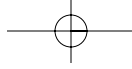


PART ONE

Introduction

- 1 Limits, Alternatives, and Choices
- 2 The Market System and the Circular Flow



To the Student

This book and its ancillaries contain several features designed to help you learn economics:

- **Icons in the margins** A glance through the book reveals many pages with symbols in the margins. These icons are designed to alert you to helpful learning aids available with the book. The graph icon denotes “Interactive Graphs” found at the text’s Web site, www.brueonline.com. Brief exercises have you interact with the graphs, for example, by clicking on a specific curve and dragging it to a new location. These exercises will enhance your understanding of the underlying concepts. The light-bulb icon, in contrast, stands for “Origin of the Idea.” Each of these pieces traces a particular idea to the person or persons who first developed it.



graph icon

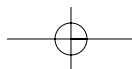


light-bulb icon

- **Other Internet aids** Our Internet site contains many other aids. In the student section at the Online Learning Center, you will find self-testing multiple-choice quizzes, links to relevant news articles, and much more.
- **Appendix on graphs** To understand the content in this book, you will need to be comfortable with basic graphical analysis and a few quantitative concepts. The appendix (pages ●●●–●●●) near the end of the book reviews graphing and slopes of curves. Be sure not to skip it.
- **Key terms** Key terms are set in boldface type within the chapters, defined in the margins, listed at the end of each chapter, and again defined in the Glossary toward the end of the book.
- **“Illustrating the Idea” and “Applying the Analysis”** These sections flow logically and smoothly from the content that precedes them. They are part and parcel of the development of the ideas and cannot be skipped.
- **Questions** Each “Illustrating the Idea” and “Applying the Analysis” section is followed by a question. A comprehensive list of study questions is located at the end of each chapter. At the Internet site, there are multiple-choice quizzes and one or more Web-based questions that require you to find information at specified Web sites to formulate answers.
- **Study Guide** We enthusiastically recommend the *Study Guide* accompanying this text. This “portable tutor” contains not only a broad sampling of various kinds of questions but a host of useful learning aids.

Our two main goals are to help you understand and apply economics and help you improve your analytical skills. An understanding of economics will enable you to comprehend a whole range of economic, social, and political problems that otherwise would seem puzzling and perplexing. Also, your study will enhance reasoning skills that are highly prized in the workplace.

Good luck with your study. We think it will be well worth your effort.



CHAPTER ONE

Limits, Alternatives, and Choices

In this chapter you will learn:

- The definition of economics and the features of the economic perspective.
- The role of economic theory in economics.
- The distinction between microeconomics and macroeconomics.
- The categories of scarce resources and the nature of the economic problem.
- About production possibilities analysis, increasing opportunity costs, and economic growth.

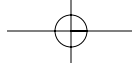
Economics is about wants and means. Biologically, people need only air, water, food, clothing, and shelter. But in modern society people also desire goods and services that provide a more comfortable or affluent standard of living. We want bottled water, soft drinks, and fruit juices, not just water from the creek. We want salads, burgers, and pizzas, not just berries and nuts. We want jeans, suits, and coats, not just woven reeds. We want apartments, condominiums, or houses, not just mud huts. And, as the saying goes, “that is not the half of it.” We also want DVD players, Internet service, education, homeland security, cell phones, and much more.

Fortunately, society possesses productive resources, such as labor and managerial talent, tools and machinery, and land and mineral deposits. These resources, employed in the economic system (or simply the economy), help us produce goods and services that satisfy many of our economic wants.

But the blunt reality is that our economic wants far exceed the productive capacity of our scarce (limited) resources. We are forced to make choices. This unyielding truth underlies the definition of **economics**: It is the study of how people, institutions, and society make choices under conditions of scarcity.

1.1
Origin of
the term
“economics”



**economics**

The study of how people, institutions, and society make economic choices under conditions of scarcity.

economic perspective

A viewpoint that envisions individuals and institutions making rational decisions by comparing the marginal benefits and marginal costs of their actions.

opportunity cost

The value of the good, service, or time forgone to obtain something else.

The Economic Perspective

Economists view things through a particular perspective. This **economic perspective**, or economic way of thinking, has several critical and closely interrelated features.

Scarcity and Choice

From our definition of economics, it is easy to see why economists view the world through the lens of scarcity. Scarce economic resources mean limited goods and services. Scarcity restricts options and demands choices. Because we “can’t have it all,” we must decide what we will have and what we must forgo.

At the core of economics is the idea that “there is no free lunch.” You may be treated to lunch, making it “free” to you, but someone bears a cost—ultimately, society. Scarce inputs of land, equipment, farm labor, the labor of cooks and waiters, and managerial talent are required. Because these resources could have been used to produce something else, society sacrifices those other goods and services in making the lunch available. Economists call such sacrifices **opportunity costs**: the value of what is given up to obtain something else. To get more of one thing, society forgoes the opportunity of getting something else. So the cost of that obtained is the value of that sacrificed to get it.

Illustrating the Idea

Did Gates, Winfrey, and Rodriguez Make Bad Choices?

The importance of opportunity costs in decision making is illustrated by different choices people make with respect to college. College graduates usually earn about 50% more during their lifetimes than persons with just high school diplomas. For most capable students, “Go to college, stay in college, and earn a degree” is very sound advice.

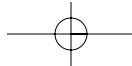
Yet Microsoft cofounder Bill Gates and talk-show host Oprah Winfrey* both dropped out of college, and baseball star Alex Rodriguez (“A-Rod”) never even bothered to enroll. What were they thinking? Unlike most students, Gates faced enormous opportunity costs for staying in college. He had a vision for his company, and his starting work young helped ensure Microsoft’s success. Similarly, Winfrey landed a spot in local television news when she was a teenager, eventually producing and starring in the *Oprah Winfrey Show* when she was 32 years old. Getting a degree in her twenties might have interrupted the string of successes that made her famous talk show possible. And Rodriguez knew that professional athletes have short careers. Therefore, going to college directly after high school would have taken away 4 years of his peak earning potential.

So Gates, Winfrey, and Rodriguez understood opportunity costs and made their choices accordingly. The size of opportunity costs greatly matters in making individual decisions.

Question:

Professional athletes sometimes return to college after they retire from professional sports. How does that college decision relate to opportunity costs?

* Winfrey eventually went back to school and earned a degree from Tennessee State University when she was in her thirties.



Purposeful Behavior

Economics assumes that human behavior reflects “rational self-interest.” Individuals look for and pursue opportunities to increase their **utility**: pleasure, happiness, or satisfaction. They allocate their time, energy, and money to maximize their satisfaction. Because they weigh costs and benefits, their decisions are “purposeful” or “rational,” not “random” or “chaotic.”

Consumers are purposeful in deciding what goods and services to buy. Business firms are purposeful in deciding what products to produce and how to produce them. Government entities are purposeful in deciding what public services to provide and how to finance them.

Purposeful behavior does not assume that people and institutions are immune from faulty logic and therefore are perfect decision makers. They sometimes make mistakes. Nor does it mean that people’s decisions are unaffected by emotion or the decisions of those around them. Purposeful behavior simply means that people make decisions with some desired outcome in mind.

Nor is rational self-interest the same as selfishness. People make personal sacrifices to others. They contribute time and money to charities because they derive pleasure from doing so. Parents help pay for their children’s education for the same reason. These self-interest, but unselfish, acts help maximize the givers’ satisfaction as much as any personal purchase of goods or services. Self-interest behavior is simply behavior designed to increase personal satisfaction, however it may be derived.

utility

The satisfaction obtained from consuming a good or service.



1.2
Utility

Marginalism: Benefits and Costs

The economic perspective focuses largely on **marginal analysis**—comparisons of marginal benefits and marginal costs. To economists, “marginal” means “extra,” “additional,” or “a change in.” Most choices or decisions involve changes in the status quo, meaning the existing state of affairs.

Should you attend school for another year? Should you study an extra hour for an exam? Should you supersize your fries? Similarly, should a business expand or reduce its output? Should government increase or decrease its funding for a missile defense system?

Each option involves marginal benefits and, because of scarce resources, marginal costs. In making choices rationally, the decision maker must compare those two amounts. Example: You and your fiancée are shopping for an engagement ring. Should you buy a 1/2-carat diamond, a 5/8-carat diamond, a 3/4-carat diamond, a 1-carat diamond, or something even larger? The marginal cost of a larger-size diamond is the added expense beyond the cost of the smaller-size diamond. The marginal benefit is the perceived greater lifetime pleasure (utility) from the larger-size stone. If the marginal benefit of the larger diamond exceeds its marginal cost (and you can afford it), buy the larger stone. But if the marginal cost is more than the marginal benefit, buy the smaller diamond instead, even if you can afford the larger stone!

In a world of scarcity, the decision to obtain the marginal benefit associated with some specific option always includes the marginal cost of forgoing something else. The money spent on the larger-size diamond means forgoing some other product. Opportunity costs are present whenever a decision is made.

marginal analysis

The comparison of marginal (“extra” or “additional”) benefits and marginal costs, usually for decision making.



1.3
Marginal
analysis



Applying the Analysis

Fast-Food Lines

The economic perspective is useful in analyzing all sorts of behaviors. Consider an everyday example: the behavior of fast-food customers. When customers enter the restaurant, they go to the shortest line, believing that line will minimize their time cost of obtaining food. They are acting purposefully; time is limited, and people prefer using it in some way other than standing in a long line.

If one fast-food line is temporarily shorter than other lines, some people will move to that line. These movers apparently view the time saving from the shorter line (marginal benefit) as exceeding the cost of moving from their present line (marginal cost). The line switching tends to equalize line lengths. No further movement of customers between lines occurs once all lines are about equal.

Fast-food customers face another cost-benefit decision when a clerk opens a new station at the counter. Should they move to the new station or stay put? Those who shift to the new line decide that the time saving from the move exceeds the extra cost of physically moving. In so deciding, customers must also consider just how quickly they can get to the new station compared with others who may be contemplating the same move. (Those who hesitate in this situation are lost!)

Customers at the fast-food establishment do not have perfect information when they select lines. Thus, not all decisions turn out as expected. For example, you might enter a short line and find someone in front of you is ordering hamburgers and fries for 40 people in the Greyhound bus parked out back (and the employee is a trainee)! Nevertheless, at the time you made your decision, you thought it was optimal.

Finally, customers must decide what food to order when they arrive at the counter. In making their choices, they again compare marginal costs and marginal benefits in attempting to obtain the greatest personal satisfaction for their expenditure.

Economists believe that what is true for the behavior of customers at fast-food restaurants is true for economic behavior in general. Faced with an array of choices, consumers, workers, and businesses rationally compare marginal costs and marginal benefits in making decisions.

Question:

Have you ever gone to a fast-food restaurant only to observe long lines and then leave? Use the economic perspective to explain your behavior.

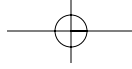
scientific method

The systematic pursuit of knowledge by observing facts and formulating and testing hypotheses to obtain theories, principles, and laws.

Theories, Principles, and Models

Like the physical and life sciences, as well as other social sciences, economics relies on the **scientific method**. That procedure consists of several elements:

- The observation of real-world behavior and outcomes.



- Based on those observations, the formulation of a possible explanation of cause and effect (hypothesis).
- The testing of this explanation by comparing the outcomes of specific events to the outcome predicted by the hypothesis.
- The acceptance, rejection, or modification of the hypothesis, based on these comparisons.
- The continued testing of the hypothesis against the facts. As favorable results accumulate, the hypothesis evolves into a *theory*. A very well tested and widely accepted theory is referred to as a *law* or *principle*. Combinations of such laws or principles are incorporated into *models*, which are simplified representations of how something works, such as a market or segment of the economy.

Economists develop theories of the behavior of individuals (consumers, workers) and institutions (businesses, governments) engaged in the production, exchange, and consumption of goods and services. Economic theories and **principles** are statements about economic behavior or the economy that enable prediction of the probable effects of certain actions. They are “purposeful simplifications.” The full scope of economic reality itself is too complex and bewildering to be understood as a whole. In developing theories and principles, economists remove the clutter and simplify.

principles
Statements about economic behavior that enable prediction of the probable effects of certain actions.

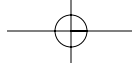
Economic principles and models are highly useful in analyzing economic behavior and understanding how the economy operates. They are the tools for ascertaining cause and effect (or action and outcome) within the economic system. Good theories do a good job of explaining and predicting. They are supported by facts concerning how individuals and institutions actually behave in producing, exchanging, and consuming goods and services.

There are some other things you should know about economic principles:

- **Generalizations** Economic principles are *generalizations* relating to economic behavior or to the economy itself. Economic principles are expressed as the tendencies of typical or average consumers, workers, or business firms. For example, economists say that consumers buy more of a particular product when its price falls. Economists recognize that some consumers may increase their purchases by a large amount, others by a small amount, and a few not at all. This “price-quantity” principle, however, holds for the typical consumer and for consumers as a group.
- **Other-things-equal assumption** Like other scientists, economists use the *ceteris paribus* or **other-things-equal assumption** to construct their theories. They assume that all variables except those under immediate consideration are held constant for a particular analysis. For example, consider the relationship between the price of Pepsi and the amount of it purchased. It helps to assume that, of all the factors that might influence the amount of Pepsi purchased (for example, the price of Pepsi, the price of Coca-Cola, and consumer incomes and preferences), only the price of Pepsi varies. The economist can then focus on the “price of Pepsi–purchases of Pepsi” relationship without being confused by changes in other variables.
- **Graphical expression** Many economic models are expressed graphically. Be sure to read the special appendix at the end of this book as a review of graphs.



other-things-equal assumption
The assumption that factors other than those being considered do not change.



Macroeconomics and Microeconomics

Economists develop economic principles and models at two levels.

Microeconomics

microeconomics
The part of economics concerned with individual units such as a household, a firm, or an industry.

Microeconomics looks at specific economic units. At this level of analysis, the economist observes the details of an economic unit, or very small segment of the economy, under a figurative microscope. In microeconomics we talk of an individual household, firm, or industry. We measure the price of a specific product, the number of workers employed by a single firm, the revenue or income of a particular firm or household, or the expenditures of a specific firm, government entity, or family.

Macroeconomics

macroeconomics
The part of economics concerned with the economy as a whole or major components of the economy.

Macroeconomics examines either the economy as a whole or its basic subdivisions or aggregates, such as the government, household, and business sectors. An **aggregate** is a collection of specific economic units treated as if they were one unit. Therefore, we might lump together the millions of consumers in the U.S. economy and treat them as if they were one huge unit called “consumers.”

aggregate
A collection of specific economic units treated as if they were one unit.

In using aggregates, macroeconomics seeks to obtain an overview, or general outline, of the structure of the economy and the relationships of its major aggregates. Macroeconomics speaks of such economic measures as total output, total employment, total income, aggregate expenditures, and the general level of prices in analyzing various economic problems. No or very little attention is given to specific units making up the various aggregates.



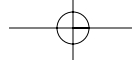
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Photo Op Micro versus Macro

Figuratively, microeconomics examines the sand, rock, and shells, not the beach; in contrast, macroeconomics examines the beach, not the sand, rocks, and shells.



Individual's Economic Problem

It is clear from our previous discussion that both individuals and society face an **economic problem**: They need to make choices because economic wants are unlimited but the means (income, time, resources) for satisfying those wants are limited. Let's first look at the economic problem faced by individuals. To explain the idea, we will construct a very simple microeconomic model.

economic problem
The need for individuals and society to make choices because wants exceed means.

Limited Income

We all have a finite amount of income, even the wealthiest among us. Sure Bill Gates earns a bit more than the rest of us, but he still has to decide how to spend his money! And the majority of us have much more limited means. Our income comes to us in the form of wages, interest, rent, and profit, although we may also receive money from government programs or family members. As Global Snapshot 1.1 shows, the average income of Americans in 2003 was \$37,610. In the poorest nations, it was less than \$500.



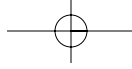
Average Income, Selected Nations

Average income (total income/population) and therefore typical budget constraints vary greatly among nations.

Country	Per capita income, 2003*
Switzerland	\$39,880
United States	37,610
Japan	34,510
France	24,770
South Korea	12,020
Mexico	6,230
Brazil	2,710
China	1,100
Pakistan	470
Nigeria	320
Rwanda	220
Liberia	130

* U.S. dollars.

Source: World Bank, www.worldbank.org.

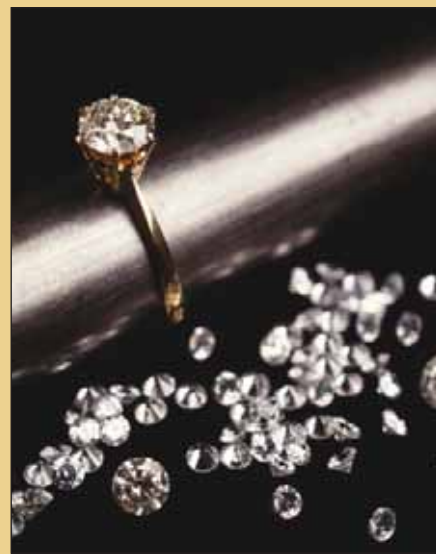


Unlimited Wants

For better or worse, most people have virtually unlimited wants. We desire various goods and services that provide utility. Our wants extend over a wide range of products, from *necessities* (food, shelter, clothing) to *luxuries* (perfumes, yachts, sports cars). Some wants such as basic food, clothing, and shelter have biological roots. Other wants, for example, specific kinds of food, clothing, and shelter, arise from the conventions and customs of society.



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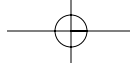
Photo Op Necessities versus Luxuries

Economic wants include both necessities and luxuries. Each type of item provides utility to the buyer.

Over time, economic wants tend to change and multiply, fueled by new products. Only recently have people wanted MP3 players, Internet service, digital cameras, or camera phones because those products did not exist a few decades ago. Also, the satisfaction of certain wants may trigger others: The acquisition of a Neon or a Civic has been known to whet the appetite for a Porsche or a Mercedes.

Services, as well as goods, 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.

For most people, the desires for goods and services cannot be fully satisfied. Bill Gates may have all that he wants for himself, but it is clear from his massive charitable



giving that he keenly wants better health care for the world's poor. Our desires for a *particular* good or service can be satisfied; over a short period of time we can surely obtain enough toothpaste or pasta. And one appendectomy is plenty. But goods and services *in general* seem to be another story.

Because we have only limited income but seemingly insatiable wants, it is in our self-interest to economize: to pick and choose goods and services that create maximum utility.

A Budget Line

The economic problem facing individuals can be depicted as a **budget line** (or, more technically, *budget constraint*). It is a schedule or curve that shows various combinations of two products a consumer can purchase with a specific money income.

To understand this idea, suppose that you received a Barnes & Noble (or Borders) gift card as a birthday present. The \$120 card is soon to expire. You take the card to the store and confine your purchase decisions to two alternatives: DVDs and paperback books. DVDs are \$20 each and paperback books are \$10 each. Your purchase options are shown in the table in Figure 1.1.

At one extreme, you might spend all of your \$120 "income" on 6 DVDs at \$20 each and have nothing left to spend on books. Or, by giving up 2 DVDs and thereby gaining \$40, you can have 4 DVDs at \$20 each and 4 books at \$10 each. And so on to the other extreme, at which you could buy 12 books at \$10 each, spending your entire gift card on books with nothing left to spend on DVDs.

The graph in Figure 1.1 shows the budget line. Note that the graph is not restricted to whole units of DVDs and books as is the table. Every point on the graph represents a possible combination of DVDs and books, including fractional quantities. The slope of the graphed budget line measures the ratio of the price of books (P_b) to the price of DVDs (P_{dvd}); more precisely, the slope is $P_b/P_{dvd} = \$10/\$20 = -1/2$ or $-.5$. So you must forgo 1 DVD (measured on the vertical axis) to buy 2 books (measured on the horizontal axis). This yields a slope of $-1/2$ or $-.5$.

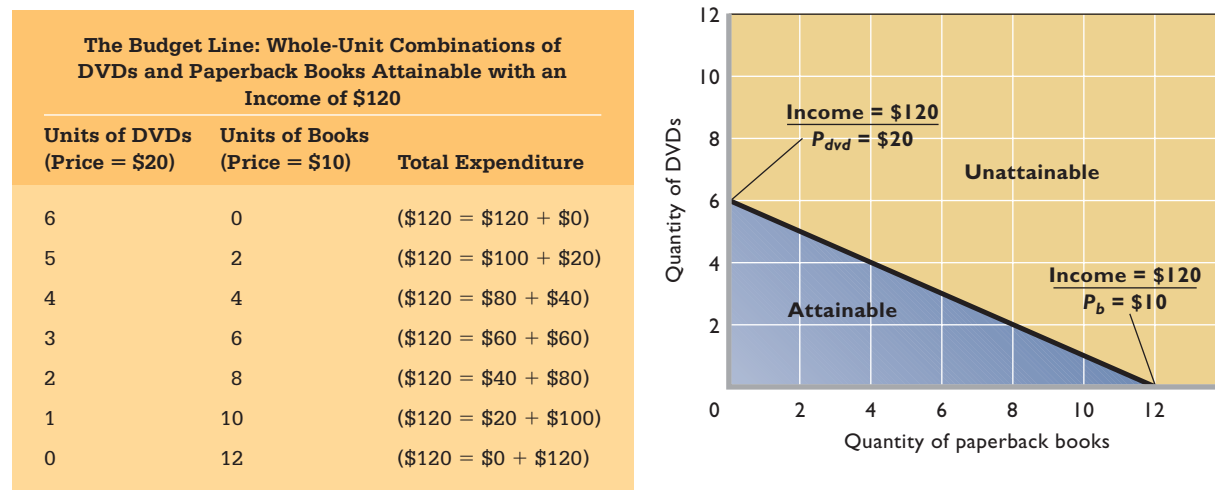
The budget line illustrates several ideas.

budget line

A line that shows various combinations of two products a consumer can purchase with a specific money income, given the products' prices.

FIGURE 1.1

A consumer's budget line. The budget line (or budget constraint) shows all the combinations of any two products that can be purchased, given the prices of the products and the consumer's money income.





Attainable and Unattainable Combinations All the combinations of DVDs and books on or inside the budget line are *attainable* from the \$120 of money income. You can afford to buy, for example, 3 DVDs at \$20 each and 6 books at \$10 each. You also can obviously afford to buy 2 DVDs and 5 books, if so desired, and not use up the value on the gift card. But to achieve maximum utility you will want to spend the full \$120.

In contrast, all combinations beyond the budget line are *unattainable*. The \$120 limit simply does not allow you to purchase, for example, 5 DVDs at \$20 each and 5 books at \$10 each. That \$150 expenditure would clearly exceed the \$120 limit. In Figure 1.1 the attainable combinations are on and within the budget line; the unattainable combinations are beyond the budget line.

1.5
Opportunity
cost



constant opportunity cost
An opportunity cost that remains the same as consumers shift purchases from one product to another along a straight-line budget line.

Tradeoffs and Opportunity Costs The budget line in Figure 1.1 illustrates the idea of tradeoffs arising from limited income. To obtain more DVDs, you have to give up some books. For example, to acquire the first DVD, you trade off 2 books. So the opportunity cost of the first DVD is 2 books. To obtain the second DVD the opportunity cost is also 2 books. The straight-line budget constraint, with its constant slope, indicates **constant opportunity cost**. That is, the opportunity cost of 1 extra DVD remains the same (= 2 books) as more DVDs are purchased. And, in reverse, the opportunity cost of 1 extra book does not change (= 1/2 DVD) as more books are bought.

Choice Limited income forces people to choose what to buy and what to forgo to fulfill wants. You will select the combination of DVDs and paperback books that you think is “best.” That is, you will evaluate your marginal benefits and your marginal costs (here, product price) to make choices that maximize your satisfaction. Other people, with the same \$120 gift card, would undoubtedly make different choices.

Income Changes The location of the budget line varies with money income. An increase in money income shifts the budget line to the right; a decrease in money income shifts it to the left. To verify this, recalculate the table in Figure 1.1, assuming the card value (income) is (a) \$240 and (b) \$60, and plot the new budget lines in the graph. No wonder people like to have more income: That shifts their budget lines outward and enables them to buy more goods and services. But even with more income, people will still face spending tradeoffs, choices, and opportunity costs.

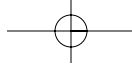
Society's Economic Problem

Society must also make choices under conditions of scarcity. It, too, faces an economic problem. Should it devote more of its limited resources to the criminal justice system (police, courts, and prisons) or to education (teachers, books, and schools)? If it decides to devote more resources to both, what other goods and services does it forgo? Health care? Homeland defense?

economic resources
The land, labor, capital, and entrepreneurial ability used in the production of goods and services.

Scarce Resources

Society's 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 the entire set of 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.

Resource Categories

Economists classify economic resources into four general categories.

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

land
Natural resources (“gifts of nature”) used to produce goods and services.

Labor The resource **labor** consists of the physical and mental talents of individuals used 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.”

labor
The physical and mental talents and efforts of people used to produce goods and services.

Capital For economists, **capital** (or *capital goods*) includes all manufactured aids used in producing consumer goods and services. Included are all factory, storage, transportation, and distribution facilities, as well as all tools and machinery. Economists refer to the purchase of capital goods as **investment**.

capital
Human-made resources (buildings, machinery, and equipment) used to produce goods and services.

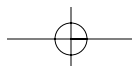
Capital goods differ from consumer goods because consumer goods satisfy wants directly, while capital goods do so indirectly by aiding the production of consumer goods. Note that the term “capital” as used by economists refers not to money but to tools, machinery, and other productive equipment. Because money produces nothing, economists do not include it as an economic resource. Money (or money capital or financial capital) is simply a means for purchasing real capital.

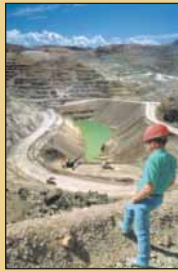
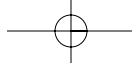
investment
The purchase of capital resources.

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

entrepreneurial ability
The human talent that combines the other resources to produce a product, make strategic decisions, and bear risks.

- The entrepreneur takes the initiative in combining the resources of land, labor, and capital to produce a good or a service. Both a spark plug 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 the strategic business decisions that set the course of an enterprise.
- The entrepreneur is an innovator. He or she commercializes new products, new production techniques, or even new forms of business organization.
- The entrepreneur is a risk bearer. The entrepreneur 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.





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Photo Op Economic Resources

Land, labor, capital, and entrepreneurial ability all contribute to producing goods and services.

factors of production
Economic resources:
land, labor, capital, and
entrepreneurial ability.

Because land, labor, capital, and entrepreneurial ability are combined to produce goods and services, they are called the **factors of production** or simply inputs.

Production Possibilities Model

Society uses its scarce resources to produce goods and services. The alternatives and choices it faces can best be understood through a macroeconomic model of production possibilities. To keep things simple, we assume:

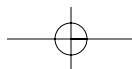
- **Full employment** The economy is employing all its available resources.
- **Fixed resources** The quantity and quality of the factors of production are fixed.
- **Fixed technology** The state of technology (the methods used to produce output) is constant.
- **Two goods** The economy is producing only two goods: food products and manufacturing equipment. Food products symbolize **consumer goods**, products that satisfy our wants directly; manufacturing equipment symbolizes **capital goods**, products that satisfy our wants indirectly by making possible more efficient production of consumer goods.

consumer goods
Products and services
that directly satisfy
consumer wants.

capital goods
Items that are used to
produce other goods
and therefore do not
directly satisfy
consumer wants.

Production Possibilities Table

A production possibilities table lists the different combinations of two products that can be produced with a specific set of resources, assuming full employment. Figure 1.2 contains such a table for a simple economy that is producing food products and manufacturing equipment; the data are, of course, hypothetical. At alternative A, this economy would be devoting all its available resources to the production of manufacturing equipment (capital goods); at alternative E, all resources would go to food-product 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 food products at the expense of the production of manufacturing equipment.



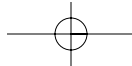
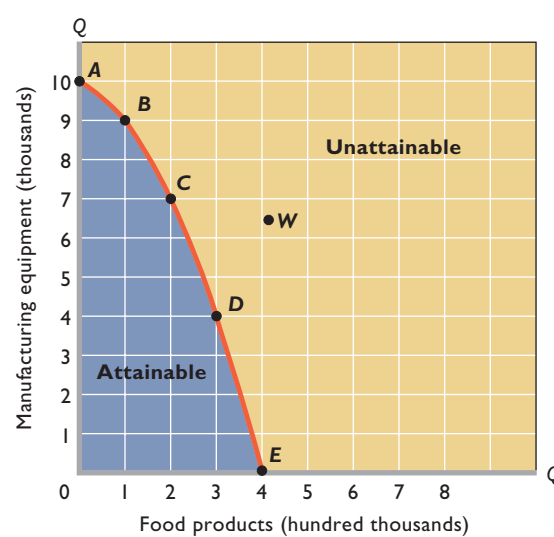


FIGURE 1.2

The production possibilities curve. Each point on the production possibilities curve represents some maximum combination of two products that can be produced if resources are fully and efficiently employed. When an economy is operating on the curve, more manufacturing equipment means less food products, and vice versa. Limited resources and a fixed technology make any combination of manufacturing equipment and food products lying outside the curve (such as at *W*) unattainable. Points inside the curve are attainable, but they indicate that full employment has not been realized.

Type of Product	Production Alternatives				
	A	B	C	D	E
Food products (hundred thousands)	0	1	2	3	4
Manufacturing equipment (thousands)	10	9	7	4	0



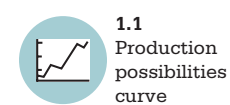
Because consumer goods satisfy our wants directly, any movement toward E looks tempting. In producing more food products, society increases the current satisfaction of its wants. But there is a cost: More food products mean less manufacturing equipment. This shift of resources to consumer goods catches up with society over time because the stock of capital goods does not 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.”

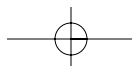
Generalization: At any point in time, a fully employed economy must sacrifice some of one good to obtain more of another good. Scarce resources prohibit such an economy from having more of both goods. Society must choose among alternatives. There is no such thing as a free bag of groceries or a free manufacturing machine.

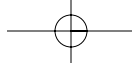
Production Possibilities Curve

The data presented in a production possibilities table can also be shown graphically. We arbitrarily represent the economy’s output of capital goods (here, manufacturing equipment) on the vertical axis and the output of consumer goods (here, food products) on the horizontal axis, as shown in Figure 1.2.



1.1
Production possibilities curve





production possibilities curve

A curve showing the different combinations of goods and services that can be produced in a fully employed economy, assuming the available supplies of resources and technology are fixed.

Each point on the **production possibilities curve** represents some maximum output of the two products. The curve is a “constraint” because it shows the limit of attainable outputs. Points on the curve are attainable as long as the economy uses all its available resources. Points lying inside the curve are also attainable, but they reflect less total output and therefore are not as desirable as points on the curve. Points inside the curve imply that the economy could have more of both manufacturing equipment and food products if it achieved full employment. Points lying beyond the production possibilities curve, like *W*, would represent a greater output than the output at any point on the curve. Such points, however, are unattainable with the current availability of resources and technology.

Law of Increasing Opportunity Cost

Figure 1.2 clearly shows that more food products mean less manufacturing equipment. The number of units of manufacturing equipment that must be given up to obtain another unit of food products, of course, is the opportunity cost of that unit of food products.

In moving from alternative A to alternative B in the table in Figure 1.2, the cost of 1 additional unit of food products is 1 less unit of manufacturing equipment. But when additional units are considered—B to C, C to D, and D to E—an important economic principle is revealed: The opportunity cost of each additional unit of food products is greater than the opportunity cost of the preceding one. When we move from A to B, just 1 unit of manufacturing equipment is sacrificed for 1 more unit of food products; but in going from B to C, we sacrifice 2 additional units of manufacturing equipment for 1 more unit of food products; then 3 more of manufacturing equipment for 1 more of food products; and finally 4 for 1. Conversely, confirm that as we move from E to A, the cost of an additional unit of manufacturing equipment (on average) is $1/4$, $1/3$, $1/2$, and 1 unit of food products, respectively, for the four successive moves.

Our example illustrates the **law of increasing opportunity costs**: The more of a product that society produces, the greater is the opportunity cost of obtaining an extra unit.

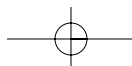
Shape of the Curve The law of increasing opportunity costs is reflected in the shape of the production possibilities curve: The curve is bowed out from the origin of the graph. Figure 1.2 shows that when the economy moves from *A* to *E*, it must give up successively larger amounts of manufacturing equipment (1, 2, 3, and 4) to acquire equal increments of food products (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*.

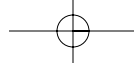
Economic Rationale The economic rationale for the law of increasing opportunity costs is that economic resources are not completely adaptable to alternative uses. Many resources are better at producing one type of good than at producing others. Farms and ranches are highly suited to producing the ingredients needed to make food products, while lands rich in mineral deposits are more suited to producing the materials needed to make manufacturing equipment. As society steps up the production of food products, it must push resources that are less and less adaptable to making them into their production.

If we start at *A* and move to *B* in Figure 1.2, we can shift resources whose productivity is relatively high in food production and low in manufacturing equipment. But

law of increasing opportunity costs

The principle that as the production of a good increases, the opportunity cost of producing an additional unit rises.





as we move from *B* to *C*, *C* to *D*, and so on, resources highly productive of food products become increasingly scarce. To get more food products, resources whose productivity in manufacturing equipment is relatively great will be needed. It will take increasingly more of such resources, and hence greater sacrifices of manufacturing equipment, to achieve each 1-unit increase in food products. This lack of perfect flexibility, or interchangeability, on the part of resources is the cause of increasing opportunity costs for society.

Optimal Allocation

Of all the attainable combinations of food products and manufacturing equipment on the curve in Figure 1.2, which is optimal? That is, what specific quantities of resources should be allocated to food products and what specific quantities to manufacturing equipment in order to maximize satisfaction?

Recall that economic decisions center on comparisons of marginal benefits (MB) and marginal costs (MC). Any economic activity 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 $MB = MC$. Society needs to make a similar assessment about its production decision.

Consider food products. We already know from the law of increasing opportunity costs that the marginal costs of additional units of food products will rise as more units are produced. We also know that we obtain extra or marginal benefits from additional units of food products. However, although economic wants in the aggregate are insatiable, it is reasonable to assume that successive units of a particular product yield less additional benefits to society than prior units.

The optimal quantity of food production is indicated by the intersection of the MB and MC curves: 200,000 units in Figure 1.3. Why is this amount the optimal quantity? If only 100,000 units of food products were produced, the marginal benefit of an extra unit of them would exceed its marginal cost. In money terms, MB is \$15, while MC is only \$5. When society gains something worth \$15 at a marginal cost of

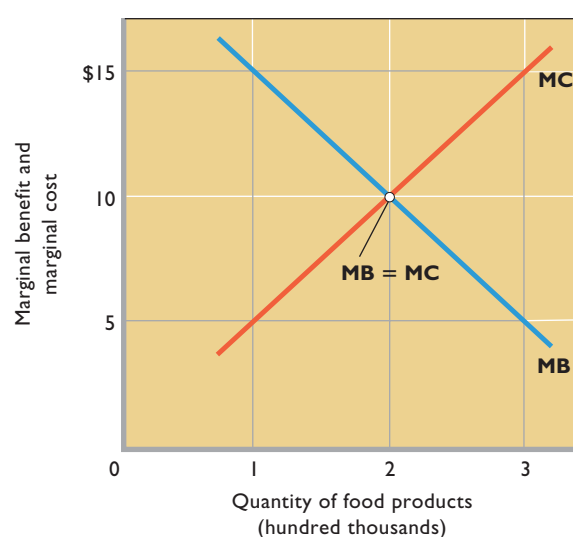
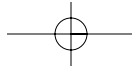


FIGURE 1.3
Optimal Output: $MB = MC$. Achieving the optimal output requires the expansion of a good's output until its marginal benefit (MB) and marginal cost (MC) are equal. No resources beyond that point should be allocated to the product. Here, optimal output occurs when 200,000 units of food products are produced.



only \$5, it is better off. In Figure 1.3, net gains of decreasing amounts can be realized until food-product production has been increased to 200,000.

In contrast, the production of 300,000 units of food products is excessive. There the MC of an added unit is \$15 and its MB is only \$5. This means that 1 unit of food products is worth only \$5 to society but costs it \$15 to obtain. This is a losing proposition for society!

So 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 manufacturing equipment, we find its optimal ($MB = MC$) output is 7000. This would mean that alternative C (200,000 units of food products and 7000 units of manufacturing equipment) on the production possibilities curve in Figure 1.2 would be optimal for this economy.

Applying the Analysis

The War on Terrorism

Production possibilities analysis is helpful in assessing the costs and benefits of waging the war on terrorism, including the wars in Afghanistan and Iraq. The Defense Department estimated that the costs of homeland security and the war on terrorism in Afghanistan were \$30 billion in 2002. First estimates of the cost of the war in Iraq are \$174 billion, and further conflict and reconstruction may cost even more.

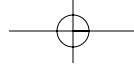
If we categorize all of U.S. production as either “defense goods” or “civilian goods,” we can measure them on the axes of a production possibilities diagram such as that shown in Figure 1.2. The opportunity cost of using more resources for defense goods is the civilian goods sacrificed. In a fully employed economy, more defense goods are achieved at the opportunity cost of fewer civilian goods—health care, education, pollution control, personal computers, houses, and so on. The cost of waging war is the other goods forgone. The benefits are numerous and diverse but clearly include the gains from protecting against future loss of American lives, assets, income, and well-being.

Society must assess the marginal benefit (MB) and marginal cost (MC) of additional defense goods to determine their optimal amounts—where to locate on the defense goods–civilian goods production possibilities curve. Although estimating marginal benefits and marginal costs is an imprecise art, the MB-MC framework is a useful way of approaching choices. Allocative efficiency requires that society expand production of defense goods until $MB = MC$.

The events of September 11, 2001, and the future threats they posed increased the perceived marginal benefits of defense goods. If we label the horizontal axis in Figure 1.3 “defense goods,” and draw in a rightward shift of the MB curve, you will see that the optimal quantity of defense goods rises. In view of the concerns relating to September 11, the United States allocated more of its resources to defense. But the MB-MC analysis also reminds us we can spend too much on defense, as well as too little. The United States should not expand defense goods beyond the point where $MB = MC$. If it does, it will be sacrificing civilian goods of greater value than the defense goods obtained.

Question:

Would society’s costs of war be lower if it drafted soldiers at low pay rather than attracted them voluntarily to the military through market pay?



Unemployment, Growth, and the Future

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. The United States has suffered a number of much milder downturns since then, the latest occurring in 2001. In that year total production fell and unemployment increased.

Almost all nations have experienced widespread unemployment and unused production capacity from business downturns at one time or another. Since 1995, for example, several nations—including Argentina, Japan, Mexico, Germany, and South Korea—have had economic downturns and unemployment.

How do these realities relate to the production possibilities model? Our analysis and conclusions change if we relax the assumption that all available resources are fully employed. The five alternatives in the table of Figure 1.2 represent maximum outputs; they illustrate the combinations of food products and manufacturing equipment that can be produced when the economy is operating at full employment. With unemployment, this economy would produce less than each alternative shown in the table.

Graphically, we represent situations of unemployment by points inside the original production possibilities curve (reproduced in Figure 1.4). Point *U* is one such point. Here the economy is falling short of the various maximum combinations of food products and manufacturing equipment represented by the points on the production possibilities curve. The arrows in Figure 1.4 indicate three possible paths back to full employment. A move toward full employment would yield a greater output of one or both products.

A Growing Economy

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

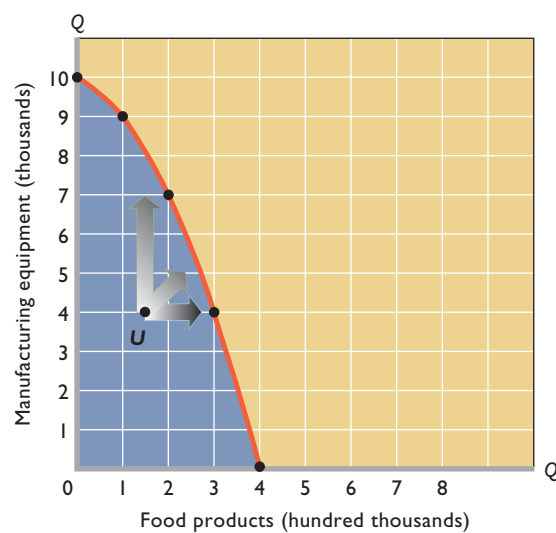


FIGURE 1.4
Unemployment and the production possibilities curve. Any point inside the production possibilities curve, such as *U*, represents unemployment or a failure to achieve full employment. The arrows indicate that, by realizing full employment, the economy could operate on the curve. This means it could produce more of one or both products than it is producing at point *U*.



Increases in Resource Supplies Although resource supplies are fixed at any specific moment, they change over time. For example, a nation's growing population brings 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 some of our energy and mineral resources are being depleted, new sources are also 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 consumer goods and capital goods. Thus 20 years from now, the production possibilities in Figure 1.5 may supersede those shown in Figure 1.2. The greater abundance of resources will result in a greater potential output of one or both products at each alternative. The economy will have achieved economic growth in the form of expanded potential output. Thus, when an increase in the quantity or quality of resources occurs, the production possibilities curve shifts outward and to the right, as illustrated by the move from the inner curve to curve $A'B'C'D'E'$ in Figure 1.5. This sort of shift represents growth of economic capacity, which when used, means **economic growth**: a larger total output.

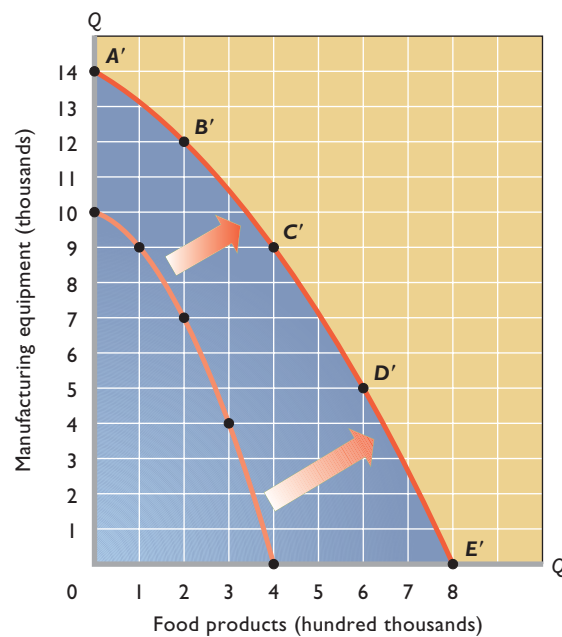
economic growth
An outward shift of the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology.

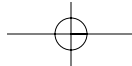
Advances in Technology An advancing technology brings both new and better goods and improved ways of producing them. For now, let's think of technological advance as being only improvements in the methods of production, for example, the introduction of computerized systems to manage inventories and schedule pro-

FIGURE 1.5

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.

Type of Product	Production Alternatives				
	A'	B'	C'	D'	E'
Food products (hundred thousands)	0	2	4	6	8
Manufacturing equipment (thousands)	14	12	9	5	0





duction. These advances alter our previous discussion of the economic problem by allowing society to produce more goods with available resources. As with increases in resource supplies, technological advances make possible the production of more manufacturing equipment and more food products.

Applying the Analysis

Information Technology and Biotechnology

A real-world example of improved technology is the recent surge of new technologies relating to computers, communications, and biotechnology. Technological advances have dropped the prices of computers and greatly increased their speed. Improved software has greatly increased the everyday usefulness of computers. Cellular phones and the Internet have increased communications capacity, enhancing production and improving the efficiency of markets. Advances in biotechnology have resulted in important agricultural and medical discoveries. The sum of these new technologies is so significant that they may be contributing to greater-than-normal U.S. economic growth (larger rightward shifts of the nation's production possibilities curve).

Question:

How have technological advances in medicine helped expand production possibilities in the United States?

Conclusion: Economic growth is the result of (1) increases in supplies of resources, (2) improvements in resource quality, and (3) technological advances. The consequence of growth is that a full-employment economy can enjoy a greater output of both consumption goods and capital goods. While static, no-growth economies must sacrifice some of one good to obtain more of another, dynamic, growing economies can have larger quantities of both goods.

Present Choices and Future Possibilities

An economy's current choice of positions on its production possibilities curve helps determine 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 1.6. 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, such as capital goods, are the ingredients of economic growth. Goods for the present are consumer goods, such as food, clothing, and entertainment.

Now suppose there are two hypothetical economies, Presentville and Futureville, which are initially identical in every respect except one: Presentville's current choice of positions on its production possibilities curve strongly favors present goods over future goods. Point *P* in Figure 1.6a 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. Futureville, in contrast, makes a current choice that stresses larger amounts of future goods and smaller amounts of present goods, as shown by point *F* in Figure 1.6b.

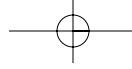
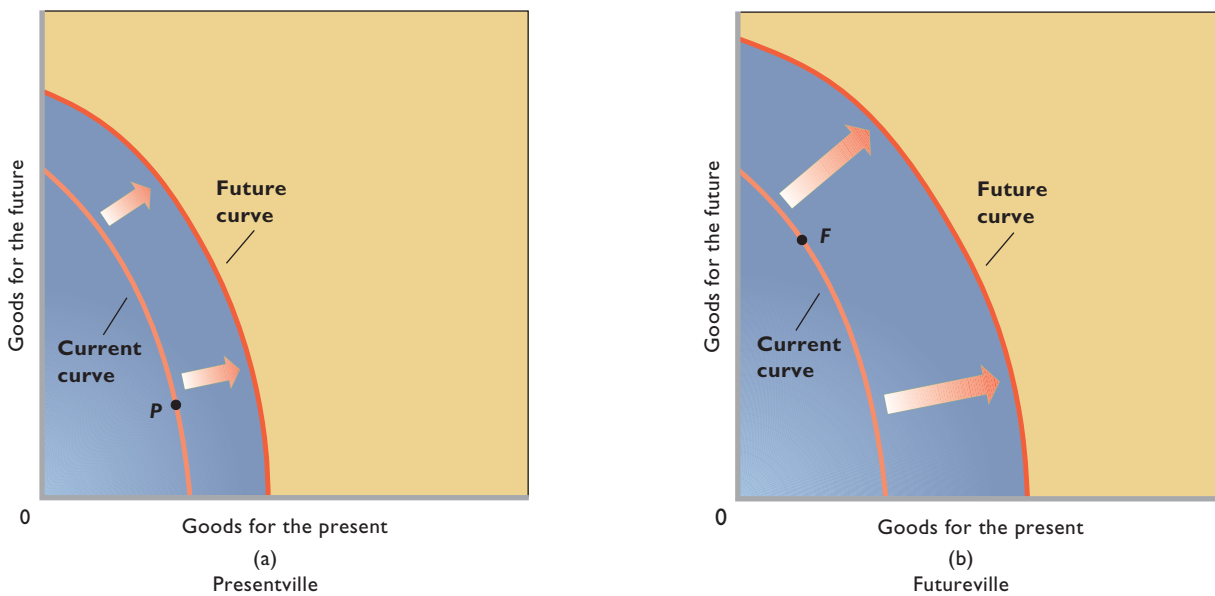


FIGURE 1.6

Present choices and future locations of production possibilities curves. A nation's current choice favoring "present goods," as made by Presentville in (a), will cause a modest outward shift of the production possibilities curve in the future. A nation's current choice favoring "future goods," as made by Futureville in (b), will result in a greater outward shift of the curve in the future.



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

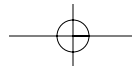
1.2
Present
choices and
future
possibilities



Is Futureville's choice thus necessarily "better" than Presentville's? That, we cannot say. The different outcomes simply reflect different preferences and priorities in the two countries. But each country will have to live with the consequences of its choice.

Summary

1. Economics is the study of how people, institutions, and society make choices under conditions of scarcity.
2. The economic perspective includes three elements: scarcity and choice, purposeful behavior, and marginalism. It sees individuals and institutions making rational decisions based on comparisons of marginal costs and marginal benefits.
3. Economists employ the scientific method, in which they form and test hypotheses of cause-and-effect relationships to generate theories, laws, and principles. Economists often combine theories into representations called models.





4. Microeconomics examines specific economic units or institutions. Macroeconomics looks at the economy as a whole or its major aggregates.
5. Individuals face an economic problem. Because their wants exceed their income, they must decide what to purchase and what to forgo. Society also faces an economic problem. Societal wants exceed the available resources necessary to fulfill them. Society therefore must decide what to produce and what to forgo.
6. Graphically, a budget line (or budget constraint) illustrates the economic problem for individuals. The line shows the various combinations of two products that a consumer can purchase with a specific money income, given the prices of the two products.
7. Economic resources are inputs into the production process and can be classified as land, labor, capital, and entrepreneurial ability. Economic resources are also known as factors of production or inputs.
8. Society's economic problem can be illustrated through production possibilities analysis. Production possibilities tables and curves show the different combinations of goods and services that can be produced in a fully employed economy, assuming that resource quantity, resource quality, and technology are fixed.
9. An economy that is fully employed and thus operating on its production possibilities curve must sacrifice the output of some types of goods and services to increase the production of others. The gain of one type of good or service is always accompanied by an opportunity cost in the form of the loss of some of the other type.
10. Because resources are not equally productive in all possible uses, shifting resources from one use to another results in increasing opportunity costs. The production of additional units of one product requires the sacrifice of increasing amounts of the other product.
11. The optimal point on the production possibilities curve represents the most desirable mix of goods and is determined by expanding the production of each good until its marginal benefit (MB) equals its marginal cost (MC).
12. 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 the extent of economic growth.

Terms and Concepts

economics	macroeconomics	investment
economic perspective	aggregate	entrepreneurial ability
opportunity cost	economic problem	factors of production
utility	budget line	consumer goods
marginal analysis	constant opportunity cost	capital goods
scientific method	economic resources	production possibilities curve
principles	land	law of increasing opportunity costs
other-things-equal assumption	labor	economic growth
microeconomics	capital	

Study Questions

1. Ralph Waldo Emerson once wrote: "Want is a growing giant whom the coat of have was never large enough to cover." How does this statement relate to the definition of economics?
2. "Buy 2, get 1 free." Explain why the "1 free" is free to the buyer but not to society.
3. Which of the following decisions would entail the largest opportunity cost: Allocating a



square block in the heart of New York City for a surface parking lot or allocating a square block at the edge of a typical suburb for such a lot? Explain.

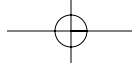
4. What is meant by the term "utility," and how does it relate to purposeful behavior?
5. Cite three examples of recent decisions that you made in which you, at least implicitly, weighed marginal cost and marginal benefit.
6. Indicate whether each of the following statements applies to microeconomics or macroeconomics:
 - a. The unemployment rate in the United States was 5.2% in January 2005.
 - b. A U.S. software firm discharged 15 workers last month and transferred the work to India.
 - c. An unexpected freeze in central Florida reduced the citrus crop and caused the price of oranges to rise.
 - d. U.S. output, adjusted for inflation, grew by 4.4% in 2004.
 - e. Last week Wells Fargo Bank lowered its interest rate on business loans by one-half of 1 percentage point.
 - f. The consumer price index rose by 2.7% in 2004.
7. Suppose you won \$15 on a lotto ticket at the local 7-Eleven and decided to spend all the winnings on candy bars and bags of peanuts. The price of candy bars is \$.75 and the price of peanuts is \$1.50.
 - a. Construct a table showing the alternative combinations of the two products that are available.
 - b. Plot the data in your table as a budget line in a graph. What is the slope of the budget line? What is the opportunity cost of one more candy bar? Of one more bag of peanuts? Do these opportunity costs rise, fall, or remain constant as each additional unit of the product is purchased?
 - c. How, in general, would you decide which of the available combinations of candy bars and bags of peanuts to buy?
 - d. Suppose that you had won \$30 on your ticket, not \$15. Show the \$30 budget line in your diagram. Why would this budget line be preferable to the old one?
8. What are economic resources? What categories do economists use to classify them? Why are resources also called factors of production? Why are they called inputs?

9. Why isn't money considered a capital resource in economics? Why is entrepreneurial ability considered a category of economic resource, distinct from labor? What are the major functions of the entrepreneur?

10. Below is a production possibilities table for consumer goods (automobiles) and capital goods (forklifts):

Type of Production	Production Alternatives				
	A	B	C	D	E
Automobiles	0	2	4	6	8
Forklifts	30	27	21	12	0

- a. Show these data graphically. Upon what specific assumptions is this production possibilities curve based?
 - b. If the economy is at point C, what is the cost of one more automobile? Of one more forklift? Explain how the production possibilities curve reflects the law of increasing opportunity costs.
 - c. If the economy characterized by this production possibilities table and curve were producing 3 automobiles and 20 forklifts, what could you conclude about its use of its available resources?
 - d. What would production at a point outside the production possibilities curve indicate? What must occur before the economy can attain such a level of production?
 - e. Suppose improvement occurs in the technology of producing forklifts but not in the technology of producing automobiles. Draw the new production possibilities curve. Now assume that a technological advance occurs in producing automobiles but not in producing forklifts. Draw the new production possibilities curve. Now draw a production possibilities curve that reflects technological improvement in the production of both goods.
11. Specify and explain the typical shapes of marginal-benefit and marginal-cost curves. How are these curves used to determine the optimal allocation of resources to a particular product? If current output is such that marginal cost exceeds marginal benefit, should more or fewer resources be allocated to this product? Explain.



12. Explain how (if at all) each of the following events affects the location of a country's production possibilities curve:
- The quality of education increases.
 - The number of unemployed workers increases.

- A new technique improves the efficiency of extracting copper from ore.
- A devastating earthquake destroys numerous production facilities.

Website Questions

At the text's Web site, www.brueonline.com, you will find three multiple-choice quizzes on this chapter's content. We encourage you to take the quizzes to see how you do. Also, you will find one or more Web-based questions that require information from the Internet to answer.

REMINDER: An appendix on understanding graphs is near the end of this book. We highly recommend it for anyone who needs a quick review of this mathematical tool.

