

F O U R T H   E D I T I O N

# MICROECONOMICS

ROBERT S. PINDYCK / DANIEL L. RUBINFELD

# **M**ICROECONOMICS

*Fourth Edition*

**Robert S. Pindyck**

*Massachusetts Institute of Technology*

**Daniel L. Rubinfeld**

*University of California, Berkeley*



Prentice Hall, Upper Saddle River, New Jersey 07458

Library of Congress Cataloging-in-Publication Data  
Pindyck, Robert S.

Microeconomics / Robert S. Pindyck, Daniel L. Rubinfeld. — 4th ed.

p. cm.  
Includes index.

ISBN 0-13-272923-7

1. Microeconomics. I. Rubinfeld, Daniel L. II. Title.

HB172.P53 1997

338.5—dc21

97-6658  
CIP

Acquisitions Editor: LEAH BRONWYN JEWELL  
Associate Editor: GLADYS SOTO  
Editorial Assistant: KRISTEN KAISER  
Editor-in-Chief: NATALIE ANDERSON  
Marketing Manager: PATRICK LYNCH  
Managing Editor: DEE JOSEPHSON  
Production Supervisor: ARNOLD VILA  
Production Manager: VINCENT SCelta  
Senior Designer: ANN FRANCE  
Interior Design: AMANDA KAVANAUGH  
Cover Design: MAUREEN EIDE  
Composition: YORK PRODUCTION SERVICES  
Cover Illustration: REGINALD WICKHAM



© 1998, 1995 by Prentice-Hall, Inc.  
A Simon & Schuster Company  
Upper Saddle River, New Jersey 07458

*All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.*

Previous editions copyright © 1992, 1989.

ISBN 0-13-272923-7

Prentice-Hall International (UK) Limited, London  
Prentice-Hall of Australia Pty. Limited, Sydney  
Prentice-Hall Canada Inc., Toronto  
Prentice-Hall Hispanoamericana, S.A., Mexico  
Prentice-Hall of India Private Limited, New Delhi  
Prentice-Hall of Japan, Inc., Tokyo  
Simon & Schuster Asia Pte. Ltd., Singapore  
Editora Prentice-Hall do Brasil, Ltda., Rio de Janeiro  
Prentice-Hall, Upper Saddle River, New Jersey

Printed in the United States of America  
10 9 8 7 6 5 4 3 2

*To our daughters*

Maya, Talia, and Shira

Sarah and Rachel

# PREFACE

For students who care about how the world works, microeconomics is one of the most relevant and interesting subjects they study. A good grasp of microeconomics is vital for managerial decision making, for designing and understanding public policy, and more generally for appreciating how a modern economy functions.

We wrote this book, *Microeconomics*, because we believe that students need to be exposed to the new topics that have come to have a central role in microeconomics over the past decade—topics such as game theory and competitive strategy, the roles of uncertainty and information, and the analysis of pricing by firms with market power. We also felt that students need to be shown how microeconomics can be used as a practical tool for decision making. Microeconomics is an exciting and dynamic subject, but students need to be given an appreciation of its relevance and usefulness. They want and need a good understanding of how microeconomics can actually be used outside the classroom.

To respond to these needs, our book provides a fresh treatment of microeconomic theory that stresses its relevance and application to both managerial and public-policy decision making. This applied emphasis is accomplished by including more than eighty extended examples that cover such topics as the analysis of demand, cost, and market efficiency, the design of pricing strategies, investment and production decisions, and public policy analysis. Because of the importance that we attach to these examples, they are included in the flow of the text, rather than being “boxed” or screened. (A list of the examples is included in the table of contents on pages xvii–xix.)

The coverage in *Microeconomics* incorporates the dramatic changes that have occurred in the field in recent years. There is growing interest in game theory and the strategic interactions of firms (Chapters 12 and 13), in the role and implications of uncertainty and asymmetric information (Chapters 5 and 17), in the pricing strategies of firms with market power (Chapters 10 and 11), and in the design of policies to deal efficiently with externalities such as environmental pollution (Chapter 18). These topics, which have only recently received attention in most books, are covered extensively here.

That the coverage in *Microeconomics* is comprehensive and up-to-date does not mean that it is “advanced” or difficult. We have worked hard to make the exposition clear and accessible as well as lively and engaging. We believe that

the study of microeconomics should be enjoyable and stimulating. We hope that our book reflects this. Except for appendices and footnotes, *Microeconomics* uses no calculus. As a result, it should be suitable for students with a broad range of backgrounds. (Those sections that are more demanding are marked with an asterisk and can be easily omitted.)

### Changes in the Fourth Edition

The second and third editions of this book contained a variety of changes and additions that built on the success of the first edition. These included a number of new topics, such as the extent of a market, revealed preference, Engel curves, advertising, the theory of comparative advantage, strategic trade policy, and incentive design in vertically integrated firms. But even more importantly, with the assistance of a number of able reviewers, we heavily revised the first eight chapters of the text, and updated many of the examples. Our primary goal in revising the book has always been to make the text as clear, accessible, and interesting as possible. The fourth edition continues this tradition. We have added some new material, but we have also revised much of the existing text with the goal of improved clarity and accessibility.

Changes in this edition include a more detailed introductory discussion of supply and demand in Chapter 2, and a revised exposition of some of the core theory throughout the book, but especially in the the first ten chapters. New material on cost-of-living indexes has been added to Chapter 3, an expanded discussion of productivity growth has been added to Chapter 6, and we have expanded our discussion of costs in Chapter 7. We have also revised and expanded our discussion of the antitrust laws in Chapter 10, and we have included new material on bundling in Chapter 11. We have added a number of new examples, and most of the existing examples have been revised and updated.

Finally, we have modified many of the diagrams to improve their accuracy and clarity. This edition, like the third edition, is printed in four colors. However, this time we have tried to use those colors more effectively to make the diagrams as clear and pedagogically effective as possible.

### Alternative Course Designs

Microeconomics offers instructors substantial flexibility in course design. For a one-quarter or one-semester course stressing the basic core material, we would suggest using the following chapters and sections of chapters: 1, 2, 3, 4.1-4.4, 6.1-6.5, 7.1-7.4, 8, 9.1-9.4, 10.1-10.4, 11.1-11.3, 12.1-12.2, 12.5-12.6, 14, 15.1-15.4, 18.1-18.2, and 18.5. A somewhat more ambitious course might also include parts of Chapters 5 and 16, and additional sections in Chapters 6, 7, 9, 10, and 12. To emphasize uncertainty and market failure, an instructor should also include substantial parts of Chapters 5 and 17.

Depending on one's interests and the goals of the course, other sections could be added or used to replace the materials listed above. A course that



emphasized modern pricing theory and business strategy would include all of Chapters 10, 11, 12, and 13, and the remaining sections of Chapter 15. A course in managerial economics might also include the appendixes to Chapters 4, 7, and 11, as well as the appendix on regression analysis at the end of the book. A course that emphasized welfare economics and public policy should include Chapter 16 and additional sections of Chapter 18.

Finally, we want to stress that those sections or subsections that are more demanding and/or are peripheral to the core material have been marked with an asterisk. These sections can easily be omitted without detracting from the flow of the book.

## Supplementary Materials

Ancillaries of an exceptionally high quality are available to instructors and students using this book. The instructor's manual was written by Gilbert Davis and Valerie Suslow of the University of Michigan. It provides answers to all of the Questions for Review and all of the Exercises that appear at the end of chapters, as well as a summary of the key points in each chapter. It also contains a series of teaching suggestions. It is available from the publisher on request, as is a separate test bank, written by Nancy Fox of Saint Joseph's University.

The study guide, written by Valerie Suslow of the University of Michigan and Jonathan Hamilton of the University of Florida, provides a wide variety of review materials and exercises for students. It can be purchased separately by students and others using the book.

For more information on the availability of the supplementary materials, contact your Prentice Hall sales representative.

## Acknowledgments

Because this book has been the outgrowth of years of experience in the classroom, we owe a debt of gratitude to our students and to the colleagues with whom we often discuss microeconomics and its presentation. We have also had the help of capable research assistants, including Walter Athier, Phillip Gibbs, Jamie Jue, Kathy O'Regan, Karen Randig, Subi Rangan, and Deborah Senior. Kathy Hill helped with the art, while Assunta Kent, Mary Knott, and Dawn Elliott Linahan provided secretarial assistance with the first edition. We especially want to thank Lynn Steele and Jay Tharp, who provided considerable editorial support for the second edition. Mark Glickman and Steve Wiggins assisted with the examples in the third edition, while Andrew Guest, Jeanette Sayre, and Lynn Steele provided valuable editorial support.

Writing this book has been a painstaking and enjoyable process. At each stage we received exceptionally fine guidance from teachers of microeconomics throughout the country. After the first draft of the first edition of this book had been edited and reviewed, it was discussed at a two-day focus group meeting in New York. This provided an opportunity to get ideas from instructors with a variety of backgrounds and perspectives. We would like

to thank the following focus group members for advice and criticism: Carl Davidson of Michigan State University; Richard Eastin of the University of Southern California; Judith Roberts of California State University, Long Beach; and Charles Strein of the University of Northern Iowa. We would also like to thank all those who reviewed the first edition at each stage of its evolution:

Ted Amato, University of North Carolina, Charlotte  
John J. Antel, University of Houston  
Kerry Back, Northwestern University  
Jeremy Bulow, Stanford University  
Larry A. Chenault, Miami University  
Jacques Cremer, Virginia Polytechnic Institute and State University  
Carl Davidson, Michigan State University  
Arthur T. Denzau, Washington University  
Richard V. Eastin, University of Southern California  
William H. Greene, New York University  
George Heitman, Pennsylvania State University  
George E. Hoffer, Virginia Commonwealth University  
Robert Inman, The Wharton School, University of Pennsylvania  
B. Patrick Joyce, Michigan Technological University  
Leonard Lardaro, University of Rhode Island  
Peter Linneman, University of Pennsylvania  
R. Ashley Lyman, University of Idaho  
Wesley A. Magat, Duke University  
Anthony M. Marino, University of Southern Florida  
Michael J. Moore, Duke University  
Daniel Orr, Virginia Polytechnic Institute and State University  
Judith Roberts, California State University, Long Beach  
Geoffrey Rothwell, Stanford University  
Edward L. Sattler, Bradley University  
Charles T. Strein, University of Northern Iowa  
Michael Wasylenko, Syracuse University  
Lawrence J. White, New York University

We had a good deal of feedback and assistance in the development of the second edition. We would like to thank the following reviewers of the second edition for the extremely valuable advice they provided:

Dale Ballou, University of Massachusetts, Amherst  
Henry Chappel, University of South Carolina  
John Coupe, University of Maine at Orono  
Richard Eastin, University of Southern California  
Otis Gilley, Louisiana Tech University  
John Gross, University of Wisconsin at Milwaukee  
Jonathan Hamilton, University of Florida



Claire Hammond, Wake Forest University  
 James Hartigan, University of Oklahoma  
 Robert Inman, The Wharton School, University of Pennsylvania  
 Joyce Jacobsen, Rhodes College  
 Richard Mills, University of New Hampshire  
 Julianne Nelson, Stern School of Business, New York University  
 Michael Podgursky, University of Massachusetts, Amherst  
 Charles Ratliff, Davidson College  
 Nestor Ruiz, University of California, Davis  
 Valerie Suslow, University of Michigan  
 David Vrooman, St. Lawrence University

We would like to thank a thoughtful and talented group of reviewers whose comments and ideas greatly improved the third edition:

Jack Adams, University of Arkansas, Little Rock  
 William Baxter, Stanford University  
 James A. Brander, University of British Columbia  
 Charles Clotfelter, Duke University  
 Kathryn Combs, California State University, Los Angeles  
 Richard Cornwall, Middlebury College  
 Tran Dung, Wright State University  
 Carl E. Enomoto, New Mexico State University  
 Ray Farrow, Seattle University  
 Gary Ferrier, Southern Methodist University  
 David Kaserman, Auburn University  
 Michael Kende, INSEAD, France  
 Anthony Krautman, DePaul University  
 James MacDonald, Rensselaer Polytechnical Institute  
 David Mills, University of Virginia, Charlottesville  
 Jennifer Moll, Fairfield University  
 Sharon J. Pearson, University of Alberta Edmonton  
 Ivan P'ng, University of California, Los Angeles  
 Roger Sherman, University of Virginia  
 Abdul Turay, Radford University  
 Robert Whaples, Wake Forest University  
 Arthur Woolf, University of Vermont  
 Chiou-nan Yeh, Alabama State University  
 Joseph Ziegler, University of Arkansas, Fayetteville

We would also like to thank the reviewers who provided comments and ideas that have contributed so much to this fourth edition:

Sheri Aggarwal, Dartmouth College  
 Winston Chang, State University of New York, Buffalo  
 Gilbert Davis, University of Michigan  
 Philip G. King, San Francisco State University

Tetteh A. Kofi, University of San Francisco  
Richard D. McGrath, College of William and Mary  
George Norman, Tufts University  
Nachum Sicherman, Columbia University  
Houston H. Stokes, University of Illinois, Chicago  
Richard W. Stratton, University of Akron

Apart from the formal review process, we are especially grateful to Jean Andrews, Paul Anglin, J. C. K. Ash, Ernst Berndt, George Bittlingmayer, Severin Borenstein, Paul Carlin, Whewon Cho, Setio Angarro Dewo, Frank Fabozzi, Joseph Farrell, Frank Fisher, Jonathan Hamilton, Robert Inman, Joyce Jacobsen, Stacey Kole, Jeannette Mortensen, John Mullahy, Krishna Pendakur, Jeffrey Perloff, Ivan P'ng, A. Mitchell Polinsky, Judith Roberts, Geoffrey Rothwell, Garth Saloner, Joel Schrag, Daniel Siegel, Thomas Stoker, David Storey, and James Walker, who were kind enough to provide comments, criticisms, and suggestions as the various editions of this book developed. We also want to thank Masaya Okoshi, Ashesh Shah, and Wilson Tai for their research assistance on the fourth edition, and Lynn Steele for her invaluable editorial assistance.

Finally, we wish to express our sincere thanks for the extraordinary effort those at Macmillan and Prentice Hall made in the development of our book. Throughout the writing of the first edition, Bonnie Lieberman provided invaluable guidance and encouragement; Ken MacLeod kept the progress of the book on an even keel; Gerald Lombardi provided masterful editorial assistance and advice; and John Molyneux ably oversaw the book's production.

In the development of the second edition, we were fortunate to have the encouragement and support of David Boelio, and the organizational and editorial help of two Macmillan editors, Caroline Carney and Jill Lectka. The second edition also benefited greatly from the superb development editing of Gerald Lombardi, and from John Travis, who managed the book's production.

Jill Lectka and Denise Abbott were our editors for the third edition, and we benefited greatly from their input. We also want to thank Valerie Ashton, John Sollami, and Sharon Lee for their superb handling of the production of the third edition.

Leah Jewell was our editor for the fourth edition; her patience, thoughtfulness, and perserverance were greatly appreciated. We also want to thank our production editor, Dee Josephson, for managing the production process so effectively, and Patricia Wosczyk, Prentice Hall's Design Manager, for her help with all aspects of the book's design.

R.S.P.  
D.L.R.

# BRIEF CONTENTS

## **PART I Introduction: Markets and Prices 1**

- 1 Preliminaries 3
- 2 The Basics of Supply and Demand 19

## **PART II Producers, Consumers, and Competitive Markets 59**

- 3 Consumer Behavior 61
- 4 Individual and Market Demand 101
- 5 Choice Under Uncertainty 147
- 6 Production 175
- 7 The Cost of Production 205
- 8 Profit Maximization and Competitive Supply 251
- 9 The Analysis of Competitive Markets 289

## **PART III Market Structure and Competitive Strategy 331**

- 10 Market Power: Monopoly and Monopsony 333
- 11 Pricing with Market Power 375
- 12 Monopolistic Competition and Oligopoly 433
- 13 Game Theory and Competitive Strategy 475
- 14 Markets for Factor Inputs 513
- 15 Investment, Time, and Capital Markets 545

## **PART IV Information, Market Failure, and the Role of Government 577**

- 16 General Equilibrium and Economic Efficiency 579
- 17 Markets with Asymmetric Information 617
- 18 Externalities and Public Goods 647
- Appendix: The Basics of Regression 683
- Glossary 693
- Answers to Selected Exercises 703
- Index 717

# CONTENTS

## Preface xxi

## PART I Introduction: Markets and Prices 1

### 1 Preliminaries 3

- 1.1 The Use and Limitations of Microeconomic Theory 4
- 1.2 Positive Versus Normative Analysis 5
- 1.3 Why Study Microeconomics? 6
  - Corporate Decision Making: Ford Introduces the Taurus 7*
  - Public Policy Design: Automobile Emission Standards 8*
- 1.4 What Is a Market? 9
  - Competitive Versus Noncompetitive Markets 10*
  - Market Price 10*
  - Market Definition—The Extent of a Market 11*
- 1.5 Real Versus Nominal Prices 12
- Summary 16
- Questions for Review 16

### 2 The Basics of Supply and Demand 19

- 2.1 The Market Mechanism 20
- 2.2 Shifts in Supply and Demand 22
- 2.3 Elasticities of Supply and Demand 31
- 2.4 Short-Run Versus Long-Run Elasticities 35
  - Demand 35*
  - Supply 40*
- \*2.5 Understanding and Predicting the Effects of Changing Market Conditions 45
- 2.6 Effects of Government Intervention—Price Controls 53
- Summary 56
- Questions for Review 57
- Exercises 57

## **PART II Producers, Consumers, and Competitive Markets 59**

### **3 Consumer Behavior 61**

- 3.1 Consumer Preferences 62
  - Some Basic Assumptions* 63
  - Indifference Curves* 64
  - Ordinal Versus Cardinal Rankings* 67
  - The Marginal Rate of Substitution* 68
  - Perfect Substitutes and Perfect Complements* 70
- 3.2 Budget Constraints 72
  - The Budget Line* 73
  - The Effects of Changes in Income and Prices* 74
- 3.3 Consumer Choice 77
  - A Corner Solution* 82
- 3.4 Revealed Preference 85
- 3.5 The Concept of Utility 88
  - Utility and Satisfaction* 88
  - Marginal Utility* 90
- 3.6 Cost-of-Living Indexes 93
- Summary 97
- Questions for Review 98
- Exercises 99

### **4 Individual and Market Demand 101**

- 4.1 Individual Demand 102
  - Price Changes* 102
  - The Demand Curve* 102
  - Income Changes* 104
  - Engel Curves* 107
  - Substitutes and Complements* 109
- 4.2 Income and Substitution Effects 110
  - Substitution Effect* 111
  - Income Effect* 112
  - A Special Case—The Giffen Good* 113
- 4.3 Market Demand 116
  - From Individual to Market Demand* 116
  - Point and Arc Elasticities of Demand* 117
- 4.4 Consumer Surplus 122
- 4.5 Network Externalities 126
  - The Bandwagon Effect* 127
  - The Snob Effect* 128
- \*4.6 Empirical Estimation of Demand 131
  - Interview and Experimental Approaches to Demand Determination* 131

*The Statistical Approach to Demand Estimation* 132

*The Form of the Demand Relationship* 133

Summary 134

Questions for Review 135

Exercises 136

#### **Appendix to Chapter 4: Demand Theory—A Mathematical Treatment** 139

*Utility Maximization* 139

*The Consumer's Optimum* 139

*Marginal Rate of Substitution* 140

*An Example* 141

*Marginal Utility of Income* 142

*Duality in Consumer Theory* 143

*Income and Substitution Effects* 144

Exercises 146

## **5 Choice Under Uncertainty** 147

### 5.1 Describing Risk 148

*Probability* 148

*Expected Value* 149

*Variability* 149

*Decision Making* 152

### 5.2 Preferences Toward Risk 153

*Different Preferences Toward Risk* 155

### 5.3 Reducing Risk 159

*Diversification* 159

*Insurance* 160

*The Value of Information* 162

### \*5.4 The Demand for Risky Assets 164

*Assets* 164

*Asset Returns* 165

*The Trade-off Between Risk and Return* 167

*The Investor's Choice Problem* 168

Summary 171

Questions for Review 171

Exercises 172

## **6 Production** 175

### 6.1 The Technology of Production 176

### 6.2 Isoquants 177

*The Short Run Versus the Long Run* 179

### 6.3 Production with One Variable Input (Labor) 179

*Average and Marginal Products* 180

*The Law of Diminishing Returns* 183

*Labor Productivity* 187

- 6.4 Production with Two Variable Inputs 191
  - Diminishing Returns* 191
  - Substitution Among Inputs* 192
  - Production Functions—Two Special Cases* 194
- 6.5 Returns to Scale 197
- Summary 201
- Questions for Review 201
- Exercises 202

## **7 The Cost of Production 205**

- 7.1 Measuring Cost: Which Costs Matter? 206
  - Economic Cost Versus Accounting Cost* 206
  - Sunk Costs* 207
- 7.2 Cost in the Short Run 208
  - The Determinants of Short-Run Cost* 210
  - The Shapes of the Cost Curves* 212
- 7.3 Cost in the Long Run 214
  - The Cost-Minimizing Input Choice* 215
  - The Isocost Line* 215
  - Choosing Inputs* 216
  - Cost Minimization with Varying Output Levels* 220
- 7.4 Long-Run Versus Short-Run Cost Curves 220
  - The Inflexibility of Short-Run Production* 220
  - Long-Run Average Cost* 221
  - Economies and Diseconomies of Scale* 223
  - The Relationship Between Short-Run and Long-Run Cost* 224
- 7.5 Production with Two Outputs—Economies of Scope 226
- \*7.6 Dynamic Changes in Costs—The Learning Curve 230
- \*7.7 Estimating and Predicting Cost 235
  - Cost Functions and the Measurement of Scale Economies* 237
- Summary 240
- Questions for Review 241
- Exercises 242
- Appendix to Chapter 7: Production and Cost Theory—**
  - A Mathematical Treatment* 245
  - Cost Minimization* 245
  - Marginal Rate of Technical Substitution* 246
  - Duality in Production and Cost Theory* 247
  - The Cobb-Douglas Cost and Production Functions* 247
- Exercises 249

## **8 Profit Maximization and Competitive Supply 251**

- 8.1 Profit Maximization 252
  - Do Firms Maximize Profit?* 252



8.2	Marginal Revenue, Marginal Cost, and Profit Maximization	253
	<i>Demand and Marginal Revenue for a Competitive Firm</i>	254
	<i>Profit Maximization by a Competitive Firm</i>	256
8.3	Choosing Output in the Short Run	256
	<i>Short-Run Profit Maximization by a Competitive Firm</i>	256
	<i>The Short-Run Profitability of a Competitive Firm</i>	258
8.4	The Competitive Firm's Short-Run Supply Curve	260
	<i>The Firm's Response to an Input Price Change</i>	262
8.5	The Short-Run Market Supply Curve	264
	<i>Elasticity of Market Supply</i>	265
	<i>Producer Surplus in the Short Run</i>	267
8.6	Choosing Output in the Long Run	269
	<i>Zero Profit</i>	271
	<i>Long-Run Competitive Equilibrium</i>	271
	<i>Economic Rent</i>	273
	<i>Producer Surplus in the Long Run</i>	274
8.7	The Industry's Long-Run Supply Curve	275
	<i>Constant-Cost Industry</i>	276
	<i>Increasing-Cost Industry</i>	277
	<i>Decreasing-Cost Industry</i>	279
	<i>The Short-Run and Long-Run Effects of a Tax</i>	279
	<i>Long-Run Elasticity of Supply</i>	282
8.8	Perfectly Competitive Markets	283
	<i>When Is a Market Highly Competitive?</i>	284
	<i>Contestable Markets</i>	285
	Summary	286
	Questions for Review	286
	Exercises	287

## 9 The Analysis of Competitive Markets 289

9.1	Evaluating the Gains and Losses from Government Policies—	
	Consumer and Producer Surplus	290
	<i>Review of Consumer and Producer Surplus</i>	290
	<i>Application of Consumer and Producer Surplus</i>	292
9.2	The Efficiency of a Competitive Market	296
9.3	Minimum Prices	301
9.4	Price Supports and Production Quotas	305
	<i>Price Supports</i>	305
	<i>Production Quotas</i>	307
9.5	Import Quotas and Tariffs	312
9.6	The Impact of a Tax or Subsidy	318
	Summary	325
	Questions for Review	326
	Exercises	326

## PART III Market Structure and Competitive Strategy 331

### 10 Market Power: Monopoly and Monopsony 333

- 10.1 Monopoly 334
  - Average Revenue and Marginal Revenue* 335
  - The Monopolist's Output Decision* 336
  - An Example* 338
  - A Rule of Thumb for Pricing* 340
  - Shifts in Demand* 341
  - The Effect of a Tax* 342
  - \*The Multiplant Firm* 343
- 10.2 Monopoly Power 345
  - Measuring Monopoly Power* 347
  - The Rule of Thumb for Pricing* 348
- 10.3 Sources of Monopoly Power 351
  - The Elasticity of Market Demand* 352
  - The Number of Firms* 352
  - The Interaction Among Firms* 353
- 10.4 The Social Costs of Monopoly Power 354
  - Price Regulation* 355
  - Regulation in Practice* 357
- 10.5 Monopsony 358
  - Monopsony and Monopoly Compared* 360
- 10.6 Monopsony Power 361
  - Sources of Monopsony Power* 362
  - The Social Costs of Monopsony Power* 364
  - Bilateral Monopoly* 365
- 10.7 Limiting Market Power: The Antitrust Laws 367
  - Enforcement of the Antitrust Laws* 368
- Summary 370
- Questions for Review 371
- Exercises 372

### 11 Pricing with Market Power 375

- 11.1 Capturing Consumer Surplus 376
- 11.2 Price Discrimination 378
  - First-Degree Price Discrimination* 378
  - Second-Degree Price Discrimination* 380
  - Third-Degree Price Discrimination* 381
- 11.3 Intertemporal Price Discrimination and Peak-Load Pricing 388
- 11.4 The Two-Part Tariff 392
- \*11.5 Bundling 397
  - Mixed Bundling* 402
  - Bundling in Practice* 406
  - Tying* 409