SURVEY OF economics

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IRVIN B. TUCKER

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University of North Carolina at Charlotte

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***Survey of Economics*, Tenth Edition**
Irvin B. Tucker

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Cover Image: Andrew Koturanov/ Shutterstock.com

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Library of Congress Control Number: 2018932428

ISBN: 978-1-337-11152-2

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Printed in the United States of America
Print Number: 01 Print Year: 2018

ABOUT THE AUTHOR

IRVIN B. TUCKER

IRVIN B. TUCKER was a longtime leader in economic education with over 30 years of experience teaching introductory economics at the University of North Carolina Charlotte. He earned his B.S. in economics at N.C. State University and his M.A. and Ph.D. in economics from the University of South Carolina. Dr. Tucker served as executive director of the S.C. Council of Education and director of the Center for Economic Education at the University of North Carolina Charlotte. Dr. Tucker is recognized for his ability to relate basic principles to economic issues and public policy. His work has received national recognition by being awarded the Meritorious Levy Award for Excellence in Private Enterprise Education, the Federation of Independent Business Award for Postsecondary Educator of the Year in Entrepreneurship and Economic Education, and the Freedom Foundation's George Washington Medal for Excellence in Economic Education. In addition, his research has been published in numerous professional economics journals on a wide range of topics including industrial organization, entrepreneurship, and economics of education. Dr. Tucker is also the author of the highly successful Economics for Today, tenth edition, a text for the two-semester principles of economics courses, published by Cengage Learning.

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Note: Chapter numbers refer to the complete book, *Economics for Today*.

PREFACE

TEXT WITH A MISSION

The purpose of *Survey of Economics*, tenth edition, is to teach, in an engaging style, the basic operations of the U.S. economy to students who will take a one-term economics course. Rather than taking an encyclopedic approach to economic concepts, *Survey of Economics* focuses on the most important tools in economics and applies these concepts to clearly explain real-world economic issues and events.

Every effort has been made to make *Survey of Economics* the most student-friendly text on the market. This text was written because so many others expose students to a confusing array of economic analyses that force students to simply memorize in order to pass the course. Instead, *Survey of Economics* presents a straightforward and unbiased approach that effectively teaches the application of basic economic principles. After reading this text, the student should be able to say, "Now that economics stuff in the news makes sense."

HOW IT FITS TOGETHER

This text presents the core principles of microeconomics, macroeconomics, and international economics. The first 10 chapters introduce the logic of economic analysis and develop the core of microeconomic analysis. Here, students learn the role of demand and supply in determining prices in competitive markets versus monopolistic markets. Within these chapters, the book explores such issues as minimum wage laws, rent control, and pollution. The next 10 chapters develop the macroeconomics part of the text. Using the modern yet simple aggregate demand and aggregate supply model, the text explains measurement of and changes in the price level, national output, and employment in the economy. The study of macroeconomics also includes how the supply of and the demand for money influences the economy. Finally, this text concludes with three chapters devoted entirely to global issues. For example, students will learn how the supply of and demand for currencies determine exchange rates and what the implications are for a strong or a weak dollar on our nation's economy.

TEXT FLEXIBILITY

Survey of Economics is easily adapted to an instructor's preference for the sequencing of microeconomics and macroeconomics topics. This text can be used in a macroeconomic-microeconomic sequence by teaching the first two chapters and then Parts 2, 3, and 4. Also, some instructors prefer to teach Chapter 22, Economies in Transition, after Chapter 1. Instructors should note the appendices on the self-correcting aggregate demand and supply model that follow Chapter 14, Aggregate Demand and Supply, and Chapter 20, Monetary Policy. This approach allows instructors to decide whether to cover this model. An alternative placement for Chapter 21, International Trade and Finance, is also possible. Some instructors say they prefer to emphasize international economics by placing it before the macroeconomic material in Parts 3 and 4. Other instructors believe that students should learn both the microeconomic and macroeconomic material before tackling Chapter 21. Also, a customized text might meet your needs. If so, contact your Cengage South-Western sales representative for information.

HOW NOT TO STUDY ECONOMICS

To some students, studying economics is a little frightening because many chapters are full of graphs. Students often make the mistake of preparing for tests by trying to memorize the lines of graphs. When their graded tests are returned, the students using this strategy will probably exclaim, "What happened?" The answer to this question is that the students should have learned the economic concepts *first*; then they would understand the graphs as *illustrations* of these underlying concepts. Stated simply, superficial cramming for economics quizzes does not work.

For students who are anxious about using graphs, the Appendix to Chapter 1 provides a brief review of graphical analysis. In addition, Graph Builder in the Tucker MindTap product contains step-by-step features on how to construct and interpret graphs. Moreover, and new to this edition, Videos entitled "GuideMe Videos" (*A Graphing Tutorial for Students*) are found in the Tucker MindTap product that explain numerous key graphs throughout the textbook.

CHANGES TO THE TENTH EDITION

The basic layout of the tenth edition remains the same. The following are changes:

- Chapter 1, Introducing the Economic Way of Thinking, recognizes that students taking introductory, college-level economics courses are considering their major. One reason to select economics is that the average starting salary for an undergraduate economics major is higher compared to many other majors. To aid their decision, current average starting salary figures for selected majors have been updated. In addition, the *You're the Economist* feature on the Minimum Wage has been updated with the positive and normative arguments both for and against the minimum wage.
- Chapter 2, Production Possibilities, Opportunity Cost, and Economic Growth, has an updated discussion on how public investment in infrastructure can promote economic growth and enhance the average absolute standard of living for a nation.
- Chapter 4, Markets in Action, has updated the *You're the Economist* feature entitled "Rigging the Market for Milk" to reflect the latest changes in government's attempts at supporting farm incomes.
- Chapter 8, Monopoly, has an example of the "sharing economy" that has been updated in the *You're the Economist* on New York Taxicabs. This feature now concludes with a discussion of the unregulated rideshares market with companies like Uber and Lyft.
- Chapter 10, Labor Markets and Income Distribution, has a new *Checkpoint* that asks students to consider a business' location decision based on union membership. This chapter has also been updated with the latest figures on family income distribution and poverty rates. In addition, the *You're the Economist* that addresses fair pay for females has been updated.
- Chapter 11, Gross Domestic Product, has updated data on all components of GDP.
- Chapter 12, Business Cycles and Unemployment, includes updated business cycles and unemployment data. This chapter also includes updated unemployment data by demographic groups with a section on the impacts of globalization on unemployment. This chapter also features a new *You're the Economist* examining the potential impact of artificial intelligence and other technological advancements on unemployment in the future.
- Chapter 13, Inflation, updates data on inflation including a global comparison of annual inflation rates. A new *You're the Economist* feature reports on the high inflation rates for health care in the United States and examines the impact on

households, businesses, and government. In addition, a couple of *Checkpoints* provide an application for adjusting the price of going to college and the price of gasoline for inflation over time. Here students can also enjoy learning how Babe Ruth's 1932 salary is converted into today's dollars.

- Chapter 16, The Public Sector, highlights the important current issue of the changing economic character of the United States with global comparisons to other countries. Here, for example, updated data and exhibits trace the growth of U.S. government expenditures and taxes since the Great Depression. And global comparison of spending and taxation exhibits have been revised.
- Chapter 17, Federal Deficits, Surpluses, and the National Debt, focuses on the current "hot button" issue of federal deficits and the national debt using updated data and exhibits. This chapter includes global comparisons of the deficit and national debt as a percentage of GDP.
- Chapter 18, Money and the Federal Reserve System, has updated money supply figures and an updated listing of the top 10 U.S. banks by asset size. This chapter also features a new *Checkpoint* that examines the role of bitcoins as money, and a new *You're the Economist* entitled "Should the Fed be Independent?"
- Chapter 19, Money Creation, has a new *Checkpoint* that asks students to determine how the Fed could utilize its tools to combat unemployment.
- Chapter 20, Monetary Policy, features a new *Checkpoint* that tests students' understanding of how the Fed could push interest rates down.
- Chapter 21, International Trade and Finance, has updated data for international balance of payments and trade.
- Chapter 22, Economies in Transition, has greater clarification on the differences between capitalism and socialism and why all real-world economies are mixed economies. This chapter also features a new *You're the Economist* entitled "The unrealistic path to communism." In addition, there is a new *Global Economics* section that points to a satellite photo of North Korea as perhaps a compelling testimony to the long-run failure of undemocratic command economies. Students should find this interesting.
- Chapter 23, Growth and the Less-Developed Countries, presents updated data ranking countries by their GDP per capita. It also presents updated data comparing regions of the world by their average GDP per capita. Here, updated data is used to explain the link between economic freedom and quality-of-life indicators. There is a new *You're the Economist* section entitled "India and China's Economic Growth: An Updated Version of Aesop's Tale" that probes the ingredients for sustained economic growth.

ALTERNATIVE VERSIONS OF THE BOOK

For instructors who want to spend various amounts of time for their courses and offer different topics of this text:

- *Economics for Today.* This complete version of the book contains all 30 chapters. It is designed for two-semester introductory courses that cover both microeconomics and macroeconomics.
- *Microeconomics for Today.* This version contains 17 chapters and is designed for one-semester courses in introductory microeconomics.
- *Macroeconomics for Today.* This version contains 20 chapters and is designed for one-semester courses in introductory macroeconomics.
- *Survey of Economics.* This version of the book contains 23 chapters. It is designed for one-semester courses that cover the basics of both microeconomics and macroeconomics.

The Available Versions accompanying table on page xiv shows precisely which chapters are included in each book.

Instructors who want more information about these alternative versions should contact their local Cengage Learning consultant.

MOTIVATIONAL PEDAGOGICAL FEATURES

Survey of Economics strives to motivate and advance the boundaries of pedagogy with the following features:

Part Openers

Each part begins with a statement of the overall mission of the chapters in the part. In addition, there is a nutshell introduction of each chapter in relation to the part's learning objective.

Chapter Previews

Each chapter begins with a preview designed to pique the student's interest and reinforce how the chapter fits into the overall scheme of the book. Each preview appeals to students' "Sherlock Holmes" impulses by posing several economics puzzles that can be solved by understanding the material presented in the chapter.

Margin Definitions and Flashcards

Key concepts introduced in the chapter are highlighted in bold type and then defined with the definitions again in the margins. This feature therefore serves as a quick reference. Key terms are also defined on the Tucker MindTap product with a flashcard feature that is great for learning terms.

You're the Economist

Each chapter includes boxed inserts that provide the acid test of "relevance to everyday life." This feature gives the student an opportunity to encounter timely, real-world extensions of economic theory. For example, students read about Fred Smith as he writes an economics term paper explaining his plan to create FedEx. To ensure that the student wastes no time figuring out which concepts apply to the article, applicable concepts are listed after each title. Several of these boxed features include quotes from newspaper articles over a period of years demonstrating that economic concepts remain relevant over time. Many of these boxed features have been updated or changed in the tenth edition to reflect the latest issues, developments, and relevant applications of economics for students today.

Conclusion Statements

Throughout the chapters, highlighted conclusion statements of key concepts appear at the ends of sections and tie together the material just presented. Students will be able to see quickly if they have understood the main points of the section. A summary of these conclusion statements is provided at the end of each chapter.

Global Economics

Today's economic environment is global. *Survey of Economics* carefully integrates international topics throughout the text and presents the material using a highly readable and accessible approach designed for students with no training in international economics. All sections of the text that present global economics are identified by a special global icon in the text margin and in the *Global Economics* boxes. In addition, the final three chapters of the book are devoted entirely to international economics.

Analyze the Issue

This feature follows each *You're the Economist* and *Global Economics* feature and asks specific questions that require students to test their knowledge of how the material in the boxed insert is relevant to the applicable concept. To allow these questions to be used in classroom discussions or homework assignments, answers are provided in the Instructor's Manual rather than in the text.

Checkpoint

Watch for these! Who said learning economics can't be fun? This feature is a unique approach to generating interest and critical thinking. These questions spark students to check their progress by asking challenging economics puzzles in game-like style. Students enjoy thinking through and answering the questions, and then checking the answers at the end of the chapter. Students who answer correctly earn the satisfaction of knowing they have mastered the concepts. Many of these have been updated for the tenth edition to pique interest and to apply to the experiences of students today.

Exhibits

Attractive large graphical presentations with grid lines and real-world numbers are essential for any successful economics textbook. Each exhibit has been carefully analyzed to ensure that the key concepts being represented stand out clearly. Brief descriptions are included with graphs to provide guidance for students as they study the graph. The MindTap course brings these exhibits to life:

- Students can interact with selected exhibits via GraphBuilder.
- Students can watch detailed explanations of selected exhibits via GuideMe Videos (*A graphing tutorial for students.*)

Causation Chain Game

This will be one of your favorites. The highly successful causation chains are included under many graphs throughout the text. This pedagogical device helps students visualize complex economic relationships in terms of simple box diagrams that illustrate how one change causes another change. Each exhibit has a causation chain in the text, and a correlating in the animated causation chain game exercise in the Tucker MindTap product. Arrange the blocks correctly to win the game.

Key Concepts

Key concepts introduced in the chapter are listed at the end of each chapter and defined in the margins. Visit the Tucker MindTap to access for interactive flashcards.

Visual Summaries

Each chapter ends with a brief point-by-point summary of the key concepts. Many of these summarized points include miniaturized versions of the important graphs and causation chains that illustrate many of the key concepts. These are intended to serve as visual reminders for students as they finish the chapters and are also useful in reviewing and studying for quizzes and exams.

Study Questions and Problems

These end-of-chapter questions and problems offer a variety of levels ranging from straightforward recall to deeply thought-provoking applications. The answers to odd-numbered questions and problems are found in Appendix A in the back of the text. This feature gives

students immediate feedback without requiring the instructor to check their work. The even-numbered answers are found in the Instructor's Manual.

End-of-Chapter Sample Quizzes

These particular assessments are a great help before quizzes. Many instructors test students using multiple-choice questions. For this reason, the final section of each chapter provides the type of multiple-choice questions given in the test bank. The answers are readily available to students to help them learn the material and are found in Appendix B at the end of the textbook. In addition to the end-of-chapter sample quizzes, each section quiz appears in the Tucker MindTap product. Each quiz contains multiple questions like those found on a typical exam. Feedback is included for each answer so that you may know instantly why you have answered correctly or incorrectly. Between this feature and the end-of-chapter sample quizzes, students are well prepared for tests. Finally, the Instructor's Manual also contains four to five multiple choice questions per chapter that can also be used to engage students with the material.

Road Maps

This feature concludes each sectioned part with review questions listed by chapter from the particular part. To reinforce the concepts, each set of questions relates to the interactive causation chain game that is available in the Tucker MindTap product. This makes learning fun. Answers to the questions are also found in Appendix C in the back of the text.

A SUPPLEMENTS PACKAGE DESIGNED FOR SUCCESS

Tucker is known for its unequaled resources for instructors and students. To access additional course material for *Survey of Economics,* visit www.cengagebrain.com. At the CengageBrain.com home page, search for "Tucker" using the search box on the page. This will take you to the product page where these resources can be found. For additional information, contact your Cengage Learning consultant.

INSTRUCTORS RESOURCES

Tucker Companion Site

The Tucker website at www.cengagebrain.com provides open access to PowerPoint chapter review slides; an instructor's manual prepared by Douglas Copeland of Johnson County Community College, available in various formats; updates to the text, describing key concepts relevant to the current states of economics and the world today; PowerPoint lecture tools elaborating on key concepts and exhibits, which can be used as supplies or can be customized for instructor intentions; and test banks in various downloadable formats.

STUDENT RESOURCES

MindTap for Tucker

MindTap engages students and aids them in consistently producing their best work. By seamlessly integrating course material with interactive media, step-by-step graphing, activities, apps, and much more, MindTap creates a unique learning path for courses that foster increased comprehension and efficiency of material.

- MindTap delivers real-world relevance with activities, assignments, homework, media, and study tools that help students build critical thinking and analytic skills that will carry over to their professional lives.
- MindTap helps students stay organized and efficient with a single destination that reflects what's important to the instructor and the tools to master that content. MindTap empowers students to get their "game face on" by motivating them with competitive benchmarks in performance.
- Relevant readings, multimedia, and activities are designed to take students up the levels of learning from basic knowledge to analysis and application.
- GraphBuilder exercises enable students to practice building their own graphs and honing the skills to do so for application both in the course and real-life situations.
- Students can watch detailed explanations of selected exhibits via GuideMe Videos (*A Graphing Tutorial for Students*) that explain numerous key graphs throughout the textbook.
- Analytics and reports provide a snapshot of class progress, time in course, engagement and completion rates.
- Homework and the Math & Graphing Tutorial, both powered by Aplia, as well as videos that explain key graphs round out the student learning experience within MindTap that enable students to master course content.

Acknowledgments

A deep debt of gratitude is owed to the reviewers of all ten editions for their expert assistance. All comments and suggestions were carefully evaluated and served to improve the final product.

Special Thanks

Much appreciation goes to Michael Parthenakis, Senior Product Manager. Thanks also to Clara Goosman, Content Development Manager, Julia Chase, Content Developer, Colleen Farmer, Senior Content Project Manager; Michelle Kunkler, Senior Art Director; Derek Drifmeyer, Senior Digital Project Manager; Drew Gaither, Media Producer; and Denisse Zavala-Rosalez, Product Assistant. I am also grateful to John Carey for his skillful marketing. Finally, I give my sincere thanks for a job well done to the entire team at Cengage.

A Tribute to Irvin B. Tucker

The contributing authors and the entire Cengage team want to express our heartfelt gratitude for the opportunity and the privilege to have been able to work with Irvin Tucker and this textbook over all these years. Some of us have had the honor of working with Irvin from the beginning, when this book was just a manuscript. We know of few, if any, other authors who have consistently demonstrated such a firm commitment and tireless dedication to teaching and learning. Irvin has always believed that knowledge of economics can enhance people's lives and should therefore be made accessible to everyone. And Irvin has displayed the rare ability to translate complex concepts into easily understood principles that have enriched the lives of countless numbers of students across the globe. He has made economics not only accessible but fun to learn. For this, he has distinguished himself among the very best economists of our time! He is a true complement to the profession of economics and to the noble cause of education. Beyond having earned our respect as a superb economist and author, Irvin has also been such a joy to work with. He has always been kind to everyone, willing to listen to any new ideas or suggestions, and has consistently made everyone feel needed and appreciated.

We would be remiss if we did not also make a tribute to Irvin's wife, Nonie. Nonie also possesses the traits of those you feel blessed to work with. She has also made countless meaningful contributions to this title from the very beginning. Irvin and Nonie have always been known to be "quite the team!" Thank you Irvin, and thank you Nonie! You have made the world a better place!

This edition is dedicated to Irvin B. Tucker.

PART 1

Introduction to Economics

The first two chapters introduce you to a foundation of economic knowledge vital to understanding the other chapters in the text. In these introductory chapters, you will begin to learn a valuable reasoning approach to solving economics puzzles that economists call "the economic way of thinking." Part 1 develops the cornerstone of this type of logical analysis by presenting basic economic models that explain such important topics as scarcity, opportunity cost, production possibilities, and economic growth.

CHAPTER 1

Introducing the Economic Way of Thinking

CHAPTER PREVIEW

You and I know that navigating the complex social environment in which we live as we strive to be successful and happy is not easy. However, understanding the important economic, social (cultural), and political (legal) elements at play and how they interact can certainly help. In fact, all headline-grabbing issues of our times can be viewed from these three perspectives. Perhaps all too often the economic perspective is the least understood. So, what is this *economic perspective*? What is the economic way of thinking?

In this text, you will learn what it means to think economically. You will discover that the world is full of economics problems requiring more powerful tools than just common sense. Just to give a sneak preview, in later chapters, you will discover the shortcomings of government price fixing for gasoline and health care. You will also find out why colleges and universities charge students different tuitions for the same education. You will investigate whether you should worry if the federal government fails to balance its budget. You will learn that the island of Yap uses large stones with holes in the center as money. In the final chapter, you will study why some countries grow rich while others remain poor and less developed. And the list of fascinating and relevant topics continues throughout each chapter. As you read these pages, your efforts will be rewarded by an understanding of just how much economic theories and policies affect our daily lives—past, present, and future.

Chapter 1 acquaints you with the foundation of the economic way of thinking. The first building blocks joined are the concepts of scarcity and choice. The next building blocks are the steps in the model-building process that economists use to study the choices people make. Then we look at some pitfalls of economic reasoning and explain why economists might disagree with one another. The chapter concludes with a discussion of why you may want to be an economics major.

IN THIS CHAPTER, YOU WILL LEARN TO SOLVE THESE ECONOMICS PUZZLES:

- Can you prove there is no person worth a trillion dollars?
- Why would you purchase more Coca-Cola when its price increases?
- How can the relationship between the Super Bowl winner and changes in the stock market be explained?

1–1 THE PROBLEM OF SCARCITY

At the heart of the economic way of thinking is the fact that we live in a world of scarcity. **Scarcity** is the condition in which human wants are forever greater than the available supply of time, goods, and resources. Because of scarcity, we are unable to have as much as we would like. It is impossible to satisfy every desire. Pause for a moment to list some of your unsatisfied wants. Perhaps you would like a big home, gourmet meals, designer clothes, clean air, better health care, shelter for the homeless, more leisure time, and so on. Unfortunately, nature does not offer the Garden of Eden, where every desire is fulfilled. Instead, there are always limits on the economy's ability to satisfy unlimited wants. Alas, scarcity is pervasive, so "you can't have it all."

Scarcity
The condition in which human wants are forever greater than the available supply of time, goods, and resources.

You may think your scarcity problem would disappear if you were rich, but wealth does not solve the problem. No matter how affluent an individual is, the wish list continues to grow. We are familiar with the "rich and famous" who never seem to have enough. Although they live well, they still desire finer homes, faster planes, and larger yachts. In short, the condition of scarcity means all individuals, whether rich or poor, are dissatisfied with their material well-being and would like more. What is true for individuals also applies to society. Even Uncle Sam can't escape the problem of scarcity because the federal government never has enough money to spend for education, highways, police, national defense, Social Security, and all the other programs it wants to fund.

Scarcity is a fact of life throughout the world. In much of South America, Africa, and Asia, the problem of scarcity is often life-threatening. On the other hand, North America, Western Europe, and some parts of Asia have achieved substantial economic growth and development. Although life is much less "gruelling" in the more developed countries, the problem of scarcity still exists because individuals and countries never have as much of all the goods and services as they would like to have. As a result of scarcity, every nation must decide what combination of products to produce, how much to produce, and who is going to get those goods and services. These economic choices have profound social and political implications.

CONCLUSION

The problems of scarcity and choice are basic economic problems faced by every society.

1–2 SCARCE RESOURCES AND PRODUCTION

Because of the economic problem of scarcity, no society has enough resources to produce all the goods and services necessary to satisfy all human wants. **Resources** are the basic categories of inputs used to produce goods and services. Resources are also called *factors of production*. Economists divide resources into three categories: *land*, *labor*, and *capital* (see Exhibit 1).

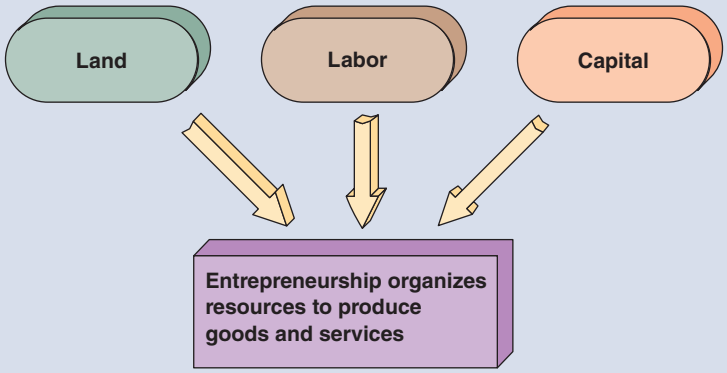
Resources
The basic categories of inputs used to produce goods and services. Resources are also called *factors of production*. Economists divide resources into three categories: land, labor, and capital.

1–2a Land

Land is a shorthand expression for any natural resource provided by nature that is used to produce a good or service. *Land* includes those resources or raw materials that are gifts of nature available for use in the production process. Farming, building factories, and constructing oil refineries would be impossible without land. Land includes anything natural above or below the ground, such as forests, gold, diamonds, oil, coal, wind, and the ocean. Two broad categories of natural resources are *renewable resources* and *nonrenewable resources*. Renewable resources are basic inputs that nature can automatically replace. Examples include crops, clean air, and the water and fish in lakes. Nonrenewable resources are basic inputs that nature cannot automatically replace. There is only so much coal, oil, and natural gas in the world. If these fossil fuels disappear, we must use substitutes.

Land
Any natural resource provided by nature that is used to produce a good or service.

EXHIBIT 1 Three Categories of Resources



Resources are the basic categories of inputs organized by entrepreneurship (a special type of labor) to produce goods and services. Economists divide resources into the three categories of land, labor, and capital.

1–2b Labor

Labor
The mental and physical capacity of workers to produce goods and services.

Labor is the mental and physical capacity of workers to produce goods and services. The services of farmers, assembly-line workers, lawyers, professional football players, and economists are all *labor*. The labor resource is measured both by the number of people available for work and by the skills or quality of workers. One reason nations differ in their ability to produce is that human characteristics, such as the education, experience, health, and motivation of workers, differ among nations.

Entrepreneurship
The creative ability of individuals to seek profits by taking risks and combining resources to produce innovative products.

Entrepreneurship is a special type of labor. **Entrepreneurship** is the creative ability of individuals to seek profits by taking risks and combining resources to produce innovative products. An *entrepreneur* is a motivated person who seeks profits by undertaking risky activities such as starting new businesses, creating new products, or inventing new ways of accomplishing tasks. Entrepreneurs are often successful when they embrace new or existing technologies (using their "know-how") in creative ways. For example, consider all of the amazing apps created for use with Androids and the iPhone. Entrepreneurship is a scarce human resource because relatively few people are willing or able to innovate and make decisions involving a high likelihood of failure. An important benefit of entrepreneurship is that it creates a growing economy.

Entrepreneurs are the agents of change who bring material progress to society. The birth of the Levi Strauss Company is a classic entrepreneurial success story. In 1853, at the age of 24, Levi Strauss, who was born in Bavaria, sailed from New York to join the California Gold Rush. His intent was not to dig for gold but to sell cloth. By the time he arrived in San Francisco, he had sold most of his cloth to other people on the ship. The only cloth he had left was a roll of canvas for tents and covered wagons. On the dock, he met a miner who wanted sturdy pants that would last while digging for gold, so Levi made a pair from the canvas. Later, a customer gave Levi the idea of using little copper rivets to strengthen the seams. Presto! Strauss knew a good thing when he saw it, so he hired workers, built factories, and became one of the largest pants makers in the world. As a reward for taking business risks, organizing production, and introducing a product, the Levi Strauss Company earned profits, and Strauss became rich and famous.

1–2c Capital

Capital can be defined as a human-made good used to produce other goods and services; for example, capital includes the physical plants, machinery, and equipment used to produce other goods. Capital can be privately or publicly owned. Private capital is owned by private companies and consists of factories, office buildings, warehouses, robots, trucks, and distribution facilities. Public (or social) capital, also known as *infrastructure*, is provided by government through taxes and is collectively owned. It consists of roads, bridges, dams, airports, harbors, and public universities and other government buildings. The term *capital,* as it is used in the study of economics, can be confusing. Economists know that capital in everyday conversations means money or the money value of paper assets, such as stocks, bonds, or a deed to a house. This is actually *financial* capital. In the study of economics, capital does not refer to money assets. Capital in economics means a factor of production, such as a factory or machinery. Stated simply, you must pay special attention to this point: Money is not capital and is, therefore, not a resource. Instead, money is used to purchase land, labor, or capital, as well as many consumer goods and services.

Capital
A human-made good used to produce other goods and services.

Money by itself does not produce goods and services; instead, it is only a means to facilitate the purchase and sale of resources and consumer products.

CONCLUSION

1–3 ECONOMICS: THE STUDY OF SCARCITY AND CHOICE

The perpetual problem of scarcity, which forces people to make choices, is the basis for the definition of economics. **Economics** is the study of how society chooses to allocate its scarce resources to satisfy unlimited wants. You may be surprised by this definition. People often think economics means studying supply and demand, the stock market, money, and banking. Well, those are certainly parts, but economics is more all-encompassing. It is the study of the choices we make because we are faced with scarcity—because we are unable to have as much as we would like.

Society makes two broad levels of choices: economy-wide, or macro choices, and individual, or micro choices. The prefixes *macro* and *micro* come from the Greek words meaning "large" and "small," respectively. Reflecting the macro and micro perspectives, economics consists of two main branches: *macroeconomics* and *microeconomics*.

Economics
The study of how society chooses to allocate its scarce resources to the production of goods and services to satisfy unlimited wants.

1–3a Macroeconomics

The old saying "Looking at the forest rather than the trees" describes **macroeconomics**, which is the branch of economics that studies decision making for the economy as a whole. Macroeconomics applies an overview perspective to an economy by examining economy-wide variables, such as inflation, unemployment, economic growth, the money supply, and the national incomes of different countries. Macroeconomic decision making considers such "big picture" policies as the effect that federal tax cuts will have on unemployment and the effect that a change in the money supply will have on inflation.

Macroeconomics
The branch of economics that studies decision making for the economy as a whole.

1–3b Microeconomics

Examining individual trees, leaves, and pieces of bark, rather than surveying the forest, illustrates microeconomics. **Microeconomics** is the branch of economics that studies decision making by a single individual, household, firm, industry, or level of government. It applies a microscope to study specific parts of an economy, as one would examine cells in

Microeconomics
The branch of economics that studies decision making by a single individual, household, firm, industry, or level of government.

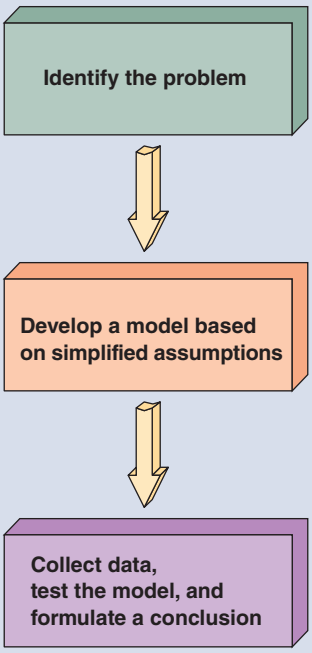
the body. The focus is on small economic units, such as economic decisions of particular groups of consumers and businesses. An example of microeconomic analysis would be to study economic units involved in the market for ostrich eggs. Will suppliers decide to supply more, less, or the same quantity of ostrich eggs to the market in response to price changes? Will individual consumers of these eggs decide to buy more, less, or the same quantity at a new price?

We have described macroeconomics and microeconomics as two separate branches, but they are related. Because the overall economy is the sum, or aggregation, of its parts, micro changes affect the macro economy, and macro changes produce micro changes.

1–4 THE METHODOLOGY OF ECONOMICS

As used by other disciplines, such as criminology, biology, chemistry, and physics, economists employ a step-by-step procedure for solving problems by identifying the problem, developing a model, gathering data, and testing whether the data are consistent with the theory. Based on this analysis, economists formulate a conclusion. Exhibit 2 summarizes the model-building process.

EXHIBIT 2 The Steps in the Model-Building Process



The first step in developing a model is to identify the problem. The second step is to select the critical variables necessary to formulate a model that explains the problem under study. Eliminating other variables that complicate the analysis requires simplifying assumptions. In the third step, the researcher collects data and tests the model. If the evidence supports the model, the conclusion is to accept the model. If the evidence doesn't support the model, the model is rejected.

1–4a Problem Identification

The first step in applying the economic method is to define the issue. Suppose an economist wishes to investigate the microeconomic problem of why U.S. motorists cut back on gasoline consumption in a given year from, for example, 400 million gallons per day in May to 300 million gallons per day in December.

1–4b Model Development

The second step in our hypothetical example toward finding an explanation is for the economist to build a model. A **model** is a simplified description of reality used to understand and predict the relationship between variables. The terms *model* and *theory* are interchangeable. A model emphasizes only those variables that are most important to explaining an event. As Albert Einstein said, "Theories should be as simple as possible, but not more so." The purpose of a model is to construct an abstraction from real-world complexities and make events understandable. Consider a model airplane that is placed in a wind tunnel to test the aerodynamics of a new design. For this purpose, the model must represent only the shapes of the wings and fuselage, but it does not need to include tiny seats, electrical wiring, or other interior design details. A highway map is another example. To find the best route to drive between two distant cities, you do not want extraneous information on the location of all roads, streets, potholes, telephone lines, trees, stoplights, schools, hospitals, and firehouses. This would be too much detail, and the complexity would make it difficult to choose the best route.

Model
A simplified description of reality used to understand and predict the relationship between variables.

To be useful, a model requires simplified assumptions. Someone must decide, for example, whether a map will include only symbols for the major highways or the details of hiking trails through mountains. In our gasoline consumption example, several variables might be related to the quantity of gasoline consumed, including the price of gasoline, consumer incomes, the fuel economy of cars, and weather conditions. Because a theory focuses only on the main or critical variables, the economist must be a "Sherlock Holmes" and use a keen sense of observation to form a model. Using his or her expertise, the economist must select the variables that are related to gasoline consumption and reject variables that have only a slight or no relationship to gasoline consumption. In this simple case, the economist removes the cloud of complexity by formulating a theory, which states that increases in the price of gasoline *cause* the quantity of gasoline consumed to decrease during the time period.

1–4c Testing a Theory

An economic model can be stated as a verbal argument, numerical table, graph, or mathematical equation. You will soon discover that a major part of this book is devoted to building and using economic models. The purpose of an economic model is to *forecast* or *predict* the results of various changes in variables. Note that the appendix to this chapter provides a review of graphical analysis. An economic theory can be expressed in the form "If X, then Y, all other things held constant." An economic model is useful only if it yields accurate predictions. When the evidence is consistent with the theory that X causes outcome Y, there is confidence in the theory's validity. When the evidence is inconsistent with the theory that X causes outcome Y, the researcher rejects this theory.

In this third step, the economist gathers data to test the theory that if the price of gasoline *rises*, then gasoline purchases *fall*—all other relevant factors held constant. Suppose the investigation reveals that the price of gasoline rose sharply between May and December of the given year. The data, therefore, appear to support the theory that the quantity of gasoline consumed per month falls when its price rises, assuming no other relevant factors change. Thus, the conclusion is that the theory is valid if, for example, consumer incomes or the fuel economy of cars does not change at the same time that gasoline prices rise.

iStock.com/Skip ODonnell

A map is a model because it is an abstraction from reality.

CHECKPOINT

Can You Prove There Is No Trillion-Dollar Person?
Suppose a theory says that no U.S. citizen is worth $1 trillion. You decide to test this theory and send researchers to all corners of the nation to check financial records to see whether someone qualifies by owning assets valued at $1 trillion or more. After years of checking, the researchers return and report that not a single person is worth at least $1 trillion. Do you conclude that the evidence proves the theory? Explain.

1–5 HAZARDS OF THE ECONOMIC WAY OF THINKING

Models help us understand and predict the impact of changes in economic variables. A model is an important tool in the economist's toolkit, but it must be handled with care. The economic way of thinking seeks to avoid reasoning mistakes. Two of the most common pitfalls to clear thinking are

1. failing to understand the *ceteris paribus assumption.*
2. confusing *association* and *causation.*

1–5a The Ceteris Paribus Assumption

Ceteris paribus
A Latin phrase that means while certain variables change, "all other things remain unchanged."

As you work through a model, try to think of a host of relevant variables assumed to be "standing still," or "held constant." **Ceteris paribus** is a Latin phrase that means while certain variables change, "all other things remain unchanged." In short, the ceteris paribus assumption allows us to isolate or focus attention on selected variables. In the gasoline example discussed earlier, a key simplifying assumption of the model is that changes in consumer incomes and certain other variables do not occur and complicate the analysis. The ceteris paribus assumption holds everything else constant and therefore allows us to concentrate on the relationship between two key variables: changes in the price of gasoline and the quantity of gasoline purchased per month.

Now suppose an economist examines a model explaining the relationship between the price and quantity purchased of Coca-Cola. The theory is "If the price increases, then the quantity of Coca-Cola purchased decreases, ceteris paribus." Now assume you observe that the price of Coca-Cola increased one summer and some people actually bought more, not less. Based on this real-world observation, you might declare that the theory is incorrect. Think again! Perhaps the reason the model appeared flawed is because another factor—for example a sharp rise in the temperature—*caused* people to buy more Coca-Cola in spite of its higher price. However, if the temperature and all other factors were held constant, and the ceteris paribus assumption is satisfied, we would find that as the price of Coca-Cola rises, people will indeed buy less Coca-Cola, as the model predicts.

CONCLUSION

A theory cannot be tested legitimately unless its ceteris paribus assumption is satisfied.

1–5b Association versus Causation

Another common error in reasoning is confusing *association* (or correlation) and *causation* between variables. Stated differently, you err when you read more into a relationship between variables than is actually there. A model is valid only when a cause-and-effect relationship is stable or dependable over time, rather than being an association that occurs by chance and eventually disappears. Suppose a witch doctor performs a voodoo dance during three different months and stock market prices skyrocket during each of these months. The voodoo dance is *associated* with the increase in stock prices, but this does not

mean the dance *caused* the event. Even though there is a statistical relationship between these two variables in a number of observations, eventually the voodoo dance will be performed, and stock prices will fall or remain unchanged. The reason is that there is no true systematic economic relationship between voodoo dances and stock prices.

Further investigation may reveal that stock prices actually responded to changes in interest rates during the months that the voodoo dances were performed. Changes in interest rates affect borrowing and spending, which in turn impacts corporate profits and stock prices. In contrast, there is no real economic relationship between voodoo dances and stock prices, and therefore, the voodoo model is not valid.

The fact that one event follows another does not necessarily mean that the first event caused the second event.

CONCLUSION

Should Nebraska State Join a Big-Time Athletic Conference?
Nebraska State (a mythical university) stood by while Penn State, Florida State, the University of Miami, and the University of South Carolina joined big-time athletic conferences. Now Nebraska State officials are pondering whether to remain independent or to pursue membership in a conference noted for high-quality football and basketball programs. An editorial in the newspaper advocates joining and cites a study showing that universities belonging to major athletic conferences have higher graduation rates than nonmembers. Because educating its students is the number one goal of Nebraska State, will this evidence persuade Nebraska State officials to join a big-time conference? Why or why not?

CHECKPOINT

Throughout this book, you will study economic models or theories that include variables linked by stable cause-and-effect relationships. For example, the theory that a change in the price of a good *causes* a change in the quantity purchased is a valid microeconomic model. The theory that a change in the money supply *causes* a change in interest rates is an example of a valid macroeconomic model. The *You're the Economist* gives some amusing examples of the "association means causation" reasoning pitfall.

1–6 WHY DO ECONOMISTS DISAGREE?

Why might one economist say a clean environment should be our most important priority and another economist say economic growth should be our most important goal? If economists share the economic way of thinking and carefully avoid reasoning pitfalls, then why do they disagree? Why are economists known for giving advice by saying, "On the one hand, if you do this, then *A* results, and, on the other hand, doing this causes result *B*?" In fact, President Harry Truman once jokingly exclaimed, "Find me an economist with only one hand." George Bernard Shaw offered another famous line in the same vein: "If you took all the economists in the world and laid them end to end, they would never reach a conclusion." These famous quotes imply that economists should agree, but the quotes ignore the fact that physicists, doctors, business executives, lawyers, and other professionals often disagree as well.

Economists may appear to disagree more than other professionals partly because it is more interesting to report disagreements than agreements. Actually, economists agree on a wide range of issues. Many economists, for example, agree that the benefits from free trade outweigh the costs, that a market-driven healthcare delivery system has many flaws, and that government deficit spending (which adds to the national debt) can be a good thing if we want to recover more quickly from a recession. When disagreements do exist, the reason can often be explained by the difference between *positive economics* and *normative economics*.

YOU'RE THE ECONOMIST

Applicable Concept: Association versus Causation

Mops and Brooms, the Boston Snow Index, the Super Bowl, and Other Economic Indicators

Although the Commerce Department, the Wharton School, the Federal Reserve Board, and other organizations publish economic forecasts and data on key economic indicators, they are not without armchair competition. For example, the chief executive of Standex International Corporation, Daniel E. Hogan, reported that his company can predict economic downturns and recoveries from sales reports of its National Metal Industries subsidiary in Springfield, Massachusetts. National makes metal parts for about 300 U.S. manufacturers of mops and brooms. A drop in National's sales always precedes a proportional fall in consumer spending. The company's sales always pick up slightly before consumer spending does.[1]

The Boston Snow Index (BSI) is the brainchild of a vice president of a New York securities firm. It predicts a rising economy for the next year if there is snow on the ground in Boston on Christmas Day. The BSI predicted correctly about 73 percent of the time over a 30-year period. However, its creator, David L. Upshaw, did not take it too seriously and views it as a spoof of other forecasters' methods.

Greeting card sales are another tried and true indicator, according to a vice president of American Greetings. Before a recession sets in, sales of higher-priced greeting cards rise. It seems that people substitute the cards for gifts, and since there is no gift, the card must be fancier.

A Super Bowl win by a National Football Conference (NFC) team predicts that in the following December the stock market will be higher than the year before. A win by an old American Football League (AFL) team predicts a dip in the stock market.

Several other less well-known indicators have also been proposed. For example, one economist suggested that the surliness of servers is a countercyclical indicator. If they are nice, expect that bad times are coming, but if they are rude, expect an upturn. Servers on the other hand counter that a fall in the average tip usually precedes a downturn in the economy.

Finally, Anthony Chan, chief economist for Bank One Investment Advisors, studied marriage trends over a 34-year period. He discovered that when the number of marriages increases, the economy rises significantly, and a slowdown in marriages is followed by a decline in the economy. Chan explains that there is usually about a one-year lag between a change in the marriage rate and the economy.[2]

TIMOTHY A. CLARY/GettyImages

ANALYZE THE ISSUE

Which of the above indicators are examples of causation? Explain.

1. "Economic Indicators, Turtles, Butterflies, Monks, and Waiters," *The Wall Street Journal*, August 27, 1979, pp. 1, 16.
2. Sandra Block, "Worried? Look at Wedding Bell Indicator," *The Charlotte Observer*, April 15, 1995, p. 8A.

1–6a Positive Economics

Positive economics
An analysis limited to statements that are verifiable.

Positive economics deals with facts and therefore addresses "what is" true or false about how the economy really works. **Positive economics** is an analysis limited to statements that are verifiable. Positive statements can be proven either true or false. Often a positive statement is expressed: "If *X*, then *Y*." For example, if the national unemployment rate rises to 9 percent, then teenage unemployment exceeds 80 percent. This is a positive "if-then" prediction, which may or may not be correct. Accuracy is not the criterion for a statement to be positive. The key consideration is whether the statement is *testable* and not whether it is true or false. Suppose the data show that when the nation's overall unemployment rate

is close to 9 percent, the unemployment rate for teenagers never reaches 80 percent. For example, the overall unemployment rate was 9.6 percent in 2010, and the rate for teenagers was 25.9 percent—far short of 80 percent. Based on the facts, we would conclude that this positive statement is false.

Now we can explain one reason why economists' forecasts can diverge. The statement "If event *X* occurs, then event *Y* follows" can be thought of as a *conditional* positive statement. For example, two economists may agree that if the federal government cuts spending by 10 percent this year, prices will fall about 2 percent next year. However, their predictions about the fall in prices may differ because one economist assumes Congress will not cut spending, while the other economist assumes Congress will cut spending by 10 percent.

Economists' forecasts can differ because using the same methodology, economists can agree that event *X* causes event *Y*, but disagree over the assumption that event *X* will occur.

CONCLUSION

1–6b Normative Economics

Instead of using objective statements, an argument can be phrased subjectively. Normative economics attempts to determine "what should be." **Normative economics** is an analysis based on subjective value judgments. Normative statements express an individual or collective opinion on a subject and cannot be proven by facts to be true or false. Certain words or phrases, such as *good*, *bad*, *need*, *should*, and *ought to*, tell us clearly that we have entered the realm of normative economics.

Normative economics
An analysis based on subjective value judgments.

The point here is that these subjective value judgments are the result of ever-present social and political influences that shape our opinions. An animal rights activist says that no one *should* purchase a fur coat. Someone else may argue that government *ought to* take steps to ensure a more *fair* distribution of income and wealth. Others argue that health care is a basic human right that *needs* to be made available to all regardless of their ability to pay.

When opinions or points of view are not based on facts, they are scientifically untestable.

CONCLUSION

When considering a debate, make sure to separate the arguments into their positive and normative components. This distinction allows you to determine whether you are choosing a course of action based on factual evidence or on opinion. The material presented in this textbook, like most of economics, takes pains to stay within the boundaries of positive economic analysis. In our everyday lives, however, politicians, business executives, relatives, and friends use mostly normative statements to discuss economic issues. Economists may also associate themselves with a political position and use normative arguments for or against some economic policy. When using value judgments, an economist's normative arguments may have no greater validity than those of other people. Biases or preconceptions can cloud an economist's thinking about deficit spending or whether to increase taxes on gasoline. Like beginning economics students, economists are human.

1–7 CAREERS IN ECONOMICS

The author of this text entered college more years ago than I would like to admit. In those days, economics was not taught in high school, so I knew nothing of the subject. Like many students taking this course, I was uncertain about which major to pursue, but selected electrical engineering because I was an amateur radio operator and enjoyed building radio receivers and transmitters. My engineering curriculum required a course in economics. I signed up thinking that "econ is boring." Instead, it was an eye-opening experience that inspired me to change my major to economics and pursue an economics teaching career.

YOU'RE THE ECONOMIST

Applicable Concepts: Positive and Normative Analyses

Does the Minimum Wage Really Help the Working Poor?

Minimum wages exist in more than 100 countries. In 1938, Congress enacted the federal Fair Labor Standards Act, commonly known as the "minimum-wage law." Today, a minimum wage worker who works full-time still earns a deplorably low annual income. One approach to help the working poor earn a living wage might be to raise the minimum wage.

The dilemma for Congress is that a higher minimum wage for the employed is enacted at the expense of jobs for unskilled workers. Opponents forecast that the increased labor cost from a large minimum wage hike would jeopardize hundreds of thousands of unskilled jobs. For example, employers may opt to purchase more capital and less expensive labor. Restaurants can use iPads instead of servers to take orders and install robotic burger flippers. The fear of such sizable job losses forces Congress to perform a difficult balancing act to ensure that a minimum wage increase is large enough to help the working poor, but not so large as to threaten their jobs.

Some politicians claim that raising the minimum wage is a way to help the working poor without cost to taxpayers. Others believe the cost is hidden in inflation and lost employment opportunities for marginal workers, such as teenagers, the elderly, and minorities. One study by economists, for example, examined 60 years of data and concluded that minimum wage increases resulted in reduced employment and hours of work for low-skilled workers.[1]

Another problem with raising the minimum wage to aid the working poor is that the minimum wage is a blunt weapon for redistributing wealth. Some studies show that only a small percentage of minimum wage earners are full-time workers whose family income falls below the poverty line. This means that most increases in the minimum wage go to workers who are not poor. For example, many minimum wage workers are students living at home or workers whose spouse earns a much higher income. To help only the working poor, some economists argue that the government should target only those who need assistance, rather than using the "shotgun" approach of raising the minimum wage.

Supporters of raising the minimum wage are not convinced by these arguments. They say it just isn't right that a worker who works full-time should live in poverty. They point to the fact that the minimum wage has not kept pace with the typical worker's wage or with the cost of living. As a result, a growing underclass has to rely on some form of public assistance, like food stamps. And this, they argue, only adds to income inequality as taxpayers end up subsidizing profitable companies who don't pay their workers a living wage. Moreover, people on this side of the debate believe that opponents exaggerate many of their claims, especially the extent to which unemployment and higher prices result from a higher minimum wage. They provide evidence that the benefits from a higher minimum wage may more than offset these costs.[2] For example, when earning a higher wage, workers will spend more money, generating a need for companies to expand production and to hire even more workers. In addition, the gain from these higher incomes far exceed the cost of higher prices, leaving workers better off. To proponents, increasing the minimum wage is a win-win proposition. We return to this issue in Chapter 4 as an application of supply and demand analysis.

Tony Stock/Shutterstock.com

ANALYZE THE ISSUE

1. **Identify two positive and two normative statements given above concerning raising the minimum wage. List other minimum wage arguments not discussed in this *You're the Economist* and classify them as either positive or normative economics.**
2. **Give a positive and a normative argument why a business leader would oppose raising the minimum wage. Give a positive and a normative argument why a labor leader would favor raising the minimum wage.**
3. **Explain your position on this issue. Identify positive and normative reasons for your decision. Are there alternative ways to aid the working poor? Explain.**

1. David Neumark and William Wascher, *Minimum Wages,* Cambridge, MA, The MIT Press, 2008.
2. Economic Policy Institute, "The impact of raising the federal minimum wage to $12 by 2020 on workers, businesses, and the economy." Testimony before the U.S. House Committee on Education and the Workforce Member Forum. April 27, 2016, found at http://www.epi.org/publication/the-impact-of-raising-the-federal-minimum-wage-to-12-by-2020-on-workers-businesses-and-the-economy-testimony-before-the-u-s-house-committee-on-education-and-the-workforce-member-forum/.

The study of economics has attracted a number of well-known people. For example, The Rolling Stones' Mick Jagger attended the London School of Economics, and other famous people who majored in economics include four presidents—George H. W. Bush, Ronald Reagan, Gerald Ford, and Donald Trump.

An economics major can choose many career paths. Most economics majors work for business firms. Because economists are trained in analyzing financial matters, they find good jobs in management, sales, or as a market analyst interpreting economic conditions relevant to a firm's market. For those with an undergraduate degree, private-sector job opportunities exist in banking, securities brokering, management consulting, computer and data processing firms, the power industry, market research, finance, health care, and many other industries. Other economics majors work for government agencies and in colleges and universities.

Government economists work for federal, state, and local governments. For example, a government economist might compile and report national statistics for economic growth or work on projects such as how to improve indexes to measure trends in consumer prices. Economists in academe not only enjoy the challenge of teaching economics but also have great freedom in selecting research projects.

Studying economics is also an essential preparation for other careers. Those preparing for law school, for example, find economics an excellent major because of its emphasis on

EXHIBIT 3 Average Yearly Salary for Selected Bachelor Majors with 0–5 Years of Experience

Bachelor's Major	Median Salary with 0–5 Years of Experience, 2016–2017
Petroleum engineering	96,700
Nuclear engineering	68,500
Computer science	65,300
Nursing	57,500
Economics	53,900
Finance	53,300
International business	48,800
Accounting	48,300
Business administration	46,100
Chemistry	45,700
Marketing	45,300
Philosophy	44,700
Communications	42,100
Human resources	41,900
Journalism	41,200
Biology	40,800
Sociology	40,400
Psychology	37,800
Criminal justice	37,000
Animal science	35,800
Early childhood education	30,700

Source: www.payScale.com/college-salary-report

a logical approach to problem solving. Economics is also great preparation for an MBA. In fact, students majoring in any field will benefit throughout their lives from learning how to apply the economic way of thinking to analyze real-world economic issues.

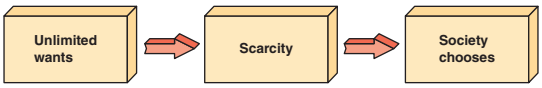
Finally, economics majors shine in salary offers upon graduation. Exhibit 3 shows average yearly salaries for some bachelor's degrees with 0–5 years of experience for 2016–2017.

Key Concepts

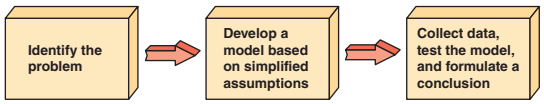
Scarcity
Resources
Land
Labor
Entrepreneurship
Capital
Economics
Macroeconomics
Microeconomics
Model
Ceteris paribus
Positive economics
Normative economics

Summary

- **Scarcity** is the fundamental economic problem that human wants exceed the availability of time, goods, and resources. Individuals and society therefore can never have everything they desire.
- **Resources** are factors of production classified as land, labor, and capital. Entrepreneurship is a special type of labor. An entrepreneur seeks profits by taking risks and combining resources to produce innovative products.
- **Economics** is the study of how individuals and society choose to allocate scarce resources to satisfy unlimited wants. Faced with unlimited wants and scarce resources, we must make choices among alternatives.



- **Macroeconomics** applies an economy-wide perspective that focuses on such issues as inflation, unemployment, and the growth rate of the economy.
- **Microeconomics** examines individual decision-making units within an economy, such as a consumer's response to changes in the price of coffee and the reasons for changes in the market price of personal computers.
- **Models** are simplified descriptions of reality used to understand and predict economic events. An economic model can be stated verbally or in a table, a graph, or an equation. If the event is not consistent with the model, the model is rejected.



- **Ceteris paribus** holds "all other factors unchanged" that might affect a particular relationship. If this assumption is violated, a model cannot be tested. Another reasoning pitfall is to think that *association* means *causation*.
- Use of positive versus normative economic analysis is a major reason for disagreements among economists. **Positive economics** uses testable statements. Often a positive argument is expressed as an *if-then* statement. **Normative economics** is based on value judgments or opinions and uses words such as *good*, *bad*, *ought to*, and *should*.

Summary of Conclusion Statements

- The problems of scarcity and choice are basic economic problems faced by every society.
- Money by itself does not produce goods and services; instead, it is only a means to facilitate the purchase and sale of resources and consumer products.
- A theory cannot be tested legitimately unless its ceteris paribus assumption is satisfied.
- The fact that one event follows another does not necessarily mean that the first event caused the second event.

- Economists' forecasts can differ because using the same methodology, economists can agree that event *X* causes event *Y*, but disagree over the assumption that event *X* will occur.
- When opinions or points of view are not based on facts, they are scientifically untestable.

Study Questions and Problems

Please see Appendix A for answers to the odd-numbered questions. Your instructor has access to the answers for even-numbered questions.

1. Explain why both nations with high living standards and nations with low living standards face the problem of scarcity. If you won $1 million in a lottery, would you escape the scarcity problem?
2. Why isn't money considered capital in economics?
3. Explain the difference between macroeconomics and microeconomics. Give examples of the areas of concern to each branch of economics.
4. Which of the following are microeconomic issues? Which are macroeconomic issues?
   a. How will an increase in the price of Coca-Cola affect the quantity of Pepsi Cola sold?
   b. What will cause the nation's inflation rate to fall?
   c. How does a quota on textile imports affect the textile industry?
   d. Does a large federal budget deficit reduce the rate of unemployment in the economy?
5. Explain why it is important for an economic model to be an abstraction from the real world.
6. Explain the importance of the ceteris paribus assumption for an economic model.
7. Suppose Congress cuts spending for the military, and then unemployment rises in the U.S. defense industry. Is there causation in this situation, or are we observing an association between events?
8. Analyze the positive versus normative arguments in the following case. What statements of positive economics are used to support requiring air bags? What normative reasoning is used?

Should the Government Require Air Bags?

Technological advances continuously provide new high-tech options to save lives that add to the price of cars, such as cameras, radar, and airbags. Air bag advocates say air bags will save lives and the government should require them in all cars. Air bags add an estimated $600 to the cost of a car, compared to about $100 for a set of regular seat belts. Opponents argue that air bags are electronic devices subject to failure and have produced injuries and death. For example, air bags have killed both adults and children whose heads were within the inflation zone at the time of deployment. Opponents therefore believe the government should leave the decision of whether to spend an extra $600 or so for an air bag to the consumer. The role of the government should be limited to providing information on the risks of having versus not having air bags.

CHECKPOINT ANSWERS

Can You Prove There Is No Trillion-Dollar Person?

How can researchers ever be certain they have found all the rich people in the United States? There is always the possibility that somewhere there is a person who qualifies. If the researchers had found one, you could have rejected the theory. Because they did not, you cannot reject the theory. If you said that the evidence can support but never prove the theory, **YOU ARE CORRECT**.

Should Nebraska State Join a Big-Time Athletic Conference?

Suppose universities that belong to big-time athletic conferences do indeed have higher graduation rates than nonmembers. This is not the only possible explanation for the statistical correlation (or association) between the graduation rate and membership in a big-time athletic conference. A more plausible explanation is that improving academic variables, such as tuition, quality of faculty, and student-faculty ratios, and not athletic conference membership, increases the graduation rate. If you said correlation, does not mean causation, and therefore Nebraska State officials will not necessarily accept the graduation rate evidence, **YOU ARE CORRECT**.

Sample Quiz

Please see Appendix B for answers to Sample Quiz questions.

1. Which of the following illustrates the concept of scarcity?
   a. More clean air is wanted than is available in large polluted metropolitan areas such as Mexico City.
   b. There is usually more than one use of your "free" time in the evening.
   c. There are many competing uses for the annual budget of your city, county, or state.
   d. All of the above are correct.

2. Which of the following are factors of production?
   a. The outputs generated by the production process transforming land, labor, and capital into goods and services
   b. Resources restricted to the land, such as natural resources that are unimproved by human economic activity
   c. Land (natural resources), labor (human capital, entrepreneurship), and capital (constructed inputs such as factories)
   d. Just labor and capital in industrialized countries, where natural resources are no longer used to produce goods and services

3. Which of the following is *not* an example of a capital input?
   a. A person's skills and abilities, which can be employed to produce valuable goods and services
   b. Factories and offices where goods and services are produced
   c. Tools and equipment
   d. Computers used by a company to record inventory, sales, and payroll

4. Which of the following is the best definition of economics?
   a. Economics is the study of how to manage corporations to generate the greatest return on shareholder investment.
   b. Economics is the study of how to manage city and county government to generate the greatest good to its citizens.
   c. Economics is the study of how society chooses to allocate its scarce resources.
   d. Economics is the study of how to track revenues and costs in a business.

5. Which of the following *best* illustrates the application of the model-building process to economics?
   a. On a Sunday morning talk show, two economists with differing political agendas argue about the best way to solve the Social Security problem.
   b. A labor economist notices that unemployment tends to be higher among teenagers than more experienced workers, develops a model, and gathers data to test the hypotheses in the model.
   c. A Ph.D. student in economics makes up data on the lumber market and develops a model for his dissertation that seems to be consistent with the data.
   d. Economists come to believe that some economic models are true simply because prominent leading economists say they are true.

6. Which of the following represents causality rather than association?
   a. In years that fashion dictates wider lapels on men's jackets, the stock market grows by at least 5 percent.
   b. Interest rates are higher in years ending with a 1 or a 6.
   c. Unemployment falls when the AFC champion wins the Super Bowl.
   d. Quantity demanded goes up when price falls because lower prices increase consumer purchasing power and because some consumers of substitute goods switch.

7. Which of the following describes the ceteris paribus assumption?
   a. If we increase the price of a good, reduce consumer income, and lower the price of substitutes and if quantity demanded is observed to fall, we know that the price increase caused the decline in quantity demanded.
   b. If the federal government increases government spending and the Federal Reserve Bank lowers interest rates, we know that the increase in government spending caused unemployment to fall.
   c. If a company reduces its labor costs, negotiates lower materials costs from its vendors, and advertises, we know that the reduced labor costs are why the company's profits are higher.
   d. We observe an increase in the quantity demanded when the price of the good decreases and when, at the same time, all other factors are held constant.

8. The condition of scarcity
   a. cannot be eliminated.
   b. prevails in poor economies.
   c. prevails in rich economies.
   d. all of the above are correct.

9. Which of the following *best* describes an entrepreneur?
   a. A person who works as an office clerk at a major corporation
   b. A person who combines the factors of production to produce innovative products
   c. A special type of capital
   d. Wealthy individuals who provide savings that stimulate the economy

10. Which of the following is *true* about renewable natural resources?
   a. They are a type of land resource (for example, oil, coal, and natural gas) that has a fixed stock.
   b. They are a type of capital resource (for example, irrigation networks and wastewater treatment plants) that utilize water.
   c. They are a type of capital resource (for example, air filtration systems in buildings) that renew and refresh polluted air from the outside.
   d. They are a type of land resource (for example, forests, rangelands, and marine fisheries) that naturally regenerate and thus can tolerate a sustained harvest but can be depleted from excessive harvest.

11. Because of scarcity,
   a. it is impossible to satisfy every desire and choices must be made.
   b. the available supply of time, goods, and resources is greater than human wants.
   c. every desire is fulfilled.
   d. there are no limits on the economy's ability to satisfy unlimited wants.

12. Which of the following represents positive economics?
   a. Policy X is fair.
   b. Outcome Y is the best objective to achieve.
   c. If policy X is followed, then outcome Y results.
   d. All of the above are positive economic analyses.

13. Which of the following is the last step in the model-building process?
   a. Collect data and test the model.
   b. Develop a model based on simplified assumptions.
   c. Identify the problem.
   d. Formulate an assumption.

14. Which of the following is *not* a type of economic analysis?
   a. Positive
   b. Resources
   c. Normative
   d. None of the above

15. Which word indicates that an economist is using positive economics?
   a. Good
   b. Bad
   c. If-then
   d. Should

16. Which of the following would eliminate scarcity as an economic problem?
   a. Moderation of people's competitive instincts
   b. Discovery of new, sufficiently large energy reserves
   c. Resumption of steady productivity growth
   d. None of the above is correct

17. Which resource is *not* an example of capital?
   a. Equipment
   b. Machinery
   c. Physical plants
   d. Stocks and bonds

18. Which of the following is the second step in the model-building process?
   a. Collect data and test the model.
   b. Develop a model based on simplified assumptions.
   c. Identify the problem.
   d. Include all possible variables that affect the model.

19. Which of the following is a type of economic analysis?
   a. Positive
   b. Resources
   c. Association
   d. None of the above is correct

20. Which of the following careers could result from majoring in economics?
   a. Management
   b. Banking
   c. Government
   d. All of the above is correct

APPENDIX TO CHAPTER 1

Applying Graphs to Economics

Economists are famous for their use of graphs. The reason is "a picture is worth a thousand words." Graphs are used throughout this text to present economics models. By drawing a line, you can use a two-dimensional illustration to analyze the effects of a change in one variable on another. You could describe the same information using other model forms, such as verbal statements, tables, or equations, but a graph is the simplest way to present and understand the relationship between economic variables.

Don't be worried that graphs will "throw you for a loop." Relax! This appendix explains all the basic graphical language you will need. The following illustrates the simplest use of graphs for economic analysis.

1A–1 A DIRECT RELATIONSHIP

Basic economic analysis typically concerns the relationship between two variables, both having positive values. Hence, we can confine our graphs to the upper-right (northeast) quadrant of the coordinate number system. In Exhibit A-1, notice that the scales on the horizontal axis (*x*-axis) and the vertical axis (*y*-axis) do not necessarily measure the same numerical values.

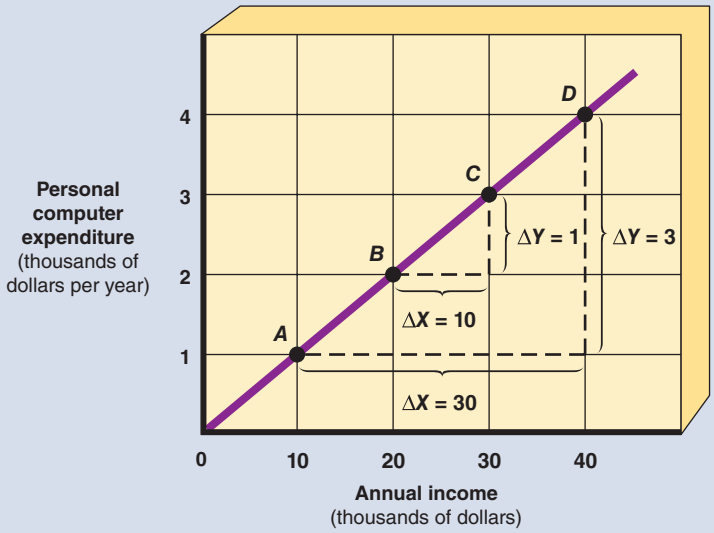
The horizontal axis in Exhibit A-1 measures annual income, and the vertical axis shows the amount spent per year for a personal computer (PC). The intersection of the horizontal and vertical axes is the *origin* and the point at which both income and expenditure are zero. In Exhibit A-1, each point is a coordinate that matches the dollar value of income and the corresponding expenditure for a PC. For example, point *A* on the graph shows that people with an annual income of $10,000 spent $1,000 per year for a PC. Other incomes are associated with different expenditure levels. For example, at $30,000 per year (point *C*), $3,000 will be spent annually for a PC.

The straight line in Exhibit A-1 allows us to determine the direction of change in PC expenditure as annual income changes. This relationship is *positive* because PC expenditure, measured along the vertical axis, and annual income, measured along the horizontal axis, move in the same direction. PC expenditure increases as annual income increases. As income declines, so does the amount spent on a PC. Thus, the straight line representing the relationship between income and PC expenditure is a direct relationship. A **direct relationship** is a positive association between two variables. When one variable increases, the other variable increases, and when one variable decreases, the other variable decreases. In short, both variables change in the *same* direction.

Direct relationship
A positive association between two variables. When one variable increases, the other variable increases, and when one variable decreases, the other variable decreases.

Finally, an important point to remember: A two-variable graph, like any model, isolates the relationship between two variables and holds all other variables constant under the ceteris paribus assumption. In Exhibit A-1, for example, factors such as the prices of PCs and

EXHIBIT A-1 Direct Relationship between Variables



Expenditure for a Personal Computer at Different Annual Incomes		
Point	Personal Computer Expenditure (thousands of dollars per year)	Annual Income (thousands of dollars)
A	$1	$10
B	2	20
C	3	30
D	4	40

The line with a positive slope shows that the expenditure per year for a personal computer has a direct relationship to annual income, ceteris paribus. As annual income increases along the horizontal axis, the amount spent on a PC also increases, as measured by the vertical axis. Along the line, each 10-unit increase in annual income results in a 1-unit increase in expenditure for a PC. Because the slope is constant along a straight line, we can measure the same slope between any two points. Between points *A* and *D*, the slope $= \Delta Y/\Delta X = +3/+30 = +1/+10 = 1/10$.

education are held constant by assumption. In Chapter 3, you will learn that allowing variables not shown in the graph to change can shift the position of the line or curve.

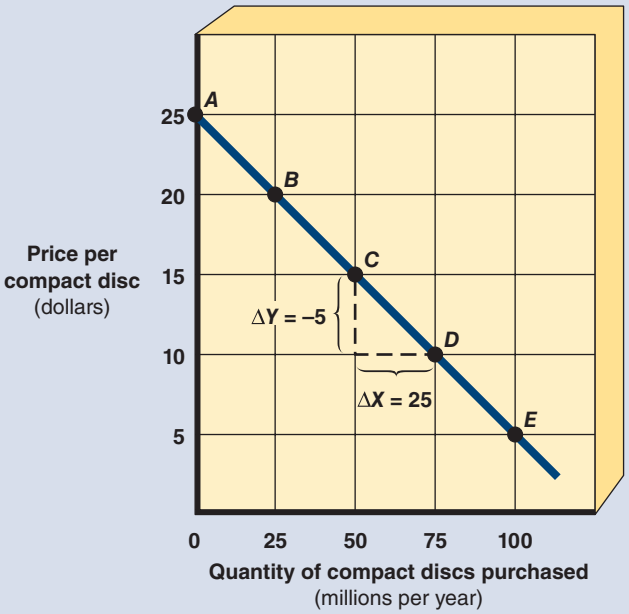
1A–2 AN INVERSE RELATIONSHIP

Now consider the relationship between the price of compact discs (CDs) and the quantity consumers will buy per year, shown in Exhibit A-2. These data indicate an *inverse* (or *negative*) relationship between the price and quantity variables. When the price is low, consumers purchase a greater quantity of CDs than when the price is high.

In Exhibit A-2, there is an inverse relationship between the price per CD and the quantity consumers buy. An **inverse relationship** is a negative association between two variables.

Inverse relationship
A negative association between two variables. When one variable increases, the other variable decreases, and when one variable decreases, the other variable increases.

EXHIBIT A-2 An Inverse Relationship between Variables



The Quantity of Compact Discs Consumers Purchase at Different Prices

Point	Price per Compact Disc	Quantity of Compact Discs Purchased (millions per year)
A	$25	0
B	20	25
C	15	50
D	10	75
E	5	100

The line with a negative slope shows an inverse relationship between the price per compact disc and the quantity of CDs consumers purchase, ceteris paribus. As the price of a CD rises, the quantity of CDs purchased falls. A lower price for CDs is associated with more CDs purchased by consumers. Along the line, with each $5 decrease in the price of CDs, consumers increase the quantity purchased by 25 units. The slope $= \Delta Y/\Delta X = -5/+25 = -1/5$.

When one variable increases, the other variable decreases, and when one variable decreases, the other variable increases. Stated simply, the variables move in *opposite* directions.

The line drawn in Exhibit A-2 is an inverse relationship. By long-established tradition, economists put price on the vertical axis and quantity on the horizontal axis. In Chapter 3, we will study in more detail the relationship between the price and the quantity demanded called the *law of demand*.

In addition to observing the inverse relationship (negative slope), you must interpret the *intercept* at point *A* in the exhibit. The intercept in this case means that at a price of $25 no consumer is willing to buy a single CD.

1A–3 THE SLOPE OF A STRAIGHT LINE

Plotting numbers provides a clear visual expression of the relationship between two variables, but it is also important to know how much one variable changes as another variable changes. To find out, we calculate the slope. The **slope** is the ratio of the change in the variable on the vertical axis (the rise or fall) to the change in the variable on the horizontal axis (the run). Algebraically, if Y is on the vertical axis and X is on the horizontal axis, the slope is expressed as follows (the delta symbol, Δ, means "change in"):

Slope
The ratio of the change in the variable on the vertical axis (the rise or fall) to the change in the variable on the horizontal axis (the run).

$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in vertical axis}}{\text{change in horizontal axis}} = \frac{\Delta Y}{\Delta X}$$

Consider the slope between points B and C in Exhibit A-1. The change in expenditure for a PC, Y, is equal to $+1$ (from \$2,000 to \$3,000 per year), and the change in annual income, X, is equal to $+10$ (from \$20,000 to \$30,000 per year). The slope is therefore $+1/+10 = 0.10$. The sign is positive because computer expenditure is directly, or positively, related to annual income. The steeper the line, the greater the slope because the ratio of ΔY to ΔX rises. Conversely, the flatter the line, the smaller the slope. Exhibit A-1 also illustrates that the slope of a straight line is constant. That is, the slope between any two points along the line, such as between points A and D, is equal to $+3/+30 = 1/10 = 0.10$.

What does the slope of 1/10 mean? It tells you that a \$1,000 increase (decrease) in PC expenditure each year occurs for each \$10,000 increase (decrease) in annual income. The line plotted in Exhibit A-1 has a *positive slope,* and we describe the line as "upward-sloping."

On the other hand, the line in Exhibit A-2 has a *negative slope*. The change in Y between points C and D is equal to -5 (from \$15 down to \$10), and the change in X is equal to $+25$ (from 50 million up to 75 million CDs purchased per year). The slope is therefore $-5/+25 = -1/5$, and this line is described as "downward-sloping."

What does this slope of $-1/5$ mean? It means that raising (lowering) the price per CD by \$1 decreases (increases) the quantity of CDs purchased by 5 million per year.

Suppose we calculate the slope between any two points on a flat line—for example, points B and C in Exhibit A-3. In this case, there is no change in Y (expenditure for toothpaste) as X (annual income) increases. Consumers spend \$20 per year on toothpaste regardless of annual income. It follows that $\Delta Y = 0$ for any ΔX, so the slope is equal to 0. The two variables along a flat line (horizontal or vertical) have an independent relationship. An **independent relationship** is a zero association between two variables. When one variable changes, the other variable remains unchanged.

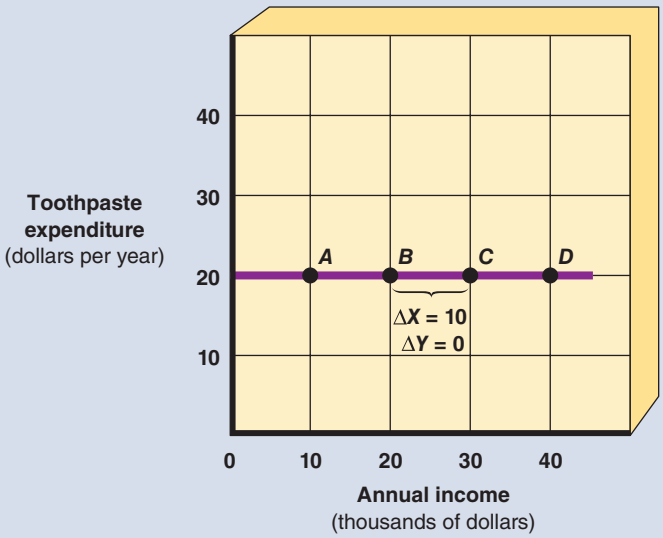
Independent relationship
A zero association between two variables. When one variable changes, the other variable remains unchanged.

1A–4 A THREE-VARIABLE RELATIONSHIP IN ONE GRAPH

The two-variable relationships drawn so far conform to a two-dimensional flat piece of paper. For example, the vertical axis measures the price per CD variable, and the horizontal axis measures the quantity of CDs purchased variable. All other factors, such as consumer income, that may affect the relationship between the price and quantity variables are held constant by the ceteris paribus assumption. But reality is frequently not so accommodating. Often a model must take into account the impact of changes in a third variable (consumer income) drawn on a two-dimensional piece of paper.

Economists' favorite method of depicting a three-variable relationship is shown in Exhibit A-4. As explained earlier, the cause-and-effect relationship between price and quantity of CDs determines the downward-sloping curve. A change in the price per CD

EXHIBIT A-3 An Independent Relationship between Variables



Expenditure for Toothpaste at Different Annual Incomes

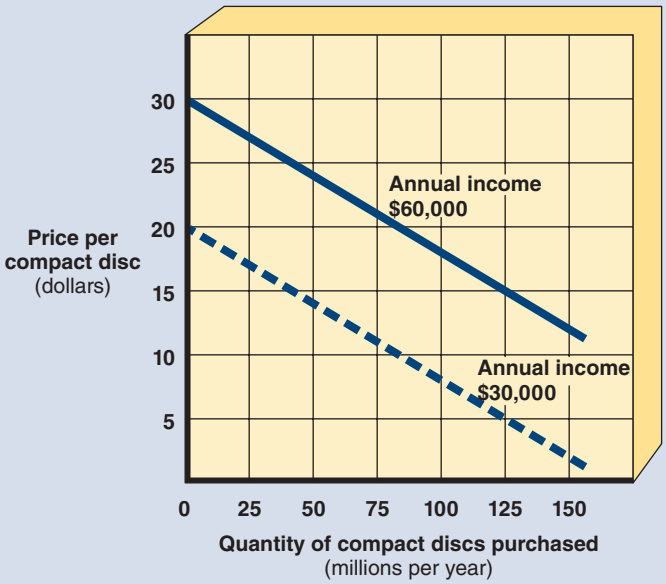
Point	Toothpaste Expenditure (dollars per year)	Annual Income (thousands of dollars)
A	$20	$10
B	20	20
C	20	30
D	20	40

The flat line with a zero slope shows that the expenditure per year for toothpaste is unrelated to annual income. As annual income increases along the horizontal axis, the amount spent each year for toothpaste remains unchanged at 20 units. If annual income increases 10 units, the corresponding change in expenditure is zero. The slope $= \Delta Y/\Delta X = 0/+10 = 0$.

causes a movement downward along either of the two separate curves. As the price falls, consumers increase the quantity of CDs demanded. The location of each curve on the graph, however, depends on the annual income of consumers. As the annual income variable increases from $30,000 to $60,000 and consumers can afford to purchase more at any price, or pay more at any quantity, the price–quantity demanded curve shifts rightward. Conversely, as the annual income variable decreases and consumers have less to spend, the price–quantity demanded curve shifts leftward.

This is an extremely important concept that you must understand: Throughout this text, you must distinguish between *movements along* and *shifts in* a curve. Here's how to tell the difference. A change in one of the variables shown on either of the coordinate axes of the graph causes *movement along* a curve. On the other hand, a change in a variable not shown on one of the coordinate axes of the graph causes a *shift* in a curve's position on the graph.

EXHIBIT A-4 Changes in Price, Quantity, and Income in Two Dimensions



Economists use a multicurve graph to represent a three-variable relationship in a two-dimensional graph. A decrease in the price per CD causes a movement downward along each curve. As the annual income of consumers rises, there is a shift rightward in the position of the demand curve.

CONCLUSION

A shift in a curve occurs only when the ceteris paribus assumption is relaxed and a third variable not shown on either axis of the graph is allowed to change.

1A–5 A HELPFUL STUDY HINT FOR USING GRAPHS

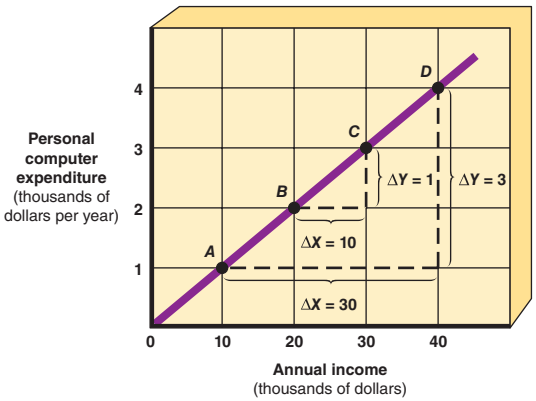
To some students, studying economics is a little frightening because many chapters are full of graphs. Just remember that a graph is simply a visual aid that illustrates the relationship between economic variables. Noting these relationships is the ticket to understanding how the economy really works. So, keep in mind that all inverse (negative) relationships are expressed as downward-sloping curves (or lines), and all direct (positive) relationships are expressed as upward-sloping curves. This will help you to do well on tests!

Key Concepts

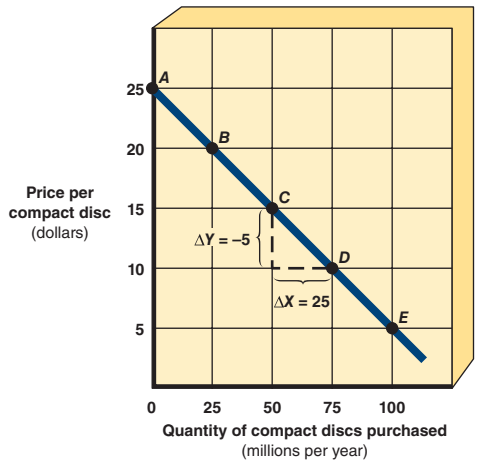
Direct relationship
Inverse relationship
Slope
Independent relationship

Summary

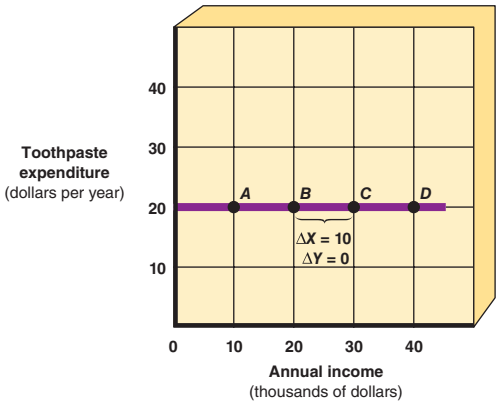
- **Graphs** provide a means to clearly show economic relationships in two-dimensional space. Economic analysis is often concerned with two variables confined to the upper-right (northeast) quadrant of the coordinate number system.
- A **direct relationship** occurs when two variables change in the *same* direction.



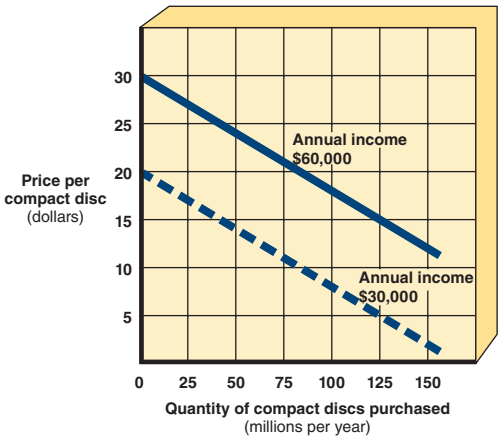
- An **inverse relationship** occurs when two variables change in *opposite* directions.



- An **independent relationship** occurs when two variables are unrelated.



- A **three-variable relationship** is depicted by a graph showing a shift in a curve when the ceteris paribus assumption is relaxed and a third variable (such as annual income) not on either axis of the graph is allowed to change.



Summary of Conclusion Statement

- A shift in a curve occurs only when the ceteris paribus assumption is relaxed and a third variable not shown on either axis of the graph is allowed to change.

Study Questions and Problems

Please see Appendix A for answers to the odd-numbered questions. Your instructor has access to the answers for even-numbered questions.

1. Draw a graph without specific data for the expected relationship between the following variables:
   a. The probability of living and age
   b. Annual income and years of education
   c. Inches of snow and sales of bathing suits
   d. Number of football games won and the athletic budget

   In each case, state whether the expected relationship is *direct* or *inverse*. Explain an additional factor that would be included in the *ceteris paribus* assumption because it might change and influence your theory.
2. Assume a research firm collects survey sales data that reveal the relationship between the possible selling prices of hamburgers and the quantity of hamburgers consumers would purchase per year at alternative prices. The report states that if the price of a hamburger is $4, then 20,000 will be bought. However, at a price of $3, there will be 40,000 hamburgers bought. At $2, there will be 60,000 hamburgers bought, and at $1, there will be 80,000 hamburgers purchased.

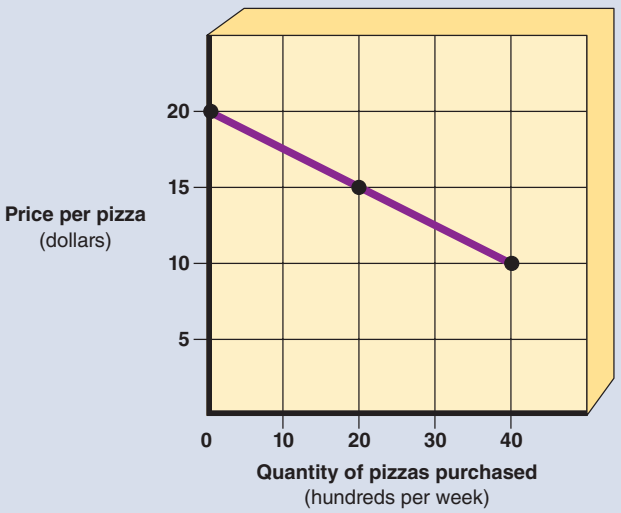
   Based on these data, describe the relevant relationship between the price of a hamburger and the quantity consumers are willing to purchase, using a verbal statement, a numerical table, and a graph. Which model do you prefer? Why?

Sample Quiz

Please see Appendix B for answers to Sample Quiz questions.

1. What is used to illustrate an independent relationship between two variables?
   a. An upward-sloping curve
   b. A downward-sloping curve
   c. A hill-shaped curve
   d. A horizontal or vertical line
2. Which of the following pairs is *most* likely to exhibit an inverse relationship?
   a. The amount of time you study and your grade point average
   b. People's annual income and their expenditure on personal computers
   c. Baseball players' salaries and their batting averages
   d. The price of a concert and the number of tickets that people purchase
3. According to Exhibit A-5, what is the relationship between the price per pizza and the quantity of pizzas purchased?
   a. Direct
   b. Inverse
   c. Complex
   d. Independent
4. What is the slope of the line shown in Exhibit A-5?
   a. −1
   b. −1/2
   c. −1/4
   d. 0
5. Which of the following would cause a leftward shift in the relationship shown in Exhibit A-5?
   a. A fall in household incomes
   b. A fall in the price of pizza
   c. A fall in the quantity of pizza that people want to purchase
   d. All of the above would shift the line in the graph

EXHIBIT A-5



6. Suppose two variables are directly related. If one variable rises, the other variable
   a. also rises.
   b. falls.
   c. remains unchanged.
   d. reacts unpredictably.

7. When an inverse relationship is graphed, the resulting line or curve is
   a. horizontal.
   b. vertical.
   c. upward-sloping.
   d. downward-sloping.

8. Straight line *AB* in Exhibit A-6 shows that
   a. increasing values for *X* decreases the values of *Y*.
   b. decreasing values for *X* increases the values of *Y*.
   c. there is a direct relationship between *X* and *Y*.
   d. all of the above are true.

9. In Exhibit A-6, what is the slope of straight line *AB*?
   a. Positive
   b. Zero
   c. Negative
   d. Variable

10. In Exhibit A-6, what is the slope of straight line *AB*?
    a. 1
    b. 5
    c. 1/2
    d. −1

11. As shown in Exhibit A-6, the slope of straight line *AB*
    a. decreases with increases in *X*.
    b. increases with increases in *X*.
    c. increases with decreases in *X*.
    d. remains constant with changes in *X*.

12. In Exhibit A-6, as *X* increases along the horizontal axis, the *Y* values increase. What is the relationship between the *X* and *Y* variables?
    a. Direct
    b. Inverse
    c. Independent
    d. Variable

13. In Exhibit A-7, as *X* increases along the horizontal axis, the *Y* values decrease. What is the relationship between the *X* and *Y* variables?
    a. Direct
    b. Inverse
    c. Independent
    d. Variable

14. Straight line *AB* in Exhibit A-7 shows that
    a. increasing values for *X* reduces the value of *Y*.
    b. decreasing values for *X* increases the value of *Y*.
    c. there is an inverse relationship between *X* and *Y*.
    d. all of the above are true.

15. As shown in Exhibit A-7, the slope of straight line *AB*
    a. decreases with increases in *X*.
    b. increases with increases in *X*.
    c. increases with decreases in *X*.
    d. remains constant with changes in *X*.

16. In Exhibit A-7, what is the slope for straight line *AB*?
    a. 3
    b. 1
    c. −1
    d. −5

EXHIBIT A-6

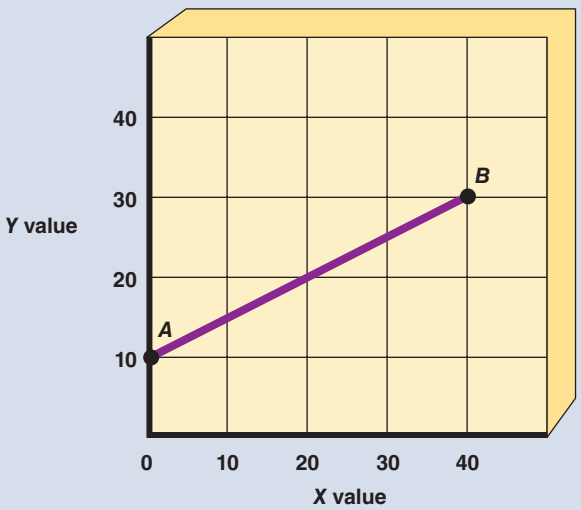
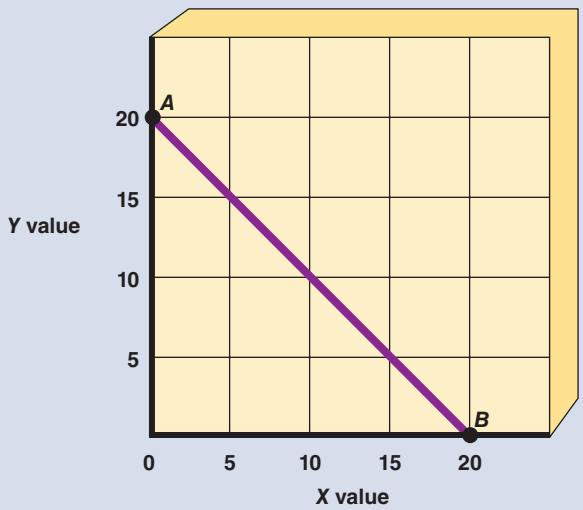


EXHIBIT A-7



17. In Exhibit A-7, what is the slope of straight line *AB*?
    a. Positive
    b. Zero
    c. Negative
    d. Variable

18. In Exhibit A-8, as *X* increases along the horizontal axis, corresponding to points *A*–*D* on the line, the *Y* values remain unchanged at 20 units. What is the relationship between the *X* and *Y* variables?
    a. Direct
    b. Inverse
    c. Independent
    d. Undefined

19. In Exhibit A-8, what is the slope of straight line *A*–*D*?
    a. Greater than 1
    b. Equal to 1
    c. Less than 1
    d. Zero

20. Exhibit A-9 represents a three-variable relationship. As the annual income of consumers falls from $50,000 (line A) to $30,000 (line B), the result is a(n)
    a. upward movement along each curve.
    b. downward movement along each curve.
    c. leftward shift in curve A to curve B.
    d. rightward shift in curve A to curve B.

EXHIBIT A-8

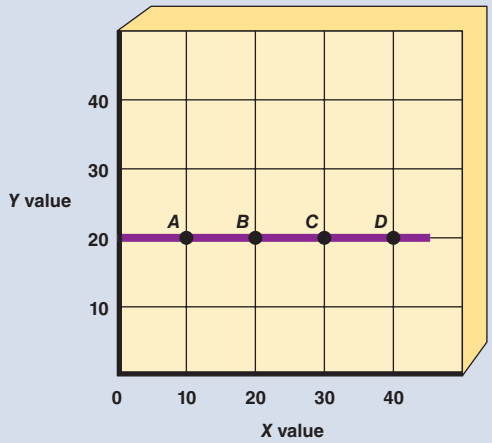
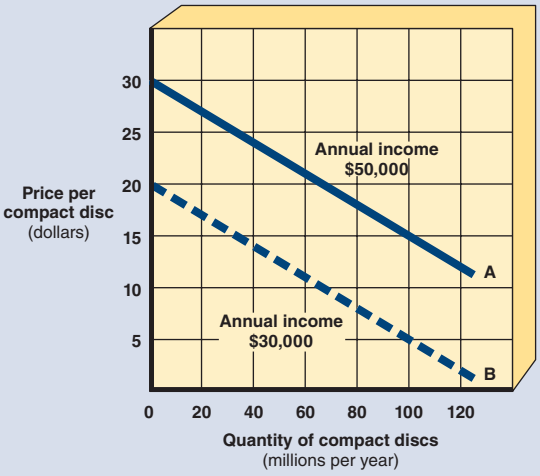


EXHIBIT A-9



CHAPTER **2**

Production Possibilities, Opportunity Cost, and Economic Growth

CHAPTER PREVIEW

This chapter continues building on the foundation laid in the preceding chapter. Having learned that *scarcity* forces ***choices***, here you will study the choices people make in more detail. This chapter begins by examining the three basic choices: *What, How,* and *For Whom* to produce. The process of answering these basic questions introduces two other key building blocks in the economic way of thinking—*opportunity cost* and *marginal analysis*. Once you understand these important concepts stated in words, it will be easier to interpret our first formal economic model, the *production possibilities curve*. This model illustrates how economists use graphs as a powerful tool to supplement words and develop an understanding of basic economic principles. You will discover that the production possibilities model teaches many of the most important concepts in economics, including scarcity, the law of increasing opportunity costs, efficiency, investment, and economic growth. For example, this chapter applies the production possibilities curve to explain why developing countries find it difficult to achieve economic growth and thereby reach a higher standard of living for their people.

IN THIS CHAPTER, YOU WILL LEARN TO SOLVE THESE ECONOMICS PUZZLES:

- Why do so few rock stars and movie stars go to college?
- Why would you spend an extra hour reading this text rather than going to a movie or sleeping?
- Why are investment and economic growth so important?
- What does a war on terrorism really mean?

2–1 THREE FUNDAMENTAL ECONOMIC QUESTIONS

Because of the problem of scarcity, whether rich or poor, every nation must answer the same three fundamental economic questions:

1. ***What*** products will be produced?
2. ***How*** will they be produced? and
3. ***For Whom*** will they be produced?

Later, the chapter on economies in transition introduces various types of economic systems and describes how each deals with these three economic choices.

2–1a What to Produce?

The *What* question requires an economy to decide the mix and quantity of goods and services it will produce. Should society devote more of its limited resources to producing more health care and fewer military goods? Should society produce more iPods and fewer Blu-rays? Should more capital goods be produced instead of consumer goods, or should more small hybrid cars and fewer SUVs be produced? The problem of scarcity restricts our ability to produce everything we want during a given period, so the choice to produce "more" of one good requires producing "less" of another good. In the United States, consumer sovereignty answers the *What* question. In Cuba and North Korea, for example, the government and not the consumer answers this question.

2–1b How to Produce?

After deciding *what* products to make, the second question for society to decide is *how* to mix technology and scarce resources in order to produce these goods. For instance, a towel can be sewn primarily by hand (labor), partially by hand and partially by machine (labor and capital), or primarily by machine (capital). In short, the *How* question asks whether a production technique will be more or less capital-intensive. The *How* question also concerns choices among resources for production. Should electricity be produced from oil, solar power, or nuclear power?

Education plays an important role in answering the *How* question. Education improves the ability of workers to perform their work. Variation in the quality and quantity of education among nations is one reason economies differ in their capacities to apply resources and technology to answer the *How* question. For example, the United States is striving to catch up with Japan in the use of robotics. Answering the question *How do we improve our robotics*? requires engineers and employees with the proper training in the installation and operation of robots.

2–1c For Whom to Produce?

After the *What* and *How* questions are resolved, the third question is *For Whom*. Among all those desiring the produced goods, who actually receives them? This question concerns how the economic pie is divided. Who is fed well? Who drives a Mercedes? Who receives organ transplants? Should economics professors earn a salary of $1 million a year and others pay higher taxes to support economists? The *For Whom* question means that society must have a method to decide who will be "rich and famous" and who will be "poor and unknown." Chapter 10 returns to the *For Whom* question and discusses it in more detail.

2–2 OPPORTUNITY COST

Because of scarcity, the three basic questions cannot be answered without sacrifice or cost. But what does the term *cost* really mean? The common response would be to say that the purchase price is the cost. A movie ticket *costs* $8, or a shirt *costs* $50. Applying the economic way of thinking, however, *cost* is defined differently. A well-known phrase from Nobel Prize–winning economist Milton Friedman says, *There is no such thing as a free lunch.* This expression captures the links among the concepts of scarcity, choice, and cost. Because of scarcity, people must make choices, and each choice incurs a cost (sacrifice). Once one option is chosen, another option is given up. The money you spend on a movie ticket cannot also buy a Blu-ray. A business may purchase a new textile machine to manufacture towels, but this same money cannot be used to buy a new recreation facility for employees.

Opportunity cost
The best alternative sacrificed for a chosen alternative.

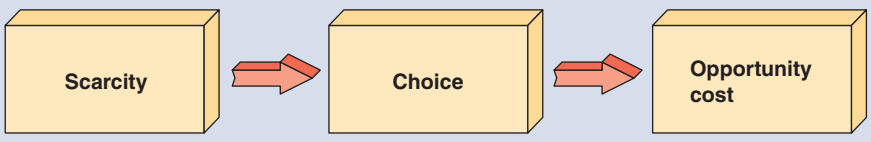
The Blu-ray and recreation facility examples illustrate that the true cost of these decisions is the *opportunity* cost of a choice, not the purchase price. **Opportunity cost** is the best alternative sacrificed for a chosen alternative. Stated differently, it is the cost of not choosing the next best alternative. This principle states that some highly valued opportunity must be forgone in all economic decisions. The highest-valued good or use of time given up for the chosen good or use of time measures the opportunity cost. We may omit the *opportunity* before the word *cost,* but the concept remains the same. Exhibit 1 illustrates the causation chain linking scarcity, choice, and opportunity cost.

Examples are endless, but let's consider a few. Suppose your economics professor decides to become a rock star in the Rolling in Dough band. Now all his or her working hours are devoted to creating hit music, and the opportunity cost is the educational services no longer provided. Now a personal example: The opportunity cost of dating a famous model or movie star (name your favorite) might be the loss of your current girlfriend or boyfriend. Opportunity cost also applies to national economic decisions. Suppose the federal government decides to spend tax revenues on a space station. The opportunity cost depends on the next best program *not* funded. Assume roads and bridges are the highest-valued projects not built as a result of the decision to construct the space station. Then the opportunity cost of the decision to devote resources to the space station is the forgone roads and bridges and not the money actually spent to build the space station.

To personalize the relationship between time and opportunity cost, ask yourself what you would be doing if you were not reading this text. Your answer might be watching television or sleeping. If sleeping is your choice, the opportunity cost of studying this text is the sleep you sacrifice. Rock stars and movie stars, on the other hand, must forfeit a large amount of income to attend college. Now you know why you see so few of these stars in class.

Decisions often involve sacrifice of *both* goods and time. Suppose you decide to see a movie at a theater located 15 minutes from campus. If you had not spent the money at the

EXHIBIT 1 The Links between Scarcity, Choice, and Opportunity Cost



Scarcity means that no society has enough resources to produce all the goods and services necessary to satisfy all human wants. As a result, society is always confronted with the problem of making choices. This concept is captured in Milton Friedman's famous phrase, "There is no such thing as a free lunch." This means that each decision has a sacrifice in terms of an alternative choice that has to be foregone.

movie theater, you could have purchased a Blu-ray and watched a movie at home. And the time spent traveling to and from the movie and sitting through it could have been devoted to studying for your economics exam. The opportunity cost of the movie consists of giving up a Blu-ray as well as the study time needed to score higher on the economics exam.

2–3 MARGINAL ANALYSIS

Marginal analysis
An examination of the effects of additions to or subtractions from a current situation.

At the heart of all rational decision-making is marginal analysis. **Marginal analysis** examines the effects of additions to or subtractions from a current situation. This is a very valuable tool in the economic way of thinking toolkit because it considers the "marginal" effects of change. The rational decision maker decides on an option only if the marginal benefit exceeds the marginal cost. For example, you must decide how to use your scarce time. Should you devote an extra hour to reading this text, going to a movie, watching television, texting, or sleeping? Which of your many options do you choose? The answer depends on marginal analysis. If you decide the benefit of a higher grade in economics exceeds the opportunity cost of, say sleep, then you allocate the extra hour to studying economics. Excellent choice!

Businesses use marginal analysis. Hotels, for example, rent space to student groups for dances and other events. Assume you are the hotel manager, and a student group offers to pay $400 to use the ballroom for a party. To decide whether to accept the offer requires marginal analysis. The marginal benefit of renting otherwise vacant space is $400, and the marginal cost is $300 for extra electricity and cleaning services. Since the marginal benefit exceeds the marginal cost, the manager sensibly accepts the offer.

Similarly, farmers use marginal analysis. For example, a farmer must decide whether to add more fertilizer when growing corn. Using marginal analysis, the farmer estimates that the corn revenue yield will be about $75 per acre with the current amount of fertilizer usage and about $100 per acre using one more application of fertilizer. If the cost of fertilizer is $20 per acre, marginal analysis tells the farmer to add one more application of fertilizer. The addition of fertilizer will increase profit by $5 per acre because fertilizing adds $25 to the value of each acre at a cost of $20 per acre.

Marginal analysis is an important concept when the government considers changes in various programs. For example, as demonstrated in the next section, it is useful to know that an increase in the production of military goods will result in an opportunity cost of fewer consumer goods produced.

2–4 THE PRODUCTION POSSIBILITIES CURVE

Production possibilities curve
A curve that shows the maximum combinations of two outputs an economy can produce in a given period of time with its available resources and technology.

The economic problem of scarcity means that society's capacity to produce combinations of goods is constrained by its limited resources. This condition can be represented in a model called the production possibilities curve (PPC). The **production possibilities curve** shows the maximum combinations of two outputs that an economy can produce in a given period of time with its available resources and technology. Three basic assumptions underlie the production possibilities curve model:

1. **Fixed Resources.** The quantities and qualities of all resource inputs remain unchanged during the time period. But the "rules of the game" do allow an economy to shift any resource from the production of one output to the production of another output. For example, an economy might shift workers from producing consumer goods to producing capital goods. Although the number of workers remains unchanged, this transfer of labor will produce fewer consumer goods and more capital goods.
2. **Fully Employed Resources.** The economy operates with all its factors of production fully employed and producing the greatest output possible without waste or mismanagement.