

PRINCIPLES OF
Microeconomics



N. Gregory Mankiw

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Harvard University



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About the cover The cover illustrates, as Alfred Marshall pointed out a century ago, that economics is “a study of mankind in the ordinary business of life.” Alois Schonn’s classic artwork was chosen by the author because of its beauty, elegance, simplicity, and friendly appeal. It overlays a modern financial report containing graphs and numbers. The contrast between the artwork and the financial report represents the art and science of economics.

About the interior illustrations The interior illustrations are the work of Michael Steirnagle. Each illustration brings to life the economic markets and activities associated with the chapter topics presented in the book. Steirnagle, an award-winning illustrator and artist, teaches at Palomar College in San Marcos, Calif. He has been awarded two gold medals from the Society of Illustrators and has recently illustrated a children’s book.

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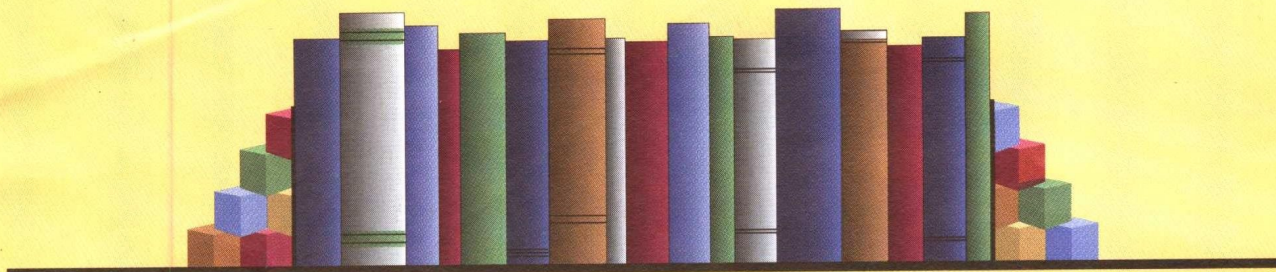
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SUGGESTIONS FOR SUMMER READING

If you enjoyed the economics course you have just finished, you might like reading more about economic issues in the following books.

- **GETTING IT RIGHT: MARKETS AND CHOICES IN A FREE SOCIETY**, Robert J. Barro, Cambridge, Mass.: MIT Press, 1996. In this collection of essays based on his *Wall Street Journal* columns, conservative economist Robert Barro offers his view about the workings of the economy and the proper scope of economic policy.
- **HARD HEADS, SOFT HEARTS: TOUGH-MINDED ECONOMICS FOR A JUST SOCIETY**, Alan S. Blinder, Reading, Mass.: Addison-Wesley, 1987. How should government policymakers balance economic efficiency and social compassion? Alan Blinder, who has served as an economic adviser to President Clinton, offers his answers in this wide-ranging book.
- **NEW IDEAS FROM DEAD ECONOMISTS**, Todd G. Buchholz, New York: Penguin Books, 1989. This amusing book provides an overview of the history of economic thought.
- **THINKING STRATEGICALLY: A COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE**, Avinash Dixit and Barry Nalebuff, New York: Norton, 1991. This introduction to game theory discusses how all people—from corporate executives to arrested criminals—should and do make strategic decisions that affect themselves and others.
- **THE WINNER-TAKE-ALL SOCIETY: HOW MORE AND MORE AMERICANS COMPETE FOR FEWER AND BIGGER PRIZES, ENCOURAGING ECONOMIC WASTE, INCOME INEQUALITY, AND AN IMPOVERISHED CULTURAL LIFE**, Robert H. Frank and Philip J. Cook, New York: The Free Press, 1995. This book examines some of the reasons for, and the effects of, increasing inequality of incomes in the United States.
- **DAY OF RECKONING: THE CONSEQUENCES OF AMERICAN ECONOMIC POLICY UNDER REAGAN AND AFTER**, Benjamin Friedman, New York: Random House, 1988. Benjamin Friedman presents an uncompromising critique of the large increase in government debt that began during the first Reagan administration.

PART IV ■ THE ECONOMICS OF THE PUBLIC SECTOR

- Chapter 10 Externalities
- Chapter 11 Public Goods and Common Resources
- Chapter 12 The Design of the Tax System
- Market outcomes are not always efficient, and governments can sometimes remedy market failure.*
- To fund programs, governments raise revenue through their tax systems, which are designed with an eye toward balancing efficiency and equity.*

PART V ■ FIRM BEHAVIOR AND THE ORGANIZATION OF INDUSTRY

- Chapter 13 The Costs of Production
- Chapter 14 Firms in Competitive Markets
- Chapter 15 Monopoly
- Chapter 16 Oligopoly
- Chapter 17 Monopolistic Competition
- The theory of the firm sheds light on the decisions that lie behind supply in competitive markets.*
- Firms with market power can cause market outcomes to be inefficient.*

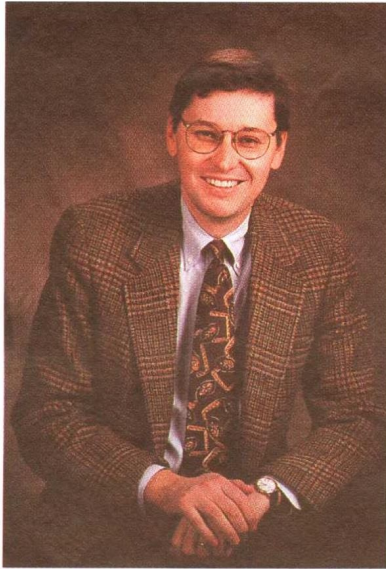
PART VI ■ THE ECONOMICS OF LABOR MARKETS

- Chapter 18 The Markets for the Factors of Production
- Chapter 19 Earnings and Discrimination
- Chapter 20 The Distribution of Income
- These chapters examine the special features of labor markets, in which most people earn most of their income.*

PART VII ■ ADVANCED TOPIC

- Chapter 21 The Theory of Consumer Choice
- The analysis of household decisionmaking sheds light on the choices behind market demand and related issues.*

ABOUT THE AUTHOR



N. Gregory Mankiw is Professor of Economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught various courses, including macroeconomics, microeconomics, statistics, and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.

Professor Mankiw is a prolific writer. His work has been published in academic journals, such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums, such as *The New York Times*, *Boston Globe*, and *The Wall Street Journal*. He is also the author of the best-selling textbook *Macroeconomics* (Worth Publishers). In addition to his teaching, research, and writing, Mankiw is Director of the Monetary Economics Program at the National Bureau of Economic Research, a non-profit think tank in Cambridge, Mass., and an adviser to the Federal Reserve Bank of Boston and the Congressional Budget Office.

Professor Mankiw lives in Wellesley, Mass., with his wife, Deborah, their children, Catherine and Nicholas, and the family's border terrier, Keynes.

*To Catherine and Nicholas,
my other contributions to the next generation*

PREFACE: TO THE INSTRUCTOR

During my twenty-year career as a student, the course that excited me most was the two-semester sequence on the principles of economics I took during my freshman year in college. It is no exaggeration to say that it changed my life.

I had grown up in a family that often discussed politics over the dinner table. The pros and cons of various solutions to society's problems generated fervent debate. But, in school, I had been drawn to the sciences. Whereas politics seemed vague, rambling, and subjective, science was analytic, systematic, and objective. While political debate continued without end, science made progress.

My freshman course on the principles of economics opened my eyes to a new way of thinking. Economics combines the virtues of politics and science. It is, truly, a social science. Its subject matter is society—how people choose to lead their lives and how they interact with one another. But it approaches its subject with the dispassion of a science. By bringing the methods of science to the questions of politics, economics tries to make progress on the fundamental challenges that all societies face.

I was drawn to write this book in the hope that I could convey some of the excitement about economics that I felt as a student in my first economics course. Economics is a subject in which a little knowledge goes a long way. (The same cannot be said, for instance, of the study of physics or the Japanese language.) Economists have a unique way of viewing the world, much of which can be taught in one or two semesters. My goal in this book is to transmit this way of thinking to the widest possible audience and to convince readers that it illuminates much about the world around them.

I am a firm believer that everyone should study the fundamental ideas that economics has to offer. One of the purposes of general education is to make people more informed about the world in order to make them better citizens. The study of economics, as much as any discipline, serves this goal. Writing an economics textbook is, therefore, a great honor and a great responsibility. It is one way that economists can help promote better government and a more prosperous future. As the great economist Paul Samuelson put it, "I don't care who writes a nation's laws, or crafts its advanced treaties, if I can write its economics textbooks."

BREVITY

To reach a wide audience, I felt that one characteristic of this book would be especially important: its length. If you turn to the end of this book, you will find that it is hundreds of pages shorter than many of the standard texts used to teach the principles of economics. Moreover, the page count has not been reduced by cramming as much as possible on each page. As I requested, the designers of the book have given it an open, uncluttered, and friendly look. Instead, brevity has been achieved by trying to present the principles of economics in the fewest words possible.

To explain this choice, I must make a confession: I am a slow reader. As a student, I rarely finished the readings I was assigned. I relied on Cliff's Notes an embarrassing number of times. I groaned whenever a professor gave the class a 1,000-page tome to read (together, of course, with ancillary articles). I took some solace in the fact that my reaction was not unique. The Greek poet Callimachus

put it succinctly: “Big book, big bore.” Callimachus made that observation in 250 B.C., so he was probably not referring to an economics textbook. But today his sentiment is echoed around the world every semester in the first lecture of many economics courses.

When I decided to write a text for the first course in economics, I wanted to write a book that as a student I would like to have read. My first and foremost goal, therefore, was brevity. I kept in mind a dictum from the great novelist Robertson Davies: “One of the most important things about writing is to boil it down and not bore the hell out of everybody.”

All textbooks on economics teach that resources are scarce, but few textbook writers remember that student time is one of those scarce resources. I have tried to respect that scarcity by avoiding the bells, whistles, and extraneous details that distract students from the key lessons. I hope this book lives up to the first word of its title, *Principles of Microeconomics*.

ORIENTATION

To boil economics down to its essentials, I had to consider what is truly important for students to learn in their first course in economics. As a result, this book differs from others not only in its length but also in its orientation.

It is tempting for a professional economist writing a textbook to take the economist’s point of view and to emphasize those topics that fascinate him and other economists. I have done my best to avoid that temptation. I have tried to put myself in the position of someone seeing economics for the first time. My goal is to emphasize the material that *students* should and do find interesting about the study of the economy.

One result is that more of this book is devoted to applications and policy, and less is devoted to formal economic theory, than is the case with many other books written for the principles course. For example, after students learn about the market forces of supply and demand in Chapters 4 through 6, they immediately apply these tools in Chapters 7 through 9 to consider three important questions facing our society: Why is the free market a good way to organize economic activity? How does taxation interfere with the market mechanism? Who are the winners and losers from international trade? These kinds of questions resonate with the concerns and interests that students hear about in the news and bring from their own lives.

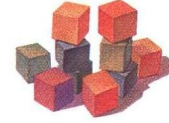
Throughout this book I have tried to return to applications and policy questions as often as possible. Most chapters include “Case Studies” illustrating how the principles of economics are applied. In addition, “In the News” boxes offer excerpts of newspaper articles showing how economic ideas shed light on the current issues facing society. It is my hope that after students finish their first course in economics, they will think about news stories from a new perspective and with greater insight.

ORGANIZATION

To write a brief and student-friendly book, I had to consider new ways to organize the material. This book includes all the topics that are central to a first course in economics, but the topics are not always arranged in the traditional order.

What follows is a whirlwind tour of this text. This tour will, I hope, give instructors some sense of how the pieces fit together.

Chapter 1, “Ten Principles of Economics,” introduces students to the economist’s view of the world. It previews some of the big ideas that recur throughout economics, such as opportunity cost, marginal decisionmaking, the role of incentives, the gains from trade, and the efficiency of market allocations. Throughout the book, I refer regularly to the *Ten Principles of Economics* in Chapter 1 to remind students that these principles are the foundation for most economic analysis. A building-blocks icon in the margin calls attention to these references.



Chapter 2, “Thinking Like an Economist,” examines how economists approach their field of study. It discusses the role of assumptions in developing a theory and introduces the concept of an economic model. It also discusses the role of economists in making policy. The appendix to this chapter offers a brief refresher course on how graphs are used and how they can be abused.

Chapter 3, “Interdependence and the Gains from Trade,” presents the theory of comparative advantage. This theory explains why individuals trade with their neighbors, as well as why nations trade with other nations. Much of economics is about how market forces coordinate the many individual production and consumption decisions that take place in the economy. As a starting point for this analysis, students see in this chapter why specialization, interdependence, and trade can benefit everyone.

The next three chapters introduce the basic tools of supply and demand. Chapter 4, “The Market Forces of Supply and Demand,” develops the supply curve, the demand curve, and the notion of market equilibrium. Chapter 5, “Elasticity and Its Application,” introduces the concept of elasticity and uses it to analyze events in three different markets. Chapter 6, “Supply, Demand, and Government Policies,” uses these tools to examine price controls, such as rent-control and minimum-wage laws, and tax incidence.

Chapter 7, “Consumers, Producers, and the Efficiency of Markets,” extends the analysis of supply and demand using the concepts of consumer surplus and producer surplus. It begins by developing the link between consumers’ willingness to pay and the demand curve and the link between producers’ costs of production and the supply curve. It then shows that the market equilibrium maximizes the sum of the producer and consumer surplus. In this book, therefore, students learn early about the efficiency of market allocations.

The next two chapters apply the concepts of producer and consumer surplus to questions of policy. Chapter 8, “Application: The Costs of Taxation,” shows why taxation results in deadweight losses and what determines the size of those losses. Chapter 9, “Application: International Trade,” considers who wins and who loses from international trade and presents the debate over protectionist trade policies.

Having examined why market allocations are often desirable, the book then considers how the government can sometimes improve on market allocations. Chapter 10, “Externalities,” explains how external effects such as pollution can render market outcomes inefficient. It also discusses the possible public and private solutions to those inefficiencies. Chapter 11, “Public Goods and Common Resources,” considers the inefficiencies that arise when goods, such as national defense, have no market price. Chapter 12, “The Design of the Tax System,” describes how the government raises the revenue necessary to pay for public goods. It presents some institutional background about the U.S. tax system and

then discusses how the goals of efficiency and equity come into play in the design of a tax system.

The next five chapters examine firm behavior and industrial organization. Chapter 13, "The Costs of Production," discusses what to include in a firm's costs, and it introduces cost curves. Chapter 14, "Firms in Competitive Markets," analyzes the behavior of price-taking firms and derives the market supply curve. Chapter 15, "Monopoly," discusses the behavior of a firm that is the sole seller in its market. It discusses the inefficiency of monopoly pricing, the possible policy responses, and the attempts by monopolies to price discriminate. Chapter 16, "Oligopoly," covers markets in which there are only a few sellers and uses the prisoners' dilemma as the model for examining strategic interaction. Chapter 17, "Monopolistic Competition," looks at behavior in a market in which many sellers offer similar but differentiated products. It also discusses the debate over the effects of advertising.

The following three chapters present issues related to labor markets. Chapter 18, "The Markets for the Factors of Production," emphasizes the link between factor prices and marginal productivity. Chapter 19, "Earnings and Discrimination," discusses the determinants of equilibrium wages, including compensating differentials, human capital, and discrimination. Chapter 20, "The Distribution of Income," examines the degree of inequality in U.S. society, the alternative views about the government's role in changing the distribution of income, and the various policies aimed at helping society's poorest members.

Chapter 21, "The Theory of Consumer Choice," analyzes individual decisionmaking using budget constraints and indifference curves. It covers material that is somewhat more advanced than the rest of the book. Some instructors may want to skip this chapter, depending on the emphases of their courses and the interests of their students. Instructors who do cover this material may want to do so earlier, and I have written this chapter so that it can be covered anytime after the basics of supply and demand have been introduced.

LEARNING TOOLS

The purpose of this book is to help students learn the fundamental lessons of economics and to show students how those lessons can be applied to the world in which they live. Toward that end, I have used various learning tools that recur throughout the book.

- ✦ **Chapter Objectives** Every chapter begins with a list of the chapter's primary objectives to give students a sense of where the chapter is heading. Each list has been kept brief in order to help students stay focused on the four or five key lessons presented in that chapter.
- ✦ **Case Studies** Economic theory is useful and interesting only if it can be applied to understand actual events and policies. This book, therefore, contains numerous case studies that apply the theory that has just been developed.
- ✦ **In the News Boxes** One benefit from studying economics is that it gives students a new perspective and greater understanding about news from around the world. To highlight this benefit, I have included excerpts from many newspaper articles. These articles, together with my brief intro-

ductions, show how basic economic theory can be applied. Some of these articles are opinion columns written by prominent economists.

• **FYI Boxes** These boxes provide additional material “for your information.” Some of them give a glimpse into the history of economic thought. Others clarify difficult technical issues. Still others discuss supplementary topics that instructors might choose either to discuss or skip in their lectures.

• **Definitions of Key Concepts** When key concepts are introduced in the chapter, they are presented in **bold** typeface. In addition, their definitions are placed in the margins. This treatment should aid students in learning and reviewing the material.

Quick Quizzes After each major section, students are offered a “quick quiz” to check their comprehension of what they have just learned. If students cannot readily answer these quizzes, they should stop and reread material before continuing.

Chapter Summaries Each chapter ends with a brief summary that reminds students of the most important lessons that they have just learned. Later in their studying it offers them an efficient way to review for exams.

List of Key Concepts A list of key concepts at the end of each chapter allows students to test their understanding of the new terms that have been introduced. Page references are included so students can review the terms they do not understand.

Questions for Review At the end of each chapter are questions for review that test the chapter’s primary lessons. Students can use these questions to check their comprehension after finishing a chapter and to prepare for exams.

Problems and Applications Each chapter also contains a variety of problems and applications that ask students to apply the material they have learned. Some professors may use these questions for homework assignments. Others may use them as a starting point for classroom discussions.

SUPPLEMENTS

The Dryden Press offers a variety of supplements for instructors and students who use this book. The goal of these ancillary resources is to provide an integrated package that makes teaching the principles of economics easy for the professor and learning them easy for the student. A. Andrew John (University of Virginia), an excellent economist and economics teacher, helped oversee the development of these materials.

The Dryden Press provides copies of these supplements free of charge to those instructors qualified under its adoption policy. Please contact your sales representative to learn how you may qualify, or call The Dryden Press at 1-800-237-2665.

For the Instructor

Teaching the principles of economics can be a demanding job. Often, classes are large and teaching assistants in short supply. The supplements designed for the instructor make that job less demanding and more fun.

- ✦ **Test Bank** Christopher Fawson and Dwight Israelsen (both of Utah State University) have prepared a test bank to accompany this text. The test bank contains 6,500 test questions consisting of multiple-choice questions and a large number of class-tested conceptual questions and problems. For the instructor's convenience, every question in the test bank is identified according to the chapter "Learning Objective" the question covers, the chapter section in which the material is covered, the level of difficulty, and the type of question (multiple-choice, true-false, short answer, critical thinking, definition, or graphical). Answers immediately follow each question.
- ✦ **Computerized Test Bank** The Dryden Press also offers a computerized version of the test bank (EXAMaster+) for IBM and Macintosh users. This software has many features that facilitate test preparation, scoring, and grade recording. It also offers great flexibility. The order of test questions can be altered to create different versions of any given test, and it is easy to modify questions and reproduce any of the graphing questions to meet the instructor's needs.
- ✦ **Instructor's Resource Manual with Adjunct & Teaching Assistant Guide** William T. Harris (University of Delaware) and Carolyn T. Bodkin (Trident Technical College) have written an instructor's manual aimed at helping both experienced and novice instructors prepare their lectures. Harris has written lecture notes for every chapter in this book. These notes briefly summarize the text material and provide additional examples and applications. Bodkin's adjunct and teaching assistant guide offers extensive outlines of every chapter, even more examples, and classroom warm-up activities to help introduce chapter topics.
- ✦ **Electronic Instructor's Resource Manual** The entire *Instructor's Resource Manual* is also available in an electronic format (for Windows). Using these electronic files, instructors can create their own lecture notes or incorporate parts of the *Instructor's Resource Manual* into their PowerPoint presentations.
- ✦ **Solutions Manual** Dean Croushore (Federal Reserve Bank of Philadelphia) has written a solutions manual that contains complete solutions for all the "Questions for Review" and "Problems and Applications" found in the text. The entire manual is three-hole punched and perforated to make it easier for the instructor to hand out solutions to students.
- ✦ **PowerPoint Presentation** Steve McGary (Ricks College) has developed a computer-based PowerPoint slide show that can save professors time as they prepare for class. This supplement covers all the essential topics presented in each chapter of this book. Graphs, tables, lists, and concepts are developed sequentially, much as one might develop them on a blackboard. Additional examples and applications, pulled from the *Instructor's Resource Manual*, are used to reinforce major lessons. The slides are crisp, clear, and colorful. Instructors may adapt or add slides to customize their lectures.
- ✦ **Web Site** Robert Rycroft (Mary Washington College) has helped The Dryden Press develop a Web site to accompany this text. To appreciate this

resource, we invite you to visit the site at <http://www.dryden.com/econ>. The ever-evolving Web site is both a teaching and economic research tool, with separate areas for students and instructors. Students visiting this page can learn from tutorials featuring interactive graphs, access a page of economic indicators, follow links relevant to each chapter, find out about career opportunities, and test their knowledge with our on-line quizzes. Instructors will be able to search a bank of news summaries and comprehension questions, download the instructor's resource material, and share ideas with others who are using this textbook.

- **Classroom Activities, Demonstrations, and Games for Principles of Economics** Charles A. Stull (Kalamazoo College) has written a supplement that helps instructors interested in incorporating "cooperative learning" and "learning by experiment" exercises in their courses. This supplement contains over 50 games, classroom experiments, in-class demonstrations, and take-home and in-class assignments. Each activity is linked to a specific text chapter and lists the type of activity, topics covered, materials list, time required for completion, and classroom limitations. Thorough directions are provided for the instructor. For the instructor's convenience, the supplement is three-hole punched and perforated, and all pages are designed for easy overhead use and photocopying. The activities supplement is also available on the Web site.
- **The "Ten Principles" Video Set** The Dryden Press has commissioned and produced ten video segments that illustrate the *Ten Principles of Economics* introduced in Chapter 1. Instructors can show these videos as an interesting and visually appealing introduction to topics. Questions for use with the videos will be available.
- **Overhead Transparencies** For instructors who do not want to use PowerPoint presentations, overhead transparency acetates are available. These overhead transparencies consist of figures and tables from the text, allowing instructors to build text images into their lectures. Some of the more complex acetates are layered to show what happens graphically when curves shift.

For the Student

The Dryden Press makes supplements available for students who are studying the principles of economics. These supplements reinforce the basic lessons taught in this book and offer opportunities for additional practice and feedback.

• **Student Study Guide** David R. Hakes (University of Northern Iowa) and Robert Harris (Indiana University–Purdue University at Indianapolis) have written a study guide that provides students with a useful summary and review of the important concepts presented in the text. Each study guide chapter includes a chapter overview, a chapter review, helpful hints, and definitions. Students can test their understanding of the material with practice problems and a chapter self-test. Solutions to all study guide problems follow each chapter.

TAG: Tutorial-Analytical-Graphical Student Software

Andrew Foshee (McNeese State University) has customized for this book the award-winning educational software by Tod Porter and Teresa Riley

(both of Youngstown University). This software contains an extensive chapter-by-chapter tutorial, a hands-on graphic section in which students are required to draw curves (with key strokes or a mouse), and a practice exam for each section. Students receive immediate feedback on their answers. It is available in both DOS and Windows formats.

Supplement Accuracy

The accuracy of supplements is of critical importance for instructors and students. As a result, every supplement was thoroughly reviewed for accuracy and solid linkage to this text. I am grateful to the following team of "accuracy specialists" for helping to fine-tune the supplements:

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Wall Street Journal Edition

One goal in teaching the principles of economics is to provide students a better understanding of the world around them. Many instructors, therefore, encourage students to read about economic issues in the newspaper as they take the course. Those instructors may want to consider the special *Wall Street Journal Edition* of this text. This edition is the same as the standard edition but includes a ten-week subscription to *The Wall Street Journal*. Students can activate their subscriptions simply by completing and mailing the business reply card found in the back of the book. Talk to your Dryden Press sales representative for more information, or call 1-800-237-2665.

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