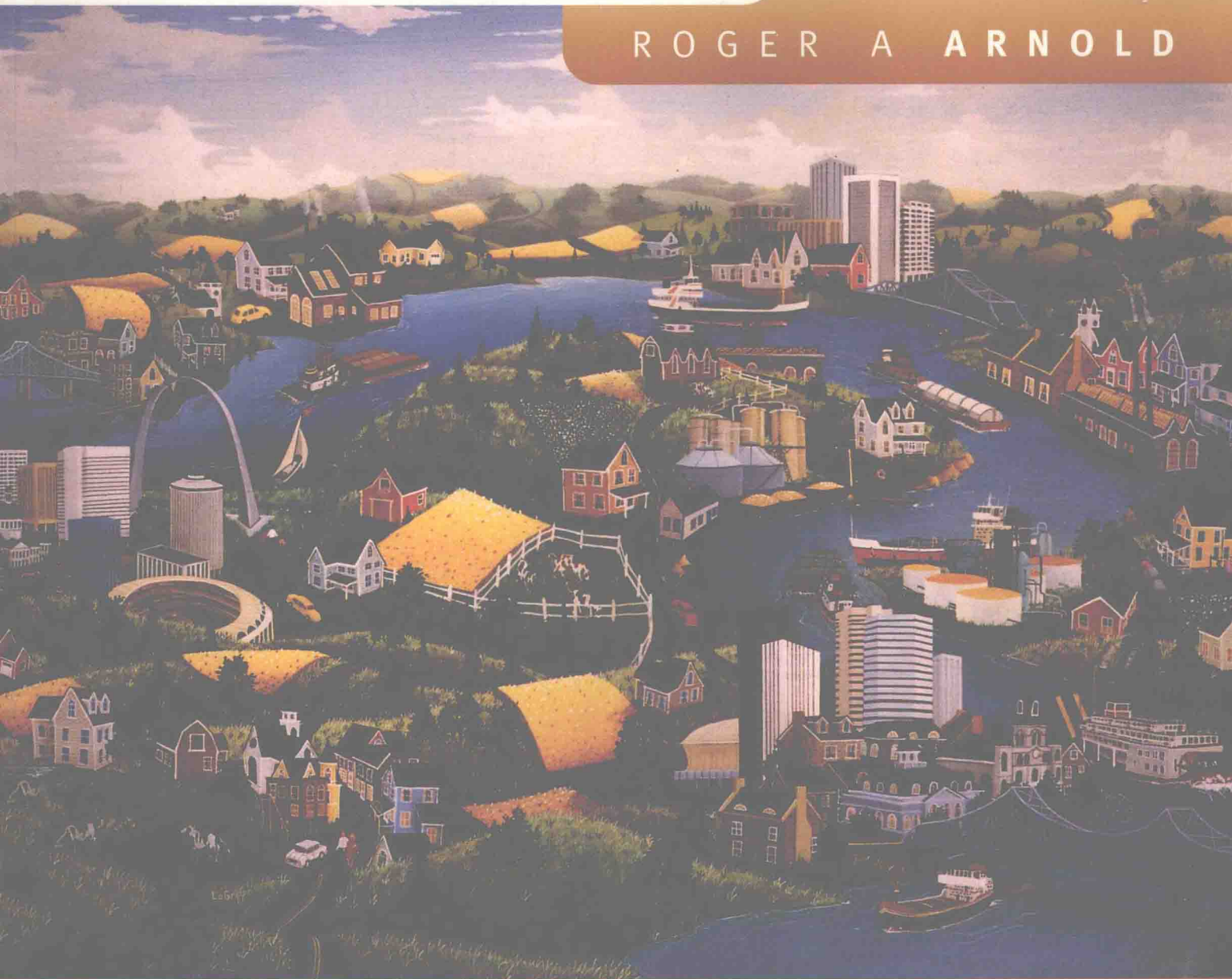


M I C R O
ECONOMICS

EDITION

5

ROGER A ARNOLD



Microeconomics

FIFTH EDITION

ROGER A. ARNOLD CALIFORNIA STATE UNIVERSITY, SAN MARCOS



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To Sheila, David, and Daniel

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PREFACE

To the Instructor

When I first started teaching the principles of economics course, I adopted one of the many introductory economics texts on the market at the time. I read it carefully, prepared my lectures based on what I had read, and then assigned the book to my students. The textbook worked fairly well in the classroom, but I knew that something was missing. So I adopted a different text the next semester. The second text worked about as well as the first, but still something was missing. Over the next few years, I changed textbooks at least six to eight times. Every time I came away with the same feeling: Something was missing.

Identifying What Was Missing

Finally, I tried to identify what was missing. All the theories and policies were there, the economic terms were defined completely, and the graphs were drawn properly—but I realized that *these textbooks didn't seem to communicate to students the excitement that I feel about economics*. To me, economics is a powerful tool of analysis that I can use to understand the world. I know that economics can be found almost everywhere—in the newspaper and on the television news, of course—but also walking across a college campus, buying a cup of coffee, or watching a prime-time television show.

I know that once a person learns how to think like an economist, he or she will never be the same. Somehow the textbooks that I was adopting for class didn't communicate these wonderful things to the students.

So I rewrote my lectures the way I wanted to teach economics—to communicate the power and excitement of economics. The result was that both the students and I were a lot happier, and the students learned a lot more economics. I then set out to do in a book what I was doing in the classroom.

What Makes This Book Different

If you are newcomer to *Economics*, at this point you may be scratching your head and saying, “Wait a minute, I’ve leafed through this book, and it looks much like other principles books: same diagrams, fairly standard topic coverage, etc. What is so different here?”

I agree that if you give this book only five minutes, it looks a lot like its competition. But having taught from many principles books, I’ve been *surprised how books that look alike can be so different*. Adopters of the past four editions of *Economics* seem to agree. When they write or talk to me, they often say they were *surprised* by the book.

“Surprised by what?” I ask. Surprised by the fact that it is one of the few textbooks they’ve adopted that the student actually reads.

They also say that they not only find it a more interesting textbook to teach from than most, but that their students ask more questions about economics having read this book than having read others, and that the reason they continue to use it is because it presents topics in a 1-2-3, logical way. Huge gaps aren’t left for the student to fill in.

Why This Book Works

I think the book works because it does three things well. First, it gets the students' attention. It does this by discussing and analyzing many of the things that today's college students want to talk about. Economics isn't only about economic growth, interest rates, and the theory of the firm. Economics is about driving on a freeway, watching a movie, listening to music, kissing, finding a parking space, watching a Las Vegas show, and much more.

I often receive e-mail from students and the most common remark they make is, "I didn't know economics was about so many different things. I thought I was going to dislike studying economics, but to my surprise, I don't."

The second reason I think the book works is that I make connections between things that students often don't realize are connected. I think that education is largely about making the invisible visible. If we, as instructors, can help students better understand the world they live in, then we have done our jobs. There is nothing more exciting than when a student reads the text and says, "I had no idea that an economic policy change halfway around the world could impact my chances of getting a job after college."

Finally, and perhaps most importantly, this book works because it conveys to students the power of the economic way of thinking. According to James Buchanan, the Nobel-prize winning economist, "what a science [such as economics] does, or should do, is simply to allow the average man . . . to command the heights of genius." I think this book leaves students with a true sense of intellectual enrichment upon completion of the course because it successfully communicates to students how economists think.

Almost every textbook states that it teaches students how to "think like economists." But I believe that most books fail to accomplish what they set out to do, not because the authors don't know how economists think and not because they fail to write clearly, interestingly, and compellingly. It's because most texts are too narrowly focused. The only way that students come to think like economists is by applying economics to hundreds of topics—many of which are of particular interest to them. In other words, one doesn't learn how economists think by applying economics to the handful of topics chosen by the professor. He or she learns how economists think by applying economics to almost everything in life. The representative student learns more about how economists think by applying economics to driving a car, sleeping, or watching a movie than by studying the mundane topics found in many introductory texts.

The economic concepts, theories, and ways of thinking in this textbook are not mine, of course. They belong to the economists of two centuries. It is from them that the student has to learn. My main objective in writing the first edition of the book was to make sure that I did not get in the way of students' learning. I've continually worked toward refining this objective in subsequent editions. To this end, I have attempted to present the truths, tools, and theories of great economists in a way that is clear, understandable, relevant, interesting, and exciting. It is only with this Fifth Edition that I believe I have fully accomplished what I originally set out to do. The Fifth Edition is better organized; the more difficult material is broken down into more manageable pieces; the features are more relevant to economics professors and their students; the economic way of thinking is more visible; there are more ways for the student to work with the material; and it is a much faster read.

Key Content Changes

Here are some of the major things that are new to the Fifth Edition of *Economics*:

GENERAL UPDATES & CHANGES

- More discussion of economics and technology.
- More discussion of economics in our everyday lives.

- More discussion of economics in popular culture.
- More and better integration of global economic issues throughout the text.
- More flowcharts that summarize key information and visually establish cause-effect relationships.
- More features to capture the interest and imagination of students.

- More interspersed questions and answers that address how economists think.
- A better means of identifying the key questions that economists try to answer.
- More numerical and graphical questions for the student to answer.

INTRODUCTORY CHAPTERS

- Two chapters on supply and demand, including a new chapter that applies supply and demand to both market and nonmarket behavior.
- A new chapter on exchange.
- More discussion and use of consumers' surplus and producers' surplus.

MICRO CHAPTERS

- A discussion of elasticity immediately following the discussion of supply and demand.

- The expansion of a theme first developed in the second edition—that microeconomics is about objectives, constraints, and choices. Much of the microeconomic discussion now centers around this trilogy.
- An emphasis on giving students an appreciation of how microeconomic tools can be used to answer questions relevant to both individuals and firms.
- A new discussion of network goods and network externalities.
- An expanded discussion of rent seeking.

INTERNATIONAL CHAPTERS

- A new discussion of optimum currency areas.
- An update of new policy initiatives.

Supplements

FOR THE STUDENT

Study Guide

by Roger A. Arnold

Each chapter explains, reviews, and tests for the important facts, concepts, and diagrams found in corresponding chapters of this book. Chapter parts include a chapter outline, multiple choice questions, problems and exercises, and a self-test. The Study Guide is also available in microeconomics and macroeconomics splits.

Economics Study Guide ISBN: 0-324-01900-9

Macroeconomics Study Guide ISBN: 0-324-01749-9

Microeconomics Study Guide ISBN: 0-324-01748-0

Practice Tests

by Scott Bloom of North Dakota State University

Each practice test allows students to test their knowledge of the chapter material before they take the assigned test in class.

ISBN: 0-324-01975-0

Graphing Exercises in Economics

by Roger A. Arnold

For the introductory economics student, the many graphs in economics may initially seem overwhelming. It takes time and practice to master the “language” of graphs. *Graphing Exercises in Economics* provides you with the practice you need to shorten the time it takes you to master this language. There are graphing exercises for 17 different topics, including supply and demand, the production possibilities frontier, perfect competition, monopoly, factor markets, and aggregate demand and aggregate supply.

ISBN: 0-324-05799-7

Student Study CD-ROM

This powerful study tool, available packaged with the text, provides additional software tools and learning support—helping you build your level of understanding even when you can't be online.

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Economics Alive! CD-ROMs

These interactive multimedia study aids for economics are the high-tech, high-fun way to study economics. Through a combination of animated presentations, interactive graphing exercises, and simulations, the core principles of economics come to life and are driven home in an upbeat and entertaining way.

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Microeconomics Alive CD-ROM ISBN: 0-538-84650-X

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The Wall Street Journal Edition

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InfoTrac College Edition

With InfoTrac College Edition, your students can receive anytime, anywhere, online access to a database of full-text articles from hundreds of scholarly and popular periodicals such as *Newsweek*, *Fortune*, *American Economist*, and the *Quarterly Journal of Economics*. Students can use its fast and easy search tools to find what they're looking for among the tens of thousands of articles—updated daily and dating back as far as four years—all in this single Web site. It's a great way to expose students to online research techniques, while being secure in the knowledge that the content they find is academically based and reliable. An InfoTrac College Edition subscription card can be packaged free with new copies of the Arnold text. Contact your South-Western/Thomson Learning sales representative for package pricing and ordering information, or for more information on InfoTrac College Edition, visit <http://www.swcollege.com/infotrac/infotrac.html>.

The Tobacco Wars

The Tobacco Wars, by Walter Adams (Michigan State University) & James W. Brock (Miami University of Ohio) presents the economic theory surrounding the tobacco litigation as a creative dialog between many key players in the debate—including tobacco industry executives, consumers, attorneys, economists, health care professionals, historians, and political activists. Their fictional conversations illustrate the real-life issues, controversies, and points of view currently at play, giving readers a balanced and provocative framework to reach their own conclusions. The text provides a unique way to illustrate microeconomic principles, such as:

- Consumer behavior
- Industrial organization and public policy
- Antitrust policy
- Externalities, social costs, and market imperfections

ISBN: 0-324-01296-9

The New York Times Guide to Economics

by Sliger, Jennings, and Murphy

This guide is a collection of the best economics related articles from *The New York Times* and can be used formally in the classroom or informally for life-long learning. All articles are accompanied by exploratory exercises and probing questions developed by experts in the field. Previews provide context for each chapter of articles and link them to key economic principles. The guide is divided into six sections organized to highlight critical factors in economics today. This organization allows for easy integration into any economics course. Also available are *The New York Times Guides*—for business communication, business law, economics, finance, management, and marketing.

ISBN: 0-324-04159-4

FOR THE INSTRUCTOR

Test Bank

The Test Bank has been revised by Bill Robinson of the University of Nevada, Las Vegas. There are more than 4,000 multiple-choice questions in the test bank; approximately 25 percent are new to this edition and many have been revised.

Macroeconomics Test Bank ISBN: 0-324-01972-6

Microeconomics Test Bank ISBN: 0-324-01971-8

ExamView Testing Software

ExamView—Computerized Testing Software contains all of the questions in the printed test banks. ExamView is an easy-to-use test creation software compatible with Microsoft Windows. Instructors can add or edit questions, instructions, and answers, and select questions by previewing them on the screen; selecting them randomly, or selecting them by number. Instructors can also create and administer quizzes online, whether over the Internet, a local area network (LAN), or a wide area network (WAN).

ExamView for Macroeconomics ISBN: 0-324-06498-5

ExamView for Microeconomics ISBN: 0-324-06497-7

Instructor's Manual

by Bill Robinson of University of Nevada, Las Vegas

The Instructor's Manual offers detailed lecture assistance, including an overview of each chapter, a list of chapter objectives, key terms, a detailed chapter outline with lecture notes, answers to end-of-chapter questions, and supplemental lecture and reading material.

ISBN: 0-324-01974-2

Transparency Acetates

More than 150 full color transparencies of key exhibits in the text are available for classroom use.

Macroeconomics Acetates ISBN: 0-324-05851-9

Microeconomics Acetates ISBN: 0-324-05852-7

Microsoft PowerPoint™ Presentation Slides

These slides include all exhibits from the textbook. They are available for downloading under "Teaching Resources" at the Arnold Web site: <http://arnold.swcollege.com>.

CNN Video

Professors can bring the real world into the classroom by using the CNN Principles of Economics Video Updates. This video provides current stories of economic interest. The video is produced by Turner Learning, Inc., using the

resources of CNN, the world's first 24-hour, all-news network. Ask your Thomson Learning sales representative for more details.

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ISBN: 0-324-05797-0

FOR STUDENTS AND INSTRUCTORS

The Arnold Economics Web Site

<http://arnold.swcollege.com> provides instructors and students with updates to the text, teaching and learning resources, and the opportunity to communicate with the author. All Internet addresses in the text are found at this site and are updated regularly.

South-Western Economics Resource Center

A unique, rich and robust online resource for economics instructors and students. <http://economics.swcollege.com> provides customer service and product information, teaching and learning tips and tools, information about careers in economics, access to all of our text-supporting Web sites, and other cutting-edge educational resources such as our highly-regarded EconNews, EconDebate, EconData, and EconLinks Online features.

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In Appreciation

This book could not have been written and published without the generous expert assistance of many people. A deep debt of gratitude is owed to the reviewers of the first through fifth editions. There are also many persons who assisted me in the writing of this book who were not reviewers. They suggested how to do something better, gave me an idea of how to rearrange material, suggested a topic to write about, and provided constructive and critical comments. For the fifth edition, these people include Robert W. Brown, James Bryan, Cindy Cannon, Karen Smith Conway, Mahmoud Davoudi, Hassan Pirasteh, Robert Rider, Charles D. Van Eaton, and Thomas Wyrick.

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One of the benefits of writing a book like this one is that you get to work with many creative people. In this regard, I owe a deep debt of gratitude to many persons at South-Western College Publishing for all the hard work and creative talent they brought to this project. These persons include Jack Calhoun, Vice President and Publisher; Keri Witman, Acquisitions Editor for Economics; Peggy Buskey, Production Editor; Jan Lamar, Senior Developmental Editor; Kurt Gerdenich, Media Technology Editor; Lisa Lysne, Senior Marketing Manager for Economics; Jennifer Mayhall, Art Director; and Cary Benbow, Photo Manager. I also wish to thank Barbara Sheridan, copyeditor, of Sheridan Publications Services, who not only made the text read smoother, but made many important suggestions as to how to make the book better.

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Roger A. Arnold



STUDENT LEARNING GUIDE

To the Student

As a 20-year-old college student, I went to an ophthalmologist to have my eyes examined. He placed several sets of lenses before my eyes and asked if I could see better with them. After doing this for about 15 minutes, he told me that I needed eyeglasses. When I first put my new glasses on, I thought, "There is so much to see." It was only after I had the glasses that I realized I hadn't seen as much as I should have been seeing.

I had a similar experience after learning economics. I recall my first few economics professors telling me that economics was an exciting subject that would help me understand the world I lived in. I also recall not paying too much attention to what they said. But as I learned more economics, I realized they were right. Without economics, I was blind to many of the things that I could easily see after studying it. In short, economics turned out to be much like my first pair of eyeglasses: it helped me to see what I had been blind to before.

There is no doubt about it: I would like for you to have the same thrilling experience learning economics that started for me many years ago and continues to this day. In fact,

if you don't have that experience, I have to some degree failed to meet my objective. But I can't do it alone. It takes you and me working together to make it happen. You have to have the motivation, interest, and patience to learn economics, and I have to present economics to you in as clear, relevant, and interesting a way as possible.

Before you begin your study of economics, it is important to know something about the road you are about to travel. That's what this preface is about. Let me tell you how you should read and study this book to get the most out of it. It is important that you know something about the structure of each chapter, and about the pedagogical devices used throughout.

Chapter Structure and Pedagogy

Keep in mind that an economics textbook is not a novel. It is easy to read a novel straight through without stopping.

It is not so easy to read a chapter of an economics textbook without stopping.

I've built numerous features into this book to help you read more actively—stopping frequently to absorb, apply, and test yourself on the material in each chapter.

AFTER YOU STUDY THIS CHAPTER, YOU WILL BE ABLE TO . . .

As you begin to read a chapter, you might wonder, "What topics are discussed in this chapter? What will I learn or be able to do after studying this chapter?" This feature responds to these questions. Keep the chapter objectives in mind as you read to help you pay close attention to the main ideas you should remember. Reviewing the chapter objectives after you've finished reading the chapter is a useful study tool in helping you determine whether or not you have indeed absorbed the chapter's central concepts.

way of thinking in this chapter and throughout the book.

AFTER YOU STUDY THIS CHAPTER, YOU WILL BE ABLE TO:

- 1 Identify many of the consequences of scarcity.
- 2 Explain how changes in opportunity cost affect behavior.
- 3 Explain what it means to think like an economist.
- 4 Discuss how theory is used in economics.
- 5 Explain how and why economists use the *ceteris paribus* condition.
- 6 Identify the components of scientific thinking.
- 7 State the difference between microeconomics and macroeconomics and between positive and normative economics.

YOU WILL ALSO LEARN:

Why young rock stars, movie stars, and fashion models rarely go to college.

What the amount you earn has to do with how long you sleep.

Why you're not likely to live with your parents and grandparents after you're in your twenties.

Quantity demanded is the number of units of a good that individuals are willing and able to buy at a particular price during some time period. For example, suppose individuals are willing and able to buy 100 TV dinners per week at the price of \$4 per unit. Therefore, 100 units is the quantity demanded of TV dinners at \$4.

Q: If a person is willing and able to buy a particular car at \$40,000, will she actually make this purchase?

A: Not necessarily. Willingness and ability to buy refers to the buyer, but both a buyer and a seller are required for an exchange to be made. A person may be willing and able to buy a particular car for \$40,000, but that car may not currently exist, or it may exist but the seller may not be willing to sell it for \$40,000.

of supply and demand, profits, production, costs, international trade, and competition. Both know the language of economics. It is becoming an increasingly important language for you to know, too.

Self-Test (Answers to Self-Test questions are in the Self-Test Appendix.)

1. Why do people and societies have to make choices?
2. Scarcity is the condition of finite resources. True or false? Explain your answer.
3. An economist said: "Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually slaves of some defunct economist." Who said this and what does it mean?

Thinking Like an Economist

seller would be willing and able to sell the ticket for is **producers' (or sellers') surplus**. For this trade, the producers' surplus is \$2. A seller prefers a large producers' surplus. The seller would have preferred to sell the movie ticket for \$8 and receive \$3 worth of producers' surplus.

Producers' (or sellers') surplus = Price received - Minimum selling price

Consumers' surplus and producers' surplus are important ideas in economics. Some of the ways they are used to analyze situations are considered in the following sections.

WILL A POLICY MAKE YOU BETTER OFF OR WORSE OFF?

Many different policies and laws are put into effect by governments and organizations each year. For example, the federal government may change its tariff policy and place a tariff (tax) on certain imported goods. Or it could subsidize the production of wheat, corn, or sugar. HMOs (Health Maintenance Organizations) may institute a policy in which they will pay for only some of the medicines you may need. The state legislators in your state may increase or decrease the tuition at a state-supported college or university. The federal government may block a merger between two major companies that produce and sell office supplies. When you hear about a new policy or law, you may naturally wonder, "How does this affect me? Will I be better off or worse off?"

To answer these questions, you need to remember that you do many things. You buy goods, you sell goods, you may work for a company, you may own your own business. In other words, you wear many hats. One day you wear the hat of a buyer, the next day, that of a seller. On any given day, you may wear both the hat of an employee and the hat of a buyer. As a buyer, there is an easy way to figure out how a policy will

RealityCheck



Is there any way to determine how much consumers' surplus a person receives from buying a ticket to see a movie?

Answer: You would need to find out the maximum price the person would be willing to pay for the ticket. Then the ticket price could be subtracted from this amount. If the person would tell you the truth, you could simply ask to find out the maximum price.

YOU WILL ALSO LEARN

This feature lists some of the more unusual and unexpected things you will learn by reading the chapter. When finished with the chapter, go back and review these additional learning objectives to make sure that you can apply the analytical skills you've learned in the chapter to explain how economics comes into play in each of these statements.

INTERSPERSED QUESTIONS AND ANSWERS

As you are reading, you may have some questions. This feature tries to anticipate the questions you might have. It then answers those questions. These questions and answers are placed at natural stopping places in each chapter.

SELF-TESTS

Frequent feedback plays an important role in learning new material, so a Self-Test is included at the end of each section of each chapter. The answers to the Self-Tests are at the end of the book. Don't skip over the Self-Test because you are in a hurry. Stop, take the test, and then check your answers. If you don't answer a question correctly, go back and reread the sectional material so that you can answer it correctly.

REALITY CHECK

You can use this feature to test your knowledge. A photo captures an issue in action. An accompanying question asks you to explore the economic implications. An immediate answer lets you make sure you are on the right track.

Utility

The satisfaction one receives from a good.

Good

Anything from which individuals receive utility or satisfaction.

Disutility

The dissatisfaction one receives from a bad.

Thinking Like an Economist

This section begins a discussion of the economic way of thinking. It is a discussion that will go on for the entire book.

THINKING IN TERMS OF SCARCITY AND ITS EFFECTS

Recall that *scarcity* is the condition in which our wants are greater than the limited resources available to satisfy them. But what are our wants? Our wants include anything that provides **utility** or satisfaction. In economics, something that provides utility or satisfaction is called a **good**. Something that provides **disutility** or dissatisfaction is

MARGIN DEFINITIONS

The first time you study economics, you have a lot to learn: language, concepts, theories, ways of thinking. This feature helps you to learn the language of economics.

All key economics terms are in bold type in the text and are defined alongside in the margins of the text.

To more effectively learn and understand these definitions, it is very useful to first read them, and then state in your own words what you just read.

http:

Go to <http://www.ebay.com>. Click on "New to eBay?" and use the links to read the information on browsing, bidding, and selling. Go back to the main page, select a category of interest, find an item you like and look at the bidding history. How does eBay affect the transactions costs of the bidders and sellers? What does the bidding process tell us about consumer surplus that shopping at a store with predetermined prices does not? The buyer can't be sure that the item offered for sale is exactly as described by the seller. How might this risk influence the bidding process?

into the mall, look in different stores, try on different clothes, pay for the items, get back in his car, and drive home. Suppose Kurt spends an average of 2 hours when he shops and he estimates that an hour of his time is worth \$30. It follows, then, that Kurt incurs \$60 worth of transaction costs when he buys clothes. Usually, he is not willing to incur the transaction costs necessary to buy a pair of trousers or a shirt.

Now, suppose we ask Kurt if he would be more willing to buy clothes if shopping were easier. Suppose, we say, the transaction costs associated with buying clothes could be lowered from \$60 to less than \$10. At lower transaction costs, Kurt says that he would be willing to shop more often.

How can transaction costs be lowered? Both people and computers can help lower the transaction costs of exchanges. For example, real estate brokers lower the transaction costs of selling and buying a house. Jim has a house to sell but doesn't know how to find a buyer. Karen wants to buy a house but doesn't know how to find a seller. Enter the real estate broker, who brings buyers and sellers together. In so doing, she lowers the transaction costs of buying and selling a house.

As another example, consider e-commerce on the Internet. Ursula can buy a book by getting in her car, driving to a bookstore, getting out of her car, walking into the bookstore, looking at the books on the shelves, taking a book to the cashier, paying for it, leaving the store, getting back in her car, and returning home. Or, Ursula can buy a book over the Internet. She can click on one of the online booksellers, search for the book by title, read a short description of the book, and then click on 1-Click Buying. Buying on the Internet has lower transaction costs than shopping at a store because online buying requires less time and effort. Before online book buying and

http:

This Internet feature is placed in the margins of the text. It points you to a Web site address at which you can find information that relates to the discussion of the material in the text. You can use this feature to enhance your understanding of the chapter, as a starting point for research, or just to check out some interesting, real-world applications of economics.

Thinking Like an Economist

THINKING LIKE AN ECONOMIST

Most economics instructors believe that a primary goal of this course is to teach you how economists think. There's more to thinking like an economist than knowing the concepts and technical tools of analysis. There's a special way of looking at situations, events, decisions, and behavior. Pay attention to this feature in each chapter—it will give you unique insight into the economist's mind, allowing you to see how interesting issues are approached from an economic perspective.

APPLICATIONS FEATURES

Read the boxed features (*Economics in Everyday Life*, *Economics Around the World*, *Economics and Technology*, *Economics in Popular Culture*) in each chapter. Often students will gloss over the boxed features because they think they are irrelevant to the discussion in the main body of the text. Nothing could be further from the truth. The boxed features often apply the tools, concepts, and theories discussed in the main body of the text. Without these applications, economics may initially seem dry and abstract. To dispel the notion that economics is simply about inflation, unemployment, costs of production, profit, economic growth, monetary and fiscal policy, and so on, I have included these applications features to show you some of the interesting, everyday things that economics is about. Economics, as I hope you will soon learn, is about many more things than you have ever imagined.

Make use of the **Think About It** and **On the Internet** activities that accompany the boxed features. These activities will help you hone the analytical skills you'll need to do well on exams.

economics in everyday life

Does How Much You Sleep Depend on How Much You Earn?

Most people realize that economics affects many areas of their lives. For example, the state of the economy is often thought to be a conscious choice in response to changing economic incentives.¹ In other words, the amount of time a person sleeps may not be a person may sleep, but additional sleep costs a person time or six hours? opportunity cost of influences how much a person sleeps. To Biddle and her wage rates.

economics around the world

Why You're Not Likely to Live with Your Parents and Grandparents in Your Twenties

People in different countries have different customs and traditions. In India, the extended family is customary. When a man in addition, the Indian government does not provide a retirement program comparable to Social Security. Company pension in India than and retirement in the United States. In their for- aged parents if the opportunity to sleep eight hours. Your final grade. Are more because the benefits you.

economics and technology

Can Technology on the Farm Affect the Number of Lawyers in the City?

There is no doubt that an advance in technology affects the industry in which it is developed and used. For example, a to produce more food, thus releasing some farmers to produce other things. In other words, there may be more services in the legal advances, it the composition in agriculture working in rural people working in suburbs. (Is due in part to the opportunity cost of attending college. An economist would put it this way: The opportunity costs are sufficiently high for the individual that the benefits of attending college are outweighed by the costs.

economics in popular culture

Why Young Rock Stars, Movie Stars, and Fashion Models Rarely Go to College

Look around your class. Are there any popular rock stars or rap artists between the ages of 18 and 25 in your class? Any movie stars? Any supermodels? Probably not. The reason has nothing to do with these people not wanting to attend your particular college or university. It has to do with the opportunity cost of their attending any college or university.

What does it cost you to go to college? Most people would answer by citing the tuition cost. If you pay \$1,000 a semester for eight semesters, the tuition amounts to \$8,000. However, \$8,000 is not the full cost of attending college because if you were not a student, you could be earning income working at a job. For example, you could be working at a full-time job earning \$25,000 annually. Certainly this \$25,000, or at least part of it if you are currently working part-time, is forfeited because you attend college. It is part of the cost of your attending college.

Even if the tuition cost is the same or nearly the same for everyone who attends your college, the opportunity cost of attending is not the same or nearly the same for everyone. What would an 18-year-old movie star be forfeiting in unearned income by attending your college? What would a 17-year-old fashion model be giving up in income? Such persons rarely attend college even though the tuition cost would be easy for them to pay. They don't attend college because of the relatively high opportunity costs. They might say that they "can't afford to attend college." This doesn't mean that they can't afford the tuition, but that they don't want to give up the large income they earn by not attending college.

Think About It

In a way, this feature points out the difference between the price of something and the cost of something. Explain.

On the Internet

At <http://www.census.gov> click "Income" under the People category and then select the most recent year for "Money Income in the United States (P60-2001)." Next, click the table "Median Earnings" (with the notation of selected characteristics). What are the median earnings of a person with some high school, but no degree? A high school diploma? A bachelor's degree? A doctorate? Make a rough calculation of the opportunity cost of your entire undergraduate degree. How many years will it take to earn back the cost of your degree, assuming you are average?

Here are some of the things that economics (in this text) has a lot to say about:

- how much you sleep
- parking congestion at your college campus
- the number of friends you have
- prices at Disneyland
- kissing
- the Mafia
- how professors teach
- speeding tickets
- living with your parents
- Hollywood
- fashion models
- tipping at a Las Vegas show
- drug busts

GRAPHS & EXHIBITS

Take your time with the diagrams. An introductory course in economics is full of diagrams, and they are central to communicating economic material. The sooner you learn to “think diagrammatically,” the more quickly and thoroughly you will learn economics. The way you learn to think in diagrams is to work with them. Read the caption, identify the curves that are mentioned in the text, explain to yourself what they mean when they shift right and left, and so on. Every diagram tells a story; learn what that story is. I’ve tried to make your job in working with diagrams as easy as possible:

■ Graphs

I’ve carefully used consistent colors, shaded arrows to show movement, multistep formats, and boxed explanations to make it easy for you to visually interpret important economic concepts at a glance.

rackets and tennis balls are used together to play tennis. If two goods are complements, as the price of one rises (falls), the demand for the other falls (rises). For example, higher tennis racket prices will decrease the demand for tennis balls, as Exhibit 4b shows. Other examples of complements are cars and tires, light bulbs and lamps, and golf clubs and golf balls.

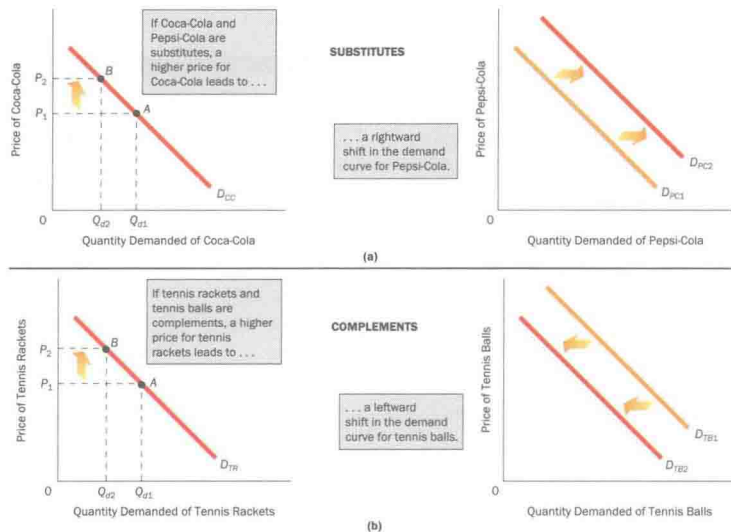
If $P_A \uparrow$ and $D_B \downarrow$, then A and B are complements.
If $P_A \downarrow$ and $D_B \uparrow$, then A and B are complements.

Number of Buyers The demand for a good in a particular market area is related to the number of buyers in the area. The more buyers, the higher the demand; the fewer buyers, the lower the demand. The number of buyers may increase owing to a higher

Exhibit 4

Substitutes and Complements

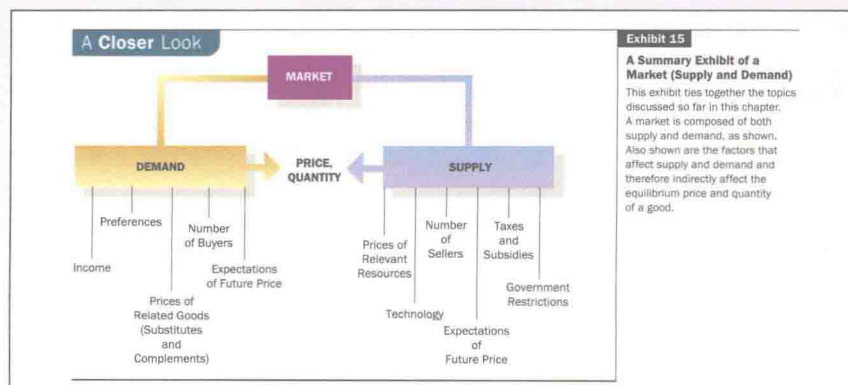
(a) Coca-Cola and Pepsi-Cola are substitutes: The price of one and the demand for the other are directly related. As the price of Coca-Cola rises, the demand for Pepsi-Cola increases. (b) Tennis rackets and tennis balls are complements: The price of one and the demand for the other are inversely related. As the price of tennis rackets rises, the demand for tennis balls decreases.



Supply, Demand, and Price: The Theory Chapter 3 | 63

■ A Closer Look

For many students, the difficulty of economics is seeing how it all fits together. Use these special diagrams to more easily understand how the separate pieces of the puzzle fit together to form a cohesive picture of complex interrelationships. Flow diagrams and other unifying devices are used to help you identify cause-effect relationships and clarify the connections between concepts.



END-OF-CHAPTER MATERIAL

Chapter Summary

Each chapter ends with a detailed and categorized summary of the main topics in the chapter. It's a useful refresher before class and a good starting point for studying.

Questions and Problems

Each chapter ends with numerous questions and problems. Be sure to answer all the questions at the end of each chapter. You never really know how well you have learned economics until someone calls upon you to answer a question. If we can't use what we have read and studied to answer a question, we have to wonder if we learned anything in the first place.

Working with Numbers and Graphs

Each chapter ends with a few numerical and graphical problems. Being able to numerically and graphically analyze economic ideas really helps solidify conceptual understanding.

Key Terms and Concepts

A list of key terms concludes each chapter. If you can define all these terms, you have a good head start on studying.

Can You Find the Economics?

Economic Connections to You and **Can You Find the Economics?** are short features at the end of the chapters. **Economic Connections to You** requires you to identify how economic facts, actions, and changes (discussed in the chapter) affect you. **Can You Find the Economics?** requires you to find the economic content in a setting that, at first glance, may not seem to have any economic content. Both of these features challenge you to apply your newly acquired economic analysis skills.

Internet Activities

Each chapter ends with Web activities, helping you broaden your understanding of the chapter by applying what you've learned to interpreting economic data on the Internet.

Chapter Summary

Economics

Economics is the science of scarcity. It is the science of how individuals and societies deal with the fact that wants are greater than the limited resources available to satisfy those wants.

Scarcity and Related Concepts

Scarcity implies choice. In a world of limited resources, we must choose which wants will be satisfied and which

Thinking Like an Economist

In this chapter, we stated that economists think in terms of (1) scarcity and its effects, (2) opportunity costs, (3) what would have been, (4) costs and benefits, (5) decisions made at the margin, and (6) unintended effects.

Theory

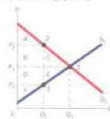
Economists build theories in order to explain and predict real-world events. Theories are necessarily abstract

Questions and Problems

1. What makes the theory of supply and demand so useful?
2. What is the "invisible hand" of the market? Explain.
3. Identify a few things we should not do if it is true that the demand curve for housing is downward sloping.
4. If Smith and Jones have the same demand for oranges, does it follow that they will buy the same number of oranges per year? Explain your answer.
5. Supply and demand curves can be used to get the same price of spending. Explain the two ways.
6. "Self-interest is not inconsistent with the satisfaction of natural desires." Do you agree or disagree? Explain your answer.
7. Supply and demand curves are identical. Explain Smith's behavior.
8. Explain why a \$1 tax placed on the production of good A eventually raises the supply curve of good B by the \$1.
9. What do the applications about housing, congestion, airport parking, oil slicks, cheese, and Las Vegas demonstrate about economics?
10. Why might Las Vegas "buy" a change in the equilibrium price for the good when it is their choice?
11. Harvard, Stanford, and Yale all charge relatively high tuition. MIT, each uses MIT and SAT scores as admission criteria. Is changing a relatively high tuition and using standardized test scores (as admission criteria) inconsistent? Explain your answer.
12. How can differences in relative prices be used to explain behavior?

Working with Numbers and Graphs

1. The probability of getting caught for speeding falls from 10 percent to 5 percent. The price of a speeding ticket is \$100 when the probability of getting caught for speeding is 5 percent. If the price of speeding is the same at both probabilities, then what must the price of a speeding ticket have been when the probability of getting caught was 10 percent?
2. In the following figure, equilibrium price is P_1 before a percent rise in the price of the good. If P_2 is \$1 and P_3 is \$10, does it follow that the rise is \$1? Explain your answer graphically.



Applications of Supply and Demand Chapter 4 | 123

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Microeconomics deals with human behavior and choices as they relate to relatively small units—an individual, a firm, an industry, a single market. Macroeconomics deals with human behavior and choices as they relate to the entire economy.

Economic Categories
Positive economics attempts to determine what is, not what economists address what should be.

Key Terms and Concepts

Scarcity	Labor	Abstract
Economics	Capital	Fallacy of Composition
Economic Analysis	Entrepreneurship	Opportunity Costs
Utility	Rational Decision	Positive Economics
Good	Opportunity Cost	Normative Economics
Disutility	Decisions at the Margin	Microeconomics
Bad	Theory	Macroeconomics
Land		

Economic Connections to You

A storm, driven into a lake, creates ripples. The ripples move away from where the storm entered the lake. Similarly, economic facts, actions, and changes create ripples that move away from their point of origin. Economists study ripples to understand how and why they occur.

Before you read each story of your own, consider the ripple effect. How do you think the ripple effect will affect you?

Based on the material in this chapter, identify which ripple in which economic facts, actions, and changes create ripples that eventually affect you.

Questions and Problems

1. The United States is considered a rich country because Americans can choose from an abundance of goods and services. How can there be scarcity in a land of abundance?
2. Give two examples for each of the following: (a) an intangible good, (b) a tangible good, (c) a bad.
3. What is the difference between the wants of a person and the wants of a nation?
4. Explain the link between scarcity and each of the following: (a) choice, (b) opportunity cost, (c) the need for a rationing device, (d) competition.
5. Is it possible for a person to incur an opportunity cost without spending any money? Explain.
6. Discuss the opportunity cost of attending college for four years. Is college more or less costly than you thought it was? Explain.