Essentials of ECONOMICS

fourth edition

Stanley L. Brue

Campbell R. McConnell

Sean M. Flynn

Mc Graw Hill Education

Essentials of ECONOMICS

The McGraw-Hill Series Economics

Essentials of Economics

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International Economics
Fifteenth Edition

Essentials of ECONOMICS

4th edition

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ESSENTIALS OF ECONOMICS, FOURTH EDITION

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Stanley L. Brue did his undergraduate work at Augustana College (S.D.) and received its Distinquished Achievement Award in 1991. He received his Ph.D. from the University of Nebraska–Lincoln. He is a professor at Pacific Lutheran University, where he has been honored as a recipient of the Burlington Northern Faculty Achievement Award. Professor Brue has also received the national Leavey Award for excellence in economic education. He has served as national president and chair of the Board of Trustees of Omicron Delta Epsilon International Economics Honorary. He is coauthor of *Economics,* Twenty-first Edition (McGraw-Hill), *Economic Scenes,* Fifth Edition (Prentice-Hall), *Contemporary Labor Economics,* Eighth Edition (McGraw-Hill/Irwin), and *The Evolution of Economic Thought,* Eighth Edition (South-Western). For relaxation, he enjoys international travel, attending sporting events, and skiing with family and friends.

Campbell R. McConnell

Campbell R. McConnell earned his Ph.D. from the University of Iowa after receiving degrees from Cornell College and the University of Illinois. He taught at the University of Nebraska–Lincoln from 1953 until his retirement in 1990. He is coauthor of *Economics,* Twenty-first Edition (McGraw-Hill), *Contemporary Labor Economics,* Eighth Edition (McGraw-Hill), and has edited readers for the principles and labor economics courses. He is a recipient of both the University of Nebraska Distinguished Teaching Award and the James A. Lake Academic Freedom Award and is past president of the Midwest Economics Association. Professor McConnell was awarded an honorary Doctor of Laws degree from Cornell College in 1973 and received its Distinguished Achievement Award in 1994. His primary areas of interest are labor economics and economic education. He has an extensive collection of jazz recordings and enjoys reading jazz history.

Sean M. Flynn

Sean M. Flynn did his undergraduate work at the University of Southern California before completing his Ph.D. at U.C. Berkeley, where he served as the Head Graduate Student Instructor for the Department of Economics after receiving the Outstanding Graduate Student Instructor Award. He teaches at Scripps College in Claremont, California, and is also the author of *Economics for Dummies* (Wiley) and coauthor of *Economics,* Twenty-first Edition (McGraw-Hill). His research interests include finance and behavioral economics. An accomplished martial artist, he has represented the United States in international aikido tournaments and is the author of *Understanding Shodokan Aikido* (Shodokan Press). Other hobbies include running, travel, and ethnic food.

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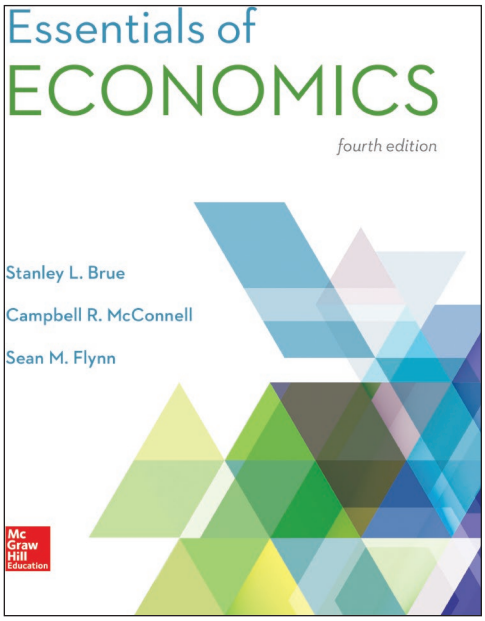


Welcome to the fourth edition of *Essentials of Economics,* a one-semester principles of economics text derived from McConnell-Brue-Flynn *Economics,* the best-selling two-semester economics textbook. Over the years, numerous instructors have requested a short, one-semester version of *Economics* that would cover both microeconomics and macroeconomics. While some other two-semester books simply eliminate chapters, renumber those that remain, and offer the "cut and splice" version as a customized book, this methodology does not fit with our vision of a tightly focused, highly integrated book. We built this text from scratch, incorporating the core content from *Economics* in a format designed specifically for the one-semester course. This book has the clear and careful language and the balanced approach that has made its two-semester counterpart a best-seller, but the pedagogy and topic discussion are much better suited to the needs of the one-semester course.

We think *Essentials of Economics* will fit nicely in various one-term courses. It is sufficiently lively and focused for use in principles courses populated primarily by non-business majors. Also, it is suitably analytical and comprehensive for use in combined micro and macro principles courses for business and potential economics majors. Finally, we think this book—if supplemented with appropriate lecture and reading assignments—will work well in refresher courses for students returning to MBA programs.

However the book is used, our goals remain the same:

- Help the student master the principles essential for understanding the economic problem, specific economic issues, and policy alternatives.
- Help the student understand and apply the economic perspective and reason accurately and objectively about economic matters.
- Promote a lasting student interest in economics and the economy.

What's New and Improved?

One of the benefits of writing a successful text is the opportunity to revise—to delete the outdated and install the new, to rewrite misleading or ambiguous statements, to introduce more relevant illustrations, to improve the organizational structure, and to enhance the learning aids. We trust that you will agree that we have used this opportunity wisely and fully.

Streamlined Coverage

As part of our ongoing effort to streamline presentation, respond to reviewer input, and keep costs down for students, we have moved all of the material previously available as Web Chapters into the core Connect and Smartbook offers. The Chapter One appendix on

Graphs and Their Meaning and the resource market chapters on **Wage Determination** and **Income Inequality and Poverty** have been converted from Web-Only content into the main product. Instructors who cover these chapters can now assign them within Connect or find them within the print book and supplements.

Updated Discussions of the Financial Crisis and the Recession

In the previous edition, we focused on incorporating an analysis of the financial crisis, the recession, and the hesitant recovery into our discussions of macroeconomics. This edition reflects more recent developments, including continued slower than historical economic growth. We found many ways to work the recession, policy responses, and recovery into our macro chapters, and are confident that our basic macroeconomic models will continue to serve well in explaining business cycles and the economy's long run-growth path. The new inclusions relating to the recession simply help students see the relevance of the models to what they are seeing in the news and perhaps experiencing in their own lives. The overall tone of the book, including the macro, continues to be optimistic with respect to the long-term growth prospects of market economies.

Updated End-of-Chapter Questions and Problems

We have updated the end-of-chapter questions, adding new problems to reflect revised and enhanced content. The questions are analytic and often ask for free responses, whereas the problems are mainly quantitative. We have aligned the questions and problems with the learning objectives presented at the beginning of the chapters. All of the questions and problems are assignable through McGraw-Hill's *Connect,* and many contain additional algorithmic variations and can be automatically graded within the system.

Chapter Changes

Individual chapters have undergone data updates and language revisions in order to remain current, yet still retain the straightforward presentation style that our users expect. In addition to the changes and features listed above, some chapter-specific revisions include:

Chapter 1: Limits, Alternatives, and Choices features updated examples of opportunity cost, and the **Chapter One Appendix: Graphs and Their Meaning** has been converted from Web-Only content into the main product.

Chapter 2: The Market System and the Circular Flow includes an updated example of consumer sovereignty, updated business and household sector data in the United States, and updated global data.

Chapter 3: Demand, Supply, and Market Equilibrium provides a new "Applying the Analysis" piece on Uber and dynamic pricing. The **Chapter Three Appendix: Additional Examples of Supply and Demand** has been converted from Web-Only content and relocated into the main product.

Chapter 5: Market Failures: Public Goods and Externalities features updated information on the U.S. tax structure. Taxes to correct negative externalities are now referred to as "Pigovian taxes" (versus "specific taxes" in previous editions).

Chapter 8: Pure Monopoly presents a new "Applying the Analysis" on monopoly power in the Internet age, replacing the De Beers diamond monopoly example.

Chapter 9: Monopolistic Competition and Oligopoly includes a new "Applying the Analysis" piece on Internet oligopolies, replacing the example of oligopoly in the beer industry.

Chapter 10: GDP and Economic Growth contains a new discussion on the recent slowdown in U.S. productivity growth, as well as numerous updates of both domestic and international data.

Chapter 11: Business Cycles, Unemployment, and Inflation presents a new "Applying the Analysis" on the specter of deflation facing the U.S. and other economies, as well as detailed coverage of current unemployment rates and inflation throughout the world.

Chapter 13: Fiscal Policy, Deficits, and Debt includes important updates related to the recession, the subsequent policy response, and the debt debate.

Chapter 15: Interest Rates and Monetary Policy features updated coverage of recent U.S. monetary policy, including a new discussion of the a negative lower bound and the European Central Bank's recent policy of negative nominal interest rates. The discussion of negative rates replaces the "Applying the Analysis" piece on the Fed's balance sheet and its extensive growth.

Chapter 16: International Trade and Exchange Rates includes updated material on recent U.S. trade deficits and a revised discussion related to Fed policy and changes in the relative value of the U.S. dollar.

Chapter 17: Wage Determination has been relocated to the main product. Revised discussion and updated data on occupational employment trends, wage differentials, and the minimum wage highlight the changes.

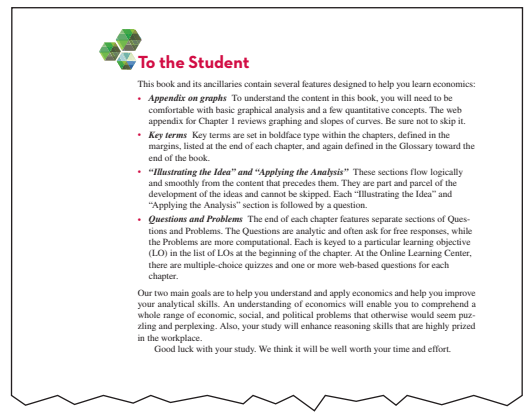
Chapter 18: Income Inequality and Poverty has been relocated to the main product. Revisions include improved discussion and significant updates to the data on distribution of income, poverty, and income-maintenance programs.

Distinguishing Features and Fourth Edition Changes

Essentials of Economics includes several features that we think add up to a unique whole.

State-of-the-Art Design and Pedagogy

Essentials incorporates a single-column design with a host of pedagogical aids, including a strategically placed "To the Student" statement, chapter opening objectives, definitions in the margins, combined tables and graphs, complete chapter summaries, lists of key terms, carefully constructed study questions, connections to our website, an appendix on graphs and a web appendix on additional examples of demand and supply, an extensive glossary, and historical statistics on the inside covers.



To the Student

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

- ***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 web appendix for Chapter 1 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. Each "Illustrating the Idea" and "Applying the Analysis" section is followed by a question.
- ***Questions and Problems*** The end of each chapter features separate sections of Questions and Problems. The Questions are analytic and often ask for free responses, while the Problems are more computational. Each is keyed to a particular learning objective (LO) in the list of LOs at the beginning of the chapter. At the Online Learning Center, there are multiple-choice quizzes and one or more web-based questions for each chapter.

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 time and effort.

Focus on Core Models

Essentials of Economics shortens and simplifies explanations where appropriate but stresses the importance of the economic perspective, including explaining and applying core economic models. Our strategy is to develop a limited set of essential models, illustrate them with analogies or anecdotes, explain them thoroughly, and apply them to real-world situations.

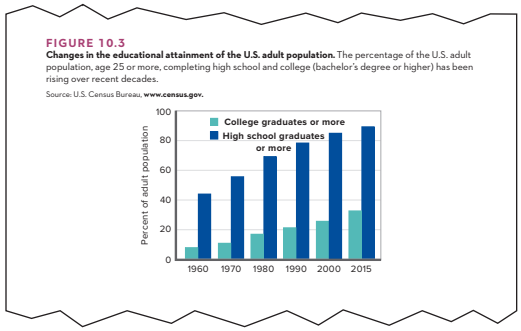
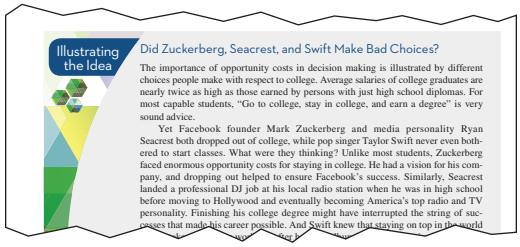


FIGURE 10.3
Changes in the educational attainment of the U.S. adult population. The percentage of the U.S. adult population, age 25 or more, completing high school and college (bachelor's degree or higher) has been rising over recent decades.
Source: U.S. Census Bureau, **www.census.gov.**

Eliminating unnecessary graphs and elaborations makes perfect sense in the one-semester course, but cutting explanations of the truly *essential* graphs does not. In dealing with the basics, brevity at the expense of clarity is false economy.

We created a student-oriented one-semester textbook that draws on the methodological strengths of the discipline and helps students improve their analytical reasoning skills. Regardless of students' eventual majors, they will discover that such skills are highly valuable in their workplaces.

Illustrating the Idea


Illustrating the Idea

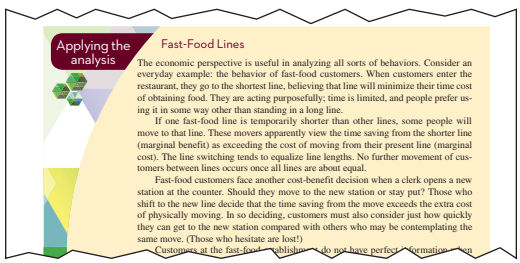
Did Zuckerberg, Seacrest, and Swift Make Bad Choices?

The importance of opportunity costs in decision making is illustrated by different choices people make with respect to college. Average salaries of college graduates are nearly twice as high as those earned by 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 Facebook founder Mark Zuckerberg and media personality Ryan Seacrest both dropped out of college, while pop singer Taylor Swift never even bothered to start classes. What were they thinking? Unlike most students, Zuckerberg faced enormous opportunity costs for staying in college. He had a vision for his company, and dropping out helped to ensure Facebook's success. Similarly, Seacrest landed a professional DJ job at his local radio station when he was in high school before moving to Hollywood and eventually becoming America's top radio and TV personality. Finishing his college degree might have interrupted the string of successes that made his career possible. And Swift knew that staying on top in the world

We include numerous analogies, examples, and anecdotes to help drive home central economic ideas in a lively, colorful, and easy-to-remember way. For instance, elastic versus inelastic demand is illustrated by comparing the stretch of an Ace bandage and that of a tight rubber tie-down. Student exam scores help demonstrate the difference between marginal product and average product. Public goods and the free-rider problem are illustrated by public art, while a pizza analogy walks students through the equity-efficiency trade-off. Inflation as a hidden tax is illustrated by a story of the prince of the realm clipping coins. These brief vignettes flow directly from the preceding content and segue to the content that follows, rather than being "boxed off" away from the flow and therefore easily overlooked.

Applying the 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 are lost!)

Customers at the fast-food establishment do not have perfect information when

A glance though this book's pages will demonstrate that this is an application-oriented textbook. *Applying the Analysis* pieces immediately follow the development of economic analysis and are part of the flow of the chapters, rather than segregated from the main-body discussion in a traditional boxed format. For example, the basics of the economic perspective are applied to why customers tend to try to wait in the shortest checkout lines. The book illustrates inelasticity of demand (with changing supply) with an explanation of fluctuating farm income. Differences in elasticity of supply are contrasted by the changing prices of antiques versus reproductions. Hidden car-retrieval systems (such as Lojack) explain the concept of positive externalities. The book describes the principal–agent problem via the problems of corporate accounting and financial fraud. The idea of minimum efficient scale is applied to ready-mix concrete plants and assembly plants for large commercial airplanes. The difference in adult and child pricing for tickets to a ballgame compared to the pricing at the concession stands illustrates the concept of price discrimination. The aggregate demand model is applied to specific periods of inflation and recession, while the trade theory discussion touches on the issue of the offshoring of U.S. jobs. These and many other applications clearly demonstrate to beginning students the relevance and usefulness of mastering the basic economic principles and models.

Applications addressing the impact of the Internet on market structure, deflation, and negative nominal interest rates are new to this edition.

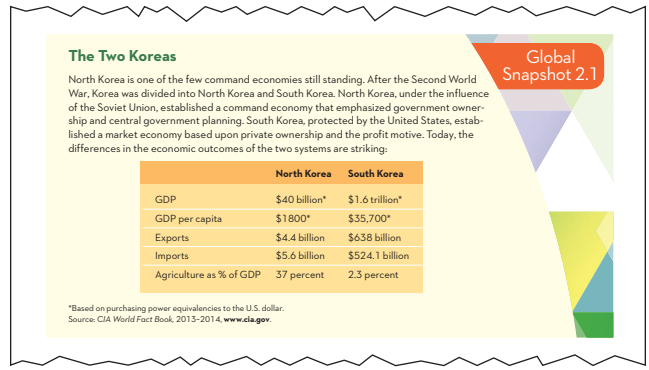
Photo Ops

Photo sets called *Photo Ops* are included throughout the book to add visual interest, break up the density, and highlight important distinctions. Just a few of the many examples are sets of photos on complements versus substitutes in consumption, homogeneous versus differentiated products, economic stocks versus economic flows, substitute resources versus complementary resources, consumer durables versus nondurables versus services, and intermediate versus final goods.

Photo Ops on traffic congestion and holiday lighting contrast negative and positive externalities, large- and small-scale production activities illustrate economies and diseconomies of scale, and Social Security checks and food stamps highlight the differences between social insurance and public assistance.

Global Snapshots

Global Snapshot pieces show bar charts and line graphs that compare data for a particular year or other time period among selected nations. Examples of lists and comparisons include income per capita, the world's 10 largest corporations, the world's top brand names, standardized budget deficits or surpluses, the index of economic freedom, sizes of underground economies, rates of economic growth, exports as percentages of GDP, and so forth. These Global Snapshots join other significant international content to help convey that the United States operates in a global economy.



Digital Solutions

Extensive Algorithmic and Graphing Assessment

Robust, auto-gradable question banks for each chapter now include even more questions that make use of the *Connect*® graphing tool. More questions featuring algorithmic variations have also been added.

Interactive Graphs

This new assignable resource within Connect® helps students see the relevance of subject matter by providing visual displays of real data for students to manipulate. All graphs are accompanied by assignable assessment questions and feedback to guide students through the experience of learning to read and interpret graphs and data.

Videos

New to this edition are videos that provide support for key economic topics. These short, engaging explanations are presented at the moment students may be struggling to help them connect the dots and grasp challenging concepts.

Math Preparedness Tutorials

Our math preparedness assignments have been reworked to help students refresh on important prerequisite topics necessary to be successful in economics.

McGraw-Hill *Connect*®

McGraw-Hill's Connect® is an online assessment solution that connects students with the tools and resources they'll need to achieve success.

McGraw-Hill's *Connect* Features *Connect* offers a number of powerful tools and features to make managing assignments easier, so faculty can spend more time teaching. With *Connect*, students can engage with their coursework anytime and anywhere, making the learning process more accessible and efficient. *Connect* offers the features as described here.

Simple Assignment Management With *Connect,* creating assignments is easier than ever, so you can spend more time teaching and less time managing. The assignment management function enables you to

- Create and deliver assignments easily with selectable end-of-chapter questions and test bank items.
- Streamline lesson planning, student progress reporting, and assignment grading to make classroom management more efficient than ever.
- Go paperless with the eBook and online submission and grading of student assignments.

Smart Grading *Connect* helps students learn more efficiently by providing feedback and practice material when they need it, where they need it. The grading function enables you to

- Score assignments automatically, giving students immediate feedback on their work and side-by-side comparisons with correct answers.
- Access and review each response; manually change grades or leave comments for students to review.
- Reinforce classroom concepts with practice tests and instant quizzes.

Instructor Library The *Connect* Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture. The *Connect* Instructor Library includes all of the instructor supplements for this text.

Student Resources

Any supplemental resources that align with the text for student use will be available through Connect.

Student Progress Tracking *Connect* keeps instructors informed about how each student, section, and class is performing, allowing for more productive use of lecture and office hours. The progress-tracking function enables you to

- View scored work immediately and track individual or group performance with assignment and grade reports.
- Access an instant view of student or class performance relative to learning objectives.
- Collect data and generate reports required by many accreditation organizations, such as AACSB and AICPA.

Connect Insight The first and only analytics tool of its kind, Connect Insight™ is a series of visual data displays that are each framed by an intuitive question and provide at-a-glance information that allows instructors to leverage aggregated information about their courses and students to provide a more personalized teaching and learning experience.

Lecture Capture Increase the attention paid to lecture discussion by decreasing the attention paid to note taking. Lecture Capture offers new ways for students to focus on the in-class discussion, knowing they can revisit important topics later. Lecture Capture enables you to

- Record and distribute your lecture with a click of a button.
- Record and index PowerPoint presentations and anything shown on your computer so they are easily searchable, frame by frame.
- Offer access to lectures anytime and anywhere by computer, iPod, or mobile device.
- Increase intent listening and class participation by easing students' concerns about note taking. Lecture Capture will make it more likely you will see students' faces, not the tops of their heads.

Test Bank The Test Bank has been rigorously revised for this fourth edition of *Essentials of Economics* by Randy Grant. All questions are coded according to chapter learning objectives, AACSB Assurance of Learning, and Bloom's Taxonomy guidelines. The computerized Test Bank is available in EZ Test, a flexible and easy-to-use electronic testing program that accommodates a wide range of question types, including user-created questions. You can access the test bank through McGraw-Hill *Connect*.

Computerized Test Bank Online TestGen is a complete, state-of-the-art test generator and editing application software that allows instructors to quickly and easily select test items from McGraw Hill's test bank content. The instructors can then organize, edit, and customize questions and answers to rapidly generate tests for paper or online administration. Questions can include stylized text, symbols, graphics, and equations that are inserted directly into questions using built-in mathematical templates. TestGen's random generator provides the option to display different text or calculated number values each time questions are used. With both quick-and-simple test creation and flexible and robust editing tools, TestGen is a complete test generator system for today's educators.

You can use our test bank software, TestGen, or *Connect* to easily query for learning outcomes and objectives that directly relate to the learning objectives for your course. You can then use the reporting features to aggregate student results in a similar fashion, making the collection and presentation of assurance-of-learning data simple and easy.

Diagnostic and Adaptive Learning of Concepts: LearnSmart

Adaptive Reading Experience SmartBook contains the same content as the print book, but actively tailors that content to the needs of the individual through adaptive probing. Instructors can assign SmartBook reading assignments for points to create incentives for students to come to class prepared.

LEARNSMART® Students want to make the best use of their study time. The LearnSmart adaptive self-study technology within *Connect* provides students with a seamless combination of practice, assessment, and remediation for every concept in the textbook. LearnSmart's intelligent software adapts to every student response and automatically delivers concepts that advance students' understanding while reducing time devoted to the concepts already mastered. The result for every student is the fastest path to mastery of the chapter concepts. LearnSmart

- Applies an intelligent concept engine to identify the relationships between concepts and to serve new concepts to each student only when he or she is ready.
- Adapts automatically to each student, so students spend less time on the topics they understand and practice more those they have yet to master.
- Provides continual reinforcement and remediation, but gives only as much guidance as students need.
- Integrates diagnostics as part of the learning experience.
- Enables you to assess which concepts students have efficiently learned on their own, thus freeing class time for more applications and discussion.

SMARTBOOK® Smartbook is an extension of LearnSmart—an adaptive eBook that helps students focus their study time more effectively. As students read, Smartbook assesses comprehension and dynamically highlights where they need to study more.

Digital Image Library Every graph and table in the text is available in the Instructor's Resource section in Connect.

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Tegrity Campus: Lectures 24/7 Tegrity Campus is a fully automated lecture capture solution used in traditional, hybrid, "flipped classes," and online courses to record lessons, lectures, and skills. Its personalized learning features make study time incredibly efficient and its ability to affordably scale brings this benefit to every student on campus. Patented search technology and real-time LMS integrations make Tegrity the market-leading solution and service.

create™ McGraw-Hill Create™ is a self-service website that allows you to create customized course materials using McGraw-Hill's comprehensive, cross-disciplinary content and digital products. You can even access third-party content such as readings, articles, cases, videos, and more. Arrange the content you've selected to match the scope and sequence of

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Built-in Student Problem Set The built-in student problem set is found at the end of every chapter of *Essentials of Economics.* Each chapter has 8 to 10 numerical and graphing problems tied to the content of the text.

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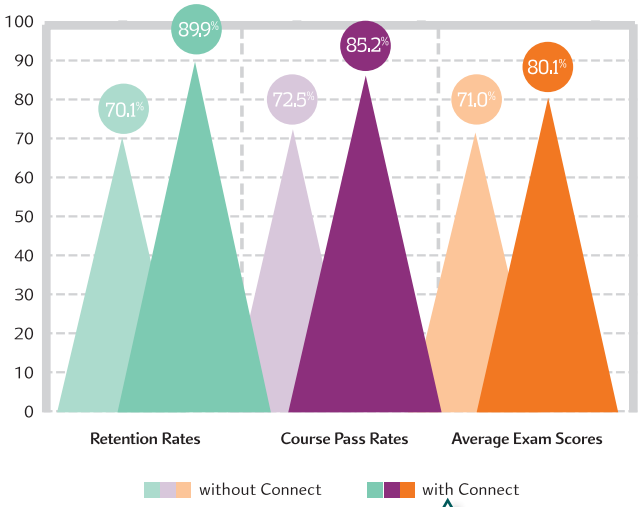

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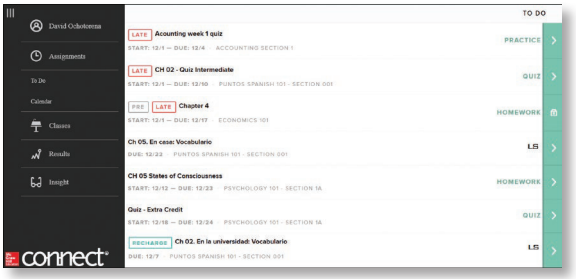

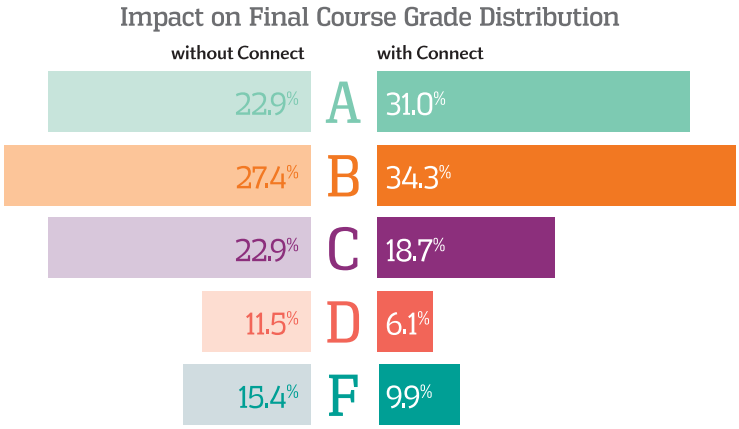

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Essentials of ECONOMICS

PART ONE

Introduction

To the Student

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

- ***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 web appendix for Chapter 1 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. Each "Illustrating the Idea" and "Applying the Analysis" section is followed by a question.
- ***Questions and Problems*** The end of each chapter features separate sections of Questions and Problems. The Questions are analytic and often ask for free responses, while the Problems are more computational. Each is keyed to a particular learning objective (LO) in the list of LOs at the beginning of the chapter. At the Online Learning Center, there are multiple-choice quizzes and one or more web-based questions for each chapter.

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 time and effort.

CHAPTER ONE

Limits, Alternatives, and Choices

Learning Objectives

LO1.1 Define economics and the features of the economic perspective.

LO1.2 Describe the role of economic theory in economics.

LO1.3 Distinguish microeconomics from macroeconomics.

LO1.4 List the categories of scarce resources and delineate the nature of the economic problem.

LO1.5 Apply production possibilities analysis, increasing opportunity costs, and economic growth.

LO1.6 (Chapter appendix) Understand graphs, curves, and slopes as they relate to economics.

(An appendix on understanding graphs can be found at the end of this chapter. If you need a quick review of this mathematical tool, you might benefit by reading the appendix first.)

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's not the half of it." We also want flat-panel TVs, 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,** which is the social science concerned with how individuals, institutions, and society make choices under conditions of scarcity.

The Economic Perspective

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 associated with their actions.

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. Because all resources are either privately or collectively owned by members of society, ultimately, 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:** To obtain more of one thing, society forgoes the opportunity of getting the next best thing. That sacrifice is the opportunity cost of the choice.

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

Illustrating the Idea

Did Zuckerberg, Seacrest, and Swift Make Bad Choices?

The importance of opportunity costs in decision making is illustrated by different choices people make with respect to college. Average salaries of college graduates are nearly twice as high as those earned by 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 Facebook founder Mark Zuckerberg and media personality Ryan Seacrest both dropped out of college, while pop singer Taylor Swift never even bothered to start classes. What were they thinking? Unlike most students, Zuckerberg faced enormous opportunity costs for staying in college. He had a vision for his company, and dropping out helped to ensure Facebook's success. Similarly, Seacrest landed a professional DJ job at his local radio station when he was in high school before moving to Hollywood and eventually becoming America's top radio and TV personality. Finishing his college degree might have interrupted the string of successes that made his career possible. And Swift knew that staying on top in the world of pop takes unceasing work. So after her first album became a massive hit for her at the age of 16, it made sense for her to skip college in order to relentlessly pursue continuing success.

So Zuckerberg, Seacrest, and Swift 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?

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."

utility
The want-satisfying power of a good or service; the satisfaction or pleasure a consumer obtains from the consumption of a good or service (or from the consumption of a collection of goods and services).

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. People sometimes are impulsive or emulative. "Purposeful behavior" simply means that people make decisions with some desired outcome in mind.

Nor is rational self-interest the same as selfishness. Increasing one's own wage, rent, interest, or profit normally requires identifying and satisfying somebody else's want. Also, many people make personal sacrifices to others without expecting any monetary reward. 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-interested, but unselfish, acts help maximize the givers' satisfaction as much as any personal purchase of goods or services. Self-interested behavior is simply behavior designed to increase personal satisfaction, however it may be derived.

Marginalism: Comparing 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.

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

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 $\frac{1}{2}$-carat diamond, a $\frac{5}{8}$-carat diamond, a $\frac{3}{4}$-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, you should 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. An

opportunity cost, the value of the next best thing forgone, is always present whenever a choice is made.

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 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 procedure for the systematic pursuit of knowledge involving the observation of facts and the formulation and testing of 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:

- Observing real-world behavior and outcomes.

- Based on those observations, formulating a possible explanation of cause and effect (hypothesis).
- Testing this explanation by comparing the outcomes of specific events to the outcome predicted by the hypothesis.
- Accepting, rejecting, or modifying the hypothesis, based on these comparisons.
- Continuing to test 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 relationship between the price of Pepsi and purchases of Pepsi in isolation without being confused by changes in other variables.
- ***Graphical expression*** Many economic models are expressed graphically. Be sure to read the special appendix for this chapter as a review of graphs.

other-things-equal assumption
The assumption that factors other than those being considered are held constant; *ceteris paribus* assumption.

Microeconomics and Macroeconomics

Economists develop economic principles and models at two levels.

microeconomics
The part of economics concerned with such individual units as a household, a firm, or an industry and with individual markets, specific goods and services, and product and resource prices.

macroeconomics
The part of economics concerned with the economy as a whole; with such major aggregates as the household, business, and government sectors; and with measures of the total economy.

aggregate
A collection of specific economic units treated as if they were one. For example, all prices of individual goods and services are combined into a price level, or all the units of output are aggregated into gross domestic product.

Microeconomics

Microeconomics is the part of economics concerned with decision making by individual consumers, households, and business firms. At this level of analysis, we observe the details of their behavior under a figurative microscope. 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 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."

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. Very little attention is given to specific units making up the various aggregates.

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.

Source: NPS Photo

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Individuals' 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 2011 was $55,200. In the poorest nations, it was less than $500.

Gobal Snapshot 1.1

Average Income, Selected Nations

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

Country	Per Capita Income, 2011*
Norway	$103,630
Sweden	61,610
United States	55,200
Singapore	55,150
France	42,960
South Korea	27,090
Mexico	9,870
China	7,400
Iraq	6,500
India	1,570
Madagascar	440
Malawi	250

*U.S. dollars, based on exchange rates.

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.

Photo Op Necessities versus Luxuries

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

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Over time, economic wants tend to change and multiply, fueled by new and improved products. Only recently have people wanted wi-fi connections, tablet computers, or flying drones because those products did not exist a few decades ago. Also, the satisfaction of certain wants may trigger others: The acquisition of a Ford Focus or a Honda Civic has been known to whet the appetite for a Lexus 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 his massive charitable giving suggests that he keenly wants better health care for the world's poor. Our desires for a *particular* good or service can be satisfied—for example, over a short period of time, we can surely obtain enough toothpaste or pasta; and one appendectomy is plenty. But our broader desire for more goods and services and higher-quality goods and services seems 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 maximize our satisfaction, given the limitations we face.

A Budget Line

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

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 you received an Amazon gift card as a birthday present. The $120 card is soon to expire. You go online to Amazon.com and confine your purchase decisions to two alternatives: lifetime streaming rights to movies and paperback books. Movies 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 movies at $20 each and have nothing left to spend on books. Or, by giving up 2 movies and thereby gaining $40, you can have 4 movies 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 movies.

The graph in Figure 1.1 shows the budget line. As elsewhere in this book, we represent discrete (separate element) numbers in tables as points on continuous-data smooth curves. Therefore, note that the line (curve) in the graph is not restricted to whole units of movies and books as is the table. Every point on the line represents a possible combination of movies 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 movies (P_m); more precisely, the slope is $P_b/P_m = \$ - 10/\$ + 20 = -\frac{1}{2}$ or $-.5$. So you must forgo 1 movie (measured on the vertical axis) to buy 2 books (measured on the horizontal axis). This yields a slope of $-\frac{1}{2}$ or $-.5$.

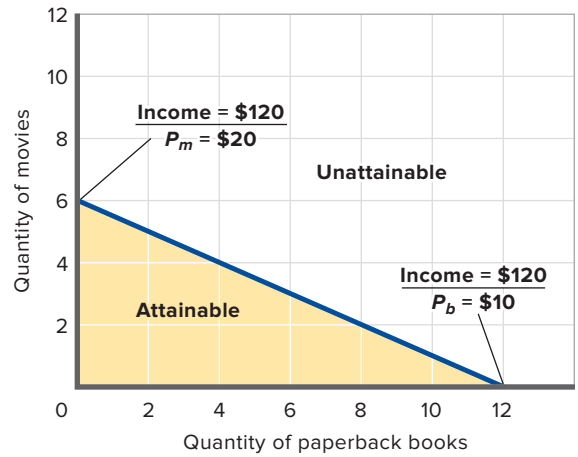
The budget line illustrates several ideas.

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.

The Budget Line: Whole-Unit Combinations of Movies and Paperback Books Attainable with an Income of $120

Units of Movies (Price = $20)	Units of Books (Price = $10)	Total Expenditure
6	0	$120 = ($120 + $0)
5	2	$120 = ($100 + $20)
4	4	$120 = ($80 + $40)
3	6	$120 = ($60 + $60)
2	8	$120 = ($40 + $80)
1	10	$120 = ($20 + $100)
0	12	$120 = ($0 + $120)



Attainable and Unattainable Combinations All the combinations of movies and books on or inside the budget line are *attainable* from the $120 of money income. You can afford to buy, for example, 3 movies at $20 each and 6 books at $10 each. You also can obviously afford to buy 2 movies and 5 books, thereby using up only $90 of the $120 available on your gift card. But to achieve maximum utility, you will want to spend the full $120. The budget line shows all combinations that cost exactly 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 movies 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.

Trade-offs and Opportunity Costs The budget line in Figure 1.1 illustrates the idea of trade-offs arising from limited income. To obtain more movies, you have to give up some books. For example, to acquire the first movie, you trade off 2 books. So the opportunity cost of the first movie is 2 books. To obtain the second movie, 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 movie remains the same (= 2 books) as more movies are purchased. And, in reverse, the opportunity cost of 1 extra book does not change (= $\frac{1}{2}$ movie) as more books are bought.

constant opportunity cost An opportunity cost that remains the same for each additional unit as a consumer (or society) shifts purchases (production) from one product to another along a straight-line budget line (production possibilities curve).

Choice Limited income forces people to choose what to buy and what to forgo to fulfill wants. You will select the combination of movies 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 trade-offs, 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 security? Energy development?

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.

economic resources
The land, labor, capital, and entrepreneurial ability that are used in the production of goods and services; productive agents; factors of production.

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. These include mineral and oil deposits, arable land, forests, and water resources.

land
Natural resources ("free gifts of nature") used to produce goods and services.

Labor The resource **labor** consists of the physical actions and mental activities that people contribute to the production of goods and services. The work-related activities of a logger, retail clerk, machinist, teacher, professional football player, and nuclear physicist all fall under the general heading "labor."

labor
People's physical and mental talents and efforts that are used to help 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 use the term **investment** to describe spending that pays for the production and accumulation of capital goods.

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. For example, large commercial baking ovens (capital goods) help make loaves of bread (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 goods and services, including capital goods.

capital
Human-made resources (buildings, machinery, and equipment) used to produce goods and services; goods that do not directly satisfy human wants; also called *capital goods* and *investment goods*.

investment
Spending for the production and accumulation of capital and additions to inventories.

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

- 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 innovates. He or she commercializes new products, new production techniques, or even new forms of business organization.

entrepreneurial ability
The human resource that combines the other resources to produce a product, makes nonroutine decisions, innovates, and bears risks.

- The entrepreneur bears risk. Innovation is risky, as nearly all new products and ideas are subject to the possibility of failure as well as success. Progress would cease without entrepreneurs who are willing to take on risk by devoting their time, effort, and ability—as well as their own money and the money of others—to commercializing new products and ideas that may enhance society's standard of living.

Photo Op Economic Resources

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

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factors of production
Economic resources: land, capital, labor, 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 of 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: pizzas and industrial robots. Pizzas symbolize **consumer goods,** products that satisfy our wants directly; industrial robots symbolize **capital goods,** products that satisfy our wants indirectly by making possible more efficient production of consumer goods.

consumer goods
Products and services that satisfy human wants directly.

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

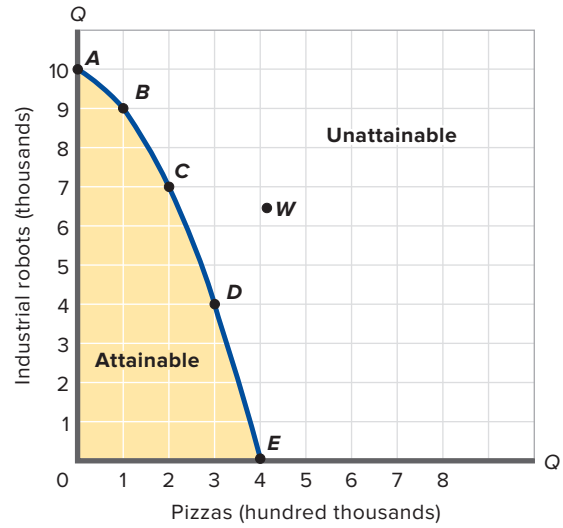
Production Possibilities Table

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 pizzas and industrial robots; the data are, of course, hypothetical. At alternative *A*, this economy would be devoting all its available resources to the production of industrial robots (capital goods);

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 industrial robots means fewer pizzas, and vice versa. Limited resources and a fixed technology make any combination of industrial robots and pizza lying outside the curve (such as at *W*) unattainable. Points inside the curve are attainable, but they indicate that full employment is not being realized.

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



at alternative *E*, all resources would go to pizza production (consumer goods). Those alternatives are unrealistic extremes; an economy typically produces both capital goods and consumer goods, as in *B*, *C*, and *D*. As we move from alternative *A* to *E*, we increase the production of pizzas at the expense of the production of industrial robots.

Because consumer goods satisfy our wants directly, any movement toward *E* looks tempting. In producing more pizzas, society increases the satisfaction of its current wants. But there is a cost: More pizzas mean fewer industrial robots. This shift of resources to consumer goods catches up with society over time because the stock of capital goods expands more slowly, thereby reducing potential future production. 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 pizza or a free industrial robot. Having more of one thing means having less of something else.

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, industrial robots) on the

vertical axis and the output of consumer goods (here, pizzas) on the horizontal axis, as shown in Figure 1.2.

production possibilities curve
A curve showing the different combinations of two goods or services that can be produced in a full-employment, full-production economy where 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 industrial robots and pizzas 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 Costs

Figure 1.2 clearly shows that more pizzas mean fewer industrial robots. The number of units of industrial robots that must be given up to obtain another unit of pizzas, of course, is the opportunity cost of that unit of pizzas.

In moving from alternative *A* to alternative *B* in the table in Figure 1.2, the cost of 1 additional unit of pizzas is 1 less unit of industrial robots. 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 pizzas is greater than the opportunity cost of the preceding one. When we move from *A* to *B*, just 1 unit of industrial robots is sacrificed for 1 more unit of pizzas, but in going from *B* to *C*, we sacrifice 2 additional units of industrial robots for 1 more unit of pizzas, then 3 more of industrial robots for 1 more of pizzas, and finally 4 for 1. Conversely, confirm that as we move from *E* to *A*, the cost of an additional unit of industrial robots (on average) is $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, and 1 unit of pizzas, respectively, for the four successive moves.

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

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 industrial robots (1, 2, 3, and 4) to acquire equal increments of pizzas (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 law of increasing opportunity costs is driven by the fact that economic resources are not completely adaptable to alternative uses. Many resources are better at producing one type of good than at producing others. Consider land. Some land is highly suited to growing the ingredients necessary for pizza production. But as pizza production expands, society has to start using land that is less bountiful for farming. Other land is rich in mineral deposits and therefore well-suited to producing the materials needed to make industrial robots. That land will be the first land devoted to the production of industrial robots. But as society steps up the production of industrial robots, it must use resources that are less and less suited to making their components.

If we start at *A* and move to *B* in Figure 1.2, we can shift resources whose productivity is relatively high in pizza production and low in industrial robots. But as we move from *B* to *C*, *C* to *D*, and so on, resources highly productive of pizzas become increasingly scarce. To get more pizzas, resources whose productivity in industrial robots is relatively great will be needed. It will take increasingly more of such resources, and hence greater sacrifices of industrial robots, to achieve each 1-unit increase in pizzas. 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 pizzas and industrial robots on the curve in Figure 1.2, which is optimal (best)? That is, what specific quantities of resources should be allocated to pizzas and what specific quantities to industrial robots 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 pizzas. We already know from the law of increasing opportunity costs that the marginal cost of additional units of pizzas will rise as more units are produced. At the same time, we need to recognize that the extra or marginal benefits that come from producing and consuming pizzas decline with each successive unit of pizzas. Consequently, each successive unit of pizzas brings with it both increasing marginal costs and decreasing marginal benefits.

The optimal quantity of pizza production is indicated in Figure 1.3 by the intersection of the MB and MC curves: 200,000 units. Why is this amount the optimal quantity? If only 100,000 units of pizzas 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 only $5, it is better off. In Figure 1.3, net gains of decreasing amounts can be realized until pizza production has been increased to 200,000.

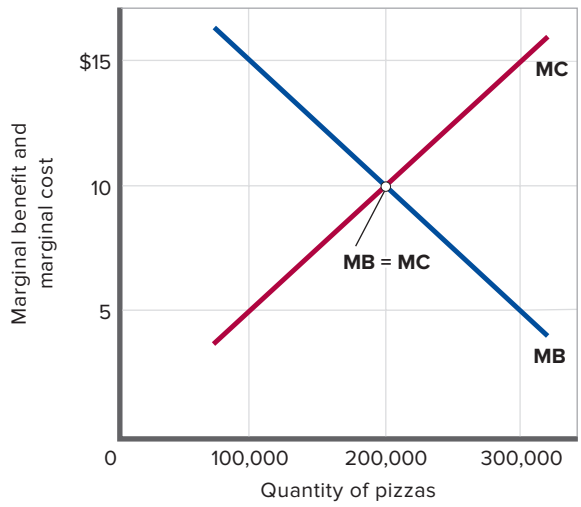


FIGURE 1.3
Optimal output: MB = MC. Achieving the optimal output requires the expansion of a good's output until its marginal benefit (MB) and marginal cost (MC) are equal. No resources beyond that point should be allocated to the product. Here, optimal output occurs when 200,000 units of pizzas are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

In contrast, the production of 300,000 units of pizzas is excessive. There, the MC of an added unit is $15 and its MB is only $5. This means that 1 unit of pizzas 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 industrial robots, we find its optimal (MB = MC) quantity is 7,000. This would mean that alternative *C* (200,000 units of pizzas and 7,000 units of industrial robots) on the production possibilities curve in Figure 1.2 would be optimal for this economy.

Applying the analysis

The Economics of War

Production possibilities analysis is helpful in assessing the costs and benefits of waging the war on terrorism, including the wars in Afghanistan and Iraq. At the end of 2015, the estimated cost of these efforts exceeded $1.7 trillion.

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 of these activities 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. An optimal allocation of resources 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. Subsequent downturns have been much less severe. During the deep 2007–2009 recession, for instance, production fell by a comparably smaller 3.7 percent, and 1 in 10 workers was without a job.

Almost all nations have experienced widespread unemployment and unused production capacity from business downturns at one time or another. Since 2010, for example, several nations—including Argentina, Italy, Russia, Japan, and France—have had economic downturns and elevated 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 pizzas and industrial robots 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 pizzas and industrial robots 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.

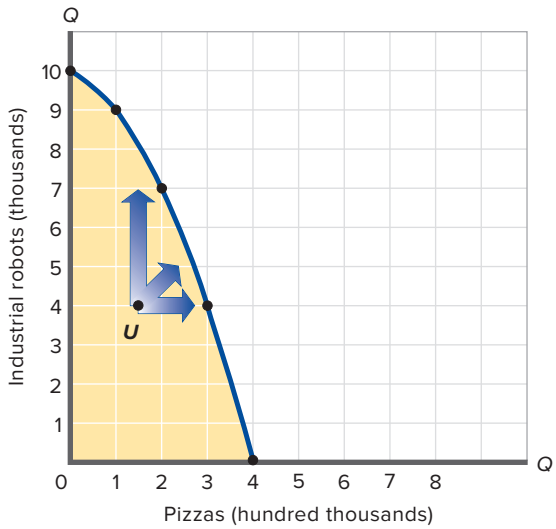


FIGURE 1.4
Unemployment and the production possibilities curve. Any point inside the production possibilities curve, such as *U*, represents unemployment or a failure to achieve full employment. The arrows indicate that, by realizing full employment, the economy could operate on the curve. This means 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 systems, 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.

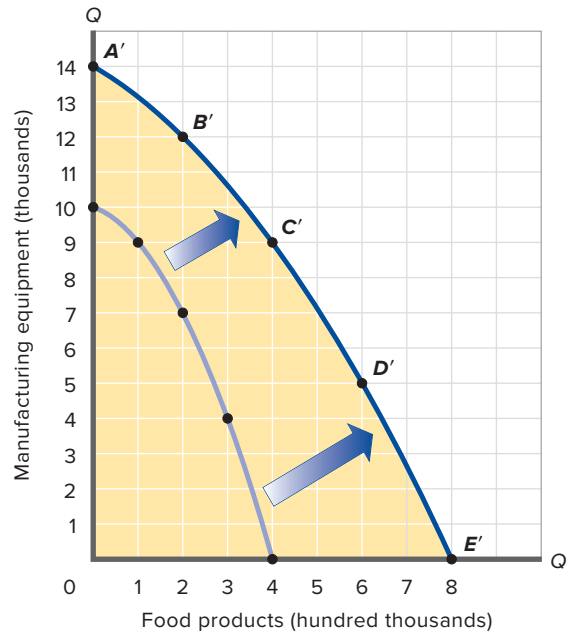
economic growth
(1) An outward shift in the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology; (2) an increase of real output (gross domestic product) or real output per capita.

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

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′
Pizzas (hundred thousands)	0	2	4	6	8
Industrial robots (thousands)	14	12	9	5	0



introduction of computerized systems to manage inventories and schedule production. 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 industrial robots and pizzas.

Information Technology and Biotechnology

Applying the analysis

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. These and other new and improved technologies have contributed to U.S. economic growth (outward 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.

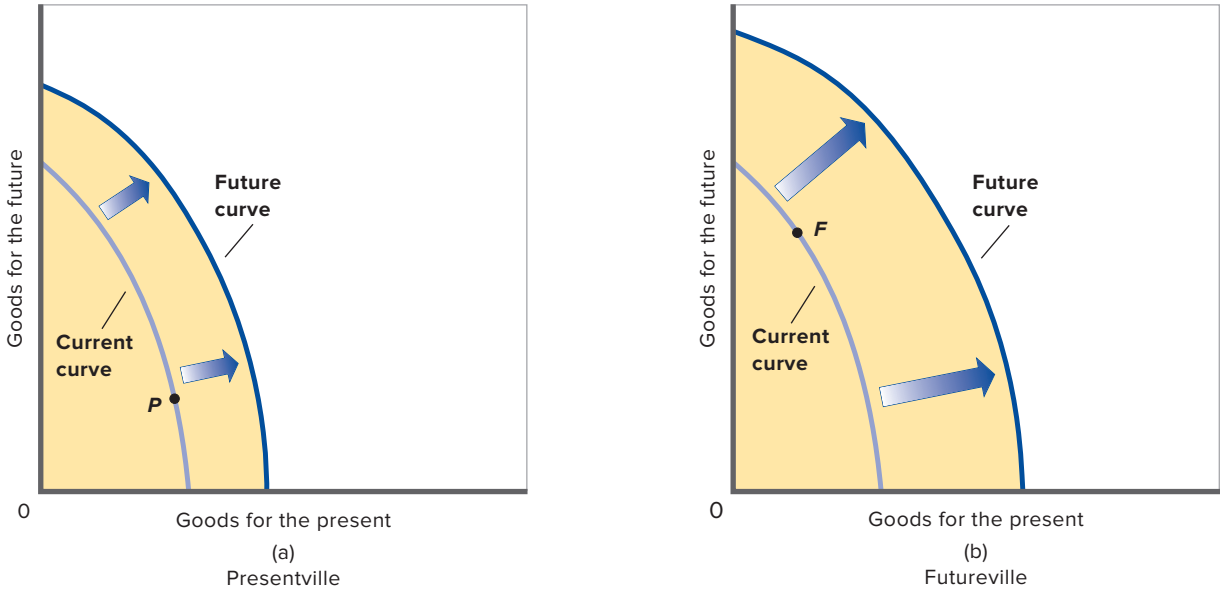
Present Choices and Future Possibilities

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, that 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 less goods for the future. Futureville, in contrast, makes a current choice that stresses larger

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.



amounts of future goods and smaller amounts of present goods, as shown by point *F* in Figure 1.6b.

Now, other things equal, we can expect Futureville's future production possibilities curve to be farther to the right than Presentville's future production possibilities 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 does 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.

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. However, each country will have to live with the consequences of its choice.

Summary

LO1.1 Define economics and the features of the economic perspective.

Economics is the social science that studies how people, institutions, and society make choices under conditions of scarcity. Central to economics is the idea of opportunity cost: the value of the good, service, or time forgone to obtain something else.

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.

LO1.2 Describe the role of economic theory in economics.

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.

LO1.3 Distinguish microeconomics from macroeconomics. Microeconomics examines the decision making of specific economic units or institutions. Macroeconomics looks at the economy as a whole or its major aggregates.

LO1.4 List the categories of scarce resources and delineate the nature of the economic problem. Individuals face an economic problem. Because their wants exceed their incomes, 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.

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.

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.

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.

LO1.5 Apply production possibilities analysis, increasing opportunity costs, and economic growth. 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.

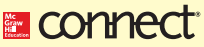
Because resources are not equally productive in all possible uses, shifting resources from one use to another results in increasing opportunity costs. The production of additional units of one product requires the sacrifice of increasing amounts of the other product.

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

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? **(LO1)**
2. "Buy 2, get 1 free." Explain why the "1 free" is free to the buyer but not to society. **(LO1)**
3. Which of the following decisions would entail the greater 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. **(LO1)**
4. What is meant by the term "utility," and how does it relate to purposeful behavior? **(LO1)**

5. Cite three examples of recent decisions you made in which you, at least implicitly, weighed marginal cost and marginal benefit. **(LO1)**
6. What are the key elements of the scientific method, and how does this method relate to economic principles and laws? **(LO2)**
7. Indicate whether each of the following statements applies to microeconomics or macroeconomics: **(LO3)**
   a. The unemployment rate in the United States was 5.1% in September 2015.
   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, increased by 2.4% in 2014.
   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 0.2% from August 2014 to August 2015.
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? **(LO4)**
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? **(LO4)**
10. 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. **(LO5)**
11. Explain how (if at all) each of the following events affects the location of a country's production possibilities curve: **(LO5)**
    a. The quality of education increases.
    b. The number of unemployed workers increases.
    c. A new technique improves the efficiency of extracting copper from ore.
    d. A devastating earthquake destroys numerous production facilities.

Problems

1. Potatoes cost Janice $1 per pound, and she has $5.00 that she could possibly spend on potatoes or other items. If she feels that the first pound of potatoes is worth $1.50, the second pound is worth $1.14, the third pound is worth $1.05, and all subsequent pounds are worth $0.30, how many pounds of potatoes will she purchase? What if she only had $2 to spend? **(LO1)**
2. Pham can work as many or as few hours as she wants at the college bookstore for $9 per hour. But due to her hectic schedule, she has just 15 hours per week that she can spend working at either the bookstore or at other potential jobs. One potential job, at a café, will pay her $12 per hour for up to 6 hours per week. She has another job offer at a garage that will pay her $10 an hour for up to 5 hours per week. And she has a potential job at a day care center that will pay her $8.50 per hour for as many hours as she can work. If her goal is to maximize the amount of money she can make each week, how many hours will she work at the bookstore? **(LO1)**
3. 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. **(LO4)**
   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 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?
4. Suppose you are on a desert island and possess exactly 20 coconuts. Your neighbor, Friday, is a fisherman, and he is willing to trade 2 fish for every 1 coconut you are willing to give him. Another neighbor, Kwame, is also a fisherman, and he is willing to trade 3 fish for every 1 coconut. **(LO4)**
   a. On a single figure, draw budget lines for trading with Friday and for trading with Kwame. (Put coconuts on the vertical axis.)