Brief Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Supply, Demand, and Equilibrium</td>
<td>1</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Prices, Costs, and the Gains from Trade</td>
<td>31</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>The Behavior of Consumers</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Appendix: Cardinal Utility</td>
<td>77</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Consumers in the Marketplace</td>
<td>81</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>The Behavior of Firms</td>
<td>115</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Production and Costs</td>
<td>137</td>
</tr>
<tr>
<td>Chapter 7</td>
<td>Competition</td>
<td>171</td>
</tr>
<tr>
<td>Chapter 8</td>
<td>Welfare Economics and the Gains from Trade</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Appendix: Normative Criteria</td>
<td>275</td>
</tr>
<tr>
<td>Chapter 9</td>
<td>Knowledge and Information</td>
<td>283</td>
</tr>
<tr>
<td>Chapter 10</td>
<td>Monopoly</td>
<td>317</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>Market Power, Collusion, and Oligopoly</td>
<td>357</td>
</tr>
<tr>
<td>Chapter 12</td>
<td>The Theory of Games</td>
<td>399</td>
</tr>
<tr>
<td>Chapter 13</td>
<td>External Costs and Benefits</td>
<td>417</td>
</tr>
<tr>
<td>Chapter 14</td>
<td>Common Property and Public Goods</td>
<td>459</td>
</tr>
<tr>
<td>Chapter 15</td>
<td>The Demands for Factors of Production</td>
<td>477</td>
</tr>
<tr>
<td>Chapter 16</td>
<td>The Market for Labor</td>
<td>501</td>
</tr>
<tr>
<td>Chapter 17</td>
<td>Allocating Goods Over Time</td>
<td>525</td>
</tr>
<tr>
<td>Chapter 18</td>
<td>Risk and Uncertainty</td>
<td>563</td>
</tr>
<tr>
<td>Chapter 19</td>
<td>What Is Economics?</td>
<td>599</td>
</tr>
<tr>
<td></td>
<td>Appendix A Calculus Supplement</td>
<td>619</td>
</tr>
<tr>
<td></td>
<td>Appendix B Answers to All the Exercises</td>
<td>645</td>
</tr>
<tr>
<td></td>
<td>Appendix C Answers to Problem Sets</td>
<td>657</td>
</tr>
<tr>
<td></td>
<td>Glossary</td>
<td>673</td>
</tr>
<tr>
<td></td>
<td>Index</td>
<td>681</td>
</tr>
</tbody>
</table>
Contents

Preface xiii

CHAPTER 1
Supply, Demand, and Equilibrium 1

1.1 Demand 1
Demand versus Quantity Demanded 1
Demand Curves 2
Changes in Demand 3
Market Demand 7
The Shape of the Demand Curve 7
The Wide Scope of Economics 10

1.2 Supply 10
Supply versus Quantity Supplied 10

1.3 Equilibrium 13
The Equilibrium Point 13
Changes in the Equilibrium Point 15
Summary 23
Author Commentary 24
Review Questions 25
Numerical Exercises 25
Problem Set 26

CHAPTER 2
Prices, Costs, and the Gains from Trade 31

2.1 Prices 31
Absolute versus Relative Prices 32
Some Applications 34

2.2 Costs, Efficiency, and Gains from Trade 35
Costs and Efficiency 35
Specialization and the Gains from Trade 37
Why People Trade 39
Summary 41
Author Commentary 41
Review Question 41
Numerical Exercises 42
Problem Set 42

CHAPTER 3
The Behavior of Consumers 45

3.1 Tastes 45
Indifference Curves 45
Marginal Values 48
More on Indifference Curves 53

3.2 The Budget Line and the Consumer's Choice 53
The Budget Line 54
The Consumer's Choice 56

3.3 Applications of Indifference Curves 59
Standards of Living 59
The Least Bad Tax 64
Summary 69
Author Commentary 69
Review Questions 70
Numerical Exercises 70
Problem Set 71
Appendix to Chapter 3 77
Cardinal Utility 77
The Consumer's Optimum 79

CHAPTER 4
Consumers in the Marketplace 81

4.1 Changes in Income 81
Changes in Income and Changes in the Budget Line 81
Changes in Income and Changes in the Optimum Point 82
The Engel Curve 84

4.2 Changes in Price 85
Changes in Price and Changes in the Budget Line 85
Changes in Price and Changes in the Optimum Point 86
The Demand Curve 88

4.3 Income and Substitution Effects 90
Two Effects of a Price Increase 90
Why Demand Curves Slope Downward 94
The Compensated Demand Curve 99
CHAPTER 5
The Behavior of Firms 115
5.1 Weighing Costs and Benefits 116
A Farmer’s Problem 116
The Equimarginal Principle 120
5.2 Firms in the Marketplace 121
Revenue 122
Costs 125
Summary 131
Author Commentary 131
Review Questions 131
Numerical Exercises 132
Problem Set 133

CHAPTER 6
Production and Costs 137
6.1 Production and Costs in the Short Run 137
The Total, Marginal, and Average Products of Labor 138
Costs in the Short Run 141
6.2 Production and Costs in the Long Run 147
Isoquants 147
Choosing a Production Process 151
The Long-Run Cost Curves 154
Returns to Scale and the Shape of the Long-Run Cost Curves 157
6.3 Relations Between the Short Run and the Long Run 159
From Isoquants to Short-Run Total Cost 159
From Isoquants to Long-Run Total Cost 160
Short-Run Total Cost versus Long-Run Total Cost 161
A Multitude of Short Runs 162

CHAPTER 7
Competition 171
7.1 The Competitive Firm 171
Revenue 173
The Firm’s Supply Decision 174
Shutdowns 177
The Elasticity of Supply 180
7.2 The Competitive Industry in the Short Run 180
Defining the Short Run 180
The Competitive Industry’s Short-Run Supply Curve 181
Supply, Demand, and Equilibrium 182
Competitive Equilibrium 182
The Industry’s Costs 185
7.3 The Competitive Firm in the Long Run 186
Long-Run Marginal Cost and Supply 186
Profit and the Exit Decision 186
The Firm’s Long-Run Supply Curve 188
7.4 The Competitive Industry in the Long Run 189
The Long-Run Supply Curve 190
Equilibrium 193
Changes in Equilibrium 195
Application: The Government as a Supplier 198
Some Lessons Learned 199
7.5 Relaxing the Assumptions 199
The Break-Even Price 200
Constant-Cost Industries 201
Increasing-Cost Industries 201
Decreasing-Cost Industries 203
Equilibrium 204
7.6 Applications 204
Removing a Rent Control 204
A Tax on Motel Rooms 207
Tipping the Busboy 208
## CONTENTS

7.7 Using the Competitive Model 209  
*Summary* 211  
*Author Commentary* 212  
*Review Questions* 212  
*Numerical Exercises* 213  
*Problem Set* 217

### CHAPTER 8  
Welfare Economics and the Gains from Trade 223

8.1 Measuring the Gains from Trade 224  
Consumers’ and Producers’ Surplus 224

8.2 The Efficiency Criterion 233  
Consumers’ Surplus and the Efficiency Criterion 234  
Understanding Deadweight Loss 238  
Other Normative Criteria 241

8.3 Examples and Applications 242  
Subsidies 242  
Price Ceilings 244  
Tariffs 247  
Theories of Value 252

8.4 General Equilibrium and the Invisible Hand 254  
The Fundamental Theorem of Welfare Economics 255  
An Edgeworth Box Economy 257  
General Equilibrium with Production 260  
*Summary* 265  
*Author Commentary* 266  
*Review Questions* 266  
*Problem Set* 267

### Appendix to Chapter 8 275  
Normative Criteria 275  
Some Normative Criteria 276  
Optimal Population 280  
*Author Commentary* 281

### CHAPTER 9  
Knowledge and Information 283

9.1 The Informational Content of Prices 283  
Prices and Information 283  
The Costs of Misallocation 288

9.2 Asymmetric Information 297  
Signaling: Should Colleges Be Outlawed? 297  
Adverse Selection and the Market for Lemons 300  
Moral Hazard 302  
Principal–Agent Problems 303  
A Theory of Unemployment 306

9.3 Financial Markets 308  
Efficient Markets for Financial Securities 308  
Stock Market Crashes 310  
*Summary* 311  
*Author Commentary* 311  
*Review Questions* 311  
*Problem Set* 312

### CHAPTER 10  
Monopoly 317

10.1 Price and Output under Monopoly 318  
Monopoly Pricing 318  
Elasticity and Marginal Revenue 319  
Measuring Monopoly Power 320  
Welfare 323  
Monopoly and Public Policy 324

10.2 Sources of Monopoly Power 328  
Natural Monopoly 328  
Patents 330  
The History of Photography: Patents in the Public Domain 331  
Resource Monopolies 332  
Economies of Scope 332  
Legal Barriers to Entry 332

10.3 Price Discrimination 333  
First-Degree Price Discrimination 334  
Third-Degree Price Discrimination 336  
Two-Part Tariffs 345  
*Summary* 348  
*Author Commentary* 349  
*Review Questions* 349  
*Numerical Exercises* 350  
*Problem Set* 351
CHAPTER 11
Market Power, Collusion, and Oligopoly 357

11.1 Acquiring Market Power 358
Mergers 358
Horizontal Integration 358
Vertical Integration 361
Predatory Pricing 363
Resale Price Maintenance 365

11.2 Collusion and the Prisoner’s Dilemma: An Introduction to Game Theory 369
Game Theory and the Prisoner’s Dilemma 370
The Prisoner’s Dilemma and the Breakdown of Cartels 373

11.3 Regulation 377
Examples of Regulation 377
What Can Regulators Regulate? 382
Creative Response and Unexpected Consequences 382
Positive Theories of Regulation 384

11.4 Oligopoly 385
Contestable Markets 385
Oligopoly with a Fixed Number of Firms 387

11.5 Monopolistic Competition and Product Differentiation 390
Monopolistic Competition 390
The Economics of Location 392
Summary 392
Author Commentary 393
Review Questions 393
Numerical Exercises 394
Problem Set 396

CHAPTER 12
The Theory of Games 399

12.1 Game Matrices 399
Pigs in a Box 399
The Prisoner’s Dilemma Revisited 401
Pigs in a Box Revisited 402
The Copycat Game 405
Nash Equilibrium as a Solution Concept 405
Mixed Strategies 407
Pareto Optima 408

12.2 Sequential Games 411
An Oligopoly Problem 411
Summary 413
Author Commentary 414
Problem Set 414

CHAPTER 13
External Costs and Benefits 417

13.1 The Problem of Pollution 417
Private Costs, Social Costs, and Externalities 417
Government Policies 420

13.2 The Coase Theorem 424
The Doctor and the Confectioner 425
The Coase Theorem 427
The Coase Theorem in the Marketplace 429
External Benefits 432
Income Effects and the Coase Theorem 433

13.3 Transactions Costs 436
Trains, Sparks, and Crops 436
The Reciprocal Nature of the Problem 438
Sources of Transactions Costs 439

13.4 The Law and Economics 443
The Law of Torts 443
A Positive Theory of the Common Law 446
Normative Theories of the Common Law 448
Optimal Systems of Law 449
Summary 449
Author Commentary 450
Review Questions 450
Problem Set 451

CHAPTER 14
Common Property and Public Goods 459

14.1 The Tragedy of the Commons 459
The Springfield Aquarium 459
It Can Pay to Be Different 463
Common Property 465
14.2 Public Goods 467
Some Market Failures 467
The Provision of Public Goods 468
The Role of Government 469
Schemes for Eliciting Information 471
Reaching the Efficient Outcome 471
Summary 472
Review Questions 473
Numerical Exercises 473
Problem Set 473

CHAPTER 15
The Demand for Factors of Production 477

15.1 The Firm’s Demand for Factors in the Short Run 477
The Marginal Revenue Product of Labor 477
The Algebra of Profit Maximization 479
The Effect of Plant Size 482

15.2 The Firm’s Demand for Factors in the Long Run 483
Constructing the Long-Run Labor Demand Curve 483
Substitution and Scale Effects 485
Relationships Between the Short Run and the Long Run 488

15.3 The Industry’s Demand Curve for Factors of Production 490
Monopsony 490

15.4 The Distribution of Income 492
Factor Shares and Rents 492
Producers’ Surplus 494
Summary 496
Review Questions 497
Numerical Exercises 497
Problem Set 499

CHAPTER 16
The Market for Labor 501

16.1 Individual Labor Supply 501
Consumption versus Leisure 501
Changes in the Budget Line 504
The Worker’s Supply of Labor 506

16.2 Labor Market Equilibrium 509
Changes in Nonlabor Income 510
Changes in Productivity 510

16.3 Differences in Wages 514
Human Capital 514
Compensating Differentials 515
Access to Capital 516

16.4 Discrimination 517
Theories of Discrimination 518
Wage Differences Due to Worker Preferences 519
Human Capital Inheritance 519
Summary 520
Review Questions 521
Problem Set 521

CHAPTER 17
Allocating Goods Over Time 525

17.1 Bonds and Interest Rates 525
Relative Prices, Interest Rates, and Present Values 526
Bonds Denominated in Dollars 529
Default Risk 530

17.2 Applications 531
Valuing a Productive Asset 531
Valuing Durable Commodities: Is Art a Good Investment? 532
Should You Pay with Cash or Credit? 533
Government Debt 534
Planned Obsolescence 535
Artists’ Royalties 536
Old Taxes Are Fair Taxes 537
The Pricing of Exhaustible Resources 538

17.3 The Market for Current Consumption 539
The Consumer’s Choice 539
The Demand for Current Consumption 542
Equilibrium and the Representative Agent 544
Changes in Equilibrium 546

17.4 Production and Investment 552
The Demand for Capital 552
The Supply of Current Consumption 553
Equilibrium 554
CONTENTS

Summary 556
Author Commentary 556
Review Questions 556
Problem Set 557

CHAPTER 18
Risk and Uncertainty 563
18.1 Attitudes Toward Risk 563
Characterizing Baskets 565
Opportunities 566
Preferences and the Consumer’s Optimum 568
Gambling at Favorable Odds 573
Risk and Society 575
18.2 The Market for Insurance 576
Imperfect Information 576
Uninsurable Risks 578
18.3 Futures Markets 578
Speculation 579
18.4 Markets for Risky Assets 581
Portfolios 582
The Geometry of Portfolios 583
The Investor’s Choice 585
Constructing a Market Portfolio 588
18.5 Rational Expectations 589
A Market with Uncertain Demand 589
Why Economists Make Wrong Predictions 592
Summary 595
Author Commentary 596
Review Questions 596
Problem Set 597
19.2 The Rationality Assumption 603
The Role of Assumptions in Science 603
All We Really Need: No Unexploited Profit Opportunities 604
19.3 What Is an Economic Explanation? 606
Celebrity Endorsements 606
The Size of Shopping Carts 607
Why Is There Mandatory Retirement? 608
Why Rock Concerts Sell Out 609
99¢ Pricing 610
Rationality Revisited 611
19.4 The Scope of Economic Analysis 611
Laboratory Animals as Rational Agents 611
Author Commentary 615
Problem Set 615

APPENDIX A
Calculus Supplement 619

APPENDIX B
Answers to All the Exercises 645

APPENDIX C
Answers to Problem Sets 657

Glossary 673
Index 681