9th ED

SURVEY *of* ECONOMICS

IRVIN B. TUCKER

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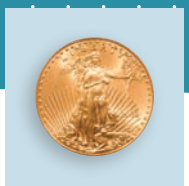
9th Edition



Dear Student,

My objective in writing this book is to provide you with everything you need for success in the course and to improve your ability to make better decisions in your everyday life—especially understanding economic issues in the news. My writing style is intended to be engaging, clear, and straightforward with an emphasis on real-world applications. As I was writing the text, I viewed myself explaining the concepts to a student in my office. As a result, there is a conversational tone to the text. To avoid boredom, the text uses a fast-paced, action-packed approach that explains all essential concepts without becoming an encyclopedia.

As a principles of economics instructor for over 30 years, I know from firsthand experience that many students are apprehensive about taking an economics course. In fact, I still recall vividly that as a freshman about to take my first economics course, I had only the vaguest idea of what this subject was about. To my delight, my freshman principles of economics course opened my eyes to a new way of thinking. And my years of teaching this powerful reasoning process inspired me to try to write a text that conveyed my excitement about economics to students.

Please read through the preface, which takes you on a tour of the special pedagogical features and ancillary materials that have been created to help you maximize your learning experience with this textbook.

Regards,

Irvin Tucker

SURVEY *of* ECONOMICS

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Survey of Economics, Ninth Edition
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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*, ninth 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 tool in economics—supply and demand analysis—and applies it to clearly explain real-world economic issues.

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 versus monopolistic markets. This part of 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 influence 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 complications of a strong or a weak dollar are.

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 four 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, the *Study Guide* contains step-by-step features on how to interpret graphs.

CHANGES TO THE NINTH EDITION

The basic layout of the ninth edition remains the same. The following are key 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.
- Chapter 2 Production Possibilities, Opportunity Cost, and Economic Growth, has new questions added to the sample questions.
- Chapter 3 Market Demand and Supply ,has an updated global economics feature on organ shortages that includes the liver transplant experience of Apple CEO Steve Jobs. New questions have been added to the sample questions.
- Chapter 4 Markets in Action, has new questions added to the sample questions.
- Chapter 6 Production Costs, has new questions added to the sample questions.
- Chapter 8 Monopoly, has an example of the "sharing economy" added to the Economics in Practice on New York Taxicabs. This feature concludes with a discussion of the unregulated rideshares market with companies like Lyft sporting thick pink mustaches on the front grill.
- Chapter 10, Labor Markets and Income Distribution, has been updated with the latest figures on family income distribution and poverty rates. In addition, the feature article on fair pay for females has been updated. These are currently hot topics that generate great interest for students.
- Chapter 11 Gross Domestic Product, has a new heading on GDP alternatives to introduce and explain alternative measures for GDP.
- Chapter 12, Business Cycles and Unemployment, includes updated business cycle data. This chapter also includes updated unemployment rate data with a section on globalization. The graph showing the GDP gap has been updated and redrawn.
- Chapter 13, Inflation, updates data on inflation, including the Economics in Practice on "How Much More Does It Cost to Laugh?" In addition, here students enjoy learning how to convert Babe Ruth's 1932 salary 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 traces the growth of U.S. government expenditures and taxes since the Great Depression. And global comparisons of spending and taxation exhibits have been revised. The chapter concludes with the latest tax rate data example for a single taxpayer. New questions have been added to the sample questions.
- Chapter 17, Federal Deficits, Surpluses, and the National Debt, focuses on the current "hot button" issues of federal deficits, the national debt, and the debt ceiling using updated data and exhibits. This chapter includes updated 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 a updated Exhibit 18.4 listing the 10 top U.S. banks by asset size.
- Chapter 21 International Trade and Finance, updates and explains recent changes in the U.S. balance of trade. To simplify the U.S. balance of payments, the lines for Investment income (net) and Unilateral transfers (net) have been combined into a single line titled Income (net).
- 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 to explain the link between economic freedom and quality-of-life indicators. New questions have been added to the sample questions.

ALTERNATE VERSIONS OF THE BOOK

For instructors who wish 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 accompanying table shows precisely which chapters are included in each book. Instructors who wish more information about these alternative versions should contact their local Cengage South-Western representative.

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 the student's "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 website with a Flashcard feature that is great for learning terms.

ECONOMICS IN PRACTICE

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. Many of these boxed features include quotes from newspaper articles over a period of years, demonstrating that economic concepts remain relevant over time.

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 *Economics in Practice* 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. So that these questions can 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 that can be found on the instructor's resource website. Students who answer correctly earn the satisfaction of knowing they have mastered the concepts.

ILLUSTRATIONS

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. When actual data are used, the website reference is provided so that students can easily locate the data source.

KEY CONCEPTS

Key concepts introduced in the chapter are listed at the end of each chapter and are featured on the Tucker MindTap asset. As a study aid, you can use the key concepts as flashcards to test your knowledge. First state the definition and then click on the term to check for correctness.

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

The 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 on the instructor's website and in the back of the book.

END-OF-CHAPTER SAMPLE QUIZZES

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 instructor's Test Bank. The answers to all of these questions are given in the back of the book.

ROAD MAP

PART ROAD MAP

This feature concludes each part with review questions listed by chapter from the previous part. To reinforce the concepts, each set of questions relates to the interactive causation chain game. You can find the games on the MindTap asset for Tucker 9e. Answers to the questions are also on the instructor's website.

INTERACTIVE QUIZZES

In addition to the end-of-chapter sample quizzes, there are additional multiple-choice questions written by the author on the Tucker instructor's website. Each quiz contains multiple questions like those found in a typical exam. In addition, you may email yourself and/or your instructor the quiz results with a listing of correct and incorrect answers. Between this feature and the end-of-chapter practice quizzes, students are well prepared for tests.

ONLINE EXERCISES

These exercises for each chapter are designed to spark student's excitement about researching on the Internet by asking them to access online economic data and then answer questions related to the content of the chapter. All Internet exercises are on the Tucker instructor's website with direct links to the addresses so that students will not have the tedious and error-prone task of entering long website addresses.

A SUPPLEMENTS PACKAGE DESIGNED FOR SUCCESS

To access additional course material for *Survey of Economics*, visit www.cengagebrain.com. At the CengageBrain.com home page, search for the ISBN of your book using the search box at the top of the page. This will take you to the product page where these resources can be found. For additional information, contact your Cengage sales representative.

INSTRUCTOR RESOURCES

TUCKER WEBSITE

The Tucker website at www.cengagebrain.com provides open access to PowerPoint chapter review slides, study guide, Instructor's manual (prepared by Douglas Copeland of Johnson County Community College), direct links to the Internet activities mentioned in the text, updates to the text, Test Bank in PDF, and other downloadable teaching and learning resources.

COGNERO

Cengage Learning Testing Powered by Cognero is a flexible, online system that allows you to

- author, edit, and manage test bank content from multiple Cengage Learning solutions.
- create multiple test versions in an instant.
- deliver tests from your LMS, your classroom, or wherever you want.

Start right away!

Cengage Learning Testing Powered by Cognero works on any operating system or browser.

- No special installs or downloads needed
- Create tests from school, home, the coffee shop—anywhere with Internet access

What will you find?

- *Simplicity at every step*. A desktop-inspired interface features drop-down menus and familiar, intuitive tools that take you through content creation and management with ease.
- *Full-featured test generator*. Create ideal assessments with your choice of 15 question types (including true/false, multiple choice, opinion scale/likert, and essay). Multi-language support, an equation editor, and unlimited metadata help ensure your tests are complete and compliant.
- *Cross-compatible capability*. Import and export content into other systems.

STUDENT RESOURCES

MINDTAP FOR TUCKER

MindTap engages and empowers students to produce their best work consistently. By seamlessly integrating course material with videos, activities, apps, and much more, MindTap creates a unique learning path that fosters increased comprehension and efficiency.

- MindTap delivers real-world relevance with activities and assignments that help students build critical thinking and analytic skills that will transfer to other courses and their professional lives.
- MindTap helps students stay organized and efficient with a single destination that reflects what's important to the instructor, along with the tools students need to master the content.
- MindTap empowers and motivates students with information that shows where they stand at all times— both individually and compared to the highest performers in class.
- Relevant readings, multimedia, and activities are designed to take students up the levels of learning, from basic knowledge to analysis and application.
- Personalized teaching becomes yours through a Learning Path built with key student objectives and your syllabus in mind. Control what students see and when they see it.
- Analytics and reports provide a snapshot of class progress, time in course, engagement, and completion rates.
- Aplia generic homework and math and graphing tutorials.
- End of chapter homework, BBC videos with assessment, Concept Clips videos, Graphing-at-a-Glance Videos with assessment, Road Map Q&A, Checkpoint Q&A, and end of chapter questions and problems.
- Causation Chain Game: 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 having a causation chain in the text is included in the Causation Chain Game within MindTap. This game makes it fun to learn.

APLIA

Created by Economist Paul Romer for his classroom, Aplia is the best-selling online economics product. In fact, Aplia is the most successful and widely used homework solution in the Economics marketing. Aplia provides automatically graded assignments that were written to make the most of the web medium and contain detailed immediate explanations of every question.

ACKNOWLEDGMENTS

A deep debt of gratitude is owed to the reviewers for their expert assistance. All comments and suggestions were carefully evaluated and served to improve the final product. To each of the reviewers of all five editions, I give my sincerest thanks.

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ABOUT THE AUTHOR

IRVIN B. TUCKER

IRVIN B. TUCKER has over 30 years of experience teaching introductory economics at the University of North Carolina Charlotte. He earned his B.S. in Economics at NC State University and his M.A. and Ph.D. in Economics from the University of South Carolina. Dr. Tucker is former director of the Center for Economic Education at the University of North Carolina Charlotte and was a longtime member of the National Council on Economic Education. He 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 journal articles 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*, Eight Edition, a text for the two-semester principles of economics courses, published by Cengage South-Western Publishing.

SURVEY *of* ECONOMICS

NINTH EDITION

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

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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 the price increases?
- How can we explain the relationship between the Super Bowl winner and changes in the stock market?

CHAPTER PREVIEW

Welcome to an exciting and useful subject economists call "the economic way of thinking." As you learn this reasoning technique, it will become infectious. You will discover that the world is full of economics problems requiring more powerful tools than just common sense. As you master the methods explained in this book, you will appreciate economics as a valuable reasoning approach to solving economics puzzles. Stated differently, the economic way of thinking is important because it provides a logical framework for organizing your thoughts and understanding an economic issue or event. Just to give a sneak preview, in later chapters, you will study the perils 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 how 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.

1–1 THE PROBLEM OF SCARCITY

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

Our world is a finite place where people, both individually and collectively, face the problem 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, 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, and more leisure time. 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."

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 cannot escape the problem of scarcity. The federal government never has enough money to spend for the poor, education, highways, police, national defense, Social Security, and all the other programs it wishes 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 grueling 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.

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

1–2 SCARCE RESOURCES AND PRODUCTION

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.

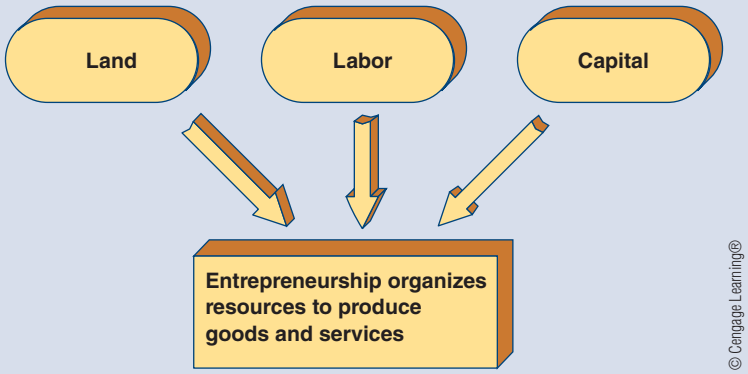
Because of the economic problem of scarcity, no society has enough **resources** to produce all the goods and services necessary to satisfy all human wants. Resources are the basic categories of inputs used to produce goods and services. Resources are also called *factors of production*. Economists divide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

1–2a Land

Land Any natural resource provided by nature used to produce goods and services.

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 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

EXHIBIT 1-1 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.

anything natural above or below the ground, such as forests, gold, diamonds, oil, coal, wind, and the sun. Two broad categories of natural resources are *renewable resources* and *nonrenewable resources*. Renewable resources are basic inputs that nature can automatically replace. Examples include lakes, crops, and clean air. 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.

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 such risky activities as starting new businesses, creating new products, or inventing new ways of accomplishing tasks. Entrepreneurship is a scarce human resource because relatively few people are willing or able to innovate and make decisions involving greater-than-normal chances for 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 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 Human-made goods used to produce other goods and services.

Capital is a human-made good used to produce other goods and services. Capital includes the physical plants, machinery, and equipment used to produce other goods. Capital goods are human-made goods that do not directly satisfy human wants. Before the Industrial Revolution, *capital* meant a tool, such as a hoe, an axe, or a bow and arrow. In those days, these items served as capital to build a house or provide food for the dinner table. Today, capital also consists of factories, office buildings, warehouses, robots, trucks, roads, and distribution facilities. College buildings, the printing presses used to produce this textbook, and computers are also examples of capital.

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.

CONCLUSION Money by itself does not produce goods and services; instead, it is only a paper means of buying capital.

1–3 ECONOMICS: THE STUDY OF SCARCITY AND CHOICE

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

The perpetual problem of scarcity forcing 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 the production of goods and services 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. In fact, there are many ways one could define *economics*, but economists accept the definition given here because it includes the link between *scarcity* and *choices*.

Society makes two kinds of choices: economywide, 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*.

1–3a Macroeconomics

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

The old saying "Looking at the forest rather than the trees" describes **macroeconomics**. Macroeconomics 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 economywide variables, such as inflation, unemployment, growth of the economy, the money supply, and the national incomes of developing countries. Macroeconomic decision making considers such "big picture" policies as the effect that federal tax cuts will have on unemployment and the effect that changing the money supply will have on prices.

1–3b Microeconomics

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

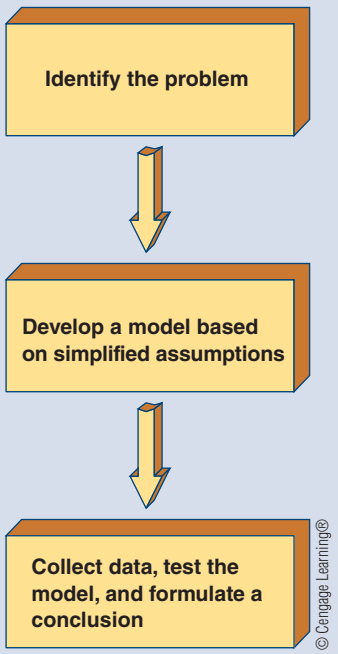
Examining individual trees, leaves, and pieces of bark, rather than surveying the forest, illustrates **microeconomics**. Microeconomics is the branch of economics that studies decision making by a single individual, household, firm, industry, or level of government. Microeconomics applies a microscope to study specific parts of an economy, as one would examine cells in 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 model. Based on this analysis, economists formulate a conclusion. Exhibit 1-2 summarizes the model-building process.

EXHIBIT 1-2 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 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

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

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, trees, stoplights, schools, hospitals, and firehouses. This would be too much detail, and the complexity would make it difficult to choose the best route.

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

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 consumer incomes, the prices of substitutes for gasoline, the price of gasoline, 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 relevant variables that are related to gasoline consumption and reject variables that have only slight or no relationship to gasoline consumption. In this simple case, the economist removes the cloud of complexity by formulating the theory 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 the appendix to this chapter provides a review of the graphical analysis. An economic theory can be expressed in the form "If *A*, then *B*, other things held constant." An economic model is useful only if it yields accurate predictions. When the evidence is consistent with the theory that *A* causes outcome *B*, there is confidence in the theory's validity. When the evidence is inconsistent with the theory that *A* causes outcome *B*, the researcher rejects this theory.

In the 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 are therefore consistent with 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 population size does not change at the same time that gasoline prices rise.

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* and (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 declare the theory is incorrect. Think again! The economist responds that this is a reasoning pitfall because the model is valid based on the assumption of ceteris paribus, and your observation gives us no reason to reject the model. The reason the model appeared flawed is because another factor, a sharp rise in the temperature, *caused* people to buy more Coca-Cola in spite of its higher price. If the temperature and all other factors are held constant as the price of Coca-Cola rises, then 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, in turn, 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.

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

CHECKPOINT

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?

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 following Economics in Practice 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 these quotes ignore the fact that physicists, doctors, business executives, lawyers, and all professionals often disagree.

ECONOMICS IN PRACTICE

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

Applicable concept: association versus causation

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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 an NFC team predicts that in the following December the stock market will be higher than the year before. A win by an old AFL team predicts a dip in the stock market.

Several other indicators have also been proposed. For example, one economist suggested that the surliness of waiters is a countercyclical indicator. If they are nice, expect that bad times are coming, but if they are rude, expect an upturn. Waiters, 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]

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*, Aug. 27, 1979, pp. 1, 16.
[2] Sandra Block, "Worried? Look at Wedding Bell Indicator," *The Charlotte Observer*, Apr. 15, 1995, p. 8A.

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 on free trade among nations, the elimination of farm subsidies and rent ceilings, government deficit spending to recover from a recession, and many other issues. When disagreements do exist, the reason can often be explained by the difference between *positive economics* and *normative economics*.

1–6a Positive Economics

Positive economics An analysis limited to statements that are verifiable.

Positive economics deals with facts and therefore addresses "what is" or "verifiable" questions. 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 A, then B." 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 9.3 percent in 2009, and the rate for teenagers was 24.3 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 *A* occurs, then event *B* 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.

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

1–6b Normative Economics

Normative economics An analysis based on value judgment.

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 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.

The point here is that people wearing different-colored glasses see the same facts differently. Each of us has individual subjective preferences that we apply to a particular subject. An animal rights activist says that no one *should* purchase a fur coat. Or one senator argues, "We *ought to* ensure that every teenager who wants a job has one." Another senator counters by saying, "Maintaining the purchasing power of the dollar is *more important* than teenage unemployment."

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

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 also may associate themselves with a political position and use normative arguments for or against some economic policy. When using value judgments, an economist's 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

ECONOMICS IN PRACTICE

Does the Minimum Wage Really Help the Working Poor?

Applicable concepts: positive and normative analyses

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 robotical 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 minimum wage is a blunt weapon for redistributing wealth. 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 people 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 is outrageous that a worker can work full time and still live in poverty. Moreover, people on this side of the debate believe that opponents exaggerate the dangers to the economy from a higher minimum wage. For example, one could argue that a higher minimum wage will force employers to upgrade the skills and productivity of their workers. Increasing the minimum wage may therefore be a win-win proposition, rather than a win-lose proposition. Finally, across the United States in 2013 walkouts and protests by fast food workers demanded a higher minimum wage and collective bargaining rights.

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 Economics in Practice, 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?

[1] David Newmark and William Wascher, *Minimum Wages*, Cambridge, MA. The MIT Press, 2008.

boring." Instead, it was an eye-opening experience that inspired me to change my major to economics and pursue an economics teaching career.

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 three former presidents—George H.W. Bush, Ronald Reagan, and Gerald Ford.

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 markets. 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. The remainder of economics majors work for government agencies or in colleges and universities.

EXHIBIT 1-3 Average Yearly Starting Salary for Selected Majors for 2013

Undergraduate Major	Salary ($)
Computer engineering	71,700
Computer science	64,800
Electrical engineering	63,400
Management information systems	63,100
Finance	57,400
Business administration	55,300
Economics	55,100
Accounting	53,300
Nursing	52,800
Marketing	51,000
Advertising	46,600
Special Education	46,100
International business	45,500
Communications	43,400
Journalism	40,400
Liberal arts	40,300
Political science	39,800
Criminal justice	35,200
Social work	35,100
Sociology	34,800
Conservation/renewable resources	30,900

Source: National Association of Colleges and Employers, *Salary Survey,* Spring 2013.

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 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.

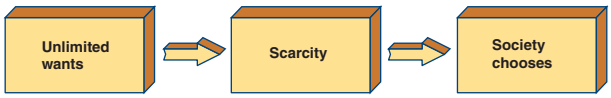
Finally, economics majors shine in salary offers upon graduation. Exhibit 1-3 shows average yearly starting salaries for bachelor's degree graduates for 2013.

Key Concepts

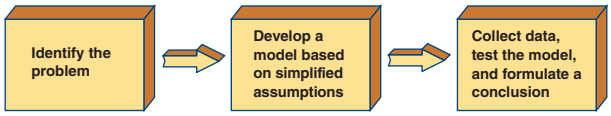
Scarcity
Resources
Land
Labor
Entrepreneurship
Capital
Economics
Macroeconomics
Microeconomics
Model
Ceteris paribus
Positive economics
Normative economics

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 economywide 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 evidence 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*.

Study Questions and Problems

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 that are 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.

Sample Quiz

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 answers 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. Restricted to the land resources 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 within a business.
5. Which of the following *best* illustrates the application of the model-building process to economics?
   a. Two economists with differing political agendas argue about the best way to solve the social security problem on a Sunday morning talk show.
   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 PhD student in economics develops a plausible mathematical model of an industry for his dissertation, but there is no data to test the model.
   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 correctly describes the ceteris paribus assumption?
   a. If we increase the price of a good, reduce consumer incomes, and lower the price of substitutes, and if quantity demanded is observed to fall, we know that the price increase caused that 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 profits are higher.
   d. If we decrease the price of a good and observe that there is an increase in the quantity demanded, holding all other factors that influence this relationship constant.

8. The condition of scarcity
   a. cannot be eliminated.
   b. prevails in poor economies.
   c. prevails in rich economies.
   d. All of the answers 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 stimulates the economy.
10. Which of the following is *true* about renewable natural resources?
    a. They are a type of land resource such as oil, coal, and natural gas that has a fixed stock.
    b. They are a type of capital resource such as irrigation networks and wastewater treatment plants that utilize water.
    c. They are a type of capital resource such as air filtration systems in buildings that renew and refresh polluted air from the outside.
    d. They are a type of land resource such as forests, range-lands, 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, good, 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 A is fair.
    b. Outcome B is the best objective to achieve.
    c. If policy A is followed, then outcome B results.
    d. All of these choices are positive economic analysis.
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 is a type of economic analysis.
15. Which word or phrase 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 sufficiently large new energy reserves.
    c. Resumption of the steady productivity growth.
    d. None of the answers above are correct.
17. Which resource is *not* an example of capital?
    a. Equipment.
    b. Machinery.
    c. Physical plants.
    d. Stocks or 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 a type of economic analysis.

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

APPENDIX 1

Applying Graphs to Economics

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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.

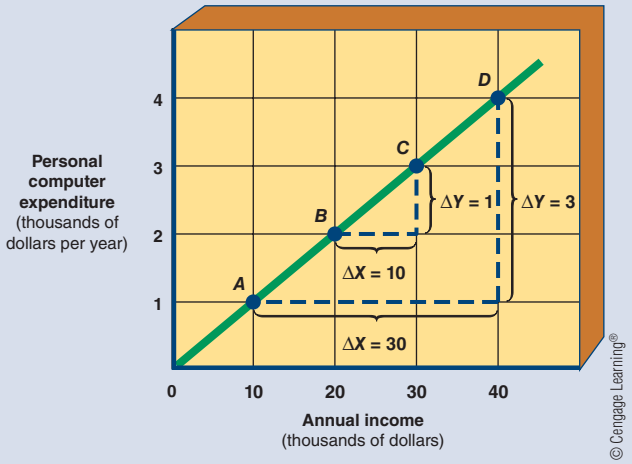
A1–1 A DIRECT RELATIONSHIP

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 1A-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 1A-1 measures annual income, and the vertical axis shows the amount spent per year for a personal computer (PC). In the absence of any established traditions, we could decide to measure income on the vertical axis and expenditure on the horizontal axis. The intersection of the horizontal and vertical axes is the *origin,* and the point at which both income and expenditure are zero. In Exhibit 1A-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 1A-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

EXHIBIT 1A-1 A 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 *B* and *C* or between points *A* and *D*, the slope = $\Delta Y/\Delta X = +3/+30 = +1/+10 = 1/10$.

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.

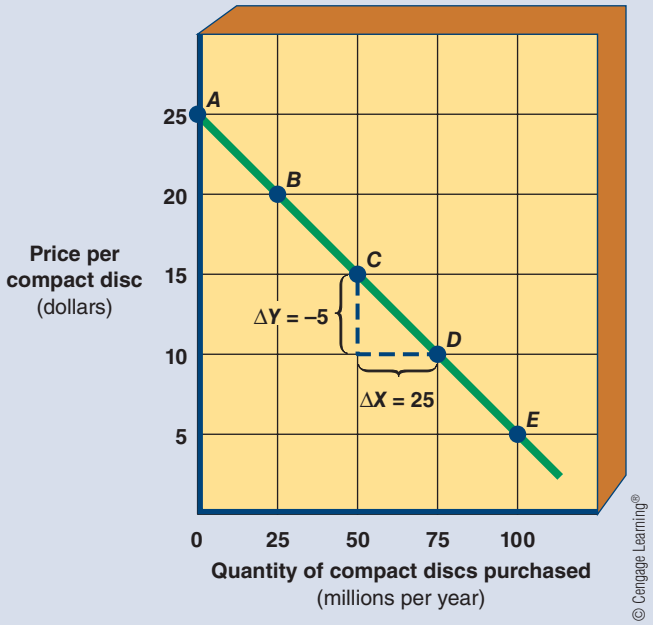
expenditure is a **direct relationship**. A direct relationship is a positive association between two variables. When one variable increases, the other variable increases, and when one variable decreases, the other variable decreases. In short, both variables change in the *same* direction.

Finally, this is 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 1A-1, for example, factors such as the prices of PCs and 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 curve.

A1–2 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 1A-2. These data indicate a *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.

EXHIBIT 1A-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 compact discs 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 = $\Delta Y/\Delta X = -5/+25 = -1/5$.

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.

In Exhibit 1A-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. 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 1A-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 price and quantity called the *law of demand*.

In addition to observing the inverse relationship (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.

A1–3 THE SLOPE OF A STRAIGHT LINE

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).

Plotting numbers gives 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"):

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

Consider the slope between points B and C in Exhibit 1A-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 $+1/+10$. 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 1A-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 $+3/+30 = 1/10$.

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 1A-1 has a *positive slope*, and we describe the line as "upward sloping."

On the other hand, the line in Exhibit 1A-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 compact discs 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 1A-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.

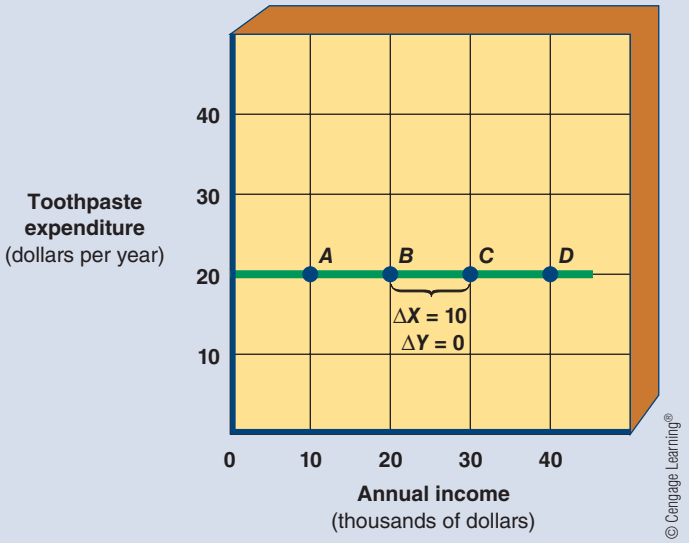
Independent relationship A zero association between two variables. When one variable changes, the other variable remains unchanged.

A1–4 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 graph paper.

Economists' favorite method of depicting a three-variable relationship is shown in Exhibit 1A-4. As explained earlier, the cause-and-effect relationship between price and quantity of CD purchases determines the downward-sloping

EXHIBIT 1A-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

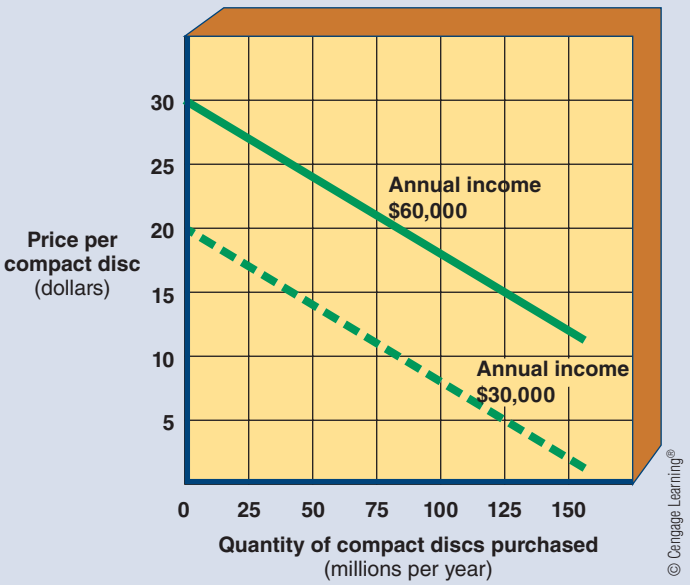
The flat line with a zero slope shows that the expenditure per year for toothpaste is unrelated to annual income. As annual income increases along the horizontal axis, the amount spent each year for toothpaste remains unchanged at 20 units. If annual income increases 10 units, the corresponding change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

curve. A change in the price per CD 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 pay more, 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 book, 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.

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.

EXHIBIT 1A-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.

A1-5 A HELPFUL STUDY HINT FOR USING GRAPHS

To some students, studying economics is a little frightening because many chapters are full of graphs. An often-repeated mistake is to prepare for tests by trying to memorize the lines of graphs. When their graded tests are returned, students using this strategy will probably exclaim, "What happened?" The answer is that if you learn the economic concepts first, then you will 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, in addition to the brief review of graphical analysis in this appendix, the Graphing Workshop on the EconCentral Web site and the Study Guide contain step-by-step features on how to interpret graphs.

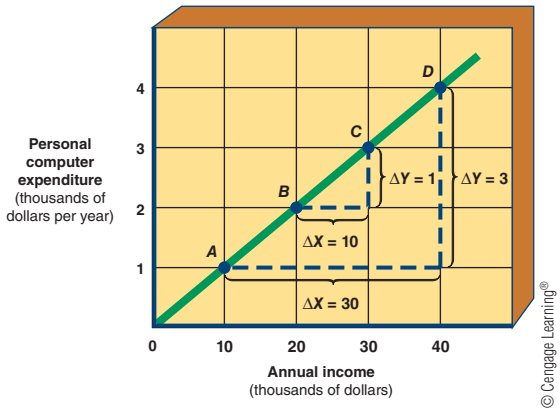
Key Concepts

Direct Relationship
Inverse Relationship
Slope
Independent Relationship

Summary

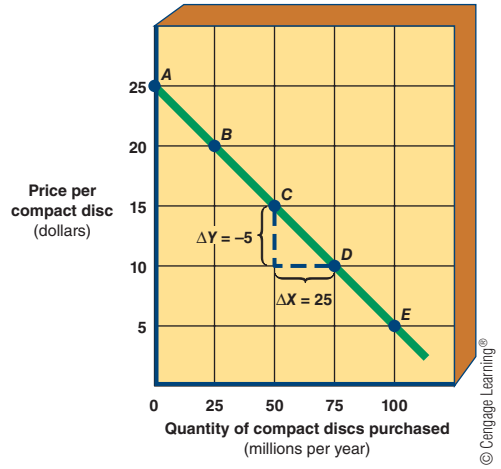
- **Graphs** provide a means to clearly show economic relationships in two-dimensional space. Economic analysis is often concerned with two variables confined to the upper-right (northeast) quadrant of the coordinate number system.
- A **direct relationship** occurs when two variables change in the *same*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

Direct Relationship



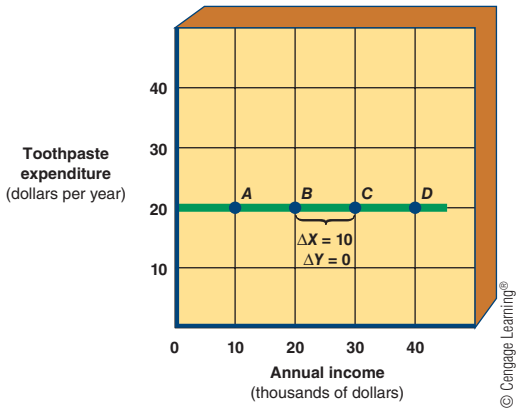
- An **inverse relationship** occurs when two variables change in *opposite* directions.

Inverse Relationship



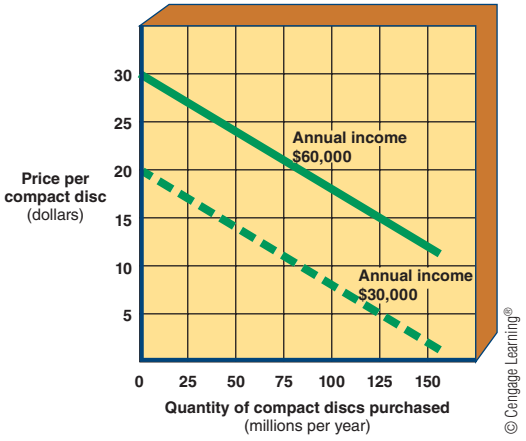
- An **independent relationship** occurs when two variables are unrelated. (Exhibit 1A-3)

Independent Relationship



- **Slope** is the ratio of the vertical change (the rise or fall) to the horizontal change (the run). The slope of an *upward-sloping* line is *positive*, and the slope of a *downward-sloping* line is *negative*.
- 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. (Exhibit 1A-4)

Three-Variable Relationship



Study Questions and Problems

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. The 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, 20,000 hamburgers will be

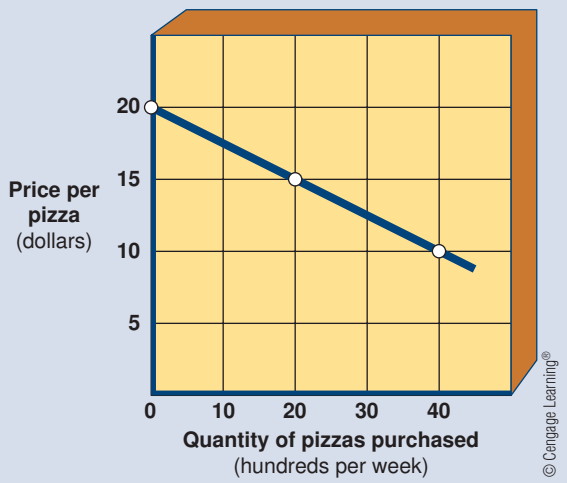
bought. However, at a price of $3, 40,000 hamburgers will be bought. At $2, 60,000 hamburgers will be bought, and at $1, 80,000 hamburgers will be purchased.

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 and why?

Sample Quiz

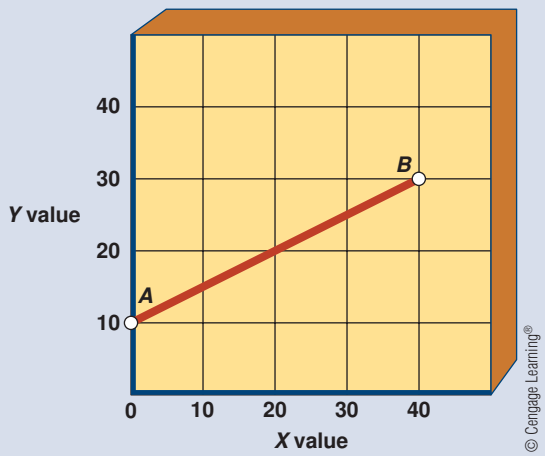
1. What is used to illustrate an independent relationship between two variables?
   a. An upward-sloping curve.
   b. A downward-sloping curve.
   c. A hill-shaped curve.
   d. A horizontal or vertical line.
2. Which of the following pairs is the *most* likely to exhibit an inverse relationship?
   a. 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 people purchase.

EXHIBIT 1A-5 Straight line relationship



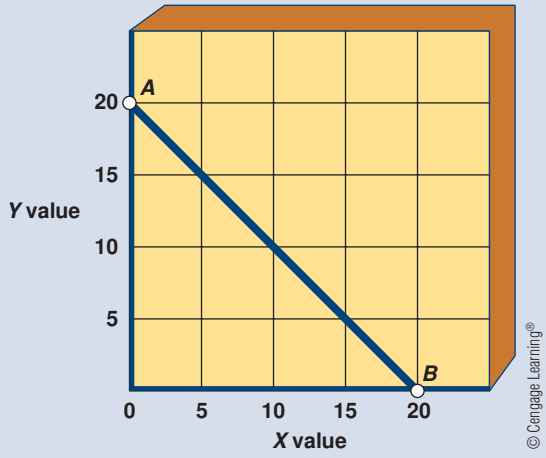
3. According to Exhibit 1A-5, the relationship between the price and quantity purchased of pizza is
   a. direct.
   b. inverse.
   c. complex.
   d. independent.
4. What is the slope of the line shown in Exhibit 1A-5?
   a. −1.
   b. −1/2.
   c. −1/4.
   d. 0.
5. Which of the following would cause a leftward shift in the relationship shown in Exhibit 1A-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 wish to purchase.
   d. All of the above would shift the line in the graph.
6. Suppose two variables are directly related. If one variable rises, then 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.

EXHIBIT 1A-6 Straight line



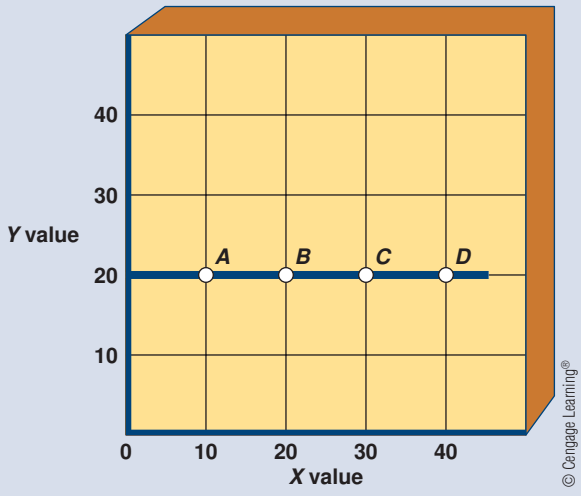
8. Straight line AB in Exhibit 1A-6 shows that
   a. increasing values for *X* will decrease the values of *Y*.
   b. decreasing values for *X* will increase the values of *Y*.
   c. there is a direct relationship between *X* and *Y*.
   d. All of the answers above are correct.
9. In Exhibit 1A-6, the slope of straight line AB is
   a. positive.
   b. zero.
   c. negative.
   d. variable.
10. In Exhibit 1A-6, the slope of straight line AB is
   a. 1.
   b. 5.
   c. 1/2.
   d. −1.
11. As shown in Exhibit 1A-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 1A-6, as *X* increases along the horizontal axis, the *Y* values increase. The relationship between the *X* and *Y* variables is
   a. direct.
   b. inverse.
   c. independent.
   d. variable.

EXHIBIT 1A-7 Straight line



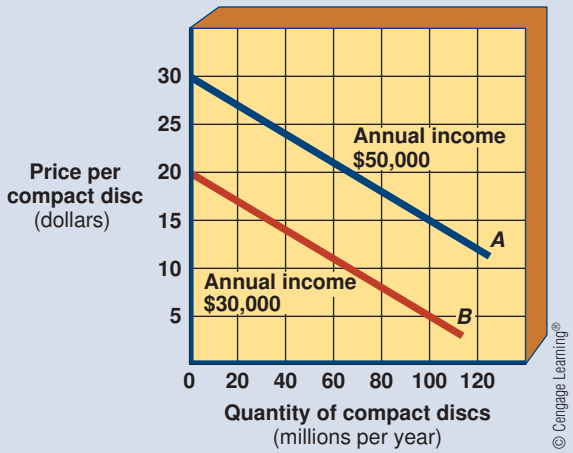
13. In Exhibit 1A-7, as *X* increases along the horizontal axis, the *Y* values decrease. The relationship between the *X* and *Y* variables is
   a. direct.
   b. inverse.
   c. independent.
   d. variable.
14. Straight line AB in Exhibit 1A-7 shows that
   a. increasing values for X reduces the value 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 answers above are correct.
15. As shown in Exhibit 1A-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 1A-7, the slope for straight line AB is
   a. 3.
   b. 1.
   c. −1.
   d. −5.
17. In Exhibit 1A-7, the slope of straight line AB is
   a. positive.
   b. zero.
   c. negative.
   d. variable.

EXHIBIT 1A-8 Straight line



18. In Exhibit 1A-8, as X increases along the horizontal axis, corresponding to points A-D on the line, the Y values remain unchanged at 20 units. The relationship between the X and Y variables is
   a. direct.
   b. inverse.
   c. independent.
   d. undefined.
19. In Exhibit 1A-8, the slope of straight line A-D is
   a. greater than 1.
   b. equal to 1.
   c. less than 1.
   d. zero.

EXHIBIT 1A-9 Multi-curve graph



20. Exhibit 1A-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 (an)
    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.

CHAPTER 2

Production Possibilities, Opportunity Cost, and Economic Growth

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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?

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, the chapter concludes by using the production possibilities curve to explain why underdeveloped countries do not achieve economic growth and thereby improve their standard of living.