced assembly-line workers in automobile assembly plants. Each advance in physical capital, however, has created new needs for labor. Someone has to design, produce, and maintain the new machines.

Putting It All Together: Entrepreneurship

Entrepreneurship is a specialized and highly valued form of human capital. It involves the combining of land, labor, and capital in new ways to produce goods and services. Entrepreneurs perform several roles in the production process, including the four listed below.

Innovator. Entrepreneurs think of ways to turn new inventions, technologies, or techniques into goods or services that people will want.

Strategist. Entrepreneurs supply the vision and make the key decisions that set the course for new business enterprises.

Risk taker. Entrepreneurs take on the risks of starting new businesses. They invest their time, energy, and abilities—not to mention their own and often other people's money—not knowing whether they will succeed or fail.

Sparkplug. Entrepreneurs supply the energy, drive, and enthusiasm needed to turn ideas into realities. As entrepreneur Nolan Bushnell, founder of Atari and Chuck E. Cheese's Pizza Time Theaters, has observed,

The critical ingredient is getting off your butt and doing something. It's as simple as that. A lot of people have ideas, but there are few who decide to do something about them now. Not tomorrow. Not next week. But today. The true entrepreneur is a doer, not a dreamer.

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Entrepreneurs come in all sizes and ages. YouTube was founded in 2005 by three entrepreneurs in their 20s: Chad Hurley, Steve Chen, and Jawed Karim. First headquartered in a garage office, YouTube quickly became one of the fastest-growing sites on the Web, with over 100 million video clips being viewed daily by mid-2006.

Working Smarter Boosts Productivity

Because all three factors of production are scarce, we will never be able to produce all of the goods and services people might want. But by using these inputs more efficiently, we can increase the productivity of our economy. **Productivity** is a measure of the output of an economy per unit of input. It is determined by dividing total output by one of the three inputs involved in its production: land, labor, or capital.

$$\text{productivity} = \frac{\text{output}}{\text{input}}$$

Productivity is stated as a ratio of output per unit of input. For example, in measuring the productivity of a lumber mill, you would begin with its output in a given period of time—in this case, the number of board feet of lumber produced in a week. You would then divide the output by one input, such as the hours of labor needed to produce that output. The mill's productivity would be the ratio of board feet produced per hour.

Because productivity is a ratio of output to input, it can be raised in two ways. The first is by getting more output from the same inputs. In the case of the lumber mill, this might be accomplished by organizing the production process in a more efficient manner. By doing so, the same number of hours of labor (one of the mill's inputs) could produce more board feet of lumber (the mill's output) each week.

Key Concept

Productivity

Productivity measures the efficiency of production as a ratio of output to input. In a lumber mill, the output is lumber. One input is labor. Productivity in this case is the amount of lumber produced per hour of labor.

Productivity of a Lumber Mill

Outputs

Total board feet of lumber



Productivity
Board feet of lumber produced per hour

Inputs

Total hours of labor



The second way to raise productivity is by getting the same output from fewer inputs. Looking again at the lumber mill, this could be done by finding a way to get more board feet of lumber out of each tree that the mill workers harvest. This improvement would enable the mill to produce the same amount of lumber (its output) using fewer trees (an input) and fewer workers to cut down the trees (another input).

■ 2.4 What Do We Give Up When We Make a Choice?

Some decisions in life are easy. You probably don't fret much over which option to choose from a school lunch menu. Other decisions are agonizing. Think back to the choice facing Mick Jagger when he realized he did not have enough time to both continue his studies and be the lead singer in a band. It was "very, very difficult," he said later, because his parents wanted him to stay in college. But there was another reason this decision was so tough. In making his choice, Jagger had to give up something he valued (education) to get something he valued even more (a chance to become a rock star).

Maximizing Utility: What We Want When We Choose

The way economists see the world, people seek to make themselves as well off as possible by maximizing the utility of their decisions. They usually define **utility** as the satisfaction or pleasure one gains from consuming a product or service or from taking an action. But utility is more than that. We also gain utility by making choices that, while not all that pleasurable, are likely to improve our lives. Getting a vaccination or studying for a test may not be your idea of fun, but both should make you better off in the long run.

Maximizing utility is seldom easy. Whether choosing which television program to watch or which college to attend, we seldom have enough information to be absolutely sure we have made the best choice. This was true for Mick Jagger as well. When choosing between school and music, he had no way of knowing how successful the Rolling Stones would become. Nonetheless, he made the best judgment he could about the utility of one alternative over the other. In retrospect, he seems to have gotten it right.

Tradeoffs: What We Give Up When We Choose

As the scarcity-forces-tradeoffs principle reminds us, every decision we make—even one as simple as deciding to read this book—Involves giving up one thing for another. To gain time to read, you are giving up all of the other things you could be doing right now. Each of those alternatives not chosen is a tradeoff.

Like individuals, businesses face tradeoffs as they try to maximize the utility of their land, labor, and capital. Suppose an automaker decided that it could best use all of its factories and workers to build pickup trucks instead of cars. The tradeoff of its decision would be the loss of its passenger car business.

Societies face tradeoffs as well. The classic example used by economists is the guns-versus-butter tradeoff, in which a society must choose between using its resources to produce guns (military goods) or butter (civilian goods). If the society chooses guns, it maximizes its security, but at the cost of lowering living standards. If it chooses butter, the society maximizes living standards, but at the cost of reducing security.

Opportunity Cost: The Best Thing We Give Up to Get What We Want

You may have noticed that each decision made by a society in the guns-versus-butter example involved a cost. The same is true for the decisions you make. When you choose one course of action, you lose the utility, or benefits, of the alternatives you did not

choose. Were you to rank those alternatives, one would likely stand out as more attractive than the rest. While you might think of this option as your second best choice, an economist would see it as your opportunity cost.

The **opportunity cost** of any action is the value of the next best alternative that you could have chosen instead. Whether you have 2 alternatives or 200, your opportunity cost is simply the value of the next best one. Think back to Mick Jagger's decision. His opportunity cost of pursuing a singing career was the future utility of the college degree he never earned. Similarly, the opportunity cost of the automobile company that decided to produce only trucks was the money it would have made by continuing to produce cars.

Understanding the opportunity costs of the choices you face every day can help you make better decisions. Put yourself in this situation. There is a new video game you want to buy. You can download the game from an online store for \$49.95. You can order the game CD from a computer catalog for \$42.95 plus \$3.00 shipping, but it will take at least a week to get to your home. Or you can buy it today for only \$35.95 at a big box store in a nearby town, but it will take an hour of your time and about \$4.00 of gas to drive there and back.

One way to sort through these alternatives is to lay them out on a decision matrix like the one in Figure 2.4. The matrix lists all the alternatives

Figure 2.4

Identifying Tradeoffs and Opportunity Costs

This decision matrix shows the tradeoffs associated with each of three purchase alternatives.

- Buying at a big box store is cheapest. Choose this if you are happy to trade off your time for money.
- Buying online is fastest. If you choose this, your opportunity cost will be the money you could have saved had you chosen the next best option.

Video-Game-Purchase Decision Matrix

	Price	Delivery Cost	Transaction Time	Delivery Time
Online store	\$49.95	\$0	5 minutes	7 minutes for download
Catalog	\$42.95	\$3.00 (shipping)	10 minutes	1 week for shipping
Big box store	\$35.95	\$4.00 (gas money)	1 hour or more	none

involved in the decision as well as the criteria, or factors, that might be used in evaluating those alternatives. In this instance, the factors are price, delivery cost, transaction time (how long it will take you to complete the purchase), and delivery time. The decision matrix doesn't tell you which alternative to choose, but it does clarify what you will gain and lose by choosing one over another.

After analyzing the alternatives, you decide you really want to buy the game today. If you choose to download it from the online store, your opportunity cost is the \$10 you would have saved by driving to the big box store. If you choose to buy it from the store, your opportunity cost is the hour you would have saved by downloading the game.

Knowing the opportunity cost of each alternative still does not tell you what to do. That depends on the value of \$10 or an hour's time to you. Should you have a better use for that hour, such as working at a job that pays \$15 an hour, you probably would be better off downloading the game. If not, you might decide that trading an hour of your time for a savings of \$10 is the better choice.

Making "How Much" Decisions at the Margin

Note that in the video-game-purchase scenario, you were not facing an all-or-nothing, "buy the game or do without" decision. Instead, you were employing

the thinking-at-the-margin principle by looking at the marginal utility of one purchase alternative over another. **Marginal utility** is the extra satisfaction or pleasure you will get from an increase of one additional unit of a good or service. One alternative in the scenario left you with more time compared to the others. Another left you with more money.

An understanding of marginal utility begins with the recognition that the amount of satisfaction we get from something usually depends on how much of that something we already have. Suppose you are so thirsty after a workout that you buy yourself a large bottle of apple juice. The first glass provides you with a high level of utility by quenching your thirst. The second glass is still satisfying, but its marginal utility is less because you are no longer so thirsty. The third or fourth glass has less utility as your thirst disappears and your stomach fills up. The fifth glass, should you go on drinking, might have a **negative utility** by making you feel sick.

As this example shows, the marginal utility of something diminishes as we get more of it. This explains why a homeless person is more likely to pick up a dollar bill off the sidewalk than a millionaire is. The dollar has a relatively high marginal utility to a person with little money. Conversely, the marginal utility of an extra buck to a person who already has a million dollars is relatively low. An economist would

Key Concept

Tradeoffs and Opportunity Costs

Having trouble deciding on what to do next with your life? Know that you are not alone. In making this decision, you need to consider all of your options and the tradeoffs they present. Your opportunity cost will be the value to you of your next best choice once you make your decision.

The Decision Maker



What to do after finishing high school?

The Choice



Go to college.

The Tradeoffs



Join a band?



Work at a bank?



Travel the world?

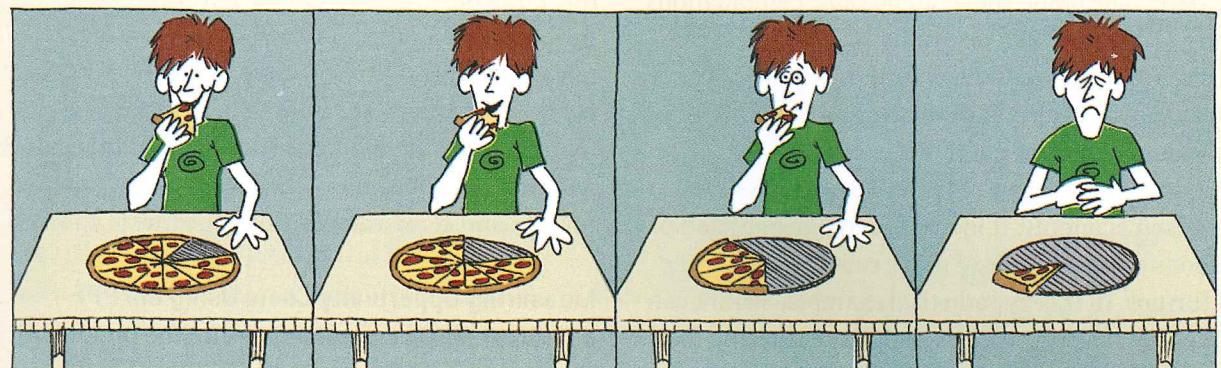
Opportunity cost: The value to you of your next best alternative, whether measured in money, utility, or happiness.

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Key Concept

The Law of Diminishing Marginal Utility

The law of diminishing marginal utility tells us that the more we consume of something, the less satisfaction we will get from each additional unit of it.



©TCI/Scott Willis

see this difference in behavior as an example of the **law of diminishing marginal utility**. According to this law, as the quantity of a good consumed increases, the marginal utility of each additional unit decreases.

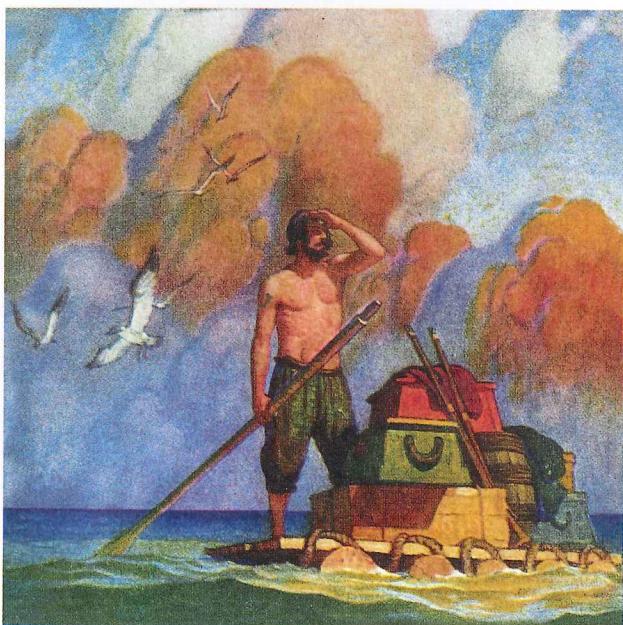
Most of the choices we face every day are “how much” decisions *at the margin*. Think back to the video game example. How much more would you be willing to pay to get the game right now? How much longer would you be willing to wait to get the game for less? Whenever you find yourself asking “how much” questions like these while considering a choice, you are thinking at the margin.

2.5 How Can We Measure What We Gain and Lose When Making Choices?

In 1719, approaching the somewhat advanced age of 60, Daniel Defoe published what would become one of the great classics of English literature: *The Life and Strange Surprising Adventures of Robinson Crusoe*. The novel tells the story of a sailor who spent 28 years marooned on a remote tropical island.

The tale may have been inspired by the true story of Alexander Selkirk, a Scottish sailor who was left on a small island off the coast of Chile by his shipmates in 1704. For the next four years and four months, Selkirk survived using whatever resources the island

had to offer. He became, in essence, a one-person economy. This makes him the ideal subject for exploring an economic model used to measure what we gain and lose when we decide how to use the resources available to us.



This illustration by American artist N. C. Wyeth first appeared in a 1920 edition of *Robinson Crusoe*. Castaway Alexander Selkirk, who may have inspired the novel, had no more capital goods than shown here with which to create his one-person island economy.

Measuring Tradeoffs Using the Production Possibilities Frontier

The **production possibilities frontier (PPF)** is an economic model, in the form of a line graph, that shows how an economy might use its resources to produce two goods. The graph shows all possible combinations of those goods that can be produced using the available resources and technology fully. It also helps us see the tradeoffs involved in devoting more resources to the production of one good or the other.

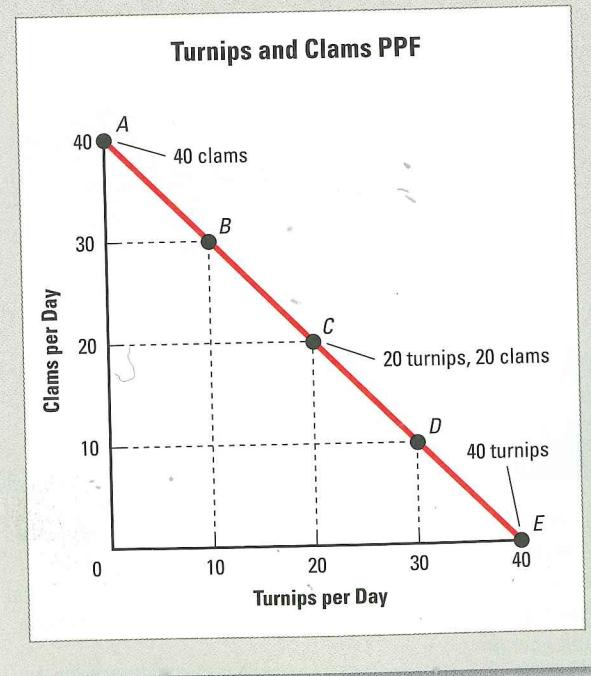
Figure 2.5A shows a PPF for Alexander Selkirk's one-person economy. It focuses on the production of two foods that were critical to his survival: clams and wild turnips. In this hypothetical example, Selkirk can use the four hours he spends each day gathering food to harvest either turnips or clams. Using his crude digging stick, he can dig up an average of 10 turnips an hour in the forest or 10 clams an hour on the beach.

Figure 2.5A

Analyzing PPFs and Tradeoffs

Selkirk's production possibilities frontier shows all the combinations of turnips and clams that his one-person economy can produce.

- At Points A and E, Selkirk devotes his time to producing just one food, either 40 clams or 40 turnips.
- At Point C, he divides his time evenly between turnips and clams. His tradeoff compared to Point A is a loss of 20 clams in exchange for a gain of 20 turnips.



The sloping line on the graph shows the various combinations of turnips and clams that Selkirk can produce in a day. That line, known as the **production possibilities curve**, is straight in this simple case. In the more complex example you will look at next, the line bows outward in a curve. This line is also called the **production possibilities frontier** because it represents the best that this economy can do with its current factors of production. Without better tools (capital) or more time devoted to food gathering (labor), Selkirk will never produce more than any combination of turnips and clams shown along the line graph.

Measuring Opportunity Costs Using the PPF

A PPF can also be used to measure the opportunity costs of different production choices. Consider a hypothetical country that can use its resources to produce just two goods: cell phones or bananas. Its land can be used for cell phone factories, banana plantations, or some combination of both. Its workers can be trained to assemble phones, raise bananas, or both. Its capital goods consist of assembly-line equipment, farm machinery, or some of each.

The graphs in Figure 2.5B show the different production possibilities for this two-goods economy, depending on how the country's resources are allocated. Notice the bowed-out shape of the curve in this PPF. This shape indicates that the tradeoffs in this economy are not the same at every point on the curve. As a result, the opportunity cost—what the country gives up—when choosing to produce more of either good changes as one moves along the curve.

Why would this be so? One reason might be that not all of the country's land is equally well suited for bananas or factories. Banana trees planted on poor land may not produce well. Factories located far from cities may have difficulty finding workers.

Another reason might be that the country's workers are not equally well trained for banana and cell phone production. Suppose the country decides to increase its output of bananas. To do so, it would have to move workers from its factories to its plantations. The factory workers would arrive at the plantations with very different skills (such as knowing how to assemble electronic components) than the experienced plantation workers. They would likely be less productive than workers who have been raising bananas for some time.

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Measuring Economic Efficiency Using the PPF

The production possibilities frontier can also help us see how efficient our choices are. **Economic efficiency**

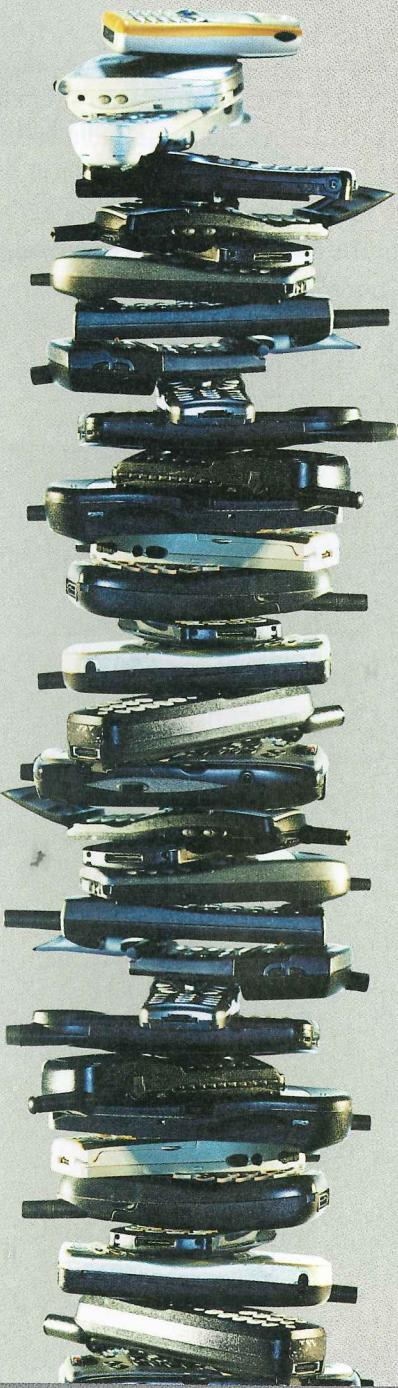
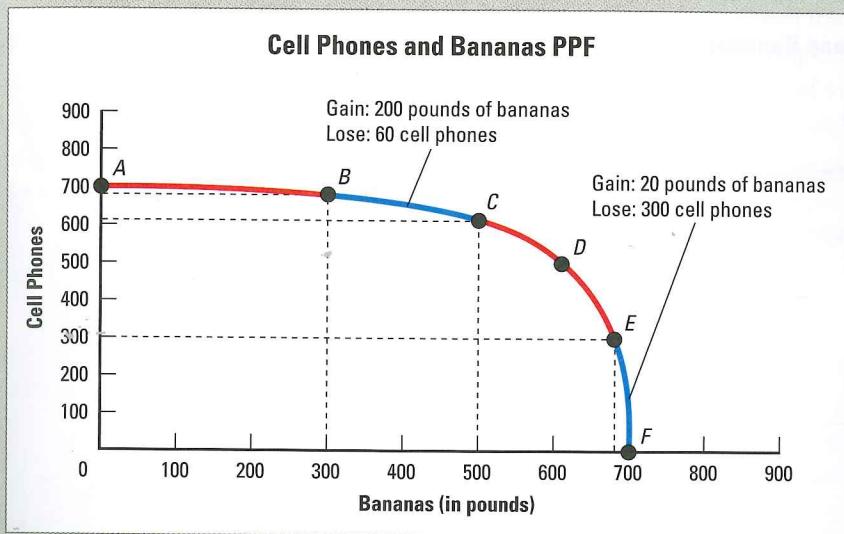
is the result of using resources in a way that produces the maximum amount of goods and services. Every point on the PPF represents an efficient use of

Figure 2.5B

Analyzing PPFs and Opportunity Costs

The shape of this PPF indicates that the opportunity cost of producing more of one product is greater at some points along the curve than at others.

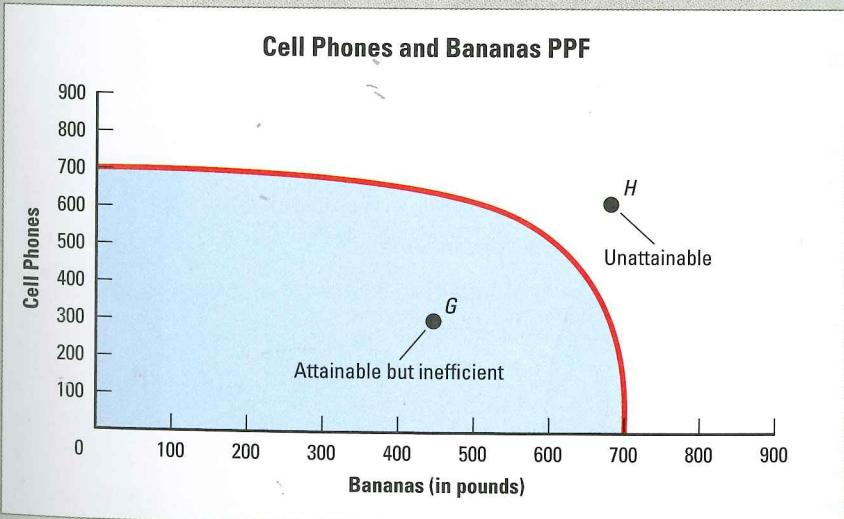
- Moving from Point *B* to Point *C* increases banana production by 200 pounds at the modest opportunity cost of 60 cell phones.
- Moving from Point *E* to Point *F* increases banana production by only 20 pounds at the much larger opportunity cost of 300 cell phones.



Analyzing PPFs and Efficiency

A PPF shows what an economy can produce using its resources as efficiently as possible.

- At Point *G*, the economy is not producing as many cell phones or bananas as it could.
- Point *H* represents a level of production that is not possible for this economy.



resources to produce that combination of outputs.

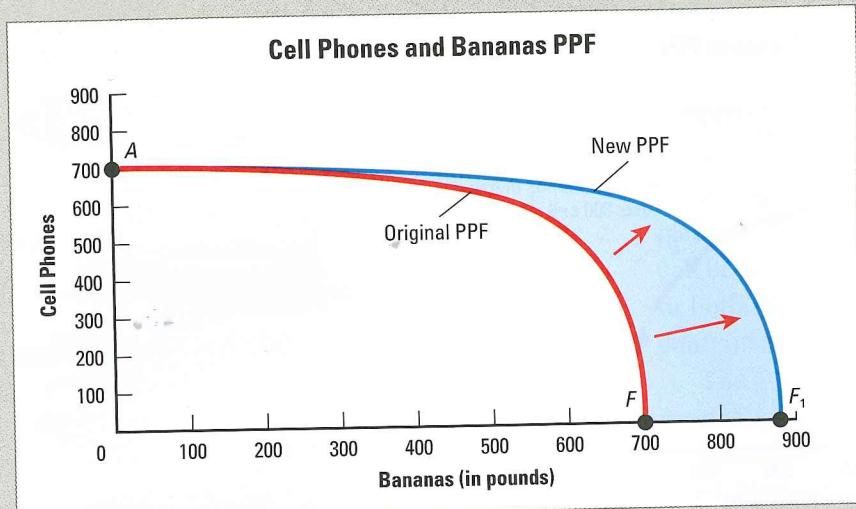
But what if an economy does not use its resources efficiently—or wishes to produce more than is currently possible given its resources? Both of those situations are illustrated in the second graph of Figure 2.5B.

Figure 2.5C

Analyzing PPFs and Changes in Productivity

Changes in productivity can shift part of a PPF to the right or left. In this graph, the productivity of banana plantations has been improved by the introduction of trees that bear more fruit. There is no change in the productivity of cell phone factories.

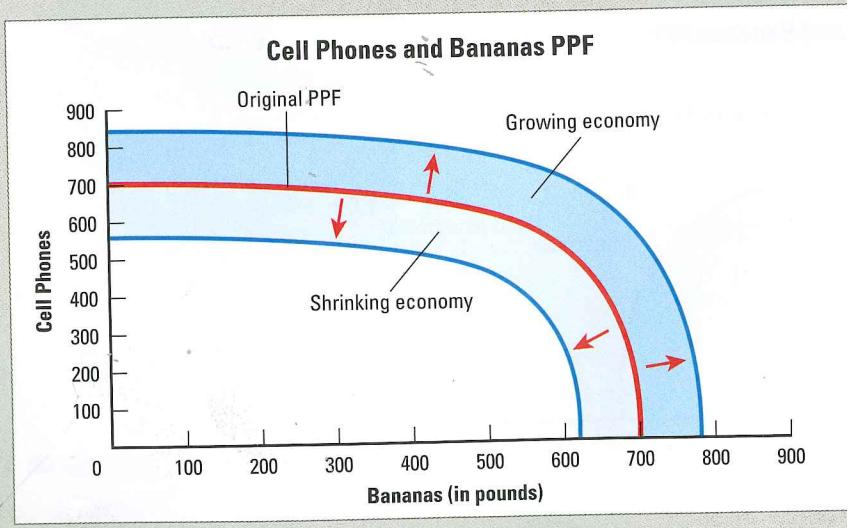
- Note that the PPF remains fixed at Point A while increasing between Points F and F_1 .
- The productivity gains of banana growers can be measured anywhere along the curve by calculating the difference between the original PPF and the new PPF.



Analyzing PPFs and Changes in the Economy

Changes in a country's economy can shift an entire PPF to the right or left.

- A shift to the right is good news. It means that output is expanding and the economy is growing.
- A shift to the left is bad news. It means that output is shrinking and the economy is heading into harder times.



Every point in the shaded area inside the PPF represents a less efficient, but still attainable, production possibility. This reduced efficiency might be the result of a natural disaster or of a slowdown in the economy and a rise in unemployment. Whatever the reason, within this shaded area, the economy is not functioning at full efficiency.

Every point outside the PPF represents an unattainable production possibility. The economy's resources are already being used to the max to reach the points on the curve. Beyond those points, the economy cannot produce more without added resources or improvements in efficiency.

Reflecting Economic Change Using the PPF

A PPF is a snapshot of an economy's production possibilities at a specific moment in time. In the real world, these possibilities are constantly changing as economic conditions change. Improvements in productivity might mean more of one good can be

produced using the same resources. Or the economy as a whole might expand or shrink. Both of these situations are illustrated in Figure 2.5C.

When an economy grows, economists say that the PPF has "shifted to the right." Productivity increases, jobs are more plentiful, and living standards improve. Likewise, when an economy shrinks, the PPF "shifts to the left." Productivity falls, unemployment rises, and living standards decline. A number of factors can cause such shifts, many of which you will study in the chapters ahead.

What is important to remember at this point is that while you can't always have everything you want, the decisions you make in life may influence what you get. The most important of those decisions, from an economic point of view, is how to maximize your human capital—and with that, your future earning power. You may never make enough money to get everything you want. But with enough human capital, you should be able, as the song says, to "get what you need."

Summary

Life is full of choices and decisions. The study of economics helps us see why we have to choose among alternatives. It also gives us tools for thinking about what we stand to gain and lose when making life's decisions.

Why is what we want scarce? Scarcity exists because our wants, which are infinite, exceed our resources, which are finite. Unlike shortages, which are temporary in nature, scarcity is an inescapable fact of life. It means we can never have everything we might want.

How do we satisfy economic wants? Goods and services are produced by bringing together the three factors of production: land, labor, and capital. Entrepreneurship is an essential part of the production process. Entrepreneurs combine land, labor, and capital in new ways to create products that satisfy economic wants.

What do we give up when we make a choice? Every choice involves tradeoffs among alternatives. When making a decision, people generally try to maximize the utility, or satisfaction, they hope to gain by choosing one alternative over another. The opportunity cost of any decision is the value of the next-best alternative.

How can we measure what we gain and lose when making choices? Economists use an economic model known as the production possibilities frontier to measure what we gain and lose when deciding how to use the factors of production in different ways. The model shows the tradeoffs and opportunity costs involved in producing more of one good at the expense of another. It also reminds us that even when an economy is working at peak efficiency, it won't be able to produce everything that we might want.