Principles of Microeconomics

About the Authors



John B. Taylor is one of the field's most inspiring teachers. As the Raymond Professor of Economics at Stanford University, his distinctive instructional methods have made him a legend among introductory economics students and have won him both the Hoagland and Rhodes prizes for teaching excellence.

Professor Taylor is also widely recognized for his research on the

foundations of modern monetary theory and policy. One of his well-known research contributions is a rule—now widely called the Taylor Rule—used at central banks around the world.

Taylor has had an active career in public service, recently completing a four-year stint as the head of the International Affairs division at the United States Treasury, where he had responsibility for currency policy, international debt, and oversight of the International Monetary Fund and the World Bank and worked closely with leaders and policymakers from countries throughout the world. He has also served as economic adviser to the governor of California, to the U.S. Congressional Budget Office, and to the President of the United States and has served on several boards and as a consultant to private industry.

Professor Taylor began his career at Princeton, where he graduated with highest honors in economics. He then received his Ph.D. from Stanford and taught at Columbia, Yale, and Princeton before returning to Stanford.



Akila Weerapana is an Professor Associate of Economics at Wellesley College. He was born and raised in Sri Lanka and came to the United States to do his undergraduate work at Oberlin College, where he earned a B.A. with highest honors in Economics and Computer Science in 1994. He received his Ph.D. in

Economics from Stanford in 1999, writing his dissertation on monetary economics under the mentorship of John Taylor.

Since then, Professor Weerapana has taught in the Economics Department at Wellesley College. His teaching interests span all levels of the department's curriculum, including introductory and intermediate macroeconomics, international finance, monetary economics, and mathematical economics. He was awarded Wellesley's Pinanski Prize for Excellence in Teaching in 2002. He also enjoys working with thesis students, advising projects ranging from a study of the economic benefits of eradication of river blindness in Ghana to an analysis of the determinants of enterprise performance in Russia.

In addition to teaching, Professor Weerapana has research interests in macroeconomics, specifically in the areas of monetary economics, international finance, and political economy.

Brief Contents

Principles of Economics		Principles of Principles of Microeconomics Macroeconomics	
Chapter Number	Chapter Title	Chapter Number	Chapter Number
	PART 1 Introduction to Economics	PART 1	PART 1
1	The Central Idea	1	1
2	Observing and Explaining the Economy	2	2
2A	APPENDIX to Chapter 2: Reading, Understanding, and Creating Graphs	2A	2A
3	The Supply and Demand Model	3	3
4	Subtleties of the Supply and Demand Model: Price Floors, Price Ceilings, and Elasticity	4	4

	PART 2 Principles of Microeconomics	PART 2	
5	The Demand Curve and the Behavior of Consumers	5	
5A	APPENDIX to Chapter 5: Consumer Theory with Indifference Curves	5A	
6	The Supply Curve and the Behavior of Firms	6	
7	The Interaction of People in Markets	7	

	PART 3 The Economics of the Firm	PART 3	
8	Costs and the Changes at Firms over Time	8	
8A	APPENDIX to Chapter 8: Producer Theory with Isoquants	8A	
9	The Rise and Fall of Industries	9	
10	Monopoly	10	
11	Product Differentiation, Monopolistic Competition, and Oligopoly	11	
12	Antitrust Policy and Regulation	12	

	PART 4 Markets, Income Distribution, and Public Goods	PART 4	
13	Labor Markets	13	
14	Taxes, Transfers, and Income Distribution	14	
15	Public Goods, Externalities, and Government Behavior	15	
16	Capital and Financial Markets	16	16: Financial Markets
16A	APPENDIX to Chapter 16: Present Discounted Value	16A	16A

	Economics	Principles of Microeconomics	Principles of Macroeconomics
Chapter Number	Chapter Title	Chapter Number	Chapter Number
	PART 5 Principles of Macroeconomics		PART 2
17	Macroeconomics: The Big Picture		5
17A	APPENDIX to Chapter 17: The Miracle of Compound Growth		5A
18	Measuring the Production, Income, and Spending of Nations		6
19	The Spending Allocation Model		7
20	Unemployment and Employment		8
21	Productivity and Economic Growth		9
21A	APPENDIX to Chapter 21: Deriving the Growth Accounting Formula		9A
22	Money and Inflation		10
	PART 6 Economic Fluctuations and Macroeconomic Policy		PART 3
23	The Nature and Causes of Economic Fluctuations		11
23A	APPENDIX to Chapter 23: Deriving the Formula for the Keynesian Multiplier and the Forward Looking Consumption Model		11A
24	The Economic Fluctuations Model		12
25	Using the Economic Fluctuations Model		13
26	Fiscal Policy		14
27	Monetary Policy and the Financial Crisis		15

	PART 7 Trade and Global Markets	PART 5	PART 4
28 Economic Growth	and Globalization		17
29 The Gains from In	ternational Trade	17	18
30 International Trade	Policy	18	19

Contents

Preface xvii

PART 1 Introduction to Economics

CHAPTER 1 The Central Idea 2

Scarcity and Choice for Individuals 4

Consumer Decisions 4 *Opportunity Cost 4* Gains from Trade: A Better *Allocation 5*

Producer Decisions 5 Gains from Trade: Greater Production 6 Specialization, Division of Labor, and Comparative Advantage 6 International Trade 8

Scarcity and Choice for the Economy as a Whole 8

Production Possibilities 8

Increasing Opportunity Costs 9

The Production Possibilities Curve 11 Inefficient, Efficient, or Impossible? 11 Shifts in the Production Possibilities Curve 11 Scarcity, Choice, and Economic Progress 13

Market Economies and the Price System 13

Key Elements of a Market Economy 15 Freely Determined Prices 15 = Property Rights and Incentives 15 = Freedom to Trade at Home and Abroad 15 = A Role for Government 15 = The Role of Private Organizations 16
The Price System 16 Signals 16 = Incentives 17 = Distribution 17
Financial Crises and Recessions 17

Conclusion 20

1

Key Points 21 • Key Terms 21 • Questions for Review 21 • Problems 22

ECONOMICS IN ACTION: GAINS FROM TRADE ON THE INTERNET 7

ECONOMICS IN ACTION: THE BOOM IN COMMUNITY COLLEGE ENROLLMENTS AND THE ECONOMIC DOWNTURN 9

ECONOMICS IN THE NEWS: FINANCIAL CRISIS GENERATES HEATED DEBATE ABOUT THE ROLE OF GOVERNMENT IN THE ECONOMY 18

CHAPTER 2 Observing and Explaining the Economy 24

What Do Economists Do? 25

Understanding Fluctuations in the Price of Gasoline 26

Description 27

Data Limitations 28

Explaining an Economic Event 29 Correlation versus Causation 30
The Lack of Controlled Experiments in Economics 30

Predicting the Impact of Future Changes 32 Economic Models 32 Microeconomic versus Macroeconomic Models 32 An Example: A Model with Two Variables 33

The Ceteris Paribus Assumption 35

The Use of Existing Models 35 The Development of New Models 35

Recommending Appropriate Policies 36

Positive versus Normative Economics36Economics as a Science versus a Partisan Policy Tool36Economics Is Not the Only Factor in Policy Issues40Disagreement Between Economists40

Conclusion: A Reader's Guide 40

Key Points 41 • Key Terms 42 • Questions for Review 42 • Problems 42

ECONOMICS IN ACTION: AN ECONOMIC EXPERIMENT TO STUDY DISCRIMINATION 31

ECONOMICS IN ACTION: THE PRESIDENT'S COUNCIL OF ECONOMIC ADVISERS IN ACTION 37

ECONOMICS IN THE NEWS: YOUNG ECONOMISTS AT WORK 38

APPENDIX TO CHAPTER 2

Reading, Understanding, and Creating Graphs 44

Visualizing Observations with Graphs 44

Time-Series Graphs 44

Time-Series Graphs Showing Two or More Variables 46

CHAPTER 3 The Supply and Demand Model 52

Demand 53

The Demand Curve 54

Shifts in Demand 54

- Consumers' Preferences 56 Consumers' Information 56
- Consumers' Incomes 57 Number of Consumers in the Market 57 Consumers' Expectations of Future Prices 57
- Prices of Closely Related Goods 57

Movements Along versus Shifts of the Demand Curve 58

Supply 60

The Supply Curve 60

Shifts in Supply 61

Technology 62 • Weather Conditions 63 • The Price of Inputs Used in Production 63 • The Number of Firms in the Market 63 • Expectations of Future Prices 63 • Government Taxes, Subsidies, and Regulations 63

Movements Along versus Shifts of the Supply Curve 64

Scatter Plots 47 Pie Charts 47

Visualizing Models with Graphs 48

Slopes of Curves 48

Graphs of Models with More Than Two Variables 49 Key Terms and Definitions 50 • Questions for Review 50 • Problems 50

Market Equilibrium: Combining Supply and Demand 65

Determination of the Market Price 66 Finding the Market Price 67 Two Predictions 70

Finding the Equilibrium with a Supply and Demand Diagram 70

Market Outcomes When Supply or Demand Changes 71 Effects of a Change in Demand 71 • Effects of a Change in Supply 71 • When Both Curves Shift 74

Conclusion 77

Key Points 77 • Key Terms 78 • Questions for Review 78 • Problems 78

Economics in the news: why roses cost more on valentine's day 68

ECONOMICS IN ACTION: USING THE SUPPLY AND DEMAND MODEL TO ANALYZE REAL-WORLD ISSUES 75

CHAPTER 4 Subtleties of the Supply and Demand Model: Price Floors, Price Ceilings, and Elasticity 80

Interference with Market Prices 81

Price Ceilings and Price Floors 81

Side Effects of Price Ceilings 82 Dealing with Persistent Shortages 82 Making Things Worse 84

Side Effects of Price Floors 84 Dealing with Persistent Surpluses 84 Making Things Worse 84

Elasticity of Demand 86

Defining the Price Elasticity of Demand86The Size of the Elasticity: High versus Low87The Impact of a Change in Supply on the Price of Oil88

Working with Demand Elasticities 93

The Advantage of a Unit-Free Measure93Elasticity versus Slope94Calculating the Elasticity with a Midpoint Formula94

Talking about Elasticities 96 Elastic versus Inelastic Demand 96 • Perfectly Elastic versus Perfectly Inelastic Demand 96 Revenue and the Price Elasticity of Demand 97 What Determines the Size of the Price Elasticity of Demand? 100 *The Degree of Substitutability* 100 Big-Ticket versus Little-Ticket Items 100 - Temporary versus Permanent Price Changes 100 Differences in Preferences 100 Long-Run versus Short-Run Elasticity 101 Income Elasticity and Cross-Price Elasticity of Demand 101

Elasticity of Supply 105

Working with Supply Elasticities 106 Perfectly Elastic and Perfectly Inelastic Supply 107 • Why the Size of the Price Elasticity of Supply Is Important 107

Conclusion 110

Key Points 110 • Key Terms 111 • Questions for Review 111 • Problems 111

ECONOMICS IN ACTION: HOW POLICYMAKERS USE PRICE ELASTICITY OF DEMAND TO DISCOURAGE UNDERAGE DRINKING 87 ECONOMICS IN THE NEWS: INCREASING SCHOOL ENROLLMENT IN AFRICA 90

ECONOMICS IN ACTION: PREDICTING THE SIZE OF A PRICE INCREASE 92

ECONOMICS IN ACTION: WILL AN INCREASE IN THE MINIMUM WAGE BENEFIT POOR WORKERS? 103

PART 2 Principles of Microeconomics 115

CHAPTER 5 The Demand Curve and the Behavior of Consumers 116

Utility and Consumer Preferences 117

A Consumer's Utility Depends on the Consumption of Goods 118 Important Properties of Utility 119

The Budget Constraint and Utility Maximization 121

The Budget Constraint 121

Maximizing Utility Subject to the Budget Constraint 122

Deriving the Individual's Demand Curve 123 *Effect of a Change in Income: A Shift in the Demand Curve 124* Income and Substitution Effects of a Price *Change 126*

Willingness to Pay and the Demand Curve 127

Measuring Willingness to Pay and Marginal Benefit 127 Graphical Derivation of the Individual Demand Curve 128 The Price Equals Marginal Benefit Rule 130

The Market Demand Curve 131

Different Types of Individuals 132

Consumer Surplus 133

Conclusion 137

Key Points 138 • Key Terms 138 • Questions for Review 139 • Problems 139 ECONOMICS IN ACTION: PEERING DEEPER INTO HOW INDIVIDUALS MAKE DECISIONS 124

ECONOMICS IN THE NEWS: CREATING CONSUMER SURPLUS FOR THE POOR $134\,$

ECONOMICS IN ACTION: BUILDING ROADS AND BRIDGES WITH CONSUMER SURPLUS 136

APPENDIX TO CHAPTER 5

Consumer Theory with Indifference Curves 141

The Budget Line 141

The Indifference Curve 142

Getting to the Highest Indifference Curve Given the Budget Line 143

The Utility-Maximizing Rule 143

Effect of a Price Change on the Quantity Demanded 144

Effect of an Income Change on Demand 144

Graphical Illustration of the Income Effect and the Substitution Effect 144

Key Points 145 • Key Terms and Definitions 145 • Questions for Review 146 • Problems 146

CHAPTER 6 The Supply Curve and the Behavior of Firms 148

Definition of a Firm 150

Your Own Firm: A Pumpkin Patch 150 Your Firm as a Price-Taker in a Competitive Market 150 Other Types of Markets 152

The Firm's Profits 152

Total Revenue 153

Production and Costs 153
The Time Period 154

The Production Function 154
Costs 155

Graphical Representation of Total Costs and Marginal Cost 157

Profit Maximization and the Individual Firm's Supply Curve 158

An Initial Approach to Derive the Supply Curve 159 A Profit Table 159 • A Profit Graph 160

- Contents х
- The Marginal Approach to Derive the Supply Curve 160 Finding the Quantity Supplied at Different Prices 161 The Price Equals Marginal Cost Rule 164
- A Comparison of the Two Approaches to Profit Maximization 165

The Market Supply Curve 166

The Slope of the Supply Curve 167 Shifts in the Supply Curve 167

Producer Surplus 170

A Graphical Representation of Producer Surplus 170 What Is the Difference between Profits and Producer Surplus? 170

Conclusion 172

Key Points 173 • Key Terms 173 • Questions for Review 173 Problems 174

ECONOMICS IN ACTION: GREEN PRICING AND INCENTIVES 163

ECONOMICS IN THE NEWS: SUPPLY SHIFTS CAUSED BY NATURAL DISASTER 168

The Interaction of People in Markets 176 **CHAPTER 7**

Individual Consumers and Firms in a Market 177

- The Hard Way to Process Information, Coordinate, and Motivate 177
- The Easy Way to Process Information, Coordinate, and Motivate 179
- The Competitive Equilibrium Model 182 Individual Production and Consumption Decisions 183 Adjustment to the Equilibrium Price 184

Are Competitive Markets Efficient? 184

The Meaning of Efficient 185 The Need for a More Precise Definition 185 - Three Conditions for Efficient Outcomes 185 186

Is the Market Efficient?

Efficiency and Income Inequality 188

Measuring Waste from Inefficiency 189

Maximizing the Sum of Producer Plus Consumer Surplus 189 Deadweight Loss 189

The Deadweight Loss from Price Floors and Ceilings 191 The Deadweight Loss from a Price Floor 192 The Deadweight Loss from a Price Ceiling 193

The Deadweight Loss from Taxation 194

A Tax Paid by a Producer Shifts the Supply Curve 194 A New Equilibrium Price and Quantity 195 Deadweight Loss and Tax Revenue 195

Informational Efficiency 197

Conclusion 198

Key Points 199 Key Terms 199 Questions for Review 199 Problems 200

ECONOMICS IN THE NEWS: COORDINATION FAILURE IN **RESPONDING TO A FAMINE** 180

ECONOMICS IN ACTION: PRICE CONTROLS AND DEADWEIGHT LOSS IN THE MILK INDUSTRY 196

The Economics of the Firm PART 3 203

Costs and the Changes at Firms over Time 204 **CHAPTER 8**

Costs for an Individual Firm 206

Total Costs, Fixed Costs, Variable Costs, and Marginal Cost 206 The Short Run and the Long Run 206 • Marginal Cost 208 Average Cost 209 The Relationship between a Firm's Costs and the Firm's Production Function 210

The Production Function 210

Cost Curves 213 Marginal versus Average in the Classroom 214 Generic Cost Curves 214

The Production Decision in the Short Run 216

The Profit or Loss Rectangle 216 The Total Revenue Area 217 - The Total Costs Area 217 Profits or Losses 218

The Breakeven Point218The Shutdown Point219

Costs and Production: The Long Run 224

The Effect of Capital Expansion on Costs224The Long-Run ATC Curve226Capital Expansion and Production in the Long Run228

Economies of Scale 229

Determining Whether a Firm Has Economies or Diseconomies of Scale 230 Mergers and Economies of Scope 231

Conclusion 234

Key Points 234 • Key Terms 234 • Questions for Review 235 • Problems 235

ECONOMICS IN THE NEWS: A DORMANT MINE STARTS UP AGAIN 222

ECONOMICS IN ACTION: EXPANDING (AND SHRINKING) A FIRM OVER TIME 229

237

ECONOMICS IN ACTION: ECONOMIST FINDS ECONOMIES OF SCALE AT PIN FACTORY 233

APPENDIX TO CHAPTER 8

Producer Theory with Isoquants 237

Combining Capital and Labor Isoquants 238 Isocost Lines 239

Minimizing Costs for a Given Quantity240The Cost Minimization Rule241A Change in the Relative Price of Labor241

Key Terms and Definitions 241 • Questions for Review 241 • Problems 242

CHAPTER 9 The Rise and Fall of Industries 244

Markets and Industries 245

The Long-Run Competitive Equilibrium Model of an Industry 246

Setting Up the Model with Graphs 246 Entry and Exit 246 Long-Run Equilibrium 247

An Increase in Demand 248 Short-Run Effects 248 Toward a New Long-Run Equilibrium 250

A Decrease in Demand 250 Economic Profits versus Accounting Profits 250 = The Equilibrium Number of Firms 254 = Entry or Exit Combined with Individual Firm Expansion or Contraction 254

Shifts in Cost Curves 256

Average Total Cost Is Minimized 256 Efficient Allocation of Capital among Industries 256

External Economies and Diseconomies of Scale 261 The Standard Assumption: A Flat Long-Run Industry

Supply Curve 261 External Diseconomies of Scale 261 External Economies of Scale 262 External and Internal Economies of Scale Together 264

Conclusion 265

Key Points 265 • Key Terms 266 • Questions for Review 266 • Problems 266

ECONOMICS IN THE NEWS: ENTRY AND EXIT IN THE DVD RENTAL INDUSTRY 252

ECONOMICS IN ACTION: THE RISE OF DIGITAL CAMERAS AND THE DEATH OF SILVER HALIDE FILM 255

ECONOMICS IN THE NEWS: CYCLES IN THE GRAPE INDUSTRY 258

CHAPTER 10 Monopoly 268

A Model of Monopoly 270

Getting an Intuitive Feel for the Market Power of a Monopoly 270 There Is No One to Undercut the Monopolist's Price 270

- The Impact of Quantity Decisions on the Price 270
- Showing Market Power with a Graph 271

The Effects of a Monopoly's Decision on Revenues 274

- Total Revenue and Marginal Revenue 275
- Marginal Revenue Is Less Than the Price 276
- Marginal Revenue and Elasticity 276
 Average Revenue 277

- Finding Output to Maximize Profits at the Monopoly 277 Comparing Total Revenue and Total Costs 277 Equating Marginal Cost and Marginal Revenue 277
- MC = MR at a Monopoly versus MC = P at a Competitive Firm 279
 Marginal Revenue Equals the Price for a Price-Taker 279
 A Graphical Comparison 279

The Generic Diagram of a Monopoly and Its Profits 281

Determining Monopoly Output and Price on the Diagram 282 Determining the Monopoly's Profits 283

Competition, Monopoly, and Deadweight Loss 284

Comparison with Competition 284

Deadweight Loss from Monopoly 285 Consumer Surplus and Producer Surplus Again 285 Meaningful Comparisons 286 The Monopoly Price Is Greater Than Marginal Cost

The Monopoly Price Is Greater Than Marginal Cost 286 Marginal Benefit Is More Than Marginal Cost 286 = The Price-Cost Margin 286

Why Monopolies Exist 287

Natural Monopolies 287 Patents and Copyrights 288 Licenses 289 Attempts to Monopolize and Erect Barriers to Entry 289

Price Discrimination 292

Consumers with Different Price Elasticities of Demand 292

Quantity Discounts 293

Conclusion 295

Key Points 295 • Key Terms 296 • Questions for Review 296 • Problems 296

ECONOMICS IN THE NEWS: THE DECLINE OF THE DIAMOND MONOPOLIST 272

ECONOMICS IN ACTION: HOW BEST TO ENSURE ACCESS TO CLEAN WATER IN DEVELOPING COUNTRIES 290

CHAPTER 11 Product Differentiation, Monopolistic Competition, and Oligopoly 298

Product Differentiation 300

Variety of Goods in a Market Economy 300 Puzzles Explained by Product Differentiation 301 Intraindustry Trade 301 = Advertising 302 = Consumer Information Services 302

How Are Products Differentiated? 302

The Optimal Amount of Product Differentiation at a Firm 303

Monopolistic Competition 308

A Typical Monopolistic Competitor 308 The Short Run: Just Like a Monopoly 310 Entry and Exit: Just Like Competition 310

The Long-Run Monopolistically Competitive Equilibrium 311 Comparing Monopoly, Competition, and Monopolistic Competition 312 Product Variety versus Deadweight Loss 312

Oligopoly 313

An Overview of Game Theory 314

Applying Game Theory to Oligopolies 315

- Competition in Quantities versus Competition in Prices 316
- Comparison with Monopoly and Perfect Competition 317
- Collusion 318 Incentives to Defect 319
- Incentives to Cooperate: Repeated Games 319 Secret Defections 319

Conclusion 320

Key Points 321 • Key Terms 321 • Questions for Review 322 • Problems 322

ECONOMICS IN ACTION: WHAT'S THE FUTURE OF PRODUCT DIFFERENTIATION? 304

ECONOMICS IN THE NEWS: THE DELICIOUSNESS OF PRODUCT DIFFERENTIATION 306

ECONOMICS IN ACTION: A DUOPOLY GAME 316

CHAPTER 12 Antitrust Policy and Regulation 324

Antitrust Policy 325

Attacking Existing Monopoly Power 325 A Brief History: From Standard Oil to Microsoft 326

Predatory Pricing 327

Merger Policy 327

The "Herf" 328 = Price-Cost Margins 329 = Market Definition 329 = Horizontal versus Vertical Mergers 332 Price Fixing 332

Vertical Restraints 333

Regulating Natural Monopolies 336

Methods of Regulating a Natural Monopoly 337 Marginal Cost Pricing 338 • Average Total Cost Pricing 339 • Incentive Regulation 339

To Regulate or Not to Regulate 341

Borderline Cases341Regulators as Captives of Industry342The Deregulation Movement343

Conclusion 344

Key Points 344 • Key Terms 345 • Questions for Review 345 • Problems 345

ECONOMICS IN ACTION: THE ISSUE: ARE MERGERS GOOD FOR THE ECONOMY? 330

ECONOMICS IN THE NEWS: PRICE FIXING IN THE IVY LEAGUE 334

PART 4

Markets, Income Distribution, and Public Goods 349

CHAPTER 13 Labor Markets 350

The Measurement of Wages 351

Measuring Workers' Pay 351 Pay Includes Fringe Benefits 352
Adjusting for Inflation: Real Wages versus Nominal Wages 352
The Time Interval: Hourly versus Weekly Measures of Pay 352

Wage Trends 352

The Labor Market 354

Labor Demand 355

A Firm's Employment Decision 355
From Marginal Product to Marginal Revenue Product 356
The Marginal Revenue Product of Labor Equals the Wage (MRP = W) 357

The Firm's Derived Demand for Labor 358 What If the Firm Has Market Power? 359 Market Demand for Labor 360

A Comparison of MRP = W with MC = P 360

Labor Supply 362

 Work versus Two Alternatives: Home Work and Leisure 362
 Effects of Wage Changes: Income and Substitution Effects 363 The Shape of Supply Curves 363

Work versus Another Alternative: Getting Human Capital 366

Explaining Wage Trends and Differences 367

Labor Productivity 367 The Relationship between Real Wages and Labor Productivity 370

Wage Dispersion and Productivity 370
 Compensating Wage Differentials 372 Discrimination
 373 Minimum Wage Laws 374 Fixed Wage
 Contracts 376 Deferred Wage Payments 376

Labor Unions 377

Union/Nonunion Wage Differentials 378 The Restricted Supply Explanation 378 • The Increased Productivity Explanation 379

Monopsony and Bilateral Monopoly 380

Conclusion and Some Advice 381

Key Points 381 • Key Terms 382 • Questions for Review 382 • Problems 383

ECONOMICS IN THE NEWS: INCENTIVES TO WORK 365

ECONOMICS IN ACTION: WHY IT'S BETTER BEING AN ECONOMIST 368

ECONOMICS IN ACTION: DOES PRODUCTIVITY OR COMPENSATING DIFFERENTIALS EXPLAIN THE ACADEMIC WAGE GAP? 371

CHAPTER 14 Taxes, Transfers, and Income Distribution 386

The Tax System 388

The Personal Income Tax 388 Computing the Personal Income Tax 388 • The Marginal Tax Rate 390 • Zero Tax on Low Incomes 391

The Payroll Tax 391

Other Taxes 394

The Effects of Taxes 394 The Effect of a Tax on a Good 394 • Effects of the Personal Income Tax 396 • The Effect of a Payroll Tax 397 • The Possibility of a Perverse Effect on Tax Revenue 399

Tax Policy and the Tradeoff between Efficiency and Equality 400

Transfer Payments 402

Means-Tested Transfer Programs 402 Incentive Effects 403 Social Insurance Programs 405 Mandated Benefits 408

The Distribution of Income in the United States 410

The Personal Distribution of Income 410

The Lorenz Curve and Gini Coefficient 411 Comparison with Other Countries 413 Income Mobility 413 Longer-Term Income Inequality 414 Changing Composition of Households 414 Distribution of Income versus Distribution of Wealth 414

Poverty and Measurement 415

Effects of Taxes and Transfers on Income Distribution and Poverty 418

Conclusion 419

Key Points 420 • Key Terms 420 • Questions for Review 421 • Problems 421

ECONOMICS IN THE NEWS: THE "DEATH TAX" DEBATE 392

ECONOMICS IN THE NEWS: ASSESSING THE SUCCESS OF THE 1996 WELFARE REFORM A DECADE LATER 406

ECONOMICS IN ACTION: SHOULD WE BE CONCERNED ABOUT INCOME INEQUALITY? 416

CHAPTER 15 Public Goods, Externalities, and Government Behavior 424

Public Goods 425

Nonrivalry and Nonexcludability 426 Free Riders: A Difficulty for the Private Sector 426 Avoiding Free-Rider Problems 428 Changes in Technology and Excludability 428 The Production of Goods by the Government 429 Cost-Benefit Analysis 429 *Marginal Cost and Marginal Benefit 429*

Externalities: From the Environment to Education 430

Negative Externalities 431 Positive Externalities 433

Externalities Spread across Borders 434

Remedies for Externalities 438

Private Remedies: Agreements between the Affected Parties 438
The Importance of Assigning Property Rights 439
Transaction Costs 439
The Free-Rider Problem Again 439
Command and Control Remedies 440

Taxes and Subsidies 440 Emission Taxes 445 • Why Is Command and Control Used More Than Taxes? 445 Balancing the Costs and Benefits of Reducing Externalities 446

Models of Government Behavior 450

Public Choice Models 451

The Voting Paradox 451

- Unanimity 451 The Median Voter Theorem 452
- Convergence of Positions in a Two-Party System 452
- Voting Paradoxes 452

Special Interest Groups 453 Concentrated Benefits and Diffuse Costs 455 • Wasteful Lobbying 455

Incentive Problems in Government 455

Conclusion 456

Key Points 457 • Key Terms 457 • Questions for Review 458 • Problems 458

ECONOMICS IN ACTION: EXCLUDABILITY, RIVALRY, AND THE CLASSIFICATION OF GOODS AND SERVICES 435

ECONOMICS IN THE NEWS: REALIZING THE POSITIVE EXTERNALITIES OF A NEW CANCER VACCINE 442

ECONOMICS IN THE NEWS: ENVIRONMENTAL ECONOMICS 448

Economics in action: advising the government to auction off the spectrum $\qquad 454 \qquad$

Tradable Permits 446

CHAPTER 16 Capital and Financial Markets 460

The Distinction Between Physical Capital and Financial Capital 462

Markets for Physical Capital 463

Rental Markets 463 The Demand Curve for Capital 464 • Demand for Factors of Production in General 465 • The Market Demand and Supply 465 • The Case of Fixed Supply: Economic Rents 466

The Ownership of Physical Capital 467 The Housing Market 470

Markets for Financial Capital 471

Stock Prices and Rates of Return471Bond Prices and Rates of Return472

The Tradeoff Between Risk and Return 476

Behavior under Uncertainty476Risk and Rates of Return in Theory478Risk and Return in Reality479Diversification Reduces Risk480Efficient Market Theory481

Corporate Governance Problems 481

Asymmetric Information: Moral Hazard and Adverse Selection 481 Incentives to Overcome Adverse Selection and Moral

Hazard Problems 484

The Role of Government in Financial Markets 485

Conclusion 487

Key Points 488 • Key Terms 488 • Questions for Review 488 • Problems 489

ECONOMICS IN THE NEWS: PHYSICAL CAPITAL ACCUMULATION OF GOOGLE 468

ECONOMICS IN ACTION: UNDERSTANDING STOCK AND BOND PRICE LISTINGS IN NEWSPAPERS 474

ECONOMICS IN THE NEWS: SEVERE CORPORATE GOVERNANCE PROBLEMS 482

ECONOMICS IN ACTION: WHAT CAUSED THE PANIC OF 2008? 486

APPENDIX TO CHAPTER 16

Present Discounted Value 490

Discounting the Future 490

Finding the Present Discounted Value 490

Key Points 491 • Key Terms and Definitions 491 • Questions for Review 491 • Problems 491

PART 5 Trade and Global Markets 493

CHAPTER 17 The Gains from International Trade 494

Recent Trends in International Trade 495

Comparative Advantage 496

Getting a Gut Feeling for Comparative Advantage 496 Opportunity Cost, Relative Efficiency, and Comparative Advantage 497 From People to Countries 497

Productivity in Two Countries 497 An American Worker's View 501 A Korean Worker's View 501

Finding the Relative Price 501 Relative Price without Trade 501
Relative Price with Trade 501

Measuring the Gains from Trade 502 One Country's Gain 502 The Other Country's Gain 502 Just Like a New Discovery 503 A Graphical Measure of the Gains from Trade 503 Production Possibilities Curves without Trade 503

- Production Possibilities Curves with Trade 504
- Increasing Opportunity Costs: Incomplete
 Specialization 506

Reasons for Comparative Advantage 507

Labor versus Capital Resources 507 The Effect of Trade on Wages 508

Gains from Expanded Markets 509

An Example of Gains from Trade through Expanded Markets 509 Effects of a Larger Market 509 Intraindustry Trade versus Interindustry Trade 511 Measuring the Gains from Expanded Markets 511

A Relationship between Cost per Unit and the Number of
Firms 511

The Effect of the Size of the Market 511

A Relationship between the Price and the Number of
Firms 512

Equilibrium Price and Number of Firms 512
Increasing the Size of the Market 514

The North
American Automobile Market 515

CHAPTER 18 International Trade Policy

Tariffs and Quotas 521

Tariffs521Quotas523The Costs of Trade Restrictions526

The History of Trade Restrictions 526

U.S. Tariffs 526 From the Tariff of Abominations to Smoot-Hawley 527 From the Reciprocal Trade Agreement Act to the WTO 528 Antidumping Duties 529 The Rise of Nontariff Barriers 529

Arguments for Trade Barriers 530

High Transition Costs 530 Phaseout of Trade Restrictions 530 - Trade Adjustment Assistance 531 The Infant Industry Argument 531 The National Security Argument 531 The Retaliation Argument 531 The Foreign Subsidies Argument 532 Environment and Labor Standards Arguments 532 The Public Health Argument 532 The Political Economy of Protection 533

Conclusion 516

Key Points 516 • Key Terms 517 • Questions for Review 517 • Problems 517

ECONOMICS IN THE NEWS: THE ECONOMIC IMPACT OF OUTSOURCING 498

ECONOMICS IN ACTION: DOING POLITICS AND ECONOMICS 505

520

How to Reduce Trade Barriers 533

Unilateral Disarmament 536 Multilateral Negotiations 536 *The Uruguay Round 536 Most-Favored-Nation Policy 537*

Regional Trading Areas 537 Trade Diversion versus Trade Creation 537 Free Trade Areas versus Customs Unions 537

Conclusion 538

Key Points 539 • Key Terms 539 • Questions for Review 539 • Problems 540

Economics in action: from steel to shrimp: the same old tariff story $\quad 523$

Economics in the news: the end of the multi-fiber agreement \$515

ECONOMICS IN THE NEWS: HOW HEALTH SCARES CAN DISRUPT TRADE 534

ECONOMICS IN ACTION: ENDING THE CORN LAWS 538

Glossary G1

Index 11

Credits C1