

MICROECONOMICS

PRINCIPLES AND TOOLS



ARTHUR O'SULLIVAN
STEVEN M. SHEFFRIN

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Principles and Tools

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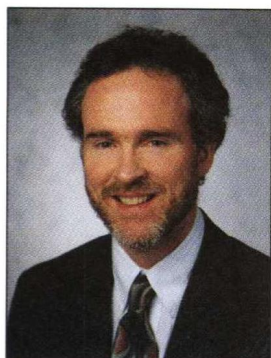
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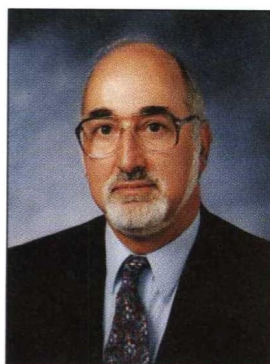


Arthur O'Sullivan is a professor of economics at Oregon State University. After receiving his B.S. in economics at the University of Oregon, he spent two years in the Peace Corps, working with city planners in the Philippines. He received his Ph.D. in economics from Princeton University in 1981, and then spent 11 years at the University of California, Davis, where he won several teaching awards. At Oregon State University, he teaches microeconomics at different levels, from the introductory course to advanced courses for doctoral students. He is the author of the best-selling textbook, *Urban Economics*, currently in its third edition.

Professor O'Sullivan's research explores economic issues concerning urban land use, environmental protection, and public finance. His articles appear in many economics journals, including *Journal of Urban Economics*, *Journal of Environmental Economics and Management*, *National Tax Journal*, and *Journal of Public Economics*.

Professor O'Sullivan lives with his wife and two children in Corvallis, Oregon. He enjoys outdoor activities, including the kids' sport du jour (soccer, basketball, baseball, badminton, lawn hockey, or football). Indoors, he is learning how to play the fiddle, much to the dismay of his family and the delight of the neighborhood dogs.

Steven M. Sheffrin



Steven M. Sheffrin is professor of economics and director of the Center for State and Local Taxation at the University of California, Davis. He has been a visiting professor at Princeton University, Oxford University, and the London School of Economics and served as a financial economist with the Office of Tax Analysis of the United States Department of Treasury. He has been on the faculty at Davis since 1976 and served as the Chairman of the Department of Economics. He received his B.A. from Wesleyan University and his Ph.D. in economics from the Massachusetts Institute of Technology.

Professor Sheffrin is the author of five other books and over 70 articles in the fields of macroeconomics, public finance, and international economics. His most recent books include *Rational Expectations* (Second Edition) and *Property Taxes and Tax Revolts: The Legacy of Proposition 13* (with Arthur O'Sullivan and Terri Sexton), both from Cambridge University Press.

Professor Sheffrin teaches macroeconomics at all levels, from large lectures of principles (classes of 400) to graduate classes for doctoral students. He is the recipient of the Thomas Mayer Distinguished Teaching Award in economics.

He lives with his wife Anjali (also an economist) and his two children in Davis, California. In addition to a passion for current affairs and travel, he plays a tough game of tennis.

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PREFACE

OUR MISSION

We wrote this book to match our teaching philosophy for a “principles” or introductory course in economics: The course should be taught as if it is the last economics course students will take. Most students don’t go beyond the introductory courses in economics, so we have just one opportunity to get them thinking like economists. From our experience, the best way to teach these students is to emphasize the key principles and ideas of economics, showing them how to use these concepts in their lives and careers. In contrast, many introductory texts are virtual encyclopedias of economic doctrine, so they overwhelm students with unimportant details and obscure the essential ideas of economics.

Extensive class testing of our book has shown us that it succeeds in getting students to think like economists: By the end of the course, they use the notion of opportunity cost, weigh marginal benefits and marginal costs, think about trade-offs, and distinguish between nominal and real values. This is a major accomplishment for students who take only one or two economics courses.

This book also provides a solid foundation for further study in economics. The best way to prepare students for advanced study is to provide them with the big picture—the framework of economic reasoning. Rather than filling their heads with forgettable details, we make the key concepts unforgettable by using them repeatedly, illustrating them with intriguing examples, and giving students many opportunities to practice what they’ve learned. As a result, they become well prepared for the more detailed and complex analysis in later economics courses.

Our approach allows us to present sophisticated material in a way that the average student of principles can understand. For example, in microeconomics, we discuss imperfect information, price discrimination, and strategic decision-making by firms. In macroeconomics, we explain the origins of hyperinflation and even present a simplified growth model in an appendix. We wish to emphasize that students don’t realize that these topics might be considered “advanced” material. To them, the material is no more difficult than the other material they encounter, and is actually less difficult than some traditional topics. Because we emphasize key concepts and use them to explain these modern topics,

we can more accurately portray economics as it is practiced today.

PRINCIPLES, TOOLS, AND ACTIVE LEARNING

As our title, *Microeconomics: Principles and Tools*, suggests, we place the principles of economics and the tools of our discipline at the center of our approach. The five principles of economics are as follows:

1. *Principle of Opportunity Cost.* The opportunity cost of something is what you sacrifice to get it. For example, the cost of a college degree includes the student’s foregone earnings, and the cost of a warship purchased by Malaysia in 1992 was safe drinking water for 2.5 million people.
2. *Marginal Principle.* Pick the level of an activity at which the marginal benefit equals the marginal cost. For example, it is sensible to run an airline flight with few passengers if the marginal benefit (revenue from tickets) exceeds the marginal cost (extra costs for the crew and fuel).
3. *Principle of Diminishing Returns.* If we increase one input while holding the other inputs fixed, output will increase, but at a decreasing rate. For example, adding workers to a one-oven pizzeria increases the number of pizzas, but at a decreasing rate.
4. *Spillover Principle.* In some circumstances, decision-makers do not bear all the costs or experience all the benefits from their decisions—i.e., there are externalities. For example, a paper producer that pollutes a river imposes costs on people downstream; a contributor to public radio generates benefits for other listeners.
5. *Reality Principle.* What matters to people is the real value or purchasing power of money. For example, workers should be interested in the purchasing power of their wages, not simply the dollar value of their wages.

We believe these are the core principles of economics. They should be self-evident to students and can be easily understood without any previous training in economics. In Chapter 2 we discuss each of these principles in detail and provide examples.

The power of economics comes from the tools that can be used to analyze a wide variety of issues

and problems. For example, we use supply and demand curves to explore market phenomena, and cost and revenue curves to explore firms' decisions. This book uses the key principles of economics to explain the logic underlying the most important tools of economics. This approach generates simple explanations that students can readily understand. We demystify the tools of economics, preparing students to use the tools properly.

This text is based on the notion of **active learning**. Once we've explained the logic of an economic tool and provided examples of its proper use, we give students plenty of opportunities to use the tool themselves. Most chapters have an "Economic Detective" exercise that provides a few clues into an economic puzzle or mystery and then asks students to solve the mystery. The last section of each chapter is a set of challenging "Using the Tools" questions that give students the opportunity to do their own economic analysis. Economic experiments throughout the text allow students to engage in role-playing as consumers, producers, citizens, and policymakers. At the beginning of each chapter, we capture students' attention with a story and a list of practical questions that are answered within the chapter. In combination, these active-learning features make studying economics a hands-on experience.

Our teaching experience tells us that a good example will stay with students longer than an abstract discussion. Students and instructors will find new and exciting examples throughout the text. In fact, every chapter of this book is jam-packed with relevant, interesting examples (and occasional "A Closer Look" features) that are fully integrated into each chapter's content.

For a preview of the special pedagogical features we've developed to assist both students and instructors, please turn to page xxviii.

ORGANIZATION AND PLAN

All three versions of our book (*Economics*, *Microeconomics*, and *Macroeconomics*) begin with a four-chapter preview. Part 1, "Introduction and Key Principles," includes several novel features. After an introduction to the discipline and a review of graphing techniques in Chapter 1, we develop the key principles of economics in Chapter 2. This chapter is essential reading for all students. In Chapter 3 we explain how markets naturally arise through specialization. We use the concept of specialization to explain comparative advantage and introduce the global economy, setting

the stage for the international examples and topics we introduce throughout the text. We also provide an overview of the role of government in a market economy. Chapter 4 provides a thorough introduction to supply and demand, showing students how to play "economic detective" by using simple clues to solve economic mysteries and puzzles.

In our combined text, we proceed directly to microeconomics. However, we have designed the text so that instructors may proceed directly to macroeconomics after teaching the four introductory chapters.

The Plan of Microeconomics

The microeconomics part of the text begins with Part 2, "A Closer Look at Demand and Supply." Chapter 5, on elasticity, is packed with examples that breathe life into what is too often a dry topic. We also show how to use elasticity to predict changes in price, quantity, and total revenue. We begin Chapter 6 with a discussion of when markets are likely to be efficient and inefficient, then highlight the many ways that governments can intervene in markets—and the trade-offs associated with intervention. Chapter 7 explains consumer choice in a simple, intuitive way, using the marginal principle. (For those who are interested, an optional appendix on indifference curves is provided.)

The firm comes to prominence in Part 3, "Market Structure and Pricing," as we discuss cost curves, pricing, and supply decisions for individual firms and the market (Chapters 8–11). This part of the book includes several innovations. To explain the long-run cost curves, we use real cost data to draw average-cost curves and provide an intuitive explanation for their shapes. In Chapter 12 we focus on the firm's entry decision, contrasting a natural monopoly with monopolistic competition. In Chapter 13 we use simple game trees to explain the notions of price fixing and entry deterrence, and then discuss the logic of antitrust policy.

Part 4, "Market Failure: Spillovers and Information," provides a detailed exploration of market failure. Chapter 14 considers the role of government in providing goods with spillover benefits—for example, protection from threatening asteroids, wildlife conservation, and college education. It also considers the issue of public choice, contrasting three models of government behavior. Chapter 15 discusses the economic approaches to solving environmental problems, including global warming and ozone depletion. Chapter 16, on imperfect information, uses simple supply and demand concepts to explain the "lemons" problem

and adverse selection, and includes discussions of the markets for used baseball pitchers, blood for transfusions, and medical insurance.

Part 5, “The Markets for Labor and Capital,” explores these markets and discusses some of the most vexing problems facing society today. Chapter 17 explains why wages vary among occupations and explores the effects of imperfect information on the labor market. Chapter 18 uses supply and demand to show why interest rates vary across financial instruments. Chapter 19 provides a wealth of factual information on four current policy issues (poverty, income distribution, the aging of society, and medical care), and explores the trade-offs associated with different policy options.

The Plan of Macroeconomics

The second part of *Macroeconomics*, “The Basic Concepts of Macroeconomics,” provides an overview of the discipline. The first chapter summarizes the big ideas in macro, and the second discusses measurement issues—including the most recent changes in government statistics. These chapters provide a natural building block for the rest of macroeconomics.

In the next part, “The Economy in the Long Run,” we begin analysis of the long run. We start with a chapter on the economy at full employment, followed by a chapter exploring economic growth. We decided to place long-run considerations early in the text for several reasons. First, many policy debates center on long-run issues (for example, productivity growth). Second, we felt that too many students take away from the course oversimplified Keynesian notions and apply them inappropriately. For example, many students come away from a macroeconomics course believing that increased government spending will always increase output. By considering a full-employment economy first, we can bring Keynesian fiscal policy into its proper perspective. Finally, there has been a resurgence of research in economic growth in recent years, which has highlighted many interesting and exciting issues.

After discussing growth, we devote an entire part (three chapters) to “Economic Fluctuations”—specifically, the business cycle and Keynesian economics. Our discussion of the macroeconomic short run is based on the idea that output is demand determined in the short run. We illustrate the difference between the macroeconomic short run and long run with aggregate demand and supply curves. With demand determining output in the short run, the Keynesian cross is

a useful tool, and we extend it to explain fiscal policy, automatic stabilizers, and the open economy.

In the two chapters that make up the next part, “Money, Banking, and Monetary Policy,” we integrate these three factors into our short-run model, highlighting important policy issues and the key role of the Federal Reserve. Finally, in the last part of the macroeconomics section, “Inflation, Unemployment, and Government Deficits,” we bring the long run back into the picture. First we develop a complete model that explains how the economy can, in principle, return to full employment after economic shocks or disturbances. Next we analyze inflation and unemployment in more depth, again stressing the links between the short run and the long run. In the last chapter of macroeconomics, we ask and answer ten important questions about government deficits and debt.

International Coverage

The concluding section of all three versions of the book (*Economics*, *Microeconomics*, and *Macroeconomics*) is devoted to exploring international topics in more depth. This part, “The International Economy,” also covers recent issues and events, such as GATT, NAFTA, and protectionism. In *Economics* and *Macroeconomics*, we also cover the international finance system. We have designed this material so that it can be read with only a knowledge of the material in Chapters 1–4.

In addition, international examples and applications are featured in every chapter, both in “A Closer Look” features and within the text.

Alternative Course Syllabi

We have designed this book to be flexible, to allow its use by instructors with different time lines and course objectives. Several chapters may be skipped without disrupting the flow of the presentation, permitting each instructor to choose his or her ideal combination of chapters.

Microeconomics Courses

Those who teach microeconomics confront two major issues. First, if the instructor wants to emphasize supply and demand (rather than the theory of consumer or producer behavior), what chapters should be covered? Second, which chapters form the core of a traditional microeconomics course, and how many additional chapters can be covered in a quarter course or a semester course?

A Course Emphasizing Supply and Demand. This book works well in any course that emphasizes supply, demand, and the application of the market model to various policy issues. The instructor can start with Chapters 1–6, which explain the basics of supply and demand, including why markets exist, how they work, the price elasticities of supply and demand, and the market effects of government intervention. The instructor could then skip Part 3 (“Market Structure and Pricing”) and go directly to the three chapters in Part 4, which consider various types of market failure. The first two chapters in Part 5 (“The Markets for Labor and Capital”) cover supply and demand in factor markets, and can be used individually or in combination. The final chapter in Part 5, “Economic Challenges for the Twenty-First Century,” uses supply and demand analysis to explore several current policy issues.

Core and Other Chapters in a Quarter or Semester Course. Chapters 1–8 constitute the core of a traditional microeconomics course. The number of additional chapters that can be covered depends on the pace and length of the course. An instructor should be able to cover four to six additional chapters in a quarter course, or five to eight additional chapters in a semester course.

Macroeconomics Courses

Most of those who teach macroeconomics confront a key issue: How much time should be devoted to more classical topics, such as growth and production, versus more Keynesian topics, such as economic fluctuations? Our book allows instructors to pursue either emphasis.

A Course Emphasizing Classical Themes. A course highlighting classical themes should initially concentrate on Chapters 1–4, which review the foundations of markets and supply and demand, before turning to the macroeconomic sections. The first five chapters in the macroeconomics section could then be covered in full. These chapters cover the big ideas in macroeconomics, measurement issues, full employment, growth, and aggregate demand and aggregate supply. The instructor could then discuss financial intermediation, the Federal Reserve, the money creation process, and other chapters as time permits.

A Course Emphasizing Keynesian Themes. After doing a quick overview of Chapters 1–3, the instructor could cover the first two chapters in macroeconomics, which emphasize the big ideas in macro-

economics and measurement issues. The instructor would then skip the two chapters on the long run and proceed directly to the chapter on aggregate demand and supply (“Coordinating Economic Activity: Aggregate Demand and Supply”). The instructor would then turn to the chapters titled “Keynesian Economics and Fiscal Policy,” “Money, the Banking System, and the Federal Reserve,” and “Monetary Policy in the Short Run.” Subsequent chapters could then be included as time permits.

A Combined Microeconomics and Macroeconomics Course

Because it emphasizes use of the key economics principles throughout, our book is the ideal text for a one-semester or one-quarter course. A combined course should first cover Chapters 1–4 in detail. The instructor could then follow the different alternatives for the micro and macro courses that we sketched above.

THE TEACHING AND LEARNING PACKAGE

Each component of the teaching and learning package has been carefully crafted to ensure that the introductory economics course is a rewarding experience for both students and instructors.

Instructor’s Manual with Video Guide

Two Instructor’s Manuals are available—one for microeconomics (by Léonie Stone of SUNY Geneseo) and one for macroeconomics (by Stephen Perez of Washington State University). Both Instructor’s Manuals reflect the textbook’s organization, incorporating policy problems in case studies, exercises, extra questions, and useful Internet links. The manuals also provide detailed outlines (suitable for use as lecture notes) and solutions to all questions in the textbook. The integrated Video Guide, with suggested questions, provides real-life examples of the textbook’s key economic principles. The videos are keyed by chapter.

Study Guides

The author of both Study Guides (for microeconomics and macroeconomics), Janice Boucher Breuer of the University of South Carolina, emphasizes the practical application of theory. Each Study Guide is a practicum designed to promote comprehension of economic principles and develop each student’s ability to apply them to different problems.

Each chapter of the Study Guides begins with an overview of the corresponding chapter in the textbook, a checklist to provide a quick summary of material covered in the textbook and lectures, and a list of key terms. The language in the Study Guide matches that in the text. Unlike all other introductory economics study guides, the O'Sullivan/Sheffrin Study Guides contain performance enhancing tips (PETs), which are designed to help students understand economics by applying the principles and promoting analytical thinking.

Two practice exams, featuring both multiple-choice and essay questions, are included at the end of each chapter. Both exams require students to apply one or more economic principles to arrive at each correct answer. Full solutions to the multiple-choice questions are included, not only listing each correct answer but also explaining in detail why one answer is correct and the others are not. Detailed answers to the essay questions are also provided.

Test Item File

Test item files are available for both *Microeconomics* and *Macroeconomics*. These offer approximately 3,500 multiple-choice, true/false, short-answer, and problem questions, both definitional and applied. Each question is keyed by topic and coded by degree of difficulty (easy, moderate, challenging, and honors) and degree of computation involved. Both are available in printed and electronic format.

Prepared by David Figlio of the University of Oregon, the test item files offer many unique features. For example, the multiple-choice questions provide five-answer questions, as recommended in the educational testing literature. In addition, the test banks integrate selected end-of-chapter problems from the text, as well as questions and answers from the Study Guides.

Prentice Hall Custom Test

The test item files are designed for use with the Prentice Hall Custom Test, a computerized package that allows instructors to custom design, save, and generate classroom tests. The test program (in PC Windows and Macintosh formats) permits instructors to edit, add, or delete questions from the test item file; edit existing graphics and create new graphics; and export questions to various word processing programs, including WordPerfect and Microsoft Word. Graphics capability ensures that all graphs included in the test item file can be printed next to the appropriate questions.

PowerPoint Presentations

The comprehensive PowerPoint supplement for this text, prepared by Donald Balch of the University of South Carolina, is a unique accompaniment to the classroom lecture. The computer-generated slides offer summaries of important text material, and clever artwork that reinforces the concepts being presented. The slides, which may be shown on a large-screen TV, a computer projector, or an LCD panel, may be used with either the IBM or Macintosh computer platform. Each chapter of the text has a corresponding slideshow presentation.

A special feature of the PowerPoint supplement is its presentation of graphic analysis. Each analysis is sequentially structured, with each slide in a series showing one step in the progression toward completion. Along with the graphic building process, each slide highlights the most recent addition(s) to the sequence, any point(s) of reference, and corresponding values of the reference point(s).

ABC/Prentice Hall Video Library

ABCNEWS

Prentice Hall and ABC News have combined their experience in academic publishing and global reporting to provide a comprehensive video ancillary to enhance our principles of economics texts. Through its wide variety of award-winning programs—*Nightline*, *This Week With David Brinkley*, *World News Tonight*, and *20/20*—ABC offers a resource for feature and documentary-style videos related to the chapters in the text. The programs have extremely high production quality, present substantial content, and are hosted by well-versed, well-known anchors.

Video Guide

The integrated Video Guide (included as part of the Instructor's Manual) provides a summary of each of the clips in the Video Library. For each video, the guide also supplies running time, teaching notes, and discussion questions, as well as useful tips on how to use the clip in class. Each video is keyed to the appropriate topic in the text.

The New York Times "Themes of the Times" Program

The New York Times and Prentice Hall cosponsor "Themes of the Times," a program designed to enhance student access to current information of relevance in the classroom.



Through this program, the text's core subject matter is supplemented by a collection of articles from one of the world's most distinguished newspapers, *The New York Times*. These articles demonstrate the vital, ongoing connections between what is learned in the classroom and what is happening in the world around us.

To enjoy the wealth of information of *The New York Times* daily, students and professors can take advantage of a reduced subscription rate. For information, call toll-free: 1-800-631-1222.

Economics: Principles and Tools CD-ROM

The O'Sullivan/Sheffrin CD-ROM gives students a chance to actively engage the theory and, with a seamless link to the Internet, launch into exploration of their own. The CD-ROM uses the text itself as a framework, so students can relate their activities directly to their class assignments. Its features include:

- *The entire O'Sullivan/Sheffrin text*: reformatted for easy reading and on-screen navigation.
- *Active Graphs*: an interactive learning device that enables students to explore examples and problems from the text by manipulating dynamic, active graphs.
- *Author Help*: hints and explanations in the authors' voices.
- *News Links*: articles and abstracts of current events, both on the CD-ROM and updated over the Web, through which students can explore the theory at work in the real world.
- *Exploration Links*: hyperlinks to relevant, engaging sites on the Web from the text itself.
- *Interactive Study Guide*: links students to on-line study guide.
- *Hot-linked Glossary, Index, and Table of Contents*: for quick reference and navigation.
- *FREE Internet browser*.

Online Student Review and PHLIP— Prentice Hall's Learning through the Internet Partnership (<http://www.prenhall.com/osullivan>)

This Web-based resource offers students another opportunity to sharpen their problem-solving skills and to assess their understanding of the text material. For each chapter, the site contains the traditional pedagogy, such as chapter objectives and multiple-choice and Internet exercises. Approximately ten questions are provided per chapter. In addition, the

online study guide has a built-in grading feature. Students take the exams and receive immediate feedback.

This site also links the student to the "Take it to the Net" exercises featured in the textbook. These Web-destination exercises are keyed to each chapter and direct the student to an appropriate, updated, economics-related Web site to gather data and analyze a specific economic problem. From the O'Sullivan home page, instructors and students can access Prentice Hall's Learning on the Internet Partnership (PHLIP). Developed by Dan Cooper at Marist College, PHLIP provides academic support for faculty adopting this text. From the PHLIP Web site, instructors can download supplements and lecture aids, including the Instructor's Manuals, lecture notes, PowerPoint presentations, problem and case solutions, and chapter outlines. Electronic delivery means that you always get the very latest in support materials.

PHLIP also helps you bring current events into the classroom. Using our *PHLIPping Through the News* service, you and your students can access the most current news in economics. Twice each month (biweekly), Scott Simkins (North Carolina Agricultural and Technical State University) and Jim Barbour (Elon College) review current articles, then post summaries of those articles, along with discussion questions, group activities, and research ideas. The stories are always keyed to specific chapters in the text, providing instructors with a dynamic and invaluable teaching tool.

To get the necessary username and password to access PHLIP and our digital supplements, please call your Prentice Hall sales representative. Or contact Prentice Hall Sales directly at college_sales@prenhall.com.

ACKNOWLEDGMENTS

There is a long distance between the initial vision of an innovative principles text and the final product. Along the way we participated in a structured process to reach our goal.

After writing a first draft of the manuscript, we participated in a two-day focus group in San Francisco. We went over the entire manuscript page by page with five economics instructors, who eagerly shared their teaching experiences and expectations. Their insightful comments helped us distinguish between the strong and the weak parts of the manuscript, giving us many opportunities to improve it.

The project went through four rounds of reviews by instructors, with the staff at Prentice Hall helping us interpret the reviewers' comments and develop strategies to refine the manuscript. The manuscript was tested in classrooms at many colleges and universities, providing us with valuable feedback from instructors and students. In the final round of reviews and revisions, we focused on making improvements that would make it easier for instructors to make the transition from other textbooks to ours.

We wish to acknowledge the assistance of the many individuals who participated in this process. First, we want to thank the participants in our two-day focus group, who helped us see the manuscript from a fresh perspective:

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A GUIDED TOUR

Microeconomics: Principles and Tools features a number of special pedagogical features to assist students and instructors. Many of these features are designed to promote an active learning environment.

ACTIVE LEARNING

Economic Detective



Throughout the book, students are invited to play “Economic Detective” to use the tools of economics to explain puzzles or answer questions. Playing detective promotes an exciting active learning environment in the classroom.

Economic Experiments

Economic experiments throughout the text involve students in experimenting with some of the key ideas in each chapter. These role-playing exercises allow students to make decisions as consumers, producers, citizens, and policymakers. Like the “Economic Detective” features, experiments provide excellent opportunities for active learning. For example, the “Market Equilibrium” experiment shows how decentralized decision-making generates an equilibrium price.



The Mystery of the Bouncing Price of Used Newspapers

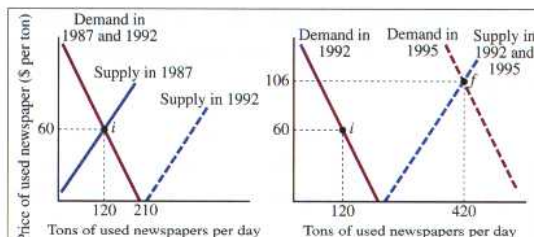
In 1987 you could sell a ton of used newspapers for \$60. Five years later, anyone with a pile of used newspapers had to pay someone to take them away.⁷ In other words, the price of used newspapers dropped from \$60 to zero in just five years. Then the price started climbing. It reached \$106 per ton in 1995, a price high enough so that thieves started stealing newspapers that people had left on the curb for recycling.⁸ What explains the bouncing price of used newspapers?

We can solve this mystery with some additional information about changes over time in the quantity of used newspapers. Between 1987 and 1992, the quantity increased dramatically, so the price and quantity moved in opposite directions. Therefore, we would conclude that the decrease in price was caused by an increase in supply (the third row of Table 2). Over this five-year period, hundreds of communities adopted curbside recycling programs. These programs increased the supply of used newspapers, generating a surplus of used newspapers that decreased the equilibrium price. As shown in the left panel of Figure 13, the increase in supply was so large that the equilibrium price fell to zero.

What happened between 1992 and 1995 to increase the price from zero to \$106? During this period, the equilibrium quantity of used newspapers increased. The price and the quantity moved in the same direction. Therefore, we would conclude that the increase in price was caused by an increase in demand (the first row in Table 2). During this period many states passed laws requiring paper manufacturers to make newsprint (the paper used to make newspapers) with a higher percentage of recycled fiber. In addition, the federal government, one of the world's largest paper users, now buys paper with a minimum recycled content of 20%. As shown in the right panel of Figure 13, these changes shifted the demand curve for used newspapers to the right, increasing the equilibrium price from zero to \$106.

Figure 13
Bouncing Price
of Used
Newspapers

Between 1987 and 1992, the price of used newspapers decreased, a result of increases in supply. Between 1992 and 1995, the price increased, a result of increases in demand.



1. ECONOMIC EXPERIMENT: Market Equilibrium

The simple experiment takes about 20 minutes to run. We start by dividing the class into two equal groups, consumers and producers.

■ The instructor provides each consumer with a number indicating the maximum amount that he or she is willing to pay (WTP) for a bushel of apples. The WTP is a number between \$1 and \$100. Each consumer has the opportunity to buy 1 bushel of apples per trading period. The consumer's score for a single trading period equals the gap between his WTP and the price actually paid for apples. For example, if the consumer's WTP is \$80 and he pays only \$30 for apples, his score is \$50. Each consumer has the option of not buying apples. This will be sensible if the best price you can get exceeds your WTP. If you do not buy apples, your score will be zero.

■ The instructor provides each producer with a number indicating the cost of producing a bushel of apples (a number between \$1 and \$100). Each producer has the opportunity to sell 1 bushel per trading period. The producer's score for a single trading period equals the gap between the selling price and the cost of producing apples. So, if a producer sells apples for \$20 and her cost is only \$15, her score is \$5. Producers have the option of not selling apples, which is sensible if the best price she can get is less than her cost. If she does not sell apples, her score is zero.

Once everyone understands the rules, consumers and producers meet in a trading area to arrange transactions. A consumer may announce how much he or she is willing to pay for apples and wait for a producer to agree to sell apples at that price. Alternatively, a producer may announce how much he or she is willing to accept for apples and wait for a consumer to agree to buy apples at that price. Once a transaction has been arranged, the two people (consumer and producer) inform the instructor of the trade, record the transaction, and leave the trading area.

There are several trading periods, each of which lasts a few minutes. After the end of each trading period, the instructor lists the prices at which apples sold during that period. Then another trading period starts, providing consumers and producers another opportunity to buy or sell 1 bushel of apples. After all the trading periods have been completed, each participant computes his or her score by adding the scores from each trading period.

Test Your Understanding

At several points in each chapter, “Test Your Understanding” questions help students determine whether they understand the preceding material before continuing. These are not brain-twisters; they are straightforward questions that ask students to review and synthesize what they’ve read. Complete answers appear at the end of each chapter.



TEST Your Understanding

- 1 True or false, and explain: The cost of a master’s degree in engineering equals the tuition plus the cost of books.
- 2 Suppose that a nation picks 1,000 young adults at random to serve in the army. What information do you need to determine the cost of using these people in the army?
- 3 Explain the logic behind the economist’s quip that “there is no such thing as a free lunch.”
- 4 If a bus company adds a third daily bus between two cities, the company’s total costs will increase from \$500 to \$600 per day and its total revenue will increase by \$150 per day. Should the company add the third bus?
- 5 Suppose that you can save \$50 by purchasing your new car in a different city. If the trip requires only \$10 in gasoline, is the trip worthwhile?

MODEL ANSWERS

Test Your Understanding

1. False. This statement ignores the opportunity cost of time spent in school.
2. We need the opportunity cost of using the people in the army instead of in the civilian economy. One measure of the opportunity cost is the wages the people could have earned as engineers, teachers, doctors, lawyers, or factory workers.
3. One of the costs of a lunch is the time spent eating it. Even if someone else pays for your lunch, it is not truly free.
4. The marginal benefit is \$150 and the marginal cost is only \$100 ($\$600 - \500), so it would be sensible to add the third bus.
5. It will be worthwhile if the opportunity cost of the time spent traveling is less than \$40.

Using the Tools



The last section of each chapter is a set of challenging “Using the Tools” questions. These are an important part of each chapter, not traditional end-of-chapter material. They are designed to stretch the students into using the ideas developed in the chapter. Complete answers are provided.



Using the TOOLS

In this chapter you learned how to use two of the tools of economics—the supply curve and the demand curve—to predict how a change in demand or supply will affect prices and quantities. Here are some opportunities to use these tools to do your own economic analysis.

2. College Enrollment and Housing

Consider a college town where the initial price of apartments is \$400 and the initial quantity is 1,000 apartments.

- a. Use supply and demand curves to show the initial equilibrium, and label the equilibrium point with an i .
- b. Suppose that the number of students attending college increases by 20%. Use your graph to show the effects of this on the price and quantity of apartments. Label the new equilibrium point with an f .

3. Innovation and Phone Prices

Suppose that the initial price of a pocket phone is \$100 and the initial quantity demanded is 500 phones per day. Depict graphically the effects of a technological innovation that decreases the cost of producing pocket phones. Label the starting point with an i and the new equilibrium with an f .

4. Market Effects of an Import Ban

Consider a nation that initially imports half the shoes it consumes. Use a supply and demand diagram to predict the effect of a ban on shoe imports on the equilibrium price and quantity of shoes.

DYNAMIC EXAMPLES

Examples bring economics to life. We've all heard the "dollar bill on the sidewalk" story a million times. Microeconomics: Principles and Tools has hundreds of fresh, new, never-before-seen examples.

Chapter-Opening Stories

Each chapter opens with a story to motivate the chapter's subject matter, followed by a series of chapter-opening questions. These questions are revisited and answered at the end of the chapter.

- 1 What is the cost of producing military goods such as bombs and warships?
- 2 If a student group offers to pay \$500 to use a college auditorium for an evening, should the college accept the offer?
- 3 As a firm hires more workers, what happens to the total output of its factory?
- 4 If a paper producer dumps chemical waste into a river, what is the true cost of paper?
- 5 Suppose that your wage doubles and that the prices of consumer goods double too. Are you better off, worse off, or about the same?

CHAPTER

2



Key Principles of Economics

Emma owned some stock in Marginal Airlines, and she flew with the airline whenever she had a chance. You can imagine her dismay when she boarded a plane and saw just 30 passengers in the 120-seat airplane. How could the airline make a profit with so few passengers? She wrote a letter to the president of the airline demanding an explanation. Did the person who scheduled the flight make a mistake, or was the airline deliberately trying to lose money?

As we'll see later in the chapter, it was sensible to run the flight because the extra revenue from the flight exceeded the extra cost. This is the *marginal principle*—one of the five key principles of economics—in action.

MODEL ANSWERS FOR THIS CHAPTER

Chapter-Opening Questions

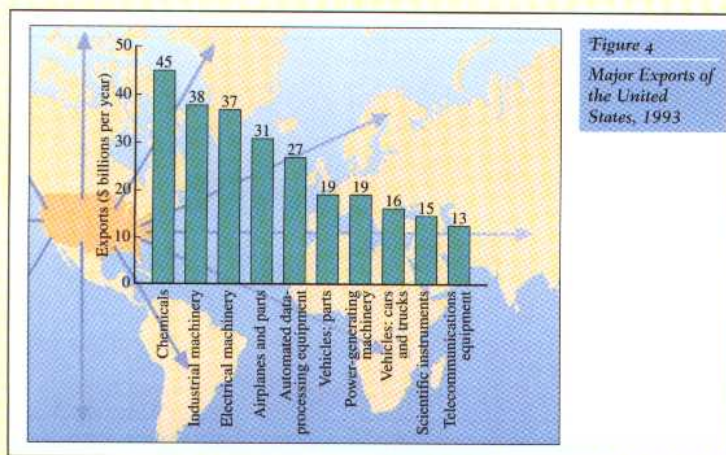
1. To get a warship, we sacrifice something else, for example, safe drinking water for 2.5 million Malaysians.
2. According to the marginal principle, the college should accept the offer if the marginal cost associated with using the auditorium (for security, lighting, heat, and cleanup) is less than the marginal benefit (\$500).
3. According to the principle of diminishing returns, output will eventually increase at a decreasing rate.
4. The true or economic cost of paper equals the firm's cost (for material, labor, and the paper mill) and the cost associated with the pollution generated as a byproduct of paper.
5. Your income will buy the same quantity of goods and services, so you will be equally well off.

Integration of International Examples

International examples are integrated throughout the text. Chapter 3 sets the stage early, introducing comparative advantage, exchange rates, and the language of trade and trade policy. Examples and illustrations from the global economy are then woven into every chapter thereafter.

Using the Principle: Opportunity Cost of Military Spending

We can use the principle of opportunity cost to explore the cost of military spending. Malaysia bought two warships in 1992, paying a price equal to the cost of providing safe drinking water for the 5 million Malaysians lacking it.¹ In other words, the opportunity cost of the warships was safe drinking water for 5 million people. When the Soviet Union fell apart and military tensions around the world diminished, citizens in the United States and Western Europe called for massive cuts in defense spending, with the idea of spending the "peace dividend" on social programs. The French cut their annual defense budget by billions of dollars and withdrew 50,000 troops stationed on German soil.² In the United States, the number of people employed by the military has decreased dramatically, and the Pentagon developed a new program, "Troops to Teachers," to help former soldiers get jobs teaching in local schools.³ The switch from army duty to teaching reminds us that the opportunity cost of a soldier may be a teacher.



A Closer Look

"A Closer Look" features throughout the text provide brief, interesting examples of the tools and concepts discussed in the text.

A Closer LOOK

Jurassic Park and the Price of Amber

Scientists who use amber to study fossils and extinct animals were shocked when the price of amber tripled during 1993.^{*} Because the equilibrium quantity of amber increased along with its price, the increase in price was caused by an increase in demand, not a decrease in supply. The increase in demand coincided with the release of the movie *Jurassic Park*, in which scientists use specimens from amber to clone dinosaurs. Many of the people who saw the movie bought amber specimens, and this new consumer demand increased the demand for amber. The demand curve shifted to the right, increasing the equilibrium price and quantity.



Amber contains the preserved remains of mosquitos that feasted on dinosaurs. In 1993 the price of amber tripled.

^{*}Tun Friend, "Dino-Craze Sends Sales of Amber with Insects Buzzing," *USA Today*, June 17, 1993, p. A1.

LEARNING WITH TECHNOLOGY

Economics: Principles and Tools offers a full technological component to stimulate active learning and retention.

Take It to the Net



At the end of each chapter, a “Take it to the Net” feature sends students to the Prentice Hall Web site, where chapter-specific exercises are located. These exercises are updated regularly. The O’Sullivan/Sheffrin site links to PHLIP, which also offers summaries of the latest news on the economic front.

Take It to the Net



We invite you to visit the O’Sullivan/Sheffrin page on the Prentice Hall Web site at:
<http://www.prenhall.com/osullivan/>
for this chapter’s World Wide Web exercise.

PHLIP—Prentice Hall Learning through the Internet Partnership

PHLIP (at <http://www.phlip.marist.edu>) provides academic support for faculty adopting this text. From the PHLIP site, instructors can download supplements and lecture aids, including the Instructor’s Manuals, lecture notes, PowerPoint presentations, problem and case solutions, and chapter outlines. Electronic delivery means that you always get the very latest in support materials.

