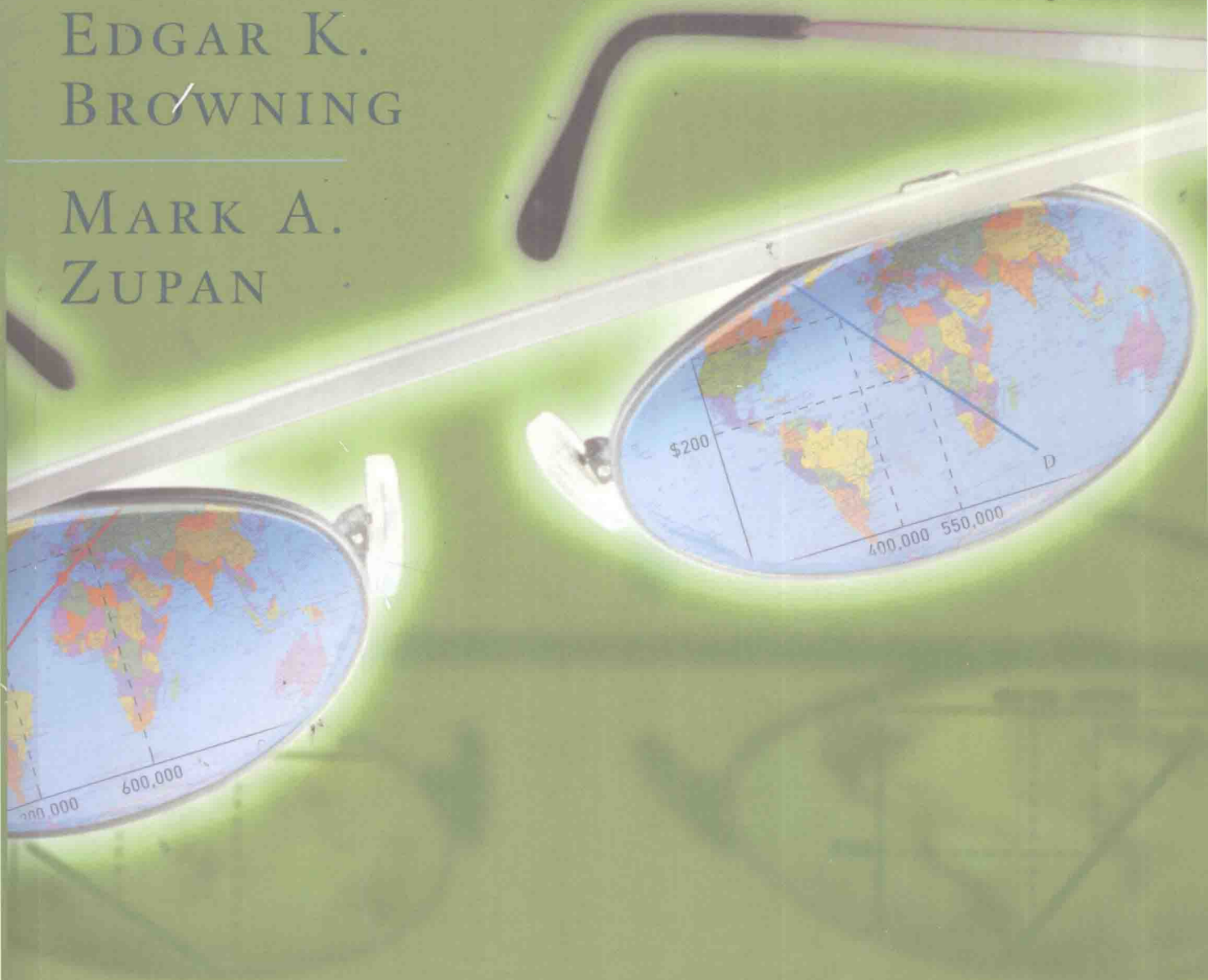


EDGAR K.
BROWNING

MARK A.
ZUPAN



Microeconomics

Theory & Applications

9TH EDITION

Microeconomics: Theory & Applications

Ninth Edition

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Texas A&M University

● Mark A. Zupan

University of Rochester



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Preface

According to certain labor unions, traditional retailers, and community groups, Wal-Mart imposes significant costs on society. Among the asserted costs are the destruction of jobs in competing stores, driving of employees toward public welfare systems by paying lower wages and providing limited health care coverage, and the fostering of urban sprawl. Arrayed against these claimed costs are the benefits generated by Wal-Mart through the employment of a large number of workers (Wal-Mart now is the largest private sector employer in the United States) and the promotion of lower retail prices for consumers.

How can one assess the validity of the claims made by Wal-Mart's critics? Moreover, is the combined magnitude of costs associated with Wal-Mart sizable enough to outweigh the benefits generated by the retailing giant? A thorough knowledge of microeconomics can help answer topical questions such as these and, more broadly, gives students an understanding of how markets operate and also helps students see the world through the eyes of an economist.

Our intention with this edition of the text is to give students the fundamental tools of analysis and to show how the tools can be used to explain and predict market phenomena. To this end, we present basic microeconomic principles in a clear, thorough way, using numerous applications to illustrate the use of theory and to reinforce students' understanding of it.

We believe that microeconomics is the most important course in the undergraduate economics curriculum. We also believe that understanding microeconomics provides an essential foundation to any bachelor's or master's degree business student. As a result, our text is written so that both economics and business students will learn microeconomic theory and how to use it correctly.

Organization and Content

The ninth edition of *Microeconomics: Theory and Applications* continues to reflect our belief that it is better for students to be exposed to thorough coverage of fundamental microeconomic concepts and techniques than to skim through a superficial treatment of a great number of topics, many of which they will never encounter again. The enthusiastic reception given the first eight editions suggests that a large number of instructors also share this view. Apart from the emphasis on the core principles of microeconomics and how to use them, the text is by and large conventional in structure and organization except for one feature: Four chapters are devoted exclusively to applications. These are Chapter 5, "Using Consumer Choice Theory"; Chapter 10, "Using the Competitive Model"; Chapter 15, "Using Noncompetitive Market Models"; and Chapter 18, "Using Input Market Analysis."

A distinguishing feature of the text is the attention we give to input market analysis. Traditionally, this has been a weak area in most microeconomics texts, with seldom more than two, and frequently only one, chapter(s) on the subject. Yet in a fundamental quantitative sense, input markets and product markets are of equal importance,

because the sum of incomes generated in input markets (national income) equals total outlays on goods and services (national product). Moreover, public policy issues relating to input markets have become increasingly important, as suggested by the recent attention given to managerial compensation, income distribution, welfare programs, discrimination, comparable worth, interest rates and investment, Social Security, and minimum wage legislation. Consequently, we devote three chapters to the subject of input market analysis (Chapters 16 through 18).

Because all microeconomics courses are not taught the same way, the text is designed to give instructors great flexibility in adapting the book to their requirements. For example, in a short course emphasizing the theoretical underpinnings of partial equilibrium analysis, the instructor might cover only Chapters 1 through 4, 7 through 11, 16, and 17. A longer, more theoretically oriented course could include all chapters except that most instructors will steer a middle course and select three or four applications from each of these chapters (the way we normally use the material). In addition, instructors can either assign the applications as they appear in the text—following the development of the theory—or integrate them into their presentations of the theory chapters.

Applications

We believe that a large dose of applications is an essential ingredient in any microeconomics course. Although economists know that microeconomics is important and often exciting, students occasionally need to be convinced that this is so. Applications serve this purpose. In addition, they enliven the subject for students and help them better appreciate the theory. Time permitting, the more applications covered, the better prepared students will be to use the theory on their own.

Each of the four applications chapters (Chapters 5, 10, 15, and 18) contains four to seven longer applications that use and reinforce the graphical and logical techniques developed in the theory chapters. In Chapter 10, for example, the competitive model is employed to analyze taxicab licensing, airline regulation, and international trade. In Chapter 18, “Using Input Market Analysis,” the theory is applied to discrimination, the incidence of the Social Security payroll tax, and the effects of the National Collegiate Athletic Association on college football players.

Applications are not relegated exclusively to the four applications chapters; all other chapters contain several shorter applications. We feel, however, that it is appropriate to use more applications in some areas than in others. For example, it seems a misallocation of limited textbook space to include as many applications for general equilibrium theory as for the competitive and monopoly models. Not only are the applications in the latter two areas likely to be more interesting to students, they are also likely to provide more useful background for students’ later work.

Changes in the Ninth Edition

Based on comments from users and reviewers of the eighth edition, as well as our own desire to further improve the text, we have revised it in four important ways. These ways are aimed to enhance the hallmarks of the text: namely, the wealth of

real-world illustrations of microeconomic theory at work; clarity of exposition; the addition of optional mathematical sections at the end of each chapter for those students who are more mathematically inclined; the development of a softcover version that provides all of the same intellectual content but in an easier to carry and considerably more affordable format; and a commitment to coverage of cutting-edge concepts and applications.

Only the Best Applications (and More of Them)

When asked to identify strengths of this text, reviewers and users overwhelmingly cite the applications—the four chapters devoted to longer illustrations of microeconomic theory at work as well as the 120-plus shorter applications sprinkled throughout other chapters. To continue building on this hallmark of our text, we rely on a systematic rating system whereby we ask reviewers to evaluate each of the applications. Based on their responses, we have added 20 new applications in this edition. The topical issues they address include the reasons for the recent rise in housing prices in the United States, especially in localities such as the San Francisco Bay Area; whether cell phone use while driving should be banned; the economic and accounting costs of the Sarbanes–Oxley (SOX) Act intended to enhance corporate governance; the hidden costs of our Social Security system, including its impact on saving; the reasons for a cross-border “grey” market in pharmaceutical drugs; asymmetric information and online dating; efficient ways to deal with telemarketing; an explanation for why the average take-home pay of dentists has been increasing relative to the average take-home pay of other types of doctors and the impact this has had on the average hours worked by dentists versus other types of doctors; why Americans are getting fatter; and the effects of outsourcing on the net well-being of Americans.

We have retained (and enhanced, whenever possible) the top 80 percent of the applications in the previous edition. These cover topics such as: why company health benefits are tax exempt; why cigarette company profits did not get smoked by a recent \$246 billion punitive damages award; an explanation for why getting an appointment with a doctor can take so long; the rise of online and mail-order shopping; compensating wage differentials for “glowboys”—individuals who fix steel pipes in aging nuclear power plants; monopsony in Major League baseball; why price ceilings are proving deadly to individuals seeking an organ transplant; the returns to investing in a BA and an MBA; and the benefits of being attractive when it comes to the wages earned by male and female workers.

By culling the cream of the applications from the preceding edition and adding numerous interesting demonstrations of the way microeconomic theory can be used to explain and predict real-world phenomena, we’ve made the book’s outstanding feature—its applications—stronger than ever in this revision.

Clarity of Exposition

A second key feature of the text consistently noted by adopters and reviewers is its clarity of exposition. To strengthen this feature, we have looked carefully at each chapter—applying Occam’s razor to make our explanations as straightforward and clear as possible. One telling manifestation of the care that has been applied is that the actual text (not counting the cover) is approximately a full pound lighter than the comparable text of our closest market competitors notwithstanding being as thorough in the topics covered. The expositional clarity we believe translates into an important benefit for students of microeconomics—superior comprehension.

To enhance the readability of the text, we have also made three important expositional improvements in this edition. First, we have increased the size of the typeface slightly based on reviewer feedback. Second, we have added a larger number of sub-headings so that the sequence of key concepts covered is more readily apparent to the reader. Third, also based on reviewer input, we have avoided, wherever possible, bunching together shorter applications so as to make sure that the reader is not distracted from the central points being made by the text.

End-of-Chapter Optional Mathematical Sections


At the suggestion of a sizable number of reviewers and users of the text, we have moved the material formerly relegated to an appendix at the end of the book to smaller sections at the end of each relevant chapter. In this manner we hope to better supplement the intuitive, geometric, and/or algebraic explanations that have traditionally been employed by our text with a calculus-based approach for teachers and students who prefer a stronger mathematical grounding. While these sections can be treated as optional ones by the less-mathematically inclined, reviewer and user input indicate that their placement in the main body of the text is bound to represent a net improvement.

Providing Exceptional Value

As most faculty and students are well aware, textbook prices have been increasing steadily in real terms over the past few decades. This trend has negatively impacted the odds of a student actually purchasing an assigned text and thereby adversely affected the learning process.

To provide a meaningful solution to the problem of rising real textbook prices, we have shifted to a soft-cover binding with this edition. Importantly the ninth edition provides all of the same intellectual content as its preceding versions but in an easier-to-carry and considerably more affordable format. We look forward to the benefits that this exceptional value will imply for students and faculty as well as the overall learning process and are proud to be a market leader in promoting such an enhancement.

A Commitment to the Cutting Edge

In addition to the new applications, we are also pleased to report that students can use  with this edition. Aplia, founded by economist Paul Romer is the first web-based company to offer interactive problem sets, news analyses, tutorials, and economic experiments designed to save time for professors and encourage students to exert more effort in their learning. Interested faculty are encouraged to contact Aplia (sales@aplia.com) for more details. For a preview of Aplia materials, visit <http://www.aplia.com>.

Also, students have access to Excel-based tutorials relating to 16 of the key microeconomic concepts covered by our text through the companion Web site of www.wiley.com/college/browning. These concepts are typically covered in the Intermediate Microeconomics one-semester course and they enable students to manipulate the graphical presentations so they can actually see the concepts in action as they change the input values associated with each tutorial.

Pedagogical Aids

Several other in-text pedagogical aids help students to structure and retain information.

Chapter Outlines and Learning Objectives

Each chapter begins with an outline as well as a list of key learning objectives. These offer a preview of the chapter content and help structure study and review.

Glossary

A running glossary has been added in the margins of the text as a way to cement students' understanding of key concepts and terms. A complete glossary is also included at the end of the book.

Graphs

We have paid careful attention to the graphs used in the text. Unusually thorough explanations of graphs are given. Furthermore, the explanatory captions and liberal use of color will help students follow the text discussion and understand graphical analysis.

End-of-Chapter Aids

A summary at the end of each chapter highlights the important points of the chapter to help students review their knowledge of the basic material. More than 450 review questions and problems test students on chapter material and require them to solve analytical exercises. Answers to questions and problems with asterisks are provided at the end of the book.

Online Ancillaries

An online *Study Guide*, prepared by John Lunn, Hope College, is available through the PLUS course for this book. These student resources include chapter-by-chapter analysis of key concepts, review questions, multiple-choice questions, and discussion questions, problems, and answers to give students further review and practice in the use of microeconomic theory.

An *Instructor's Manual*, written by the text authors and Brian Kench, University of Tampa, also accompanies the text. Each chapter in the manual features a chapter outline, general comments on the chapter, specific section-by-section comments, and suggestions that may help in developing lectures and class discussion topics. The Appendix in the Instructor's Manual contains the answers to those questions and problems in the text that are not already answered at the end of the text.

Lecture slides in Powerpoint, prepared by Della Sue Lee of Marist College, provide notes for all chapters with enlarged versions of all the figures contained in the text. This set can be used to create overhead transparencies for viewing in the classroom or they can be copied and used as handouts for students.

The *Test Bank* prepared by Mark Foley, Davidson College, contains 1,500 multiple-choice questions with answers. This Test Bank, which is also available electronically, shows instructors how to customize their exams. *WileyPLUS* is also available with the text.

A dedicated Web site with extensive resources for both students and professors (<http://www.wiley.com/college/browning>) is also available.

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Special mention should be made of the late Jacqueline M. Browning, who was the co-author of the first four editions. Her pedagogical skills, together with her insistence that the text be one from which students could learn effectively, continue to have a profound influence in the present edition.

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This book is dedicated to our loved ones without whose unflinching encouragement and support our vision for the book would have never become a reality.

Edgar K. Browning
 Mark A. Zupan

TAKE A CLOSER LOOK AT “A BOOK THAT WORKS”

Instructors who use Browning/Zupan often describe it as “a book that works.” In preparing the ninth edition, we set out to learn exactly what users of the book mean when they describe it this way. In the guided tour of the book that follows, we’ll describe what we learned: that when adopters say Browning/Zupan is a book that works, they are referring to the simple clear presentation of the book, the thorough way that concepts are developed in the graphs and the way applications are used to incite student interest. Here are some examples.

Preface

According to certain labor unions, traditional retailers, and community groups, Wal-Mart imposes significant costs on society. Among the asserted costs are the destruction of jobs in competing stores, driving of employees toward public welfare systems by paying lower wages and providing limited health care coverage, and the fostering of urban sprawl. Arrayed against these claimed costs are the benefits generated by Wal-Mart through the employment of a large number of workers (Wal-Mart now is the largest private sector employer in the United States) and the promotion of lower retail prices for consumers.

How can one assess the validity of the claims made by Wal-Mart’s critics? Moreover, is the combined magnitude of costs associated with Wal-Mart sizable enough to outweigh the benefits generated by the retailing giant? A thorough knowledge of microeconomics can help answer topical questions such as these and, more broadly, gives students an understanding of how markets operate and also helps students see the world through the eyes of an economist.

Vivid and lively writing.

From the first words of the preface to the end of the book, the authors bring microeconomics to life. Even complex material is presented in a way that today’s students can handle and appreciate.

5.3 Paying for Garbage

The Borough of Perkasee, a small Pennsylvania town, had a problem: throughout the 1980s its trash collection costs rose rapidly.⁷ The local government devised an innovative solution to the problem by changing the way residents paid to have their trash picked up. Historically, Perkasee residents paid a fixed annual fee of \$120 per residence for garbage collection, a system of payment typical of many U.S. communities. Under the new plan introduced in 1988, there is no annual fee but garbage is picked up only when it is placed in specially marked, black plastic bags. The bags are sold by the town at a price greater than their cost; for example, each large bag costs \$1.50. The net revenue from sale of the bags (revenue less the cost of the bags to the town) is used to finance the town’s trash collection services.

This change in the system of paying for garbage collection produced some dramatic effects in Perkasee. The amount of trash collected dropped nearly 50 percent, the average household spent about 30 percent less on garbage collection, and the town saved 40 percent on its garbage collection costs. Why did these changes occur? The answer lies in considering the incentives faced by households under the two payment systems. With a fixed annual fee, households faced an effective price of zero for the trash collection service: if a household doubled the amount of its trash, it bore no additional cost. In effect, the fixed fee gave no incentive to cut down on the amount of trash generated. By contrast, under the bag system, when more trash is generated, more bags have to be purchased and house-

APPLICATION 14.5

Asymmetric Information and Internet Dating

Online dating is the most widely subscribed Internet business. Over 40 million Americans participate annually in dating “markets” such as JDate.com, eHarmony.com, Yahoo Singles, Friend Finder, Match.com, ChristianSingles.com, Gay.com, and LatinMatcher.com.

Certainly, information on Internet dating sites is imperfect and asymmetrically possessed by the various participants. For example, Internet daters appear to be richer, blonder, trimmer, and better-looking than average—at least if the profiles posted by daters are to be believed. Internet daters (male and female) report being one inch taller than the national average. Roughly 70 percent claim to have “above-average” looks. Of online daters, 4 percent report earnings over \$200,000 annually versus 1 percent for Internet users in general. The average female online dater reports being twenty pounds lighter than the national average, and 28 percent say they are blond—a number much higher than the national average. According to economist Steven Levitt and journalist Stephen Dubner in their book *Freakonomics*, this indicates: “a lot of dyeing, lying, or both.”¹⁰

While information is imperfect in online dating, market responses work to curtail (although probably not entirely) the severity of any associated “lemons” problem. For example, online dating services provide means for participants to screen prospective partners through the posting of pictures, allowing for the exchange of e-mail

or voice-mail messages, and facilitating background checks through Internet-based firms such as Web Detective. Males who fail to provide a picture generate roughly one-fourth as many inquiries as those who do; a female who doesn’t include her photo gets one-sixth the volume of e-mail. According to Levitt and Dubner:¹¹

A low-income, poorly educated, unhappily employed, not-very-attractive, slightly overweight, and balding man who posts his photo stands a better chance of gleaning some e-mails than a man who says he makes \$200,000 and is deadly handsome but doesn’t post a photo. There are plenty of reasons someone might not post a photo—he’s technically challenged or is ashamed of being spotted by friends or is just plain unattractive—but as in the case of a brand-new car with a for-sale sign, prospective customers will assume he’s got something seriously wrong under the hood.

In addition, the efficacy of online dating markets cannot be determined in a vacuum and must ultimately be judged relative to other means for individuals to find suitable prospective romantic matches. As anyone who has relied on non-Internet-based singles scenes such as bars, gyms, supermarkets, and hardware stores knows, online dating offers users some very attractive features in terms of the number of prospective partners one can search over in relatively little time and at minimal expense and in the comfort and security of one’s own home. This likely explains why online dating has proven to be such a popular Internet service.

¹⁰Steven D. Levitt and Stephen J. Dubner, *Freakonomics* (New York: HarperCollins, 2005), p. 81. This application is based on a 2004 University of Chicago working paper co-authored by Dan Ariely, Gunter J. Hitsch, and Ali Hortaçsu and overviewed by Levitt and Dubner in their best-selling book. The Ariely, Hitsch, and Hortaçsu working paper focuses on 30,000 users of online dating services, half in Boston and half in San Diego.

¹¹*Ibid.*, p. 82.

Relevant examples and lots of them.

The book shows students why the concepts of microeconomics are important and relevant to their lives by using over 120 current, high-interest applications to illustrate the concepts.

14.5 Adverse Selection and Moral Hazard

Our analysis of asymmetric information has emphasized markets in which consumers have less information than sellers. In some important instances, for example, insurance markets, it is the firms that are less well informed.¹² Our discussion in Chapter 5 of in-

¹²Another example is labor markets: when a firm hires workers, it is less well informed about the quality of the workers’ labor services than the workers.

In addition to the many brief applications, four chapters of the book contain in-depth applications—showing students how microeconomics relates to a business career. These are Chapter 5 on using consumer choice theory, Chapter 10 on using the competitive model, Chapter 15 on using noncompetitive market models and Chapter 18 on using input market analysis.

Figure 3.1

An Indifference Curve

The indifference curve, U_1 , shows all the combinations of movie passes and compact discs that the consumer considers equally satisfactory. The consumer prefers any market basket lying above U_1 (like point E) to all market baskets on U_1 , and any market basket on U_1 is preferred to any market basket lying below U_1 .

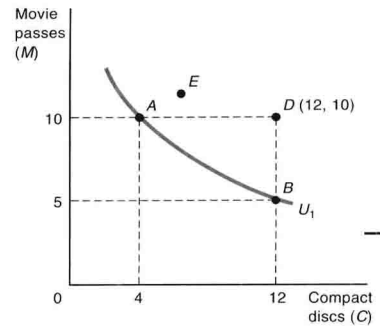
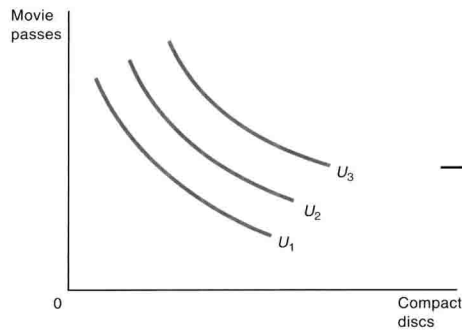


Figure 3.2

An Indifference Map

A set of indifference curves, or an indifference map, indicates how a consumer ranks all possible market baskets. Market baskets lying on indifference curves farther from the origin are preferred to those on curves closer to the origin.



Graphs that teach. Browning/Zupan have developed a set of graphs that do not merely depict data, but go much further to patiently illustrate and teach complex concepts. In many cases, this book uses a series of two or three progressive graphs to illustrate a concept, where many books would use just one.

Figure 3.3

Why Intersecting Indifference Curves Are Inconsistent

Intersecting indifference curves are inconsistent with rational choice; they violate the assumptions of nonsatiation and transitive preferences.

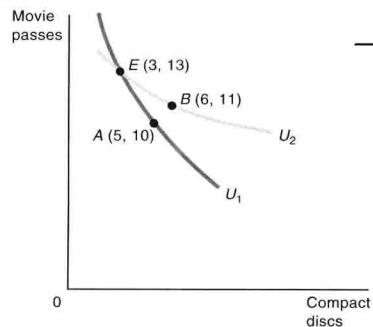


Table of Contents

Preface	v	2.3 Adjustment to Changes in Demand or Supply	24
Acknowledgments	x	<i>Application 2.3 Why Housing Prices Have Been Going Through the Roof</i>	25
Chapter 1: An Introduction to Microeconomics I		Using the Supply–Demand Model to Explain Market Outcomes	26
1.1 The Scope of Microeconomic Theory	2	<i>Application 2.4 Why Are Americans Getting Fatter?</i>	27
1.2 The Nature and Role of Theory	2	2.4 Government Intervention in Markets: Price Controls	28
What Is a Good Theory? 3		Rent Control 29 Who Loses, Who Benefits? 30	
1.3 Positive Versus Normative Analysis	3	<i>Application 2.5 Why the Doctor Is Not In</i> ..	32
1.4 Market Analysis and Real Versus Nominal Prices	4	<i>Application 2.6 Price Ceilings Can Be Deadly for Buyers</i>	33
<i>Application 1.1 The Old Rich Versus the New Rich: A Real Comparison</i>	6	2.5 Elasticities	33
1.5 Basic Assumptions about Market Participants	6	Price Elasticity of Demand 34 Calculating Price Elasticity of Demand 36	
1.6 Opportunity Cost	7	<i>Application 2.7 Demand Elasticity and Cable Television Pricing</i>	37
<i>Application 1.2 The Rise of Mail-Order and Online Shopping</i>	7	Demand Elasticities Vary among Goods 38	
<i>Application 1.3 Opportunity Cost (and Outsourcing) Hits Home</i>	8	The Estimation of Demand Elasticities 38	
Economic Versus Accounting Costs 8		<i>Application 2.8 D.C. Learns about Demand Elasticity</i>	39
<i>Application 1.4 The Accounting and Economic Costs of SOX</i>	9	Three Other Elasticities 39	
Sunk Costs 9		<i>Application 2.9 It Takes Time</i>	41
<i>Application 1.5 Why It Was Profitable to Demolish a Profitable Hong Kong Hotel</i> ..	10		
1.7 Production Possibility Frontier	10	Chapter 3: The Theory of Consumer Choice 47	
Chapter 2: Supply and Demand 15		3.1 Consumer Preferences	48
2.1 Demand and Supply Curves	16	Consumer Preferences Graphed as Indifference Curves 49 Curvature of Indifference Curves 51 Individuals Have Different Preferences 53 Graphing Economic Bads and Economic Neuters 54 Perfect Substitutes and Complements 55	
The Demand Curve 16		3.2 The Budget Constraint	56
<i>Application 2.1 The Gross Cost of Groscost: Or How Arizona Learned about the Law of Demand</i>	18	Geometry of the Budget Line 58 Shifts in Budget Lines 59	
Determinants of Demand Other Than Price 18		<i>Application 3.1 BK Versus KFC in the UK in the Wake of BSE</i>	61
Shifts in Versus Movements along a Demand Curve 19 The Supply Curve 20 Shifts in Versus Movements along a Supply Curve 21		3.3 The Consumer's Choice	61
2.2 Determination of Equilibrium Price and Quantity	22	A Corner Solution 63	
<i>Application 2.2 Is There a Parking Shortage in Major American Cities?</i>	23	<i>Application 3.2 Chicken-Free Chicken Restaurants</i>	64

	The Composite-Good Convention	64		
	Application 3.3 Consumers' Valuation of Air Bags	66		
3.4	Changes in Income and Consumption Choices	66		
	Normal Goods 68 Inferior Goods 68			
	Application 3.4 The Decline of Public Transit as a Means of Getting to Work	70		
	The Food Stamp Program 70			
	Application 3.5 The Allocation of Commencement Tickets	72		
3.5	Are People Selfish?	74		
	Application 3.6 The New Philanthropy	75		
3.6	The Utility Approach to Consumer Choice	76		
	The Consumer's Optimal Choice 77			
	Relationship to Indifference Curves 78			
<hr/>				
Chapter 4: Individual and Market Demand		84		
<hr/>				
4.1	Price Changes and Consumption Choices	85		
	The Consumer's Demand Curve 86 Some Remarks about the Demand Curve 87			
	Application 4.1 Using Price to Deter Youth Alcohol Abuse, Traffic Fatalities, and Campus Violence	88		
	Do Demand Curves Always Slope Downward? 89			
4.2	Income and Substitution Effects of a Price Change	89		
	Income and Substitution Effects Illustrated: The Normal-Good Case 90			
	Application 4.2 Income and Substitution Effects and Home Ownership	92		
	The Income and Substitution Effects Associated with a Gasoline Tax-Plus-Rebate Program 92 A Graphical Examination of a Tax-Plus-Rebate Program 93			
4.3	Income and Substitution Effects: Inferior Goods	95		
	A Hypothetical Example of a Giffen Good 97			
	The Giffen Good Case: How Likely? 97			
	Application 4.3 Do Rats Have Downward-Sloping Demand Curves?	98		
4.4	From Individual to Market Demand	99		
	Application 4.4 Aggregating Demand Curves for a UCLA MBA	100		
4.5	Consumer Surplus	101		
	The Uses of Consumer Surplus 104			
	Application 4.5 The Consumer Surplus Associated with Free TV	105		
	Consumer Surplus and Indifference Curves 105			
4.6	Price Elasticity and the Price-Consumption Curve	106		
	Application 4.6 The P-C Curve for a non-P-C Good	108		
4.7	Network Effects	108		
	The Bandwagon Effect 109 The Snob Effect 110			
	Application 4.7 Network Effects and the Diffusion of Communications Technologies and Computer Hardware and Software	111		
4.8	The Basics of Demand Estimation	112		
	Experimentation 112 Surveys 113			
	Regression Analysis 114			
	Application 4.8 Demand Estimation: McDonald's Versus Burger King	117		
<hr/>				
Chapter 5: Using Consumer Choice Theory		122		
<hr/>				
5.1	Excise Subsidies, Health Care, and Consumer Welfare	123		
	Application 5.1 Why Are Company Health Benefits Tax Exempt?	125		
	Using the Consumer Surplus Approach 126			
	Application 5.2 Burning Up Resources in Moscow	127		
5.2	Public Schools and the Voucher Proposal	128		
	Using Consumer Choice Theory to Analyze Voucher Proposals 130			
	Application 5.3 School Choice Is Nothing New	131		
5.3	Paying for Garbage	132		
	Does Everyone Benefit? 134			
	Application 5.4 Trash Pricing and Recycling	135		
5.4	The Consumer's Choice to Save or Borrow	135		
	A Change in Endowment 137			
	Application 5.5 Social Security and Saving	139		
	Changes in the Interest Rate 139			
5.5	Investor Choice	142		
	Application 5.6 Entrepreneurs and Their Risk-Return Preferences	143		

Investor Preferences toward Risk:
 Risk Aversion 144 Investor Preferences
 toward Risk: Risk Neutral and Risk
 Loving 146
**Application 5.7 Risk Aversion While
 Standing in Line** 147
 Minimizing Exposure to Risk 148

Chapter 6: Exchange, Efficiency, and Prices 152

6.1 Two-Person Exchange 153
 The Edgeworth Exchange Box Diagram 154
 The Edgeworth Exchange Box with
 Indifference Curves 156
**Application 6.1 The Benefits of Exchange
 and eBay** 158
6.2 Efficiency in the Distribution of Goods . . 159
 Efficiency and Equity 161
**6.3 Competitive Equilibrium and Efficient
 Distribution.** 162
**Application 6.2 Should Ticket Scalpers Be
 Disparaged or Deified?** 165
**6.4 Price and Nonprice Rationing
 and Efficiency** 166
**Application 6.3 The Benefits and Costs of
 Rationing by Waiting** 168
***6.5 Some of the Mathematics behind
 Efficiency in Exchange.** 169

Chapter 7: Production 173

7.1 Relating Output to Inputs 174
**7.2 Production When Only One Input Is
 Variable: The Short Run.** 175
 Total, Average, and Marginal Product
 Curves 177 The Relationship Between
 Average and Marginal Product Curves 178
**Application 7.1 What the Marginal–Average
 Relationship Means for Your Grade Point
 Average (GPA).** 178
 The Geometry of Product Curves 179 The
 Law of Diminishing Marginal Returns 180
**Application 7.2 The Law of Diminishing
 Marginal Returns, Caffeine Intake,
 and Exam Performance** 180
**7.3 Production When All Inputs Are Variable:
 The Long Run** 181
 Production Isoquants 182 MRTS and the
 Marginal Products of Inputs 184 Using

MRTS: Speed Limits and Gasoline
 Consumption 185
7.4 Returns to Scale 186
 Factors Giving Rise to Decreasing Returns 188
**Application 7.3 The Management Function
 and Decreasing Returns to Scale:
 “The Plan”** 188
**Application 7.4 Why Oil Shippers Are
 Compartmentalizing Their Firms and Fliers
 Are Building Their Own Planes** 190
**7.5 Functional Forms and Empirical Estimation
 of Production Functions** 190
 Linear Forms of Production Functions 191
 Multiplicative Forms of Production Functions:
 Cobb–Douglas as an Example 192
***7.6 The Mathematics behind Production
 Theory.** 193
 Marginal–Average Product Relationship 194
 MRTS and the Ratio of Inputs’ Marginal
 Products 194 Some Additional Properties of
 Constant Returns to Scale Production
 Functions 195

Chapter 8: The Cost of Production 199

8.1 The Nature of Cost 200
8.2 Short-Run Cost of Production 201
 Measures of Short-Run Cost: Total Fixed
 and Variable Costs 201 Fixed Versus
 Sunk Costs 202 Five Other Measures
 of Short-Run Cost 202 Behind Cost
 Relationships 203
8.3 Short-Run Cost Curves 204
 Marginal Cost 204 Average Cost 206
**Application 8.1 The Effect of Wal-Mart
 on Retailing Productivity, Costs,
 and Prices** 207
 Marginal–Average Relationships 208 The
 Geometry of Cost Curves 208
8.4 Long-Run Cost of Production. 209
 Isocost Lines 210 Least Costly Input
 Combinations 211 Interpreting the
 Tangency Points 211
**Application 8.2 American Airlines and Cost
 Minimization.** 213
 The Expansion Path 213 Is Production Cost
 Minimized? 214
**Application 8.3 The Cost of Public Versus
 Private Provision: The Case of Primary and
 Secondary Education** 214

8.5	Input Price Changes and Cost Curves . . . 215	9.6	The Short-Run Industry Supply Curve . . . 252
	<i>Application 8.4 The Economics of Raising and Razing Buildings</i> 217		Price and Output Determination in the Short Run 253
	<i>Application 8.5 Why the Necks Are Thicker in New Haven</i> 217		<i>Application 9.5 Why Electric Bills in California Increased after Deregulation</i> . . . 254
	<i>Application 8.6 The Effect of 9-11 on U.S. Production Costs</i> 218	9.7	Long-Run Competitive Equilibrium 256
8.6	Long-Run Cost Curves 218		Zero Profit When Firms' Cost Curves Differ? 258
	The Long Run and the Short Run Revisited 220	9.8	The Long-Run Industry Supply Curve . . . 260
8.7	Learning by Doing 222		Constant-Cost Industry 260 Increasing-Cost Industry 262 Decreasing-Cost Industry 263
	The Advantages of Learning by Doing to Pioneering Firms 223		<i>Application 9.6 The Bidding War for Finance Professors</i> 265
	<i>Application 8.7 Learning by Doing and the Model T</i> 223		Comments on the Long-Run Supply Curve 265
8.8	Importance of Cost Curves to Market Structure 223	9.9	When Does the Competitive Model Apply? 267
	<i>Application 8.8 Minimum Efficient Scales in Suds, Suits, and Soft Drinks</i> 225		
8.9	Using Cost Curves:		
	Controlling Pollution 226		
	<i>Application 8.9 The Cost of Dealing with Global Warming</i> 228		
8.10	Economies of Scope 229		
8.11	Estimating Cost Functions 230		
Chapter 9: Profit Maximization in Perfectly Competitive Markets		Chapter 10: Using the Competitive Model	
	237		273
<hr/>			
9.1	The Assumptions of Perfect Competition 238	10.1	The Evaluation of Gains and Losses 274
9.2	Profit Maximization 239		Producer Surplus 274 Consumer Surplus, Producer Surplus, and Efficient Output 276
	<i>Application 9.1 Are American Executives Underpaid?</i> 241		The Deadweight Loss of a Price Ceiling 278
9.3	The Demand Curve Facing the Competitive Firm 241	10.2	Excise Taxation 280
9.4	Short-Run Profit Maximization 243		The Short-Run Effects of an Excise Tax 280
	Short-Run Profit Maximization Using Per-Unit Curves 245		The Long-Run Effects 282 Who Bears the Burden of the Tax? 283 Tax Incidence: The Effect of Elasticity of Supply 283 Tax Incidence: The Effect of Elasticity of Demand 284
	<i>Application 9.2 The Importance of Thinking at the Relevant Margin</i> 246		<i>Application 10.1 Why Cigarette Company Profits Did Not Get Smoked by a Recent Punitive-Damages Award</i> 285
9.5	The Perfectly Competitive Firm's Short-Run Supply Curve 248		The Deadweight Loss of Excise Taxation 285
	<i>Application 9.3 The Method to Mothballing</i> 250		<i>Application 10.2 The Long and the Short (Run) of the Deadweight Loss of Rent Control</i> 287
	<i>Application 9.4 The Competitive Firm's Supply Curve in the Very Short Run</i> 250	10.3	Airline Regulation and Deregulation . . . 288
	Output Response to a Change in Input Prices 251		What Happened to the Profits? 289 After Deregulation 290
			<i>Application 10.3 The Contestability of Airline Markets</i> 291
			The Push for Reregulation 292
			<i>Application 10.4 Languish and Anguish at LaGuardia</i> 294
		10.4	City Taxicab Markets 294
			The Illegal Market 296
		10.5	Consumer and Producer Surplus, and the Net Gains from Trade 297