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Microeconomics

FIFTH EDITION

R. Glenn Hubbard
Anthony Patrick O'Brien

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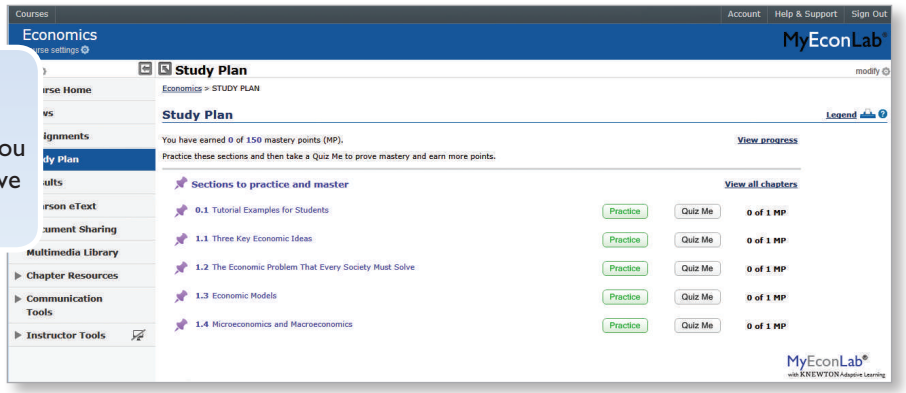

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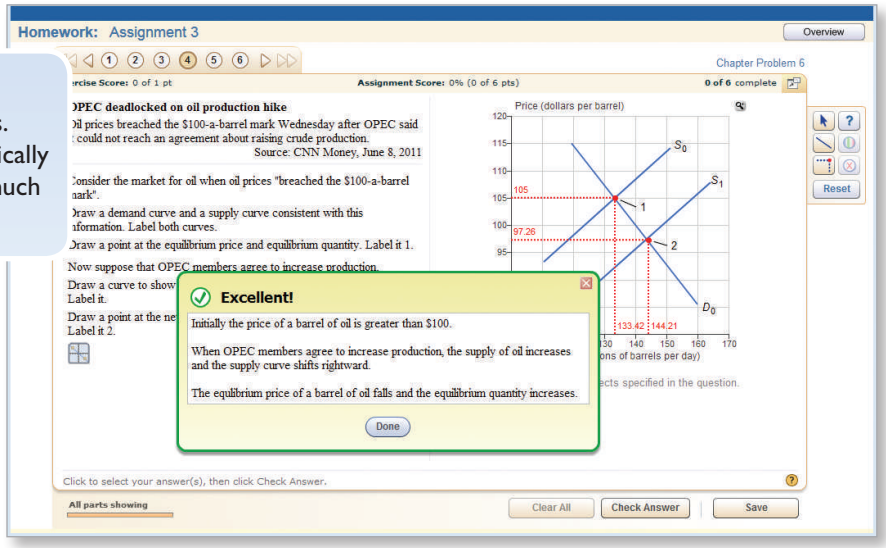

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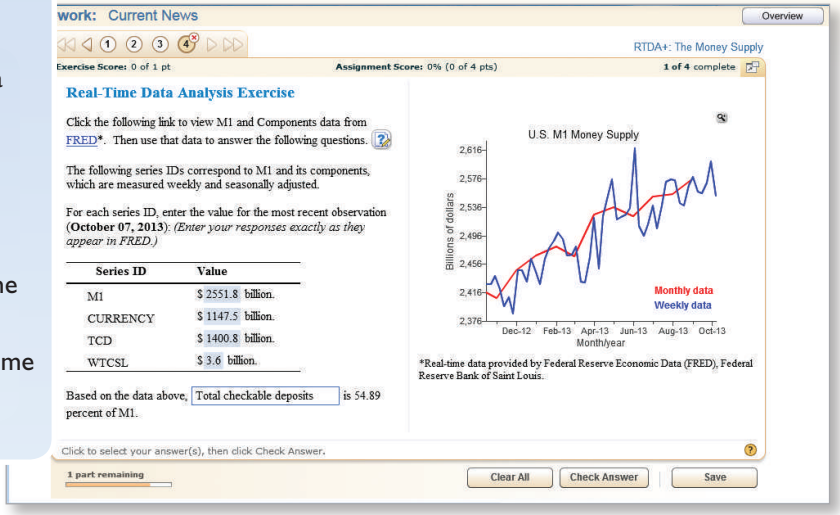

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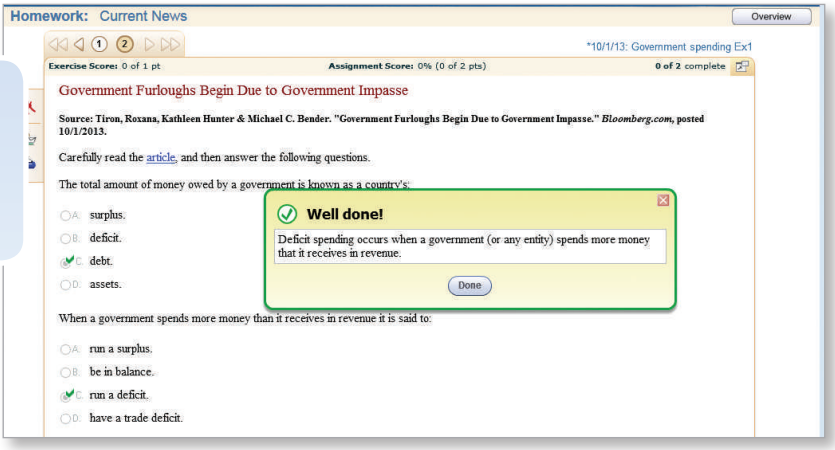

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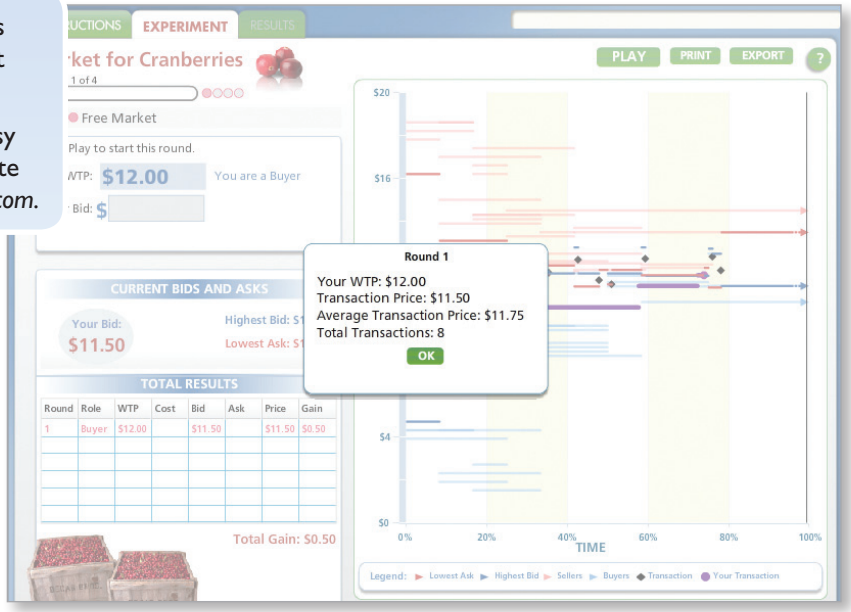

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Fifth Edition
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R. Glenn Hubbard
Columbia University

Anthony Patrick O'Brien
Lehigh University

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For Constance, Raph, and Will
—R. Glenn Hubbard

For Cindy, Matthew, Andrew, and Daniel
—Anthony Patrick O'Brien

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BRIEF CONTENTS

Preface 23
A Word of Thanks 49

PART 1: Introduction

Chapter 1: Economics: Foundations and Models 50

Appendix: Using Graphs and Formulas 72

Chapter 2: Trade-offs, Comparative Advantage, and the Market System 84

Chapter 3: Where Prices Come From: The Interaction of Demand and Supply 116

Chapter 4: Economic Efficiency, Government Price Setting, and Taxes 148

Appendix: Quantitative Demand and Supply Analysis 179

PART 2: Markets in Action: Policy and Applications

Chapter 5: Externalities, Environmental Policy, and Public Goods 184

Chapter 6: Elasticity: The Responsiveness of Demand and Supply 218

Chapter 7: The Economics of Health Care 252

PART 3: Firms in the Domestic and International Economies

Chapter 8: Firms, the Stock Market, and Corporate Governance 284

Appendix: Tools to Analyze Firms' Financial Information 309

Chapter 9: Comparative Advantage and the Gains from International Trade 318

PART 4: Microeconomic Foundations: Consumers and Firms

Chapter 10: Consumer Choice and Behavioral Economics 352

Appendix: Using Indifference Curves and Budget Lines to Understand Consumer Behavior 383

Chapter 11: Technology, Production, and Costs 398

Appendix: Using Isoquants and Isocost Lines to Understand Production and Cost 427

PART 5: Market Structure and Firm Strategy

Chapter 12: Firms in Perfectly Competitive Markets 438

Chapter 13: Monopolistic Competition: The Competitive Model in a More Realistic Setting 472

Chapter 14: Oligopoly: Firms in Less Competitive Markets 498

Chapter 15: Monopoly and Antitrust Policy 524

Chapter 16: Pricing Strategy 554

PART 6: Labor Markets, Public Choice, and the Distribution of Income

Chapter 17: The Markets for Labor and Other Factors of Production 580

Chapter 18: Public Choice, Taxes, and the Distribution of Income 616

Glossary **649**

Company Index **654**

Subject Index **657**

Credits **669**

Chapter Features Chart **670**

DETAILED CONTENTS

Preface 23
A Word of Thanks 49

PART 1: Introduction

Chapter 1: Economics: Foundations and Models 50

Is the Private Doctor's Office Going to Disappear? 51
1.1 Three Key Economic Ideas 52
People Are Rational 53
People Respond to Economic Incentives 53
Making the Connection: Does Health Insurance Give People an Incentive to Become Obese? 53
Optimal Decisions Are Made at the Margin 55
Solved Problem 1.1: A Doctor Makes a Decision at the Margin 55
1.2 The Economic Problem That Every Society Must Solve 56
What Goods and Services Will Be Produced? 57
How Will the Goods and Services Be Produced? 57
Who Will Receive the Goods and Services Produced? 57
Centrally Planned Economies versus Market Economies 57
The Modern "Mixed" Economy 58
Efficiency and Equity 59
1.3 Economic Models 59
The Role of Assumptions in Economic Models 60
Forming and Testing Hypotheses in Economic Models 60
Positive and Normative Analysis 61
Don't Let This Happen to You: Don't Confuse Positive Analysis with Normative Analysis 62
Economics as a Social Science 62
Making the Connection: Should Medical School Be Free? 62
1.4 Microeconomics and Macroeconomics 63
1.5 A Preview of Important Economic Terms 64
Conclusion 65
An Inside Look: Look Into Your Smartphone and Say "Ahh" 66
***Chapter Summary and Problems 68**
Key Terms, Summary, Review Questions, Problems and Applications

Appendix: Using Graphs and Formulas 72
Graphs of One Variable 73
Graphs of Two Variables 74
Slopes of Lines 74
Taking into Account More Than Two Variables on a Graph 75
Positive and Negative Relationships 77
Determining Cause and Effect 77
Are Graphs of Economic Relationships Always Straight Lines? 79
Slopes of Nonlinear Curves 79
Formulas 79
Formula for a Percentage Change 80
Formulas for the Areas of a Rectangle and a Triangle 81
Summary of Using Formulas 82

Chapter 2: Trade-offs, Comparative Advantage, and the Market System 84

Managers at Tesla Motors Face Trade-Offs 85
2.1 Production Possibilities Frontiers and Opportunity Costs 86
Graphing the Production Possibilities Frontier 86
Solved Problem 2.1: Drawing a Production Possibilities Frontier for Tesla Motors 88
Increasing Marginal Opportunity Costs 90
Economic Growth 91
2.2 Comparative Advantage and Trade 91
Specialization and Gains from Trade 92
Absolute Advantage versus Comparative Advantage 93
Comparative Advantage and the Gains from Trade 94
Don't Let This Happen to You: Don't Confuse Absolute Advantage and Comparative Advantage 95
Solved Problem 2.2: Comparative Advantage and the Gains from Trade 95
Making the Connection: Comparative Advantage, Opportunity Cost, and Housework 97
2.3 The Market System 98
The Circular Flow of Income 98
The Gains from Free Markets 100
The Market Mechanism 100
Making the Connection: A Story of the Market System in Action: How Do You Make an iPad? 101
The Role of the Entrepreneur 102
The Legal Basis of a Successful Market System 104
Making the Connection: Who Owns *The Wizard of Oz*? 105
Conclusion 107
An Inside Look: What's on the Horizon at Mercedes-Benz? 108

Chapter 3: Where Prices Come From: The Interaction of Demand and Supply 116

Smartphones: The Indispensible Product? 117
3.1 The Demand Side of the Market 118
Demand Schedules and Demand Curves 118
The Law of Demand 119

*These end-of-chapter resource materials repeat in all chapters. Chapter 8 includes two Real-Time Data Exercises.

What Explains the Law of Demand? 119
Holding Everything Else Constant: The *Ceteris paribus* Condition 120
Variables That Shift Market Demand 120
Making the Connection: Are Tablet Computers Substitutes for E-Readers? 121
Making the Connection: Coke and Pepsi Are Hit by U.S. Demographics 122
A Change in Demand versus a Change in Quantity Demanded 123
Making the Connection: Forecasting the Demand for iPhones 125
3.2 The Supply Side of the Market 126
Supply Schedules and Supply Curves 126
The Law of Supply 127
Variables That Shift Market Supply 128
A Change in Supply versus a Change in Quantity Supplied 129
3.3 Market Equilibrium: Putting Demand and Supply Together 130
How Markets Eliminate Surpluses and Shortages 131
Demand and Supply Both Count 132
Solved Problem 3.3: Demand and Supply Both Count: A Tale of Two Letters 132
3.4 The Effect of Demand and Supply Shifts on Equilibrium 133
The Effect of Shifts in Supply on Equilibrium 133
Making the Connection: The Falling Price of Blu-ray Players 134
The Effect of Shifts in Demand on Equilibrium 135
The Effect of Shifts in Demand and Supply over Time 135
Solved Problem 3.4: What Has Caused the Decline in Beef Consumption? 136
Shifts in a Curve versus Movements along a Curve 138
Don't Let This Happen to You: Remember: A Change in a Good's Price Does *Not* Cause the Demand or Supply Curve to Shift 138
Conclusion 139
An Inside Look: Google and Apple Face Supply and Demand Concerns in the Smartphone Market 140

Chapter 4: Economic Efficiency, Government Price Setting, and Taxes 148

The Sharing Economy, Phone Apps, and Rent Control 149
4.1 Consumer Surplus and Producer Surplus 150
Consumer Surplus 150
Making the Connection: The Consumer Surplus from Broadband Internet Service 152
Producer Surplus 153
What Consumer Surplus and Producer Surplus Measure 154
4.2 The Efficiency of Competitive Markets 154
Marginal Benefit Equals Marginal Cost in Competitive Equilibrium 155
Economic Surplus 155
Deadweight Loss 156
Economic Surplus and Economic Efficiency 157
4.3 Government Intervention in the Market: Price Floors and Price Ceilings 157
Price Floors: Government Policy in Agricultural Markets 157
Making the Connection: Price Floors in Labor Markets: The Debate over Minimum Wage Policy 159
Price Ceilings: Government Rent Control Policy in Housing Markets 160
Don't Let This Happen to You: Don't Confuse "Scarcity" with "Shortage" 161
Black Markets and Peer-to-Peer Sites 161
Solved Problem 4.3: What's the Economic Effect of a Black Market in Renting Apartments? 162
The Results of Government Price Controls: Winners, Losers, and Inefficiency 163
Positive and Normative Analysis of Price Ceilings and Price Floors 163
4.4 The Economic Impact of Taxes 164
The Effect of Taxes on Economic Efficiency 164
Tax Incidence: Who Actually Pays a Tax? 165
Solved Problem 4.4: When Do Consumers Pay All of a Sales Tax Increase? 166
Making the Connection: Is the Burden of the Social Security Tax Really Shared Equally between Workers and Firms? 167
Conclusion 169
An Inside Look At Policy: Does the Sharing Economy Increase Efficiency? 170

Appendix: Quantitative Demand and Supply Analysis 179
Demand and Supply Equations 179
Calculating Consumer Surplus and Producer Surplus 180

PART 2: Markets in Action: Policy and Applications

Chapter 5: Externalities, Environmental Policy, and Public Goods 184

Can Economic Policy Help Protect the Environment? 185
5.1 Externalities and Economic Efficiency 186
The Effect of Externalities 186
Externalities and Market Failure 188
What Causes Externalities? 188
5.2 Private Solutions to Externalities: The Coase Theorem 189
The Economically Efficient Level of Pollution Reduction 189

Making the Connection: The Clean Air Act: How a Government Policy Reduced Infant Mortality 190
The Basis for Private Solutions to Externalities 192
Don't Let This Happen to You: Remember That It's the *Net* Benefit That Counts 193
Making the Connection: The Fable of the Bees 193
Do Property Rights Matter? 194
The Problem of Transactions Costs 194
The Coase Theorem 195
5.3 Government Policies to Deal with Externalities 195
Making the Connection: Should the Government Tax Cigarettes and Soda? 196
Solved Problem 5.3: Dealing with the Externalities of Car Driving 198
Command-and-Control versus Market-Based Approaches 200
The End of the Sulfur Dioxide Cap-and-Trade System 200
Are Tradable Emission Allowances Licenses to Pollute? 201
Making the Connection: Can a Carbon Tax Reduce Global Warming? 201
5.4 Four Categories of Goods 202
The Demand for a Public Good 203
The Optimal Quantity of a Public Good 204
Solved Problem 5.4: Determining the Optimal Level of Public Goods 206
Common Resources 208
Conclusion 209

Chapter 6: Elasticity: The Responsiveness of Demand and Supply 218

Do People Respond to Changes in the Price of Gasoline? 219
6.1 The Price Elasticity of Demand and Its Measurement 220
Measuring the Price Elasticity of Demand 220
Elastic Demand and Inelastic Demand 221
An Example of Computing Price Elasticities 221
The Midpoint Formula 222
Solved Problem 6.1: Calculating the Price Elasticity of Demand 223
When Demand Curves Intersect, the Flatter Curve Is More Elastic 224
Polar Cases of Perfectly Elastic and Perfectly Inelastic Demand 224
Don't Let This Happen to You: Don't Confuse Inelastic with Perfectly Inelastic 226
6.2 The Determinants of the Price Elasticity of Demand 226
Availability of Close Substitutes 226
Passage of Time 227
Luxuries versus Necessities 227
Definition of the Market 227
Share of a Good in a Consumer's Budget 227
Some Estimated Price Elasticities of Demand 227
Making the Connection: The Price Elasticity of Demand for Breakfast Cereal 228
6.3 The Relationship between Price Elasticity of Demand and Total Revenue 229
Elasticity and Revenue with a Linear Demand Curve 230
Solved Problem 6.3: Price and Revenue Don't Always Move in the Same Direction 231
Estimating Price Elasticity of Demand 232
6.4 Other Demand Elasticities 233
Cross-Price Elasticity of Demand 233
Income Elasticity of Demand 234
Making the Connection: Price Elasticity, Cross-Price Elasticity, and Income Elasticity in the Market for Alcoholic Beverages 234
6.5 Using Elasticity to Analyze the Disappearing Family Farm 235
Solved Problem 6.5: Using Price Elasticity to Analyze a Policy of Taxing Gasoline 236
6.6 The Price Elasticity of Supply and Its Measurement 237
Measuring the Price Elasticity of Supply 237
Determinants of the Price Elasticity of Supply 238
Making the Connection: Why Are Oil Prices So Unstable? 238
Polar Cases of Perfectly Elastic and Perfectly Inelastic Supply 239
Using Price Elasticity of Supply to Predict Changes in Price 241
Conclusion 242

Chapter 7: The Economics of Health Care 252

How Much Will You Pay for Health Insurance? 253
7.1 The Improving Health of People in the United States 254
Changes over Time in U.S. Health 254
Reasons for Long-Run Improvements in U.S. Health 255
7.2 Health Care around the World 256
The U.S. Health Care System 256
The Health Care Systems of Canada, Japan, and the United Kingdom 258
Comparing Health Care Outcomes around the World 259
7.3 Information Problems and Externalities in the Market for Health Care 261
Adverse Selection and the Market for "Lemons" 261
Asymmetric Information in the Market for Health Insurance 261
Don't Let This Happen to You: Don't Confuse Adverse Selection with Moral Hazard 263
Solved Problem 7.3: If You Are Young and Healthy, Should You Buy Health Insurance? 264
Externalities in the Market for Health Care 265

Making the Connection: Should the Government Run the Health Care System? 267
7.4 The Debate over Health Care Policy in the United States 268
The Rising Cost of Health Care 268
Making the Connection: Are U.S. Firms Handicapped by Paying for Their Employees' Health Insurance? 270
Explaining Rapid Increases in Health Care Spending 271
The Continuing Debate over Health Care Policy 273
Making the Connection: How Much Is That MRI Scan? 275
Conclusion 277

PART 3: Firms in the Domestic and International Economies

Chapter 8: Firms, the Stock Market, and Corporate Governance 284

Facebook Learns the Benefits and Costs of Becoming a Publicly Owned Firm 285
8.1 Types of Firms 286
Who Is Liable? Limited and Unlimited Liability 286
Corporations Earn the Majority of Revenue and Profits 287
Making the Connection: How Important Are Small Businesses to the U.S. Economy? 288
8.2 The Structure of Corporations and the Principal–Agent Problem 289
Corporate Structure and Corporate Governance 289
Solved Problem 8.2: Should a Firm's CEO Also Be the Chairman of the Board? 290
8.3 How Firms Raise Funds 290
Sources of External Funds 291
Making the Connection: The Rating Game: Is the U.S. Treasury Likely to Default on Its Bonds? 292
Stock and Bond Markets Provide Capital—and Information 294
Don't Let This Happen to You: When Facebook Shares Are Sold, Facebook Doesn't Get the Money 294
Why Do Stock Prices Fluctuate So Much? 295
Making the Connection: Following Abercrombie & Fitch's Stock Price in the Financial Pages 296
8.4 Using Financial Statements to Evaluate a Corporation 297
The Income Statement 298
The Balance Sheet 299
8.5 Corporate Governance Policy and the Financial Crisis of 2007–2009 299
The Accounting Scandals of the Early 2000s 299
The Financial Crisis of 2007–2009 300
Did Principal–Agent Problems Help Cause the 2007–2009 Financial Crisis? 301
Making the Connection: The Ups and Downs of Investing in Facebook 302
Conclusion 303

Appendix: Tools to Analyze Firms' Financial Information 309
Using Present Value to Make Investment Decisions 309
Solved Problem 8A.1: How to Receive Your Contest Winnings 311
Using Present Value to Calculate Bond Prices 311
Using Present Value to Calculate Stock Prices 312
A Simple Formula for Calculating Stock Prices 313
Going Deeper into Financial Statements 313
Analyzing Income Statements 314
Analyzing Balance Sheets 315

Chapter 9: Comparative Advantage and the Gains from International Trade 318

Saving Jobs in the U.S. Tire Industry? 319
9.1 The United States in the International Economy 320
The Importance of Trade to the U.S. Economy 320
Making the Connection: Goodyear and the Tire Tariff 321
U.S. International Trade in a World Context 322
9.2 Comparative Advantage in International Trade 323
A Brief Review of Comparative Advantage 323
Comparative Advantage and Absolute Advantage 324
9.3 How Countries Gain from International Trade 325
Increasing Consumption through Trade 325
Solved Problem 9.3: The Gains from Trade 326
Why Don't We See Complete Specialization? 328
Does Anyone Lose as a Result of International Trade? 328
Don't Let This Happen to You: Remember That Trade Creates Both Winners and Losers 328
Where Does Comparative Advantage Come From? 329
Making the Connection: Leaving New York City Is Risky for Financial Firms 330
Comparative Advantage over Time: The Rise and Fall—and Rise—of the U.S. Consumer Electronics Industry 331
9.4 Government Policies That Restrict International Trade 331
Tariffs 333
Quotas and Voluntary Export Restraints 334
Measuring the Economic Effect of the Sugar Quota 334
Solved Problem 9.4: Measuring the Economic Effect of a Quota 335
The High Cost of Preserving Jobs with Tariffs and Quotas 336
Making the Connection: The Effect on the U.S. Economy of the Tariff on Chinese Tires 337

Gains from Unilateral Elimination of Tariffs and Quotas 338
Other Barriers to Trade 338
9.5 The Arguments over Trade Policies and Globalization 338
Why Do Some People Oppose the World Trade Organization? 339
Making the Connection: The Unintended Consequences of Banning Goods Made with Child Labor 340
Dumping 342
Positive versus Normative Analysis (Once Again) 342
Conclusion 343

PART 4: Microeconomic Foundations: Consumers and Firms

Chapter 10: Consumer Choice and Behavioral Economics 352

J.C. Penney Learns That Simplifying Prices Isn't Simple 353
10.1 Utility and Consumer Decision Making 354
The Economic Model of Consumer Behavior in a Nutshell 354
Utility 354
The Principle of Diminishing Marginal Utility 355
The Rule of Equal Marginal Utility per Dollar Spent 355
Solved Problem 10.1: Finding the Optimal Level of Consumption 358
What If the Rule of Equal Marginal Utility per Dollar Does Not Hold? 359
Don't Let This Happen to You: Equalize Marginal Utilities *per Dollar* 360
The Income Effect and Substitution Effect of a Price Change 361
10.2 Where Demand Curves Come From 362
Making the Connection: Are There Any Upward-Sloping Demand Curves in the Real World? 364
10.3 Social Influences on Decision Making 365
The Effects of Celebrity Endorsements 365
Network Externalities 366
Does Fairness Matter? 367
Making the Connection: What's Up with "Fuel Surcharges"? 369
10.4 Behavioral Economics: Do People Make Their Choices Rationally? 371
Pitfalls in Decision Making 371
Making the Connection: A Blogger Who Understands the Importance of Ignoring Sunk Costs 373
The Behavioral Economics of Shopping 374
Making the Connection: J.C. Penney Meets Behavioral Economics 375
Conclusion 376
Appendix: Using Indifference Curves and Budget Lines to Understand Consumer Behavior 383
Consumer Preferences 383
Indifference Curves 383
The Slope of an Indifference Curve 384
Can Indifference Curves Ever Cross? 384
The Budget Constraint 385
Choosing the Optimal Consumption of Pizza and Coke 386
Making the Connection: Dell Determines the Optimal Mix of Products 387
Deriving the Demand Curve 388
Solved Problem 10A.1: When Does a Price Change Make a Consumer Better Off? 389
The Income Effect and the Substitution Effect of a Price Change 391
How a Change in Income Affects Optimal Consumption 392
The Slope of the Indifference Curve, the Slope of the Budget Line, and the Rule of Equal Marginal Utility per Dollar Spent 392
The Rule of Equal Marginal Utility per Dollar Spent Revisited 393

Chapter 11: Technology, Production, and Costs 398

Fracking, Marginal Costs, and Energy Prices 399
11.1 Technology: An Economic Definition 400
Making the Connection: Improving Inventory Control at Wal-Mart 400
11.2 The Short Run and the Long Run in Economics 401
The Difference between Fixed Costs and Variable Costs 401
Making the Connection: Fixed Costs in the Publishing Industry 402
Implicit Costs Versus Explicit Costs 402
The Production Function 403
A First Look at the Relationship between Production and Cost 404
11.3 The Marginal Product of Labor and the Average Product of Labor 405
The Law of Diminishing Returns 405
Graphing Production 406
Making the Connection: Adam Smith's Famous Account of the Division of Labor in a Pin Factory 407
The Relationship between Marginal Product and Average Product 407
An Example of Marginal and Average Values: College Grades 408
11.4 The Relationship between Short-Run Production and Short-Run Cost 409
Marginal Cost 409
Why Are the Marginal and Average Cost Curves U Shaped? 409

Solved Problem 11.4: Calculating Marginal Cost and Average Cost 411
11.5 Graphing Cost Curves 412
11.6 Costs in the Long Run 414
Economies of Scale 414
Long-Run Average Cost Curves for Automobile Factories 415
Solved Problem 11.6: Using Long-Run Average Cost Curves to Understand Business Strategy 415
Making the Connection: The Colossal River Rouge: Diseconomies of Scale at Ford Motor Company 417
Don't Let This Happen to You: Don't Confuse Diminishing Returns with Diseconomies of Scale 418
Conclusion 419

Appendix: Using Isoquants and Isocost Lines to Understand Production and Cost 427
Isoquants 427
An Isoquant Graph 427
The Slope of an Isoquant 428
Isocost Lines 428
Graphing the Isocost Line 428
The Slope and Position of the Isocost Line 429
Choosing the Cost-Minimizing Combination of Capital and Labor 429
Different Input Price Ratios Lead to Different Input Choices 430
Making the Connection: The Changing Input Mix in Walt Disney Film Animation 431
Another Look at Cost Minimization 432
Solved Problem 11A.1: Determining the Optimal Combination of Inputs 433
Making the Connection: Do National Football League Teams Behave Efficiently? 434
The Expansion Path 435

PART 5: Market Structure and Firm Strategy

Chapter 12: Firms in Perfectly Competitive Markets 438

Perfect Competition in Farmers' Markets 439
12.1 Perfectly Competitive Markets 441
A Perfectly Competitive Firm Cannot Affect the Market Price 441
The Demand Curve for the Output of a Perfectly Competitive Firm 442
Don't Let This Happen to You: Don't Confuse the Demand Curve for Farmer Parker's Wheat with the Market Demand Curve for Wheat 442
12.2 How a Firm Maximizes Profit in a Perfectly Competitive Market 443
Revenue for a Firm in a Perfectly Competitive Market 443
Determining the Profit-Maximizing Level of Output 444
12.3 Illustrating Profit or Loss on the Cost Curve Graph 446
Showing a Profit on the Graph 447
Solved Problem 12.3: Determining Profit-Maximizing Price and Quantity 447
Don't Let This Happen to You: Remember That Firms Maximize Their Total Profit, Not Their Profit per Unit 449
Illustrating When a Firm Is Breaking Even or Operating at a Loss 450
Making the Connection: Losing Money in the Solar Panel Industry 450
12.4 Deciding Whether to Produce or to Shut Down in the Short Run 451
Solved Problem 12.4: When to Pull the Plug on a Movie 452
The Supply Curve of a Firm in the Short Run 453
The Market Supply Curve in a Perfectly Competitive Industry 454
12.5 "If Everyone Can Do It, You Can't Make Money at It": The Entry and Exit of Firms in the Long Run 455
Economic Profit and the Entry or Exit Decision 455
Long-Run Equilibrium in a Perfectly Competitive Market 457
The Long-Run Supply Curve in a Perfectly Competitive Market 457
Making the Connection: In the Apple iPhone Apps Store, Easy Entry Makes the Long Run Pretty Short 460
Increasing-Cost and Decreasing-Cost Industries 460
12.6 Perfect Competition and Efficiency 461
Productive Efficiency 461
Solved Problem 12.6: How Productive Efficiency Benefits Consumers 461
Allocative Efficiency 463
Conclusion 463

Chapter 13: Monopolistic Competition: The Competitive Model in a More Realistic Setting 472

Starbucks: The Limits to Growth through Product Differentiation 473
13.1 Demand and Marginal Revenue for a Firm in a Monopolistically Competitive Market 474
The Demand Curve for a Monopolistically Competitive Firm 474
Marginal Revenue for a Firm with a Downward-Sloping Demand Curve 474

13.2 How a Monopolistically Competitive Firm Maximizes Profit in the Short Run 476
Solved Problem 13.2: Does Minimizing Cost Maximize Profit at Apple? 478
13.3 What Happens to Profits in the Long Run? 479
How Does the Entry of New Firms Affect the Profits of Existing Firms? 479
Don't Let This Happen to You: Don't Confuse Zero Economic Profit with Zero Accounting Profit 480
Making the Connection: The Rise and Decline and Rise of Starbucks 482
Is Zero Economic Profit Inevitable in the Long Run? 482
Solved Problem 13.3: Can It Be Profitable to Be the High-Price Seller? 483
13.4 Comparing Monopolistic Competition and Perfect Competition 484
Excess Capacity under Monopolistic Competition 484
Is Monopolistic Competition Inefficient? 484
How Consumers Benefit from Monopolistic Competition 485
Making the Connection: Peter Thiel, e-Cigarettes, and the Monopoly in Monopolistic Competition 486
13.5 How Marketing Differentiates Products 486
Brand Management 487
Advertising 487
Defending a Brand Name 487
13.6 What Makes a Firm Successful? 488
Making the Connection: Is Being the First Firm in the Market a Key to Success? 488
Conclusion 489

Chapter 14: Oligopoly: Firms in Less Competitive Markets 498

Competition in the Video Game Console Market 499
14.1 Oligopoly and Barriers to Entry 500
Barriers to Entry 501
14.2 Using Game Theory to Analyze Oligopoly 503
A Duopoly Game: Price Competition between Two Firms 503
Firm Behavior and the Prisoner's Dilemma 504
Don't Let This Happen to You: Don't Misunderstand Why Each Firm Ends Up Charging a Price of $399 505
Solved Problem 14.2: Is Same-Day Delivery a Prisoner's Dilemma for Wal-Mart and Amazon? 505
Making the Connection: Is There a Dominant Strategy for Bidding on eBay? 506
Can Firms Escape the Prisoner's Dilemma? 507
Making the Connection: With Price Collusion, More Is Not Merrier 508
Cartels: The Case of OPEC 509
14.3 Sequential Games and Business Strategy 511
Deterring Entry 511
Solved Problem 14.3: Is Deterring Entry Always a Good Idea? 512
Bargaining 513
14.4 The Five Competitive Forces Model 515
Competition from Existing Firms 515
The Threat from Potential Entrants 515
Competition from Substitute Goods or Services 515
The Bargaining Power of Buyers 516
The Bargaining Power of Suppliers 516
Making the Connection: Can We Predict Which Firms Will Continue to Be Successful? 516
Conclusion 517

Chapter 15: Monopoly and Antitrust Policy 524

A Monopoly on Lobster Dinners in Maine? 525
15.1 Is Any Firm Ever Really a Monopoly? 526
Making the Connection: Is Google a Monopoly? 526
15.2 Where Do Monopolies Come From? 527
Government Action Blocks Entry 528
Making the Connection: Does Hasbro Have a Monopoly on Monopoly? 528
Control of a Key Resource 530
Making the Connection: Are Diamond Profits Forever? The De Beers Diamond Monopoly 530
Network Externalities 531
Natural Monopoly 531
Solved Problem 15.2: Can a Seafood Restaurant Be a Natural Monopoly? 532
15.3 How Does a Monopoly Choose Price and Output? 534
Marginal Revenue Once Again 534
Profit Maximization for a Monopolist 534
Solved Problem 15.3: Finding the Profit-Maximizing Price and Output for a Cable Monopoly 536
Don't Let This Happen to You: Don't Assume That Charging a Higher Price Is Always More Profitable for a Monopolist 537
15.4 Does Monopoly Reduce Economic Efficiency? 538
Comparing Monopoly and Perfect Competition 538
Measuring the Efficiency Losses from Monopoly 538
How Large Are the Efficiency Losses Due to Monopoly? 540
Market Power and Technological Change 540
15.5 Government Policy toward Monopoly 541
Antitrust Laws and Antitrust Enforcement 541
Making the Connection: Did Apple Violate the Law in Pricing e-Books? 542
Mergers: The Trade-off between Market Power and Efficiency 543
The Department of Justice and FTC Merger Guidelines 544
Regulating Natural Monopolies 546
Conclusion 547

Chapter 16: Pricing Strategy 554

Getting into Walt Disney World: One Price Does Not Fit All 555
16.1 Pricing Strategy, the Law of One Price, and Arbitrage 556
Arbitrage 556
Solved Problem 16.1: Is Arbitrage Just a Rip-Off? 557
Why Don't All Firms Charge the Same Price? 557
16.2 Price Discrimination: Charging Different Prices for the Same Product 558
Don't Let This Happen to You: Don't Confuse Price Discrimination with Other Types of Discrimination 558
The Requirements for Successful Price Discrimination 559
Solved Problem 16.2: How Apple Uses Price Discrimination to Increase Profits 560
Airlines: The Kings of Price Discrimination 561
Making the Connection: How Colleges Use Yield Management 563
Perfect Price Discrimination 563
Price Discrimination across Time 565
Can Price Discrimination Be Illegal? 565
Making the Connection: The Internet Leaves You Open to Price Discrimination 566
16.3 Other Pricing Strategies 567
Odd Pricing: Why Is the Price $2.99 Instead of $3.00? 567
Why Do McDonald's and other Firms Use Cost-Plus Pricing? 568
Making the Connection: Cost-Plus Pricing in the Publishing Industry 569
Why Do Some Firms Use Two-Part Tariffs? 570
Conclusion 573

PART 6: Labor Markets, Public Choice, and the Distribution of Income

Chapter 17: The Markets for Labor and Other Factors of Production 580

Who Is Zack Greinke and Why Is He Being Paid $147 Million? 581
17.1 The Demand for Labor 582
The Marginal Revenue Product of Labor 582
Solved Problem 17.1: Hiring Decisions by a Firm That Is a Price Maker 584
The Market Demand Curve for Labor 585
Factors That Shift the Market Demand Curve for Labor 585
17.2 The Supply of Labor 586
The Market Supply Curve of Labor 587
Factors That Shift the Market Supply Curve of Labor 588
17.3 Equilibrium in the Labor Market 588
The Effect on Equilibrium Wages of a Shift in Labor Demand 589
Making the Connection: Will Your Future Income Depend on Which Courses You Take in College? 590
The Effect on Equilibrium Wages of a Shift in Labor Supply 591
Making the Connection: Veterinarians Fall Victim to Demand and Supply 592
17.4 Explaining Differences in Wages 592
Don't Let This Happen to You: Remember That Prices and Wages Are Determined at the Margin 594
Making the Connection: Technology and the Earnings of "Superstars" 594
Compensating Differentials 595
Discrimination 596
Solved Problem 17.4: Is Passing "Comparable Worth" Legislation a Good Way to Close the Gap between Men's and Women's Pay? 597
Making the Connection: Does Greg Have an Easier Time Finding a Job Than Jamal? 598
Labor Unions 601
17.5 Personnel Economics 602
Should Workers' Pay Depend on How Much They Work or on How Much They Produce? 602
Making the Connection: Raising Pay, Productivity, and Profits at Safelite AutoGlass 603
Other Considerations in Setting Compensation Systems 604
17.6 The Markets for Capital and Natural Resources 604
The Market for Capital 604
The Market for Natural Resources 605
Monopsony 606
The Marginal Productivity Theory of Income Distribution 607
Conclusion 607

Chapter 18: Public Choice, Taxes, and the Distribution of Income 616

Should the Government Use the Tax System to Reduce Inequality? 617
18.1 Public Choice 618
How Do We Know the Public Interest? Models of Voting 618
Government Failure? 620
Is Government Regulation Necessary? 622
18.2 The Tax System 622
An Overview of the U.S. Tax System 623
Progressive and Regressive Taxes 624
Making the Connection: Which Groups Pay the Most in Federal Taxes? 625
Marginal and Average Income Tax Rates 625

The Corporate Income Tax 626
International Comparison of Corporate Income Taxes 626
Evaluating Taxes 627
18.3 Tax Incidence Revisited: The Effect of Price Elasticity 629
Don't Let This Happen to You: Don't Confuse Who Pays a Tax with Who Bears the Burden of the Tax 629
Making the Connection: Do Corporations Really Bear the Burden of the Federal Corporate Income Tax? 630
Solved Problem 18.3: The Effect of Price Elasticity on the Excess Burden of a Tax 631
18.4 Income Distribution and Poverty 632
Measuring the Income Distribution and Poverty 632
Explaining Income Inequality 633
Making the Connection: What Explains the 1 Percent? 636
Showing the Income Distribution with a Lorenz Curve 637
Problems in Measuring Poverty and the Distribution of Income 638
Solved Problem 18.4: Are Many People in the United States Stuck in Poverty? 640
Income Distribution and Poverty around the World 641
Conclusion 642

Glossary 649
Company Index 654
Subject Index 657
Credits 669
Chapter Features Chart 670

FLEXIBILITY CHART

The following chart helps you organize your syllabus based on your teaching preferences and objectives:

Core	Optional	Policy
Chapter 1: Economics: Foundations and Models	**Chapter 1 Appendix:** Using Graphs and Formulas	
Chapter 2: Trade-offs, Comparative Advantage, and the Market System		
Chapter 3: Where Prices Come From: The Interaction of Demand and Supply		
	Chapter 4 Appendix: Quantitative Demand and Supply Analysis	**Chapter 4:** Economic Efficiency, Government Price Setting, and Taxes
		Chapter 5: Externalities, Environmental Policy, and Public Goods
Chapter 6: Elasticity: The Responsiveness of Demand and Supply		
		Chapter 7: The Economics of Health Care
	Chapter 8: Firms, the Stock Market, and Corporate Governance	
	Chapter 8 Appendix: Tools to Analyze Firms' Financial Information	
Chapter 9: Comparative Advantage and the Gains from International Trade		
	Chapter 10: Consumer Choice and Behavioral Economics	
	Chapter 10 Appendix: Using Indifference Curves and Budget Lines to Understand Consumer Behavior	
Chapter 11: Technology, Production, and Costs	**Chapter 11 Appendix:** Using Isoquants and Isocost Lines to Understand Production and Cost	
Chapter 12: Firms in Perfectly Competitive Markets		
Chapter 13: Monopolistic Competition: The Competitive Model in a More Realistic Setting		
Chapter 14: Oligopoly: Firms in Less Competitive Markets		
Chapter 15: Monopoly and Antitrust Policy		
	Chapter 16: Pricing Strategy	
Chapter 17: The Markets for Labor and Other Factors of Production		
		Chapter 18: Public Choice, Taxes, and the Distribution of Income

PREFACE

Our approach in this new edition remains what it was in the first edition, published more than 10 years ago: To provide students and instructors with an economics text that delivers complete economics coverage with many real-world business examples. Our goal has been to teach economics in a "widget-free" way by using real-world business and policy examples. We are gratified by the enthusiastic response from students and instructors who used the first four editions of this book, which has made it one of the best-selling economic textbooks in the world. Much has happened, though, in the U.S. and world economies since we prepared the previous edition. We have incorporated many of these developments in the new real-world examples used in this edition.

New to the Fifth Edition

While our basic approach of placing applications in the forefront of the discussion remains the same, this new edition has been thoroughly revised. One exciting new addition is the significant expansion of the digital resources available to students and instructors with either the e-text version of the book or the MyEconLab supplement to the printed text.

New digital features located in MyEconLab

MyEconLab is a unique online course management, testing, and tutorial resource. It is included with the e-text version of the book or as a supplement to the print book. Students and instructors will find the following new online resources to accompany the fifth edition:

- **Videos:** There are approximately 60 *Making the Connection* features in the book that provide real-world reinforcement of key concepts. Each feature is now accompanied by a short video of the author explaining the key point of that *Making the Connection*. Each video is less than two minutes long and includes visuals, such as new photos or graphs, that are not in the main book. The goal of these videos is to summarize key content and bring the applications to life. Related assessment is included with each video. Our experience is that many students benefit from this type of online learning.
- **Concept Checks:** Each section of each learning objective concludes with an online Concept Check that contains one or two multiple choice, true/false, or fill-in questions. These checks act as "speed bumps" that encourage students to stop and check their understanding of fundamental terms and concepts before moving on to the next section. The goal of this digital resource is to help students assess their progress on a section-by-section basis, so they can be better prepared for homework, quizzes, and exams.
- **Animations:** Graphs are the backbone of introductory economics, but many students struggle to understand and work with them. Each of the 157 numbered figures in the text has a supporting animated version online. The goal of this digital resource is to help students understand shifts in curves, movements along curves, and changes in equilibrium values. Having an animated version of a graph helps students who have difficulty interpreting the static version found in the printed text. Graded practice exercises are included with the animations. Our experience is that many students benefit from this type of online learning.
- **Interactive Solved Problems:** Many students have difficulty applying economic concepts to solving problems. The goal of this digital resource is to help students overcome this hurdle by giving them a model of how to solve an economic problem by breaking it down step by step. Each of the 37 *Solved Problems* in the printed text is accompanied by a similar problem online, so students can have more practice and build their problem-solving skills. These interactive tutorials help students learn to think like economists and apply basic problem-solving skills to homework, quizzes, and exams. The goal is for students to build skills they can use to analyze real-world economic issues they hear and read

about in the news. Each Solved Problem in MyEconLab and the digital eText also includes at least one additional graded practice exercise for students.

- **Graphs Updated with Real-Time Data from FRED:** Figure 7.5, "Spending on Health Care around the World," Figure 8.2, "Movements in Stock Market Indexes," and Figures 9.1 and 9.3, both on international trade, are continuously updated online with the latest available data from FRED (Federal Reserve Economic Data), which is a comprehensive, up-to-date data set maintained by the Federal Reserve Bank of St. Louis. Students can display a pop-up graph that shows new data plotted in the graph. The goal of this digital feature is to help students understand how to work with data and understand how including new data affects graphs.
- **Interactive Problems and Exercises Updated with Real-Time Data from FRED:** Chapter 8, "Firms, the Stock Market, and Corporate Governance," includes two real-time data exercises that use the latest data from FRED. The goal of this digital feature is to help students become familiar with this key data source, learn how to locate data, and develop skills in interpreting data.

Summary of Changes to Chapters

- Chapter 5, "Externalities, Environmental Policy, and Public Goods," includes new coverage of the end of the sulfur dioxide cap-and-trade program. This discussion helps reinforce the interaction between economic analysis and politics in the formation of government policies.
- Chapter 7, "The Economics of Health Care," was introduced in the fourth edition and proved popular with instructors and students. In revising the chapter for this edition, we added several new demand and supply graphs. Our purpose was to make the content more analytical and to make the chapter more effective as an example of applied demand and supply analysis. We also extensively updated the discussion of the debate over President Obama's Patient Protection and Affordable Care Act. Figure 7.5, "Spending on Health Care around the World," is now continuously updated online with the latest available data from FRED.
- Chapter 8, "Firms, the Stock Market, and Corporate Governance," includes Figure 8.2, "Movements in Stock Market Indexes." This figure is now continuously updated online with the latest available data from FRED. The chapter also includes 2 new end-of-chapter *Real-Time-Data Exercises* that help students become familiar with a key data source, learn how to locate data, and develop skills in interpreting data. The exercise marked with a  allows students and instructors to use the very latest data from FRED.
- Chapter 9, "Comparative Advantage and the Gains from International Trade," includes two figures that are continuously updated online with the latest available data from FRED: Figure 9.1, "International Trade Is of Increasing Importance to the United States," and Figure 9.3, "International Trade As a Percentage of GDP."
- Chapter 10, "Consumer Choice and Behavioral Economics," has already provided extensive coverage of behavioral economics. We have found that many students find this material among the most interesting in the microeconomic chapters. We took advantage of the problems Ron Johnson encountered as CEO of J.C. Penney to include a new section on "The Behavioral Economics of Shopping." This section includes discussion of several behavioral studies of consumer choice.
- Chapter 18, "Public Choice, Taxes, and the Distribution of Income," includes a new *Making the Connection*, "What Explains the 1 Percent?" that summarizes the recent debate over increasing income inequality in the United States.

Other Changes to Chapters

- All companies in the chapter openers have been either replaced with new companies or updated with current information.
- Chapters 1–4 include new *An Inside Look* newspaper articles and analyses to help students apply economic thinking to current events and policy debates. Additional newspaper articles and analysis are updated weekly on MyEconLab.

- There are 13 new *Making the Connection* features to help students tie economic concepts to current events and policy issues.
- There are 6 new *Solved Problems*. This feature helps students break down and answer an economic problem down step by step.
- To make room for the new content described earlier, we have cut approximately 14 *Making the Connections* and 4 *Solved Problems* from the previous edition and transferred them to the book's *Instructor's Manual* where they are available for instructors who wish to continue using them.
- Figures and tables have been updated, using the latest data available.
- Many of the end-of-chapter problems have been either replaced or updated. To most chapters, we have added one or two new problems that include a graph for students to analyze. Chapter 8, "Firms, the Stock Market, and Corporate Governance," includes a new category entitled *Real-Time-Data Exercises*.
- Finally, we have gone over the text literally line by line, tightening the discussion, rewriting unclear points, and making many other small changes. We are grateful to the instructors and students who made suggestions for improvements in the previous edition. We have done our best to incorporate as many of those suggestions as possible.

New Chapter Openers, *Making the Connections, Solved Problems,* and *Inside Looks*

Here are the new or heavily revised chapter-opening business cases and accompanying *Inside Look* newspaper articles. The business or issue introduced in the chapter opener is revisited within the chapter in either a new *Making the Connection* or a *Solved Problem*. The following are the features new to this edition. Please see the detailed table of contents for the list of features for all chapters.

Chapter 1, "Economics: Foundations and Models," opens with a new discussion of why some doctors are leaving private practice and closes with *An Inside Look* newspaper article and analysis of how technology, such as the smartphone, may change the way doctors and patients will interact.

Chapter 2, "Trade-offs, Comparative Advantage, and the Market System," opens with a new discussion of the manufacturing decisions facing managers at Tesla Motors and closes with *An Inside Look* that discusses how managers at Mercedes-Benz face those same decisions. New *Solved Problem 2.1* asks students to use a production possibilities frontier to analyze some of the choices managers at Tesla Motors face. This chapter also has a new *Making the Connection* on comparative advantage and housework.

Chapter 3, "Where Prices Come From: The Interaction of Demand and Supply," opens with a new discussion of the market for smartphones and closes with *An Inside Look* about challenges Google and Apple face in this market. This chapter has three new *Making the Connections:* "Forecasting the Demand for iPhones," "Are Tablet Computers Substitutes for E-Readers?" and "Coke and Pepsi Are Hit by U.S. Demographics."

Chapter 4, "Economic Efficiency, Government Price Setting, and Taxes," opens with a new discussion of how the sharing economy for rooms affects rent control policy and closes with *An Inside Look* about how the sharing economy affects efficiency.

Chapter 5, "Externalities, Environmental Policy, and Public Goods," opens with an updated discussion of how people respond to changes in the price of gasoline. New *Solved Problem 5.3* is on the externalities of car driving.

Chapter 6, "Elasticity: The Responsiveness of Demand and Supply," opens with a revised and updated discussion of the price elasticity of gasoline. The chapter includes an entirely rewritten *Making the Connection* on "Price Elasticity, Cross-Price Elasticity, and Income Elasticity in the Market for Alcoholic Beverages."

Chapter 7, "The Economics of Health Care," opens with a new discussion of how much businesses and employees pay for health insurance and the role of the Patient Protection and Affordable Care Act of 2010. New *Solved Problem 7.3* explores

whether young, healthy people should buy health insurance. The chapter includes new Figure 7.4 on the externalities of vaccinations and new Figure 7.8 on the third-party payer system. It also includes a *Making the Connection* on how paying for health insurance affects the competitiveness of U.S. firms.

Chapter 8, "Firms, the Stock Market, and Corporate Governance," opens with a new discussion of the benefits and costs of becoming a publicly owned firm. New *Solved Problem 8.2* explores whether a CEO should also be a chairman of the board of the same firm. There's also a new *Making the Connection* that explores the performance of Facebook's stock.

Chapter 9, "Comparative Advantage and the Gains from International Trade," opens with a new discussion of the U.S. tariff on Chinese tires. The chapter includes a new *Making the Connection* on how the tire tariff affected Goodyear and a new *Making the Connection* on how the tariff affected the wider economy.

Chapter 10, "Consumer Choice and Behavioral Economics," opens with a new discussion of the failed pricing strategy at J.C. Penney. A new section discusses the behavioral economics of shopping. A new *Making the Connection* uses behavioral economics to explore consumer reaction to the J.C. Penney pricing strategy.

Chapter 11, "Technology, Production, and Costs," opens with a new discussion of fracking, marginal costs, and energy prices.

Chapter 12, "Firms in Perfectly Competitive Markets," opens with an updated discussion of organic foods at farmers' markets. The chapter includes a new *Making the Connection* on the solar panel industry and a new *Solved Problem 12.4* on when a movie studio should stop production of a movie.

Chapter 13, "Monopolistic Competition: The Competitive Model in a More Realistic Setting," opens with an updated discussion of the challenges Starbucks faces from other coffeehouses and includes a new *Making the Connection* on e-cigarettes.

Chapter 14, "Oligopoly: Firms in Less Competitive Markets," opens with a discussion of the video game console market and the competition between Sony's PlayStation and Microsoft's Xbox. A new *Solved Problem 14.2* explores competition between Wal-Mart and Amazon over same-day delivery.

Chapter 15, "Monopoly and Antitrust Policy," opens with a discussion of a lobster restaurant in Maine and includes a new *Making the Connection* on trademark disputes involving Hasbro's Monopoly game.

Chapter 16, "Pricing Strategy," opens with an updated coverage of pricing strategy at Walt Disney and includes a new *Making the Connection* on price discrimination and online shoppers.

Chapter 17, "The Markets for Labor and Other Factors of Production," opens with a discussion of pitcher Zach Greinke of the Los Angeles Dodgers. The chapter includes a new *Making the Connection* that uses demand and supply to analyze the falling incomes of veterinarians.

Chapter 18, "Public Choice, Taxes, and the Distribution of Income," opens with an updated coverage of the debate about tax policy and includes a new *Making the Connection* about the "1 percenters."

The Foundation:

Contextual Learning and Modern Organization

We believe a course is a success if students can apply what they have learned to both their personal lives and their careers, and if they have developed the analytical skills to understand what they read in the media. That's why we explain economic concepts by using many

real-world business examples and applications in the chapter openers, graphs, Making the Connection features, An Inside Look features, and end-of-chapter problems. This approach helps both business majors and liberal arts majors become educated consumers, voters, and citizens. In addition to our widget-free approach, we have a modern organization and place interesting policy topics early in the book to pique student interest.

We are convinced that students learn to apply economic principles best if they are taught in a familiar context. Whether they open an art studio, do social work, trade on Wall Street, work for the government, or tend bar, students benefit from understanding the economic forces behind their work. Though business students will have many opportunities to see economic principles in action in various courses, liberal arts students may not. We therefore use many diverse real-world business and policy examples to illustrate economic concepts and develop educated consumers, voters, and citizens:

- **A strong set of introductory chapters.** The introductory chapters provide students with a solid foundation in the basics. We emphasize the key ideas of marginal analysis and economic efficiency. In Chapter 4, "Economic Efficiency, Government Price Setting, and Taxes," we use the concepts of consumer and producer surplus to measure the economic effects of price ceilings and price floors as they relate to the familiar examples of rental properties and the minimum wage. (We revisit consumer and producer surplus in Chapter 9, "Comparative Advantage and the Gains from International Trade," where we discuss outsourcing and analyze government policies that affect trade; in Chapter 15, "Monopoly and Antitrust Policy," where we examine the effect of market power on economic efficiency; and in Chapter 16, "Pricing Strategy," where we examine the effect of firm pricing policy on economic efficiency.) In Chapter 8, "Firms, the Stock Market, and Corporate Governance," we provide students with a basic understanding of how firms are organized, raise funds, and provide information to investors. We also illustrate how in a market system entrepreneurs meet consumer wants and efficiently organize production.
- **Early coverage of policy issues.** To expose students to policy issues early in the course, we discuss health care policy in Chapter 1, "Economics: Foundations and Models"; rent control and the minimum wage in Chapter 4, "Economic Efficiency, Government Price Setting, and Taxes"; air pollution, global warming, and public goods in Chapter 5, "Externalities, Environmental Policy, and Public Goods"; government policy toward illegal drugs in Chapter 6, "Elasticity: The Responsiveness of Demand and Supply"; and health care policy in Chapter 7, "The Economics of Health Care."
- **Complete coverage of monopolistic competition.** We devote a full chapter, Chapter 13, "Monopolistic Competition: The Competitive Model in a More Realistic Setting," to monopolistic competition prior to covering oligopoly and monopoly in Chapter 14, "Oligopoly: Firms in Less Competitive Markets," and Chapter 15, "Monopoly and Antitrust Policy." Although many instructors cover monopolistic competition very briefly or dispense with it entirely, we think it is an overlooked tool for reinforcing the basic message of how markets work in a context that is much more familiar to students than are the agricultural examples that dominate other discussions of perfect competition. We use the monopolistic competition model to introduce the downward-sloping demand curve material usually introduced in a monopoly chapter. This approach helps students grasp the important point that nearly all firms—not just monopolies—face downward-sloping demand curves. Covering monopolistic competition directly after perfect competition also allows for the early discussion of topics such as brand management and sources of competitive success. Nevertheless, we wrote the chapter so that instructors who prefer to cover monopoly (Chapter 15, "Monopoly and Antitrust Policy") directly after perfect competition (Chapter 12, "Firms in Perfectly Competitive Markets") can do so without loss of continuity.
- **Extensive, realistic game theory coverage.** In Chapter 14, "Oligopoly: Firms in Less Competitive Markets," we use game theory to analyze competition among oligopolists.

Game theory helps students understand how companies with market power make strategic decisions in many competitive situations. We use familiar companies such as Apple, Hewlett-Packard, Coca-Cola, PepsiCo, and Dell in our game theory applications.

- **Unique coverage of pricing strategy.** In Chapter 16, "Pricing Strategy," we explore how firms use pricing strategies to increase profits. Students encounter pricing strategies everywhere—when they buy a movie ticket, book a flight for spring break, or research book prices online. We use these relevant, familiar examples to illustrate how companies use strategies such as price discrimination, cost-plus pricing, and two-part tariffs.

Special Features:

A Real-World, Hands-on Approach to Learning Economics

Business Cases and *An Inside Look* News Articles

Each chapter-opening case provides a real-world context for learning, sparks students' interest in economics, and helps unify the chapter. The case describes an actual company facing a real situation. The company is integrated in the narrative, graphs, and pedagogical features of the chapter. Many of the chapter openers focus on the role of entrepreneurs in developing new products and bringing them to the market. For example, Chapter 2 discusses Elon Musk of Tesla Motors and Chapter 8 discusses Mark Zuckerberg of Facebook. Here are a few examples of companies we explore in the chapter openers:

- Tesla Motors (Chapter 2, "Trade-offs, Comparative Advantage, and the Market System")
- Apple (Chapter 3, "Where Prices Come From: The Interaction of Demand and Supply")
- Facebook (Chapter 8, "Firms, the Stock Market, and Corporate Governance")

CHAPTER 3

Where Prices Come From: The Interaction of Demand and Supply

Chapter Outline and Learning Objectives

3.1 **The Demand Side of the Market,** page 70
Discuss the variables that influence demand.

3.2 **The Supply Side of the Market,** page 78
Discuss the variables that influence supply.

3.3 **Market Equilibrium: Putting Demand and Supply Together,** page 82
Use a graph to illustrate market equilibrium.

3.4 **The Effect of Demand and Supply Shifts on Equilibrium,** page 85
Use demand and supply graphs to predict changes in prices and quantities.

Smartphones: The Indispensible Product?

If you're like most students, professors, and businesspeople, you carry your cellphone or smartphone everywhere you go. With a cellphone, you can make and receive phone calls and text messages. With a smartphone, you can do much more: send and receive e-mails, check Facebook and other social media sites, share photos, and stream videos. By 2013, more than two million smartphones were being sold *per day* worldwide.

Ten years ago, the BlackBerry, sold by the Canadian-based firm Research in Motion, was the only widely used smartphone. The BlackBerry was expensive, though, and most buyers were businesspeople who wanted to send and answer e-mails while away from the office. When Apple introduced the iPhone in 2007, smartphones started to become popular with a wider market of consumers, including students. With the release of the iPhone 3G in 2008, Apple announced that a section of its immensely popular iTunes music and video store would be devoted to applications (or "apps") for the iPhone. Major software companies, as well as individuals writing their first software programs, have posted games, calendars, dictionaries, and many other types of apps to the iTunes store. Apple sold more than 3 million iPhones within a month of launching the iPhone 3G.

Although initially Apple had a commanding share of the smartphone market, competitors soon appeared. Companies such as Samsung, Nokia, HTC, LG, Huawei, Microsoft, Sony, ZTE, and Panasonic introduced smartphones. Most of these manufacturers followed Apple in developing apps or providing users access to online app stores.

The intense competition among firms selling smartphones is a striking example of how the market responds to changes in consumer tastes. As many consumers indicated that they would pay more for a smartphone than a regular cellphone, firms scrambled to meet the demand for smartphones. Although intense competition is not always good news for firms trying to sell products, it is great news for consumers because it increases the available choice of products and lowers the prices consumers pay for those products.

AN INSIDE LOOK on page 92 discusses how Google faced the problem of not having enough of its Nexus 4 smartphones to meet customer demand, while Apple worried about overproduction of its iPhone 5.

Sources: Brian X. Chen, "Smartphones Finally Surpass the Feature Phone," *New York Times*, April 25, 2013; Eric Pfanner, "Competition Designed to Spread Basic Technologies," *New York Times*, April 18, 2013; and Brad Reed, "A Brief History of Smartphones," pcworld.com, June 19, 2010.

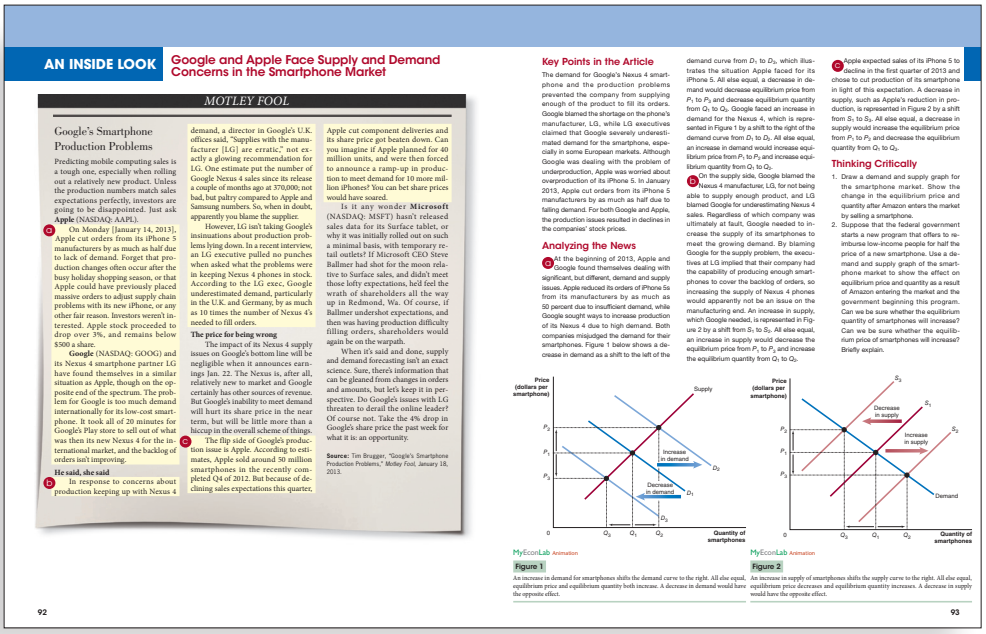
Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy?

Suppose you want to buy a smartphone and are choosing between an Apple iPhone and a Samsung Galaxy S. If you buy an iPhone, you will have access to more applications—or "apps"—that can increase the enjoyment and performance of your smartphone. In addition, the iPhone is thin, lightweight, and sleek looking. One strategy Samsung can use to overcome these advantages is to compete based on price and value. Would you choose to buy a Galaxy S if it had a lower price than a comparable iPhone? If your income increased, would it affect your decision about which smartphone to buy? As you read this chapter, try to answer these questions. You can check your answers against those we provide on **page 91** at the end of this chapter.

69

An *Inside Look* is a two-page feature that shows students how to apply the concepts from the chapter to the analysis of a news article. The feature appears at the end of Chapters 1–4. An *Inside Look* feature presents an excerpt from an article, analysis of the article, a graph(s), and critical thinking questions. Additional articles are located on MyEconLab, where they are continuously updated.



AN INSIDE LOOK Google and Apple Face Supply and Demand Concerns in the Smartphone Market

MOTLEY FOOL

Google's Smartphone Production Problems

Predicting mobile computing sales is a tough one, especially when rolling out a relatively new product. Unless the production numbers match sales expectations perfectly, investors are going to be disappointed. Just ask **Apple** (NASDAQ: AAPL).

a On Monday [January 14, 2013], Apple cut orders from its iPhone 5 manufacturers by as much as half due to lack of demand. Forget that production changes often occur after the busy holiday shopping season, or that Apple could have previously placed massive orders to adjust supply chain problems with its new iPhone, or any other fair reason. Investors weren't interested. Apple stock proceeded to drop over 3%, and remains below $500 a share.

Google (NASDAQ: GOOG) and its Nexus 4 smartphone partner LG have found themselves in a similar situation as Apple, though on the opposite end of the spectrum. The problem for Google is too much demand internationally for its low-cost smartphone. It took all of 20 minutes for Google's Play store to sell out of what was then its new Nexus 4 for the international market, and the backlog of orders isn't improving.

He said, she said

b In response to concerns about production keeping up with Nexus 4 demand, a director in Google's U.K. offices said, "Supplies with the manufacturer [LG] are erratic," not exactly a glowing recommendation for LG. One estimate put the number of Google Nexus 4 sales since its release a couple of months ago at 370,000; not bad, but paltry compared to Apple and Samsung numbers. So, when in doubt, apparently you blame the supplier.

However, LG isn't taking Google's insinuations about production problems lying down. In a recent interview, an LG executive pulled no punches when asked what the problems were in keeping Nexus 4 phones in stock. According to the LG exec, Google underestimated demand, particularly in the U.K. and Germany, by as much as 10 times the number of Nexus 4's needed to fill orders.

The price for being wrong

The impact of its Nexus 4 supply issues on Google's bottom line will be negligible when it announces earnings Jan. 22. The Nexus is, after all, relatively new to market and Google certainly has other sources of revenue. But Google's inability to meet demand will hurt its share price in the near term, but will be little more than a hiccup in the overall scheme of things.

c The flip side of Google's production issue is Apple. According to estimates, Apple sold around 50 million smartphones in the recently completed Q4 of 2012. But because of declining sales expectations this quarter, Apple cut component deliveries and its share price got beaten down. Can you imagine if Apple planned for 40 million units, and were then forced to announce a ramp-up in production to meet demand for 10 more million iPhones? You can bet share prices would have soared.

Is it any wonder **Microsoft** (NASDAQ: MSFT) hasn't released sales data for its Surface tablet, or why it was initially rolled out on such a minimal basis, with temporary retail outlets? If Microsoft CEO Steve Ballmer had shot for the moon relative to Surface sales, and didn't meet those lofty expectations, he'd feel the wrath of shareholders all the way up in Redmond, Wa. Of course, if Ballmer undershot expectations, and then was having production difficulty filling orders, shareholders would again be on the warpath.

When it's said and done, supply and demand forecasting isn't an exact science. Sure, there's information that can be gleaned from changes in orders and amounts, but let's keep it in perspective. Do Google's issues with LG threaten to derail the online leader? Of course not. Take the 4% drop in Google's share price the past week for what it is: an opportunity.

Source: Tim Brugger, "Google's Smartphone Production Problems," *Motley Fool*, January 18, 2013.

92

Key Points in the Article

The demand for Google's Nexus 4 smartphone and the production problems prevented the company from supplying enough of the product to fill its orders. Google blamed the shortage on the phone's manufacturer, LG, while LG executives claimed that Google severely underestimated demand for the smartphone, especially in some European markets. Although Google was dealing with the problem of underproduction, Apple was worried about overproduction of its iPhone 5. In January 2013, Apple cut orders from its iPhone 5 manufacturers by as much as half due to falling demand. For both Google and Apple, the production issues resulted in declines in the companies' stock prices.

Analyzing the News

c At the beginning of 2013, Apple and Google found themselves dealing with significant, but different, demand and supply issues. Apple reduced its orders of iPhone 5s from its manufacturers by as much as 50 percent due to insufficient demand, while Google sought ways to increase production of its Nexus 4 due to high demand. Both companies misjudged the demand for their smartphones. Figure 1 below shows a decrease in demand as a shift to the left of the demand curve from D_1 to D_2, which illustrates the situation Apple faced for its iPhone 5. All else equal, a decrease in demand would decrease equilibrium price from P_1 to P_2 and decrease equilibrium quantity from Q_1 to Q_2. Google faced an increase in demand for the Nexus 4, which is represented in Figure 1 by a shift to the right of the demand curve from D_1 to D_3. All else equal, an increase in demand would increase equilibrium price from P_1 to P_3 and increase equilibrium quantity from Q_1 to Q_3.

b On the supply side, Google blamed the Nexus 4 manufacturer, LG, for not being able to supply enough product, and LG blamed Google for underestimating Nexus 4 sales. Regardless of which company was ultimately at fault, Google needed to increase the supply of its smartphones to meet the growing demand. By blaming Google for the supply problem, the executives at LG implied that their company had the capability of producing enough smartphones to cover the backlog of orders, so increasing the supply of Nexus 4 phones would apparently not be an issue on the manufacturing end. An increase in supply, which Google needed, is represented in Figure 2 by a shift from S_1 to S_2. All else equal, an increase in supply would decrease the equilibrium price from P_1 to P_2 and increase the equilibrium quantity from Q_1 to Q_2.

c Apple expected sales of its iPhone 5 to decline in the first quarter of 2013 and chose to cut production of its smartphone in light of this expectation. A decrease in supply, such as Apple's reduction in production, is represented in Figure 2 by a shift from S_1 to S_2. All else equal, a decrease in supply would increase the equilibrium price from P_1 to P_2 and decrease the equilibrium quantity from Q_1 to Q_2.

Thinking Critically

1. Draw a demand and supply graph for the smartphone market. Show the change in the equilibrium price and quantity after Amazon enters the market by selling a smartphone.
2. Suppose that the federal government starts a new program that offers to reimburse low-income people for half the price of a new smartphone. Use a demand and supply graph of the smartphone market to show the effect on equilibrium price and quantity as a result of Amazon entering the market and the government beginning this program. Can we be sure whether the equilibrium quantity of smartphones will increase? Can we be sure whether the equilibrium price of smartphones will increase? Briefly explain.

MyEconLab Animation

Figure 1

An increase in demand for smartphones shifts the demand curve to the right. All else equal, equilibrium price and equilibrium quantity both increase. A decrease in demand would have the opposite effect.

MyEconLab Animation

Figure 2

An increase in supply of smartphones shifts the supply curve to the right. All else equal, equilibrium price decreases and equilibrium quantity increases. A decrease in supply would have the opposite effect.

93

Economics in Your Life

After the chapter-opening real-world business case, we include a personal dimension to the chapter opener with a feature titled *Economics in Your Life*, which asks students to consider how economics affects their lives. The feature piques the interest of students and emphasizes the connection between the material they are learning and their experiences.

Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy?

Suppose you want to buy a smartphone and are choosing between an Apple iPhone and a Samsung Galaxy S. If you buy an iPhone, you will have access to more applications—or "apps"—that can increase the enjoyment and performance of your smartphone. In addition, the iPhone is thin, lightweight, and sleek looking. One strategy Samsung can use to overcome these advantages is to compete based on price and value. Would you choose to buy a Galaxy S if it had a lower price than a comparable iPhone? If your income increased, would it affect your decision about which smartphone to buy? As you read this chapter, try to answer these questions. You can check your answers against those we provide on **page 91** at the end of this chapter.

At the end of the chapter, we use the chapter concepts to answer the questions asked at the beginning of the chapter.

Continued from page 69

Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy?

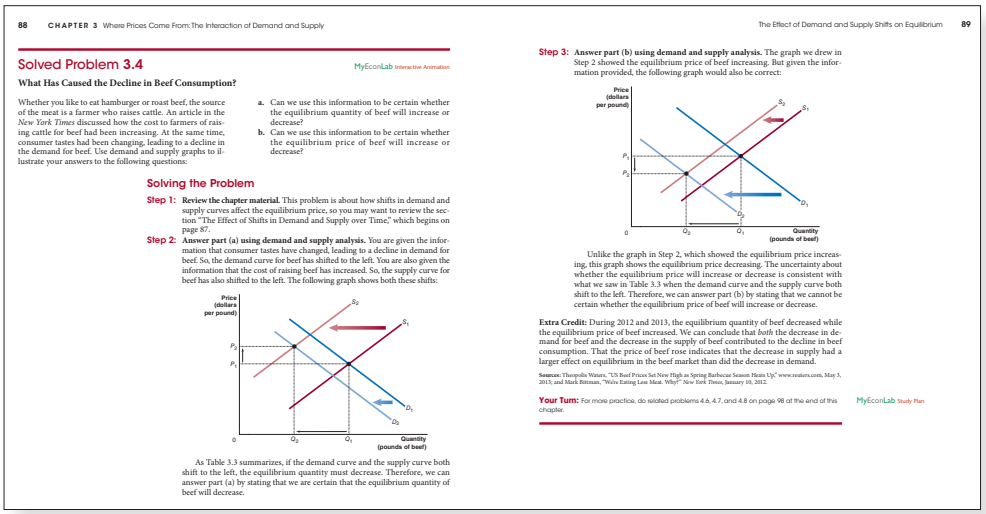
At the beginning of this chapter, we asked you to consider two questions: Would you choose to buy a Samsung Galaxy S if it had a lower price than a comparable Apple iPhone? and Would your decision be affected if your income increased? To determine the answer to the first question, you have to recognize that the iPhone and the Galaxy S are substitutes. If you consider the two smartphones to be close substitutes, then you are likely to buy the one with the lower price. In the market, if consumers generally believe that the iPhone and the Galaxy S are close substitutes, a fall in the price of the iPhone will increase the quantity of iPhones demanded and decrease the demand for Galaxy Ss. Suppose that you are currently leaning toward buying the Galaxy S because its price is lower than the price of the iPhone. If an increase in your income would cause you to change your decision and buy the iPhone, then the Galaxy S is an inferior good for you.

The following are examples of the topics we cover in the *Economics in Your Life* feature:

- Will you buy an Apple iPhone or a Samsung Galaxy? (Chapter 3, "Where Prices Come From: The Interaction of Demand and Supply")
- Is your take-home pay affected by what your employer spends on your health insurance? (Chapter 7, "The Economics of Health Care")
- Why can't you find a cheap PlayStation 4? (Chapter 14, "Oligopoly: Firms in Less Competitive Markets")

Solved Problems

Many students have great difficulty handling applied economics problems. We help students overcome this hurdle by including in each chapter two or three worked-out problems tied to select chapter-opening learning objectives. Our goals are to keep students focused on the main ideas of each chapter and give them a model of how to solve an economic problem by breaking it down step by step. Additional exercises in the end-of-chapter *Problems and Applications* section are tied to every *Solved Problem*. Additional *Solved Problems* appear in the *Instructor's Manual* and the print *Study Guide*. In addition, the *Test Item File* includes problems tied to the *Solved Problems* in the main book.



88 CHAPTER 3 Where Prices Come From: The Interaction of Demand and Supply

Solved Problem 3.4 MyEconLab Interactive Animation

What Has Caused the Decline in Beef Consumption?

Whether you like to eat hamburger or roast beef, the source of the meat is a farmer who raises cattle. An article in the *New York Times* discussed how the cost to farmers of raising cattle for beef had been increasing. At the same time, consumer tastes had been changing, leading to a decline in the demand for beef. Use demand and supply graphs to illustrate your answers to the following questions:

a. Can we use this information to be certain whether the equilibrium quantity of beef will increase or decrease?
b. Can we use this information to be certain whether the equilibrium price of beef will increase or decrease?

Solving the Problem

Step 1: **Review the chapter material.** This problem is about how shifts in demand and supply curves affect the equilibrium price, so you may want to review the section "The Effect of Shifts in Demand and Supply over Time," which begins on page 87.

Step 2: **Answer part (a) using demand and supply analysis.** You are given the information that consumer tastes have changed, leading to a decline in demand for beef. So, the demand curve for beef has shifted to the left. You are also given the information that the cost of raising beef has increased. So, the supply curve for beef has also shifted to the left. The following graph shows both these shifts:

As Table 3.3 summarizes, if the demand curve and the supply curve both shift to the left, the equilibrium quantity must decrease. Therefore, we can answer part (a) by stating that we are certain that the equilibrium quantity of beef will decrease.

The Effect of Demand and Supply Shifts on Equilibrium 89

Step 3: **Answer part (b) using demand and supply analysis.** The graph we drew in Step 2 showed the equilibrium price of beef increasing. But given the information provided, the following graph would also be correct:

Unlike the graph in Step 2, which showed the equilibrium price increasing, this graph shows the equilibrium price decreasing. The uncertainty about whether the equilibrium price will increase or decrease is consistent with what we saw in Table 3.3 when the demand curve and the supply curve both shift to the left. Therefore, we can answer part (b) by stating that we cannot be certain whether the equilibrium price of beef will increase or decrease.

Extra Credit: During 2012 and 2013, the equilibrium quantity of beef decreased while the equilibrium price of beef increased. We can conclude that *both* the decrease in demand for beef and the decrease in the supply of beef contributed to the decline in beef consumption. That the price of beef rose indicates that the decrease in supply had a larger effect on equilibrium in the beef market than did the decrease in demand.

Sources: Theopolis Waters, "US Beef Prices Set New High as Spring Barbecue Season Heats Up," www.reuters.com, May 3, 2013; and Mark Bittman, "We're Eating Less Meat. Why?" *New York Times*, January 10, 2012.

Your Turn: For more practice, do related problems 4.6, 4.7, and 4.8 on page 98 at the end of this chapter. MyEconLab Study Plan