

PRINCIPLES OF  
**Microeconomics**  
N. Gregory Mankiw



FIFTH EDITION



### FIRM BEHAVIOR AND THE ORGANIZATION OF INDUSTRY

- 13 The Costs of Production
  - 14 Firms in Competitive Markets
  - 15 Monopoly
  - 16 Monopolistic Competition
  - 17 Oligopoly
- The theory of the firm sheds light on the decisions that lie behind supply in competitive markets.*
- Firms with market power can cause market outcomes to be inefficient.*

### THE ECONOMICS OF LABOR MARKETS

- 18 The Markets for the Factors of Production
  - 19 Earnings and Discrimination
  - 20 Income Inequality and Poverty
- These chapters examine the special features of labor markets, in which most people earn most of their income.*

### TOPICS FOR FURTHER STUDY

- 21 The Theory of Consumer Choice
  - 22 Frontiers of Microeconomics
- Additional topics in microeconomics include household decision making, asymmetric information, political economy, and behavioral economics.*

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# PRINCIPLES OF Microeconomics

FIFTH EDITION



**N. GREGORY MANKIW**

HARVARD UNIVERSITY



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*To Catherine, Nicholas, and Peter,  
my other contributions to the next generation*



## About the Author

N. Gregory Mankiw is professor of economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught macroeconomics, microeconomics, statistics, and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.



Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals, such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums, such as *The New York Times* and *The Wall Street Journal*. He is also author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishers). In addition to his teaching, research, and writing, Professor Mankiw has been a research associate of the National Bureau of Economic Research, an adviser to the Federal Reserve Bank of Boston and the Congressional Budget Office, and a member of the ETS test development committee for the Advanced Placement exam in economics. From 2003 to 2005, he served as chairman of the President's Council of Economic Advisers.

Professor Mankiw lives in Wellesley, Massachusetts, with his wife, Deborah, three children, Catherine, Nicholas, and Peter, and their border terrier, Tobin.



# Brief Contents

## **PART I INTRODUCTION 1**

- CHAPTER 1** Ten Principles of Economics 3
- CHAPTER 2** Thinking Like an Economist 21
- CHAPTER 3** Interdependence and the Gains from Trade 49

## **PART II HOW MARKETS WORK 63**

- CHAPTER 4** The Market Forces of Supply and Demand 65
- CHAPTER 5** Elasticity and Its Application 89
- CHAPTER 6** Supply, Demand, and Government Policies 113

## **PART III MARKETS AND WELFARE 135**

- CHAPTER 7** Consumers, Producers, and the Efficiency of Markets 137
- CHAPTER 8** Application: The Costs of Taxation 159
- CHAPTER 9** Application: International Trade 177

## **PART IV THE ECONOMICS OF THE PUBLIC SECTOR 201**

- CHAPTER 10** Externalities 203
- CHAPTER 11** Public Goods and Common Resources 225
- CHAPTER 12** The Design of the Tax System 241

## **PART V FIRM BEHAVIOR AND THE ORGANIZATION OF INDUSTRY 265**

- CHAPTER 13** The Costs of Production 267
- CHAPTER 14** Firms in Competitive Markets 289
- CHAPTER 15** Monopoly 311
- CHAPTER 16** Monopolistic Competition 345
- CHAPTER 17** Oligopoly 365

## **PART VI THE ECONOMICS OF LABOR MARKETS 389**

- CHAPTER 18** The Markets for the Factors of Production 391
- CHAPTER 19** Earnings and Discrimination 413
- CHAPTER 20** Income Inequality and Poverty 433

## **PART VII TOPICS FOR FURTHER STUDY 455**

- CHAPTER 21** The Theory of Consumer Choice 457
- CHAPTER 22** Frontiers of Microeconomics 483



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## Preface: To the Student

“Economics is a study of mankind in the ordinary business of life.” So wrote Alfred Marshall, the great 19th-century economist, in his textbook, *Principles of Economics*. Although we have learned much about the economy since Marshall’s time, this definition of economics is as true today as it was in 1890, when the first edition of his text was published.

Why should you, as a student at the beginning of the 21st century, embark on the study of economics? There are three reasons.

The first reason to study economics is that it will help you understand the world in which you live. There are many questions about the economy that might spark your curiosity. Why are apartments so hard to find in New York City? Why do airlines charge less for a round-trip ticket if the traveler stays over a Saturday night? Why is Johnny Depp paid so much to star in movies? Why are living standards so meager in many African countries? Why do some countries have high rates of inflation while others have stable prices? Why are jobs easy to find in some years and hard to find in others? These are just a few of the questions that a course in economics will help you answer.

The second reason to study economics is that it will make you a more astute participant in the economy. As you go about your life, you make many economic decisions. While you are a student, you decide how many years to stay in school. Once you take a job, you decide how much of your income to spend, how much to save, and how to invest your savings. Someday you may find yourself running a small business or a large corporation, and you will decide what prices to charge for your products. The insights developed in the coming chapters will give you a new perspective on how best to make these decisions. Studying economics will not by itself make you rich, but it will give you some tools that may help in that endeavor.

The third reason to study economics is that it will give you a better understanding of both the potential and the limits of economic policy. Economic questions are always on the minds of policymakers in mayors’ offices, governors’ mansions, and the White House. What are the burdens associated with alternative forms of taxation? What are the effects of free trade with other countries? What is the best way to protect the environment? How does a government budget deficit affect the economy? As a voter, you help choose the policies that guide the allocation of society’s resources. An understanding of economics will help you carry out that responsibility. And who knows: Perhaps someday you will end up as one of those policymakers yourself.

Thus, the principles of economics can be applied in many of life’s situations. Whether the future finds you reading the newspaper, running a business, or sitting in the Oval Office, you will be glad that you studied economics.

N. Gregory Mankiw  
September 2008

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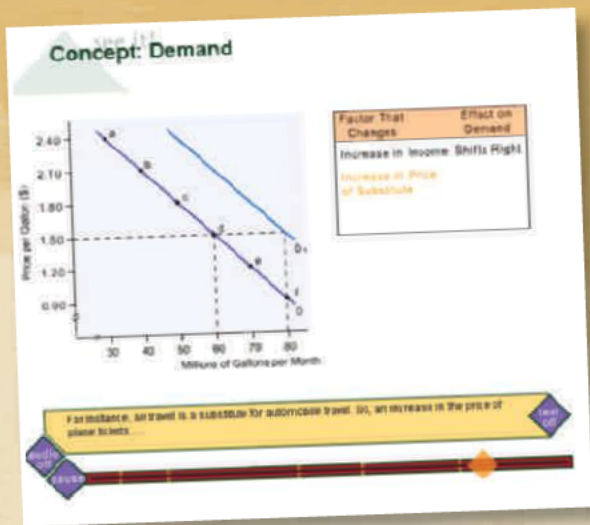
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N. Gregory Mankiw  
September 2008





# Table of Contents

Preface: To the Student ix



## PART I INTRODUCTION 1

### CHAPTER 1 TEN PRINCIPLES OF ECONOMICS 3

---

#### How People Make Decisions 4

- Principle 1: People Face Trade-offs 4
- Principle 2: The Cost of Something Is What You Give Up to Get It 5
- Principle 3: Rational People Think at the Margin 6
- Principle 4: People Respond to Incentives 7

#### How People Interact 8

- Principle 5: Trade Can Make Everyone Better Off 8
- Principle 6: Markets Are Usually a Good Way to Organize Economic Activity 8
- IN THE NEWS** Incentive Pay 9
- Principle 7: Governments Can Sometimes Improve Market Outcomes 10
- FYI** Adam Smith and the Invisible Hand 11

#### How the Economy as a Whole Works 12

- Principle 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services 12
- Principle 9: Prices Rise When the Government Prints Too Much Money 13
- IN THE NEWS** Why You Should Study Economics 14
- Principle 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment 14

#### Conclusion 15

- FYI** How to Read This Book 16

#### Summary 17

- Key Concepts 17
- Questions for Review 18
- Problems and Applications 18

### CHAPTER 2 THINKING LIKE AN ECONOMIST 21

---

#### The Economist as Scientist 22

- The Scientific Method: Observation, Theory, and More Observation 22
- The Role of Assumptions 23
- Economic Models 23
- Our First Model: The Circular-Flow Diagram 24
- Our Second Model: The Production Possibilities Frontier 25
- Microeconomics and Macroeconomics 28
- FYI** Who Studies Economics? 29

#### The Economist as Policy Adviser 30

- Positive versus Normative Analysis 30
- Economists in Washington 31
- IN THE NEWS** Football Economics 32
- Why Economists' Advice Is Not Always Followed 32

<b>Why Economists Disagree</b>	34
Differences in Scientific Judgments	34
Differences in Values	34
Perception versus Reality	35
<b>Let's Get Going</b>	36
<b>IN THE NEWS</b> Environmental Economics	37

<b>Summary</b>	38
<b>Key Concepts</b>	38
<b>Questions for Review</b>	38
<b>Problems and Applications</b>	38

<b>APPENDIX Graphing: A Brief Review</b>	40
Graphs of a Single Variable	40
Graphs of Two Variables: The Coordinate System	41
Curves in the Coordinate System	42
Slope	44
Cause and Effect	46

## **CHAPTER 3**

### **INTERDEPENDENCE AND THE GAINS FROM TRADE**

---

<b>A Parable for the Modern Economy</b>	50
Production Possibilities	50
Specialization and Trade	52
<b>Comparative Advantage: The Driving Force of Specialization</b>	54
Absolute Advantage	54
Opportunity Cost and Comparative Advantage	54
Comparative Advantage and Trade	55
The Price of the Trade	56
<b>Applications of Comparative Advantage</b>	57
<b>FYI</b> The Legacy of Adam Smith and David Ricardo	57
Should Tiger Woods Mow His Own Lawn?	58
Should the United States Trade with Other Countries?	58
<b>IN THE NEWS</b> The Changing Face of International Trade	59
<b>Conclusion</b>	60
<b>Summary</b>	60
<b>Key Concepts</b>	60
<b>Questions for Review</b>	61
<b>Problems and Applications</b>	61



## **PART II**

### **HOW MARKETS WORK**

---

#### **CHAPTER 4**

### **THE MARKET FORCES OF SUPPLY AND DEMAND**

---

<b>Markets and Competition</b>	66
What Is a Market?	66
What Is Competition?	66
<b>Demand</b>	67
The Demand Curve: The Relationship between Price and Quantity Demanded	67
Market Demand versus Individual Demand	68
Shifts in the Demand Curve	69
<b>CASE STUDY</b> Two Ways to Reduce the Quantity of Smoking Demanded	71
<b>Supply</b>	73
The Supply Curve: The Relationship between Price and Quantity Supplied	73
Market Supply versus Individual Supply	73
Shifts in the Supply Curve	74
<b>Supply and Demand Together</b>	77
Equilibrium	77
Three Steps to Analyzing Changes in Equilibrium	79
<b>Conclusion: How Prices Allocate Resources</b>	83
<b>IN THE NEWS</b> The Helium Market	83
<b>IN THE NEWS</b> Price Increases after Natural Disasters	84
<b>Summary</b>	85
<b>Key Concepts</b>	86
<b>Questions for Review</b>	86
<b>Problems and Applications</b>	87

**CHAPTER 5**  
**ELASTICITY AND ITS APPLICATION 89**

---

**The Elasticity of Demand 90**  
 The Price Elasticity of Demand and Its Determinants 90  
 Computing the Price Elasticity of Demand 91  
 The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities 91  
 The Variety of Demand Curves 92  
 Total Revenue and the Price Elasticity of Demand 94  
 Elasticity and Total Revenue along a Linear Demand Curve 95  
 Other Demand Elasticities 97  
**IN THE NEWS** Energy Demand 98

**The Elasticity of Supply 99**  
 The Price Elasticity of Supply and Its Determinants 99  
 Computing the Price Elasticity of Supply 100  
 The Variety of Supply Curves 100

**Three Applications of Supply, Demand, and Elasticity 102**  
 Can Good News for Farming Be Bad News for Farmers? 103  
 Why Did OPEC Fail to Keep the Price of Oil High? 105  
 Does Drug Interdiction Increase or Decrease Drug-Related Crime? 106

**Conclusion 108**  
**Summary 108**  
**Key Concepts 109**  
**Questions for Review 109**  
**Problems and Applications 110**

**CHAPTER 6**  
**SUPPLY, DEMAND, AND GOVERNMENT POLICIES 113**

---

**Controls on Prices 114**  
 How Price Ceilings Affect Market Outcomes 114  
**CASE STUDY** Lines at the Gas Pump 116  
**CASE STUDY** Rent Control in the Short Run and the Long Run 117  
 How Price Floors Affect Market Outcomes 118  
**CASE STUDY** The Minimum Wage 119  
 Evaluating Price Controls 121  
**IN THE NEWS** President Chavez versus the Market 122

**Taxes 123**  
 How Taxes on Sellers Affect Market Outcomes 124  
 How Taxes on Buyers Affect Market Outcomes 125  
**CASE STUDY** Can Congress Distribute the Burden of a Payroll Tax? 127  
 Elasticity and Tax Incidence 128  
**CASE STUDY** Who Pays the Luxury Tax? 130

**Conclusion 130**  
**Summary 131**  
**Key Concepts 131**  
**Questions for Review 131**  
**Problems and Applications 132**



**PART III**  
**MARKETS AND WELFARE 135**

**CHAPTER 7**  
**CONSUMERS, PRODUCERS, AND THE EFFICIENCY OF MARKETS 137**

---

**Consumer Surplus 138**  
 Willingness to Pay 138  
 Using the Demand Curve to Measure Consumer Surplus 139  
 How a Lower Price Raises Consumer Surplus 140  
 What Does Consumer Surplus Measure? 141

**Producer Surplus 143**  
 Cost and the Willingness to Sell 143  
 Using the Supply Curve to Measure Producer Surplus 144  
 How a Higher Price Raises Producer Surplus 145

**Market Efficiency 147**  
 The Benevolent Social Planner 147

Evaluating the Market Equilibrium	148
<b>CASE STUDY</b> Should There Be a Market in Organs?	150
<b>IN THE NEWS</b> Ticket Scalping	151
<b>Conclusion: Market Efficiency and Market Failure</b>	152
<b>IN THE NEWS</b> The Miracle of the Market	153
<b>Summary</b>	154
<b>Key Concepts</b>	155
<b>Questions for Review</b>	155
<b>Problems and Applications</b>	155

## CHAPTER 8

### APPLICATION: THE COSTS OF TAXATION 159

---

<b>The Deadweight Loss of Taxation</b>	160
How a Tax Affects Market Participants	161
Deadweight Losses and the Gains from Trade	163
<b>The Determinants of the Deadweight Loss</b>	164
<b>CASE STUDY</b> The Deadweight Loss Debate	166
<b>Deadweight Loss and Tax Revenue as Taxes Vary</b>	167
<b>FYI</b> Henry George and the Land Tax	169
<b>CASE STUDY</b> The Laffer Curve and Supply-Side Economics	169
<b>IN THE NEWS</b> On the Way to France	170
<b>Conclusion</b>	172
<b>Summary</b>	172
<b>Key Concepts</b>	173
<b>Questions for Review</b>	173
<b>Problems and Applications</b>	173

## CHAPTER 9

### APPLICATION: INTERNATIONAL TRADE 177

---

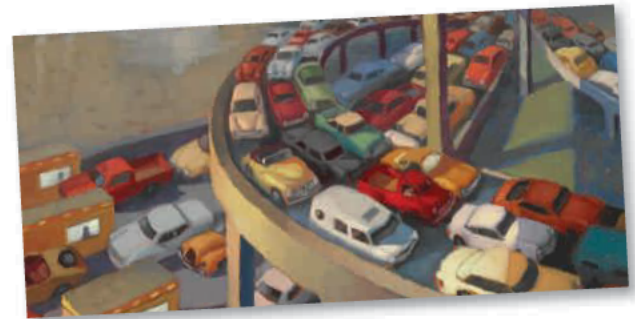
<b>The Determinants of Trade</b>	178
The Equilibrium without Trade	178
The World Price and Comparative Advantage	179
<b>The Winners and Losers from Trade</b>	180
The Gains and Losses of an Exporting Country	180
The Gains and Losses of an Importing Country	181
The Effects of a Tariff	183
The Lessons for Trade Policy	185
<b>FYI</b> Import Quotas: Another Way to Restrict Trade	185

Other Benefits of International Trade	186
<b>IN THE NEWS</b> Should the Winners from Free Trade Compensate the Losers?	187

### The Arguments for Restricting Trade 188

The Jobs Argument	188
<b>IN THE NEWS</b> Offshore Outsourcing	189
The National-Security Argument	190
The Infant-Industry Argument	190
The Unfair-Competition Argument	191
The Protection-as-a-Bargaining-Chip Argument	191
<b>IN THE NEWS</b> Second Thoughts about Free Trade	192
<b>CASE STUDY</b> Trade Agreements and the World Trade Organization	192

<b>Conclusion</b>	194
<b>Summary</b>	195
<b>Key Concepts</b>	196
<b>Questions for Review</b>	196
<b>Problems and Applications</b>	196



## PART IV THE ECONOMICS OF THE PUBLIC SECTOR 201

### CHAPTER 10 EXTERNALITIES 203

---

<b>Externalities and Market Inefficiency</b>	204
Welfare Economics: A Recap	205
Negative Externalities	205
Positive Externalities	207
<b>CASE STUDY</b> Technology Spillovers, Industrial Policy, and Patent Protection	208

**Public Policies toward Externalities 209**  
 Command-and-Control Policies: Regulation 209  
 Market-Based Policy 1: Corrective Taxes and Subsidies 210  
**CASE STUDY** Why Is Gasoline Taxed So Heavily? 211  
 Market-Based Policy 2: Tradable Pollution Permits 212  
 Objections to the Economic Analysis of Pollution 214

**Private Solutions to Externalities 215**  
 The Types of Private Solutions 215  
**IN THE NEWS** The Case for Taxing Carbon 216  
 The Coase Theorem 217  
 Why Private Solutions Do Not Always Work 218

**Conclusion 219**  
**Summary 220**  
**Key Concepts 221**  
**Questions for Review 221**  
**Problems and Applications 221**

## CHAPTER 11 PUBLIC GOODS AND COMMON RESOURCES 225

---

### The Different Kinds of Goods 226

**Public Goods 227**  
 The Free-Rider Problem 228  
 Some Important Public Goods 228  
**CASE STUDY** Are Lighthouses Public Goods? 230  
 The Difficult Job of Cost-Benefit Analysis 230  
**CASE STUDY** How Much Is a Life Worth? 231

**Common Resources 232**  
 The Tragedy of the Commons 232  
 Some Important Common Resources 233  
**IN THE NEWS** The Bloomberg Plan 234  
**CASE STUDY** Why the Cow Is Not Extinct 236

**Conclusion: The Importance of Property Rights 237**  
**Summary 238**  
**Key Concepts 238**  
**Questions for Review 238**  
**Problems and Applications 238**

## CHAPTER 12 THE DESIGN OF THE TAX SYSTEM 241

---

**A Financial Overview of the U.S. Government 242**  
 The Federal Government 243

**CASE STUDY** The Fiscal Challenge Ahead 246  
 State and Local Government 248

**Taxes and Efficiency 249**  
 Deadweight Losses 250  
**CASE STUDY** Should Income or Consumption Be Taxed? 251  
 Administrative Burden 251  
 Marginal Tax Rates versus Average Tax Rates 252  
 Lump-Sum Taxes 253

**Taxes and Equity 253**  
 The Benefits Principle 254  
 The Ability-to-Pay Principle 254  
**CASE STUDY** How the Tax Burden Is Distributed 255  
 Tax Incidence and Tax Equity 256  
**CASE STUDY** Who Pays the Corporate Income Tax? 257  
**IN THE NEWS** Questions and Answers about Tax Reform 258

**Conclusion: The Trade-off between Equity and Efficiency 258**  
**Summary 260**  
**Key Concepts 260**  
**Questions for Review 261**  
**Problems and Applications 261**



## PART V FIRM BEHAVIOR AND THE ORGANIZATION OF INDUSTRY 265

### CHAPTER 13 THE COSTS OF PRODUCTION 267

---

What Are Costs? 268

Total Revenue, Total Cost, and Profit	268
Costs as Opportunity Costs	268
The Cost of Capital as an Opportunity Cost	269
Economic Profit versus Accounting Profit	270

**Production and Costs 271**

The Production Function	271
From the Production Function to the Total-Cost Curve	273

**The Various Measures of Cost 274**

Fixed and Variable Costs	274
Average and Marginal Cost	275
Cost Curves and Their Shapes	276
Typical Cost Curves	278

**Costs in the Short Run and in the Long Run 280**

The Relationship between Short-Run and Long-Run Average Total Cost	280
Economies and Diseconomies of Scale	281
<b>FYI</b> Lessons from a Pin Factory	282

**Conclusion 282**

Summary	283
Key Concepts	284
Questions for Review	284
Problems and Applications	285

**CHAPTER 14****FIRMS IN COMPETITIVE MARKETS 289**

---

**What Is a Competitive Market? 290**

The Meaning of Competition	290
The Revenue of a Competitive Firm	290

**Profit Maximization and the Competitive Firm's Supply Curve 292**

A Simple Example of Profit Maximization	292
The Marginal-Cost Curve and the Firm's Supply Decision	293
The Firm's Short-Run Decision to Shut Down	295
Spilt Milk and Other Sunk Costs	296
<b>CASE STUDY</b> Near-Empty Restaurants and Off-Season Miniature Golf	297
The Firm's Long-Run Decision to Exit or Enter a Market	298
Measuring Profit in Our Graph for the Competitive Firm	299

**The Supply Curve in a Competitive Market 300**

The Short Run: Market Supply with a Fixed Number of Firms 301

The Long Run: Market Supply with Entry and Exit 301

Why Do Competitive Firms Stay in Business If They Make Zero Profit? 302

A Shift in Demand in the Short Run and Long Run 303

Why the Long-Run Supply Curve Might Slope Upward 304

**Conclusion: Behind the Supply Curve 306**

Summary 307

Key Concepts 307

Questions for Review 307

Problems and Applications 308

**CHAPTER 15****MONOPOLY 311**

---

**Why Monopolies Arise 312**

Monopoly Resources	313
Government-Created Monopolies	313
Natural Monopolies	314

**How Monopolies Make Production and Pricing Decisions 315**

Monopoly versus Competition	315
A Monopoly's Revenue	316
Profit Maximization	319
<b>FYI</b> Why a Monopoly Does Not Have a Supply Curve	320
A Monopoly's Profit	320
<b>CASE STUDY</b> Monopoly Drugs versus Generic Drugs	321

**The Welfare Cost of Monopolies 322**

The Deadweight Loss	323
The Monopoly's Profit: A Social Cost?	325

**Price Discrimination 326**

A Parable about Pricing	326
The Moral of the Story	327
The Analytics of Price Discrimination	328
Examples of Price Discrimination	329
<b>IN THE NEWS</b> TKTS and Other Schemes	330

**Public Policy toward Monopolies 332**

Increasing Competition with Antitrust Laws	332
Regulation	333
<b>IN THE NEWS</b> Airline Mergers	333

**IN THE NEWS** Public Transport and Private Enterprise 334  
 Public Ownership 336  
 Doing Nothing 336

**Conclusion: The Prevalence of Monopolies** 337  
 Summary 338  
 Key Concepts 339  
 Questions for Review 339  
 Problems and Applications 340

**CHAPTER 16**  
**MONOPOLISTIC COMPETITION** 345

---

**Between Monopoly and Perfect Competition** 346

**Competition with Differentiated Products** 348

The Monopolistically Competitive Firm in the Short Run 348

The Long-Run Equilibrium 348

Monopolistic versus Perfect Competition 351

Monopolistic Competition and the Welfare of Society 352

**IN THE NEWS** Insufficient Variety as a Market Failure 354

**Advertising** 355

The Debate over Advertising 356

**CASE STUDY** Advertising and the Price of Eyeglasses 357

Advertising as a Signal of Quality 357

**FYI** Galbraith versus Hayek 358

Brand Names 359

**Conclusion** 361

**Summary** 362

**Key Concepts** 362

**Questions for Review** 362

**Problems and Applications** 363

**CHAPTER 17**  
**OLIGOPOLY** 365

---

**Markets with Only a Few Sellers** 366

A Duopoly Example 366

Competition, Monopolies, and Cartels 366

The Equilibrium for an Oligopoly 368

How the Size of an Oligopoly Affects the Market Outcome 369

**The Economics of Cooperation** 370

The Prisoners' Dilemma 370

Oligopolies as a Prisoners' Dilemma 372

**CASE STUDY** OPEC and the World Oil Market 373

Other Examples of the Prisoners' Dilemma 373

The Prisoners' Dilemma and the Welfare of Society 375

Why People Sometimes Cooperate 376

**CASE STUDY** The Prisoners' Dilemma Tournament 376

**IN THE NEWS** Aumann and Schelling 377

**Public Policy toward Oligopolies** 378

Restraint of Trade and the Antitrust Laws 378

**CASE STUDY** An Illegal Phone Call 379

Controversies over Antitrust Policy 379

**IN THE NEWS** Public Price Fixing 380

**IN THE NEWS** A Reversal of Policy 382

**CASE STUDY** The Microsoft Case 383

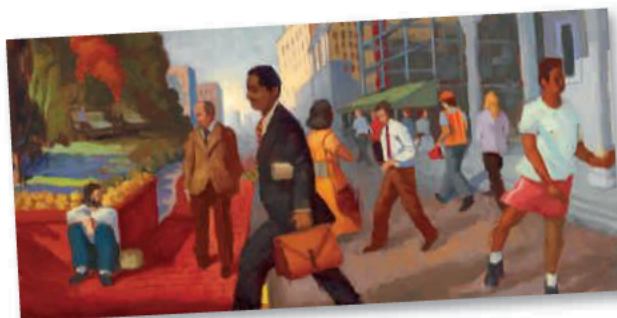
**Conclusion** 384

**Summary** 385

**Key Concepts** 385

**Questions for Review** 385

**Problems and Applications** 386



**PART VI**  
**THE ECONOMICS OF LABOR**  
**MARKETS** 389

**CHAPTER 18**  
**THE MARKETS FOR THE FACTORS OF**  
**PRODUCTION** 391

---

**The Demand for Labor** 392

The Competitive Profit-Maximizing Firm 393

The Production Function and the Marginal Product of Labor	393
The Value of the Marginal Product and the Demand for Labor	395
What Causes the Labor-Demand Curve to Shift?	397
<b>FYI</b> Input Demand and Output Supply: Two Sides of the Same Coin	397
<b>FYI</b> The Luddite Revolt	398
<b>The Supply of Labor</b>	399
The Trade-off between Work and Leisure	399
What Causes the Labor-Supply Curve to Shift?	399
<b>Equilibrium in the Labor Market</b>	400
Shifts in Labor Supply	400
<b>IN THE NEWS</b> The Economics of Immigration	402
Shifts in Labor Demand	403
<b>CASE STUDY</b> Productivity and Wages	404
<b>The Other Factors of Production: Land and Capital</b>	405
<b>FYI</b> Monopsony	406
Equilibrium in the Markets for Land and Capital	406
Linkages among the Factors of Production	407
<b>FYI</b> What Is Capital Income?	408
<b>CASE STUDY</b> The Economics of the Black Death	409
<b>Conclusion</b>	409
<b>Summary</b>	410
<b>Key Concepts</b>	410
<b>Questions for Review</b>	410
<b>Problems and Applications</b>	411
<b>CHAPTER 19</b>	
<b>EARNINGS AND DISCRIMINATION</b>	413
<hr/>	
<b>Some Determinants of Equilibrium Wages</b>	414
Compensating Differentials	414
Human Capital	414
<b>CASE STUDY</b> The Increasing Value of Skills	415
Ability, Effort, and Chance	416
<b>IN THE NEWS</b> The Loss of Manufacturing Jobs	417
<b>CASE STUDY</b> The Benefits of Beauty	418
An Alternative View of Education: Signaling	419
The Superstar Phenomenon	419
<b>IN THE NEWS</b> The Human Capital of Terrorists	420
Above-Equilibrium Wages: Minimum-Wage Laws, Unions, and Efficiency Wages	421
<b>The Economics of Discrimination</b>	422
Measuring Labor-Market Discrimination	422
<b>CASE STUDY</b> Is Emily More Employable than Lakisha?	424
Discrimination by Employers	424
<b>CASE STUDY</b> Segregated Streetcars and the Profit Motive	425
<b>IN THE NEWS</b> Gender Differences	426
Discrimination by Customers and Governments	426
<b>CASE STUDY</b> Discrimination in Sports	428
<b>Conclusion</b>	429
<b>Summary</b>	429
<b>Key Concepts</b>	430
<b>Questions for Review</b>	430
<b>Problems and Applications</b>	430
<b>CHAPTER 20</b>	
<b>INCOME INEQUALITY AND POVERTY</b>	433
<hr/>	
<b>The Measurement of Inequality</b>	434
U.S. Income Inequality	434
Inequality around the World	435
The Poverty Rate	437
Problems in Measuring Inequality	438
<b>CASE STUDY</b> Alternative Measures of Inequality	439
Economic Mobility	440
<b>IN THE NEWS</b> What to Make of Rising Inequality	441
<b>The Political Philosophy of Redistributing Income</b>	442
Utilitarianism	442
Liberalism	443
Libertarianism	444
<b>Policies to Reduce Poverty</b>	445
Minimum-Wage Laws	446
Welfare	446
Negative Income Tax	447
In-Kind Transfers	447
<b>IN THE NEWS</b> Child Labor	448
Antipoverty Programs and Work Incentives	449
<b>Conclusion</b>	451
<b>Summary</b>	452
<b>Key Concepts</b>	452
<b>Questions for Review</b>	452
<b>Problems and Applications</b>	453





## PART VII TOPICS FOR FURTHER STUDY 455

### CHAPTER 21 THE THEORY OF CONSUMER CHOICE 457

**The Budget Constraint: What the Consumer Can Afford** 458

**Preferences: What the Consumer Wants** 459  
 Representing Preferences with Indifference Curves 460  
 Four Properties of Indifference Curves 461  
 Two Extreme Examples of Indifference Curves 462

**Optimization: What the Consumer Chooses** 464  
 The Consumer's Optimal Choices 464  
**FYI** Utility: An Alternative Way to Describe Preferences and Optimization 465  
 How Changes in Income Affect the Consumer's Choices 466  
 How Changes in Prices Affect the Consumer's Choices 467  
 Income and Substitution Effects 468  
 Deriving the Demand Curve 470

**Three Applications** 471  
 Do All Demand Curves Slope Downward? 472  
**CASE STUDY** The Search for Giffen Goods 473  
 How Do Wages Affect Labor Supply? 473  
**CASE STUDY** Income Effects on Labor Supply: Historical Trends, Lottery Winners, and the Carnegie Conjecture 476

How Do Interest Rates Affect Household Saving? 477

**Conclusion: Do People Really Think This Way?** 479  
**Summary** 480  
**Key Concepts** 480  
**Questions for Review** 480  
**Problems and Applications** 481

### CHAPTER 22 FRONTIERS OF MICROECONOMICS 483

**Asymmetric Information** 484  
 Hidden Actions: Principals, Agents, and Moral Hazard 484  
 Hidden Characteristics: Adverse Selection and the Lemons Problem 485  
**FYI** Corporate Management 486  
 Signaling to Convey Private Information 487  
**CASE STUDY** Gifts as Signals 487  
 Screening to Induce Information Revelation 488  
 Asymmetric Information and Public Policy 489

**Political Economy** 489  
 The Condorcet Voting Paradox 490  
 Arrow's Impossibility Theorem 491  
 The Median Voter Is King 491  
 Politicians Are People Too 493  
**IN THE NEWS** Farm Policy and Politics 494

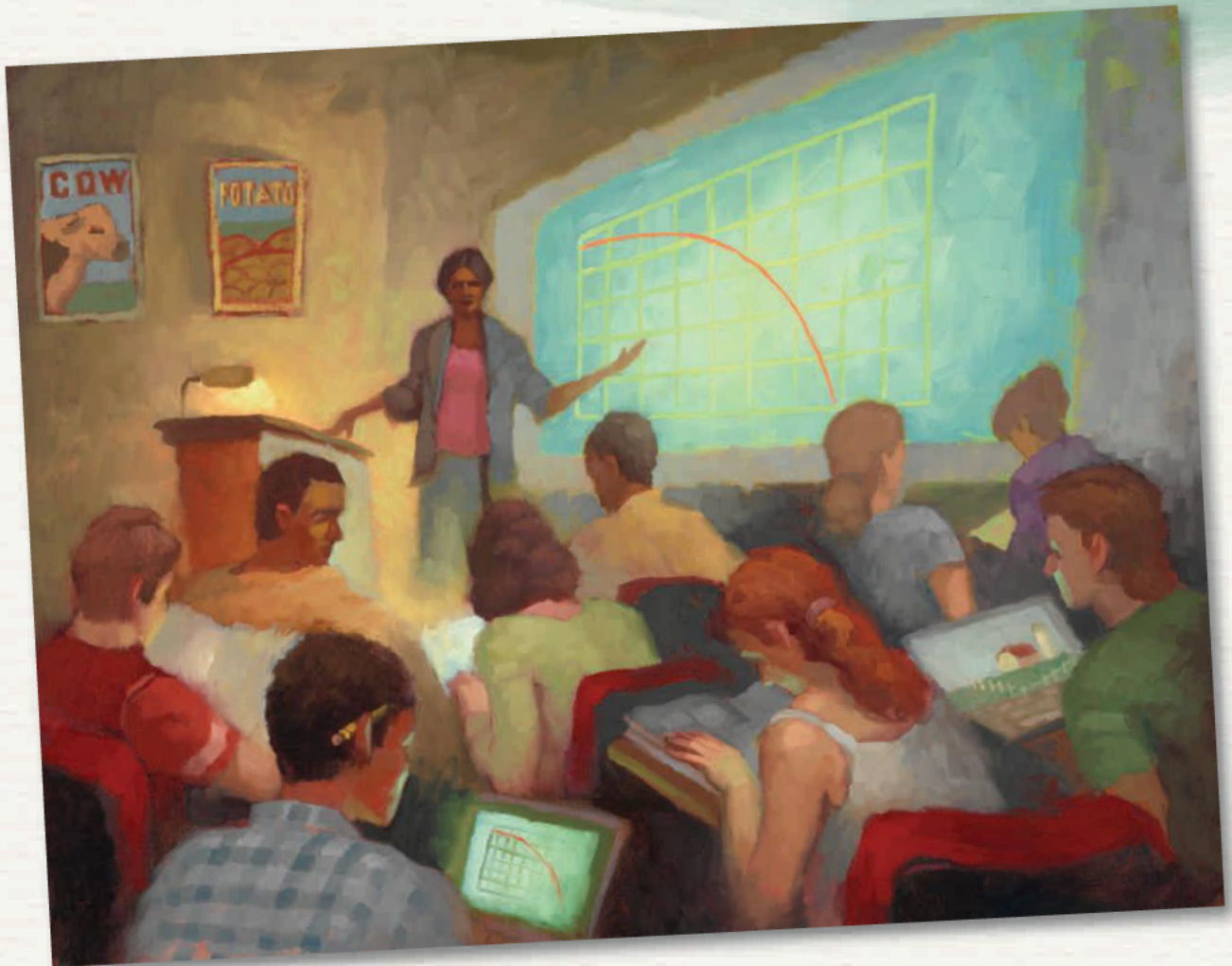
**Behavioral Economics** 494  
 People Aren't Always Rational 494  
 People Care about Fairness 497  
 People Are Inconsistent over Time 497  
**IN THE NEWS** This Is Your Brain on Economics 498

**Conclusion** 500  
**Summary** 501  
**Key Concepts** 501  
**Questions for Review** 501  
**Problems and Applications** 502

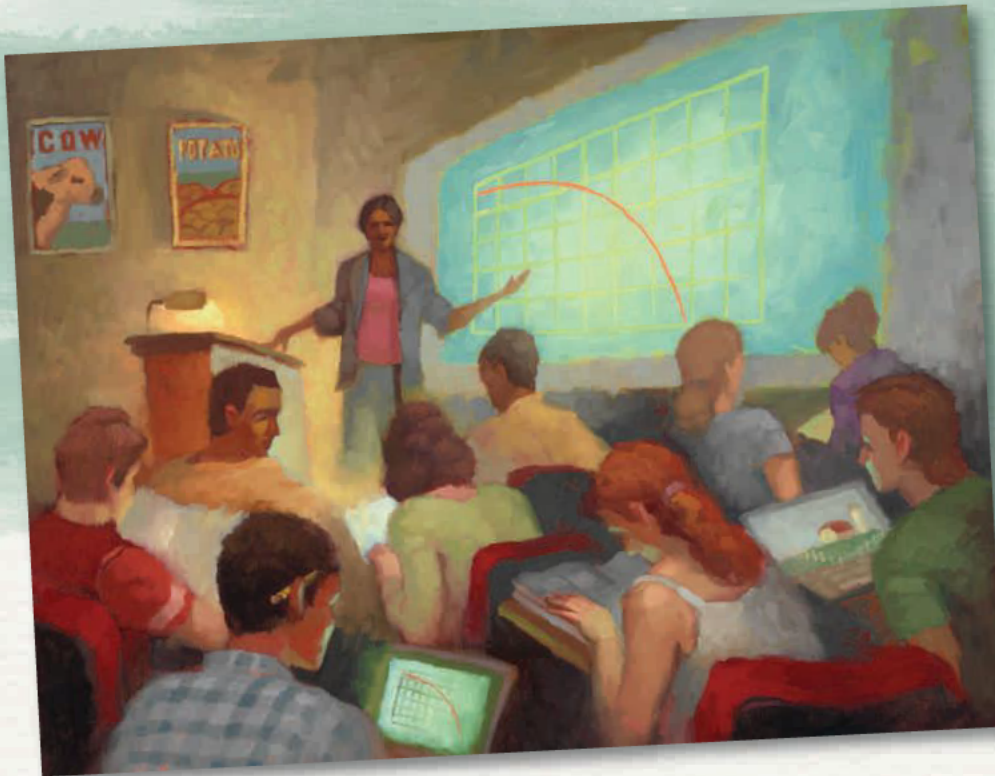
**Glossary** 505  
**Index** 509

# PART I

## Introduction



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## Ten Principles of Economics

The word *economy* comes from the Greek word *oikonomos*, which means “one who manages a household.” At first, this origin might seem peculiar. But in fact, households and economies have much in common.

A household faces many decisions. It must decide which members of the household do which tasks and what each member gets in return: Who cooks dinner? Who does the laundry? Who gets the extra dessert at dinner? Who gets to choose what TV show to watch? In short, the household must allocate its scarce resources among its various members, taking into account each member’s abilities, efforts, and desires.

Like a household, a society faces many decisions. A society must find some way to decide what jobs will be done and who will do them. It needs some people to grow food, other people to make clothing, and still others to design computer software. Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must also allocate the output of goods and services they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Ferrari and who will take the bus.

The management of society’s resources is important because resources are scarce. **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything he or she wants, each individual in a society cannot attain the highest standard of living to which he or she might aspire.

**scarcity**  
the limited nature of  
society’s resources

**economics**

the study of how society manages its scarce resources

**Economics** is the study of how society manages its scarce resources. In most societies, resources are allocated not by an all-powerful dictator but through the combined actions of millions of households and firms. Economists therefore study how people make decisions: how much they work, what they buy, how much they save, and how they invest their savings. Economists also study how people interact with one another. For instance, they examine how the multitude of buyers and sellers of a good together determine the price at which the good is sold and the quantity that is sold. Finally, economists analyze forces and trends that affect the economy as a whole, including the growth in average income, the fraction of the population that cannot find work, and the rate at which prices are rising.

The study of economics has many facets, but it is unified by several central ideas. In this chapter, we look at *Ten Principles of Economics*. Don't worry if you don't understand them all at first or if you aren't completely convinced. We will explore these ideas more fully in later chapters. The ten principles are introduced here to give you an overview of what economics is all about. Consider this chapter a "preview of coming attractions."

## HOW PEOPLE MAKE DECISIONS

There is no mystery to what an economy is. Whether we are talking about the economy of Los Angeles, the United States, or the whole world, an economy is just a group of people dealing with one another as they go about their lives. Because the behavior of an economy reflects the behavior of the individuals who make up the economy, we begin our study of economics with four principles of individual decision making.

### PRINCIPLE 1: PEOPLE FACE TRADE-OFFS

You may have heard the old saying, "There ain't no such thing as a free lunch." Grammar aside, there is much truth to this adage. To get one thing that we like, we usually have to give up another thing that we like. Making decisions requires trading off one goal against another.

Consider a student who must decide how to allocate her most valuable resource—her time. She can spend all her time studying economics, spend all of it studying psychology, or divide it between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour that she could have spent napping, bike riding, watching TV, or working at her part-time job for some extra spending money.

Or consider parents deciding how to spend their family income. They can buy food, clothing, or a family vacation. Or they can save some of the family income for retirement or the children's college education. When they choose to spend an extra dollar on one of these goods, they have one less dollar to spend on some other good.

When people are grouped into societies, they face different kinds of trade-offs. The classic trade-off is between "guns and butter." The more a society spends on national defense (guns) to protect its shores from foreign aggressors, the less it can spend on consumer goods (butter) to raise the standard of living at home. Also important in modern society is the trade-off between a clean environment and a high level of income. Laws that require firms to reduce pollution raise the

cost of producing goods and services. Because of the higher costs, these firms end up earning smaller profits, paying lower wages, charging higher prices, or some combination of these three. Thus, while pollution regulations yield the benefit of a cleaner environment and the improved health that comes with it, they have the cost of reducing the incomes of the firms' owners, workers, and customers.

Another trade-off society faces is between efficiency and equality. **Efficiency** means that society is getting the maximum benefits from its scarce resources. **Equality** means that those benefits are distributed uniformly among society's members. In other words, efficiency refers to the size of the economic pie, and equality refers to how the pie is divided into individual slices.

When government policies are designed, these two goals often conflict. Consider, for instance, policies aimed at equalizing the distribution of economic well-being. Some of these policies, such as the welfare system or unemployment insurance, try to help the members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. While achieving greater equality, these policies reduce efficiency. When the government redistributes income from the rich to the poor, it reduces the reward for working hard; as a result, people work less and produce fewer goods and services. In other words, when the government tries to cut the economic pie into more equal slices, the pie gets smaller.

Recognizing that people face trade-offs does not by itself tell us what decisions they will or should make. A student should not abandon the study of psychology just because doing so would increase the time available for the study of economics. Society should not stop protecting the environment just because environmental regulations reduce our material standard of living. The poor should not be ignored just because helping them distorts work incentives. Nonetheless, people are likely to make good decisions only if they understand the options they have available. Our study of economics, therefore, starts by acknowledging life's trade-offs.

## PRINCIPLE 2: THE COST OF SOMETHING IS WHAT YOU GIVE UP TO GET IT

Because people face trade-offs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of an action is not as obvious as it might first appear.

Consider the decision to go to college. The main benefits are intellectual enrichment and a lifetime of better job opportunities. But what are the costs? To answer this question, you might be tempted to add up the money you spend on tuition, books, room, and board. Yet this total does not truly represent what you give up to spend a year in college.

There are two problems with this calculation. First, it includes some things that are not really costs of going to college. Even if you quit school, you need a place to sleep and food to eat. Room and board are costs of going to college only to the extent that they are more expensive at college than elsewhere. Second, this calculation ignores the largest cost of going to college—your time. When you spend a year listening to lectures, reading textbooks, and writing papers, you cannot spend that time working at a job. For most students, the earnings given up to attend school are the largest single cost of their education.

The **opportunity cost** of an item is what you give up to get that item. When making any decision, decision makers should be aware of the opportunity costs

### efficiency

the property of society getting the most it can from its scarce resources

### equality

the property of distributing economic prosperity uniformly among the members of society

### opportunity cost

whatever must be given up to obtain some item

that accompany each possible action. In fact, they usually are. College athletes who can earn millions if they drop out of school and play professional sports are well aware that their opportunity cost of college is very high. It is not surprising that they often decide that the benefit is not worth the cost.

### PRINCIPLE 3: RATIONAL PEOPLE THINK AT THE MARGIN

#### rational people

people who systematically and purposefully do the best they can to achieve their objectives

Economists normally assume that people are rational. **Rational people** systematically and purposefully do the best they can to achieve their objectives, given the available opportunities. As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture and sell to maximize profits. You will also encounter individuals who decide how much time to spend working and what goods and services to buy with the resulting income to achieve the highest possible level of satisfaction.

#### marginal changes

small incremental adjustments to a plan of action

Rational people know that decisions in life are rarely black and white but usually involve shades of gray. At dinnertime, the decision you face is not between fasting or eating like a pig but whether to take that extra spoonful of mashed potatoes. When exams roll around, your decision is not between blowing them off or studying 24 hours a day but whether to spend an extra hour reviewing your notes instead of watching TV. Economists use the term **marginal changes** to describe small incremental adjustments to an existing plan of action. Keep in mind that *margin* means “edge,” so marginal changes are adjustments around the edges of what you are doing. Rational people often make decisions by comparing *marginal benefits* and *marginal costs*.

For example, consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane across the United States costs the airline \$100,000. In this case, the average cost of each seat is  $\$100,000/200$ , which is \$500. One might be tempted to conclude that the airline should never sell a ticket for less than \$500. In fact, a rational airline can often find ways to raise its profits by thinking at the margin. Imagine that a plane is about to take off with ten empty seats, and a standby passenger waiting at the gate will pay \$300 for a seat. Should the airline sell the ticket? Of course it should. If the plane has empty seats, the cost of adding one more passenger is tiny. Although the *average* cost of flying a passenger is \$500, the *marginal* cost is merely the cost of the bag of peanuts and can of soda that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling the ticket is profitable.

Marginal decision making can help explain some otherwise puzzling economic phenomena. Here is a classic question: Why is water so cheap, while diamonds are so expensive? Humans need water to survive, while diamonds are unnecessary; but for some reason, people are willing to pay much more for a diamond than for a cup of water. The reason is that a person’s willingness to pay for any good is based on the marginal benefit that an extra unit of the good would yield. The marginal benefit, in turn, depends on how many units a person already has. Water is essential, but the marginal benefit of an extra cup is small because water is plentiful. By contrast, no one needs diamonds to survive, but because diamonds are so rare, people consider the marginal benefit of an extra diamond to be large.

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost. This principle can explain why airlines are willing to sell a ticket below average cost and why people are willing to pay more for diamonds than for water. It can take some time to get used to the logic of marginal thinking, but the study of economics will give you ample opportunity to practice.

## PRINCIPLE 4: PEOPLE RESPOND TO INCENTIVES

An **incentive** is something that induces a person to act, such as the prospect of a punishment or a reward. Because rational people make decisions by comparing costs and benefits, they respond to incentives. You will see that incentives play a central role in the study of economics. One economist went so far as to suggest that the entire field could be simply summarized: “People respond to incentives. The rest is commentary.”

Incentives are crucial to analyzing how markets work. For example, when the price of an apple rises, people decide to eat fewer apples. At the same time, apple orchards decide to hire more workers and harvest more apples. In other words, a higher price in a market provides an incentive for buyers to consume less and an incentive for sellers to produce more. As we will see, the influence of prices on the behavior of consumers and producers is crucial for how a market economy allocates scarce resources.

Public policymakers should never forget about incentives: Many policies change the costs or benefits that people face and, therefore, alter their behavior. A tax on gasoline, for instance, encourages people to drive smaller, more fuel-efficient cars. That is one reason people drive smaller cars in Europe, where gasoline taxes are high, than in the United States, where gasoline taxes are low. A gasoline tax also encourages people to carpool, take public transportation, and live closer to where they work. If the tax were larger, more people would be driving hybrid cars, and if it were large enough, they would switch to electric cars.

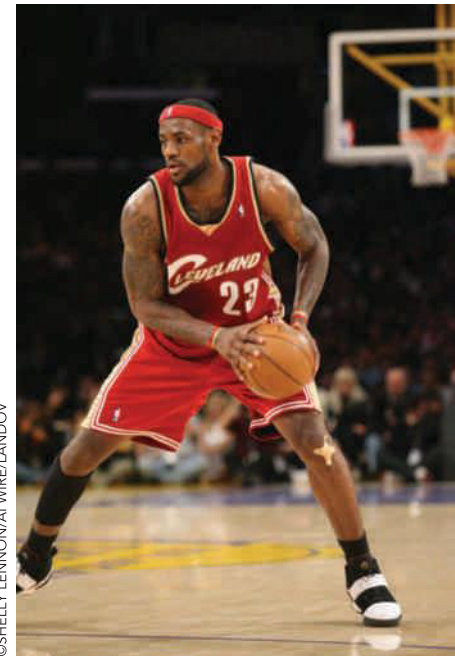
When policymakers fail to consider how their policies affect incentives, they often end up with unintended consequences. For example, consider public policy regarding auto safety. Today, all cars have seat belts, but this was not true 50 years ago. In the 1960s, Ralph Nader’s book *Unsafe at Any Speed* generated much public concern over auto safety. Congress responded with laws requiring seat belts as standard equipment on new cars.

How does a seat belt law affect auto safety? The direct effect is obvious: When a person wears a seat belt, the probability of surviving an auto accident rises. But that’s not the end of the story because the law also affects behavior by altering incentives. The relevant behavior here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver’s time and energy. When deciding how safely to drive, rational people compare, perhaps unconsciously, the marginal benefit from safer driving to the marginal cost. As result, they drive more slowly and carefully when the benefit of increased safety is high. For example, when road conditions are icy, people drive more attentively and at lower speeds than they do when road conditions are clear.

Consider how a seat belt law alters a driver’s cost–benefit calculation. Seat belts make accidents less costly because they reduce the likelihood of injury or death. In other words, seat belts reduce the benefits of slow and careful driving. People respond to seat belts as they would to an improvement in road conditions—by driving faster and less carefully. The result of a seat belt law, therefore, is a larger number of accidents. The decline in safe driving has a clear, adverse impact on pedestrians, who are more likely to find themselves in an accident but (unlike the drivers) don’t have the benefit of added protection.

At first, this discussion of incentives and seat belts might seem like idle speculation. Yet in a classic 1975 study, economist Sam Peltzman argued that auto-safety laws have had many of these effects. According to Peltzman’s evidence, these laws produce both fewer deaths per accident and more accidents. He concluded

**incentive**  
something that induces  
a person to act



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BASKETBALL STAR LEBRON JAMES UNDERSTANDS OPPORTUNITY COST AND INCENTIVES. HE DECIDED TO SKIP COLLEGE AND GO STRAIGHT TO THE PROS, WHERE HE HAS EARNED MILLIONS OF DOLLARS AS ONE OF THE NBA’S TOP PLAYERS.



that the net result is little change in the number of driver deaths and an increase in the number of pedestrian deaths.

Peltzman's analysis of auto safety is an offbeat example of the general principle that people respond to incentives. When analyzing any policy, we must consider not only the direct effects but also the less obvious indirect effects that work through incentives. If the policy changes incentives, it will cause people to alter their behavior.

**QUICK QUIZ** Describe an important trade-off you recently faced. • Give an example of some action that has both a monetary and nonmonetary opportunity cost. • Describe an incentive your parents offered to you in an effort to influence your behavior.

## HOW PEOPLE INTERACT

The first four principles discussed how individuals make decisions. As we go about our lives, many of our decisions affect not only ourselves but other people as well. The next three principles concern how people interact with one another.

### PRINCIPLE 5: TRADE CAN MAKE EVERYONE BETTER OFF

You have probably heard on the news that the Japanese are our competitors in the world economy. In some ways, this is true because American and Japanese firms produce many of the same goods. Ford and Toyota compete for the same customers in the market for automobiles. Apple and Sony compete for the same customers in the market for digital music players.

Yet it is easy to be misled when thinking about competition among countries. Trade between the United States and Japan is not like a sports contest in which one side wins and the other side loses. In fact, the opposite is true: Trade between two countries can make each country better off.

To see why, consider how trade affects your family. When a member of your family looks for a job, he or she competes against members of other families who are looking for jobs. Families also compete against one another when they go shopping because each family wants to buy the best goods at the lowest prices. In a sense, each family in the economy is competing with all other families.

Despite this competition, your family would not be better off isolating itself from all other families. If it did, your family would need to grow its own food, make its own clothes, and build its own home. Clearly, your family gains much from its ability to trade with others. Trade allows each person to specialize in the activities he or she does best, whether it is farming, sewing, or home building. By trading with others, people can buy a greater variety of goods and services at lower cost.

Countries as well as families benefit from the ability to trade with one another. Trade allows countries to specialize in what they do best and to enjoy a greater variety of goods and services. The Japanese, as well as the French and the Egyptians and the Brazilians, are as much our partners in the world economy as they are our competitors.

### PRINCIPLE 6: MARKETS ARE USUALLY A GOOD WAY TO ORGANIZE ECONOMIC ACTIVITY

The collapse of communism in the Soviet Union and Eastern Europe in the 1980s may be the most important change in the world during the past half century.



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## In The News

### Incentive Pay

*How people are paid affects their incentives and the decisions they make.*

#### Where the Buses Run on Time

By Austan Goolsbee

On a summer afternoon, the drive home from the University of Chicago to the north side of the city must be one of the most beautiful commutes in the world. On the left on Lake Shore Drive you pass Grant Park, some of the world's first skyscrapers, and the Sears Tower. On the right is the intense blue of Lake Michigan. But for all the beauty, the traffic can be hell. So, if you drive the route every day, you learn the shortcuts. You know that if it backs up from the Buckingham Fountain all the way to McCormick Place, you're better off taking the surface streets and getting back onto Lake Shore Drive a few miles north.

A lot of buses, however, wait in the traffic jams. I have always wondered about that: Why don't the bus drivers use the shortcuts? Surely they know about them—they drive the same route every day, and they probably avoid the traffic when they drive their own cars. Buses don't stop on Lake Shore Drive, so they wouldn't strand anyone by detour-

ing around the congestion. And when buses get delayed in heavy traffic, it wreaks havoc on the scheduled service. Instead of arriving once every 10 minutes, three buses come in at the same time after half an hour. That sort of bunching is the least efficient way to run a public transportation system. So, why not take the surface streets if that would keep the schedule properly spaced and on time?

You might think at first that the problem is that the drivers aren't paid enough to strategize. But Chicago bus drivers are the seventh-highest paid in the nation; full-timers earned more than \$23 an hour, according to a November 2004 survey. The problem may have to do not with how much they are paid, but how they are paid. At least, that's the implication of a new study of Chilean bus drivers by Ryan Johnson and David Reiley of the University of Arizona and Juan Carlos Muñoz of Pontificia Universidad Católica de Chile.

Companies in Chile pay bus drivers one of two ways: either by the hour or by the passenger. Paying by the passenger leads to significantly shorter delays. Give them incentives, and drivers start acting like regu-

lar people do. They take shortcuts when the traffic is bad. They take shorter meal breaks and bathroom breaks. They want to get on the road and pick up more passengers as quickly as they can. In short, their productivity increases....

Not everything about incentive pay is perfect, of course. When bus drivers start moving from place to place more quickly, they get in more accidents (just like the rest of us). Some passengers also complain that the rides make them nauseated because the drivers stomp on the gas as soon as the last passenger gets on the bus. Yet when given the choice, people overwhelmingly choose the bus companies that get them where they're going on time. More than 95 percent of the routes in Santiago use incentive pay.

Perhaps we should have known that incentive pay could increase bus driver productivity. After all, the taxis in Chicago take the shortcuts on Lake Shore Drive to avoid the traffic that buses just sit in. Since taxi drivers earn money for every trip they make, they want to get you home as quickly as possible so they can pick up somebody else.

Source: Slate.com, March 16, 2006.

Communist countries worked on the premise that government officials were in the best position to allocate the economy's scarce resources. These central planners decided what goods and services were produced, how much was produced, and who produced and consumed these goods and services. The theory behind central planning was that only the government could organize economic activity in a way that promoted economic well-being for the country as a whole.

Most countries that once had centrally planned economies have abandoned the system and are instead developing market economies. In a **market economy**, the

#### market economy

an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services

decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

At first glance, the success of market economies is puzzling. In a market economy, no one is looking out for the economic well-being of society as a whole. Free markets contain many buyers and sellers of numerous goods and services, and all of them are interested primarily in their own well-being. Yet despite decentralized decision making and self-interested decision makers, market economies have proven remarkably successful in organizing economic activity to promote overall economic well-being.

In his 1776 book *An Inquiry into the Nature and Causes of the Wealth of Nations*, economist Adam Smith made the most famous observation in all of economics: Households and firms interacting in markets act as if they are guided by an “invisible hand” that leads them to desirable market outcomes. One of our goals in this book is to understand how this invisible hand works its magic.

As you study economics, you will learn that prices are the instrument with which the invisible hand directs economic activity. In any market, buyers look at the price when determining how much to demand, and sellers look at the price when deciding how much to supply. As a result of the decisions that buyers and sellers make, market prices reflect both the value of a good to society and the cost to society of making the good. Smith’s great insight was that prices adjust to guide these individual buyers and sellers to reach outcomes that, in many cases, maximize the well-being of society as a whole.

Smith’s insight has an important corollary: When the government prevents prices from adjusting naturally to supply and demand, it impedes the invisible hand’s ability to coordinate the decisions of the households and firms that make up the economy. This corollary explains why taxes adversely affect the allocation of resources, for they distort prices and thus the decisions of households and firms. It also explains the great harm caused by policies that directly control prices, such as rent control. And it explains the failure of communism. In Communist countries, prices were not determined in the marketplace but were dictated by central planners. These planners lacked the necessary information about consumers’ tastes and producers’ costs, which in a market economy are reflected in prices. Central planners failed because they tried to run the economy with one hand tied behind their backs—the invisible hand of the marketplace.

## PRINCIPLE 7: GOVERNMENTS CAN SOMETIMES IMPROVE MARKET OUTCOMES

If the invisible hand of the market is so great, why do we need government? One purpose of studying economics is to refine your view about the proper role and scope of government policy.

One reason we need government is that the invisible hand can work its magic only if the government enforces the rules and maintains the institutions that are key to a market economy. Most important, market economies need institutions to enforce **property rights** so individuals can own and control scarce resources. A farmer won’t grow food if he expects his crop to be stolen; a restaurant won’t serve meals unless it is assured that customers will pay before they leave; and a music company won’t produce CDs if too many potential customers avoid paying

**property rights**  
the ability of an individual to own and exercise control over scarce resources

by making illegal copies. We all rely on government-provided police and courts to enforce our rights over the things we produce—and the invisible hand counts on our ability to enforce our rights.

Yet there is another reason we need government: The invisible hand is powerful, but it is not omnipotent. There are two broad reasons for a government to intervene in the economy and change the allocation of resources that people would choose on their own: to promote efficiency or to promote equality. That is, most policies aim either to enlarge the economic pie or to change how the pie is divided.

Consider first the goal of efficiency. Although the invisible hand usually leads markets to allocate resources to maximize the size of the economic pie, this is not always the case. Economists use the term **market failure** to refer to a situation in which the market on its own fails to produce an efficient allocation of resources. As we will see, one possible cause of market failure is an **externality**, which is the impact of one person's actions on the well-being of a bystander. The classic example of an externality is pollution. Another possible cause of market failure

### market failure

a situation in which a market left on its own fails to allocate resources efficiently

### externality

the impact of one person's actions on the well-being of a bystander



# FYI

## Adam Smith and the Invisible Hand

It may be only a coincidence that Adam Smith's great book *The Wealth of Nations* was published in 1776, the exact year American revolutionaries signed the Declaration of Independence. But the two documents share a point of view that was prevalent at the time: Individuals are usually best left to their own devices, without the heavy hand of government guiding their actions. This political philosophy provides the intellectual basis for the market economy and for free society more generally.

Why do decentralized market economies work so well? Is it because people can be counted on to treat one another with love and kindness? Not at all. Here is Adam Smith's description of how people interact in a market economy:

*Man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. . . . Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that we obtain from one another the far greater part of those good offices which we stand in need of.*



Adam Smith

*It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow-citizens. . . .*

*Every individual . . . neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.*

Smith is saying that participants in the economy are motivated by self-interest and that the "invisible hand" of the marketplace guides this self-interest into promoting general economic well-being.

Many of Smith's insights remain at the center of modern economics. Our analysis in the coming chapters will allow us to express Smith's conclusions more precisely and to analyze more fully the strengths and weaknesses of the market's invisible hand.

**market power**

the ability of a single economic actor (or small group of actors) to have a substantial influence on market prices

is **market power**, which refers to the ability of a single person (or small group) to unduly influence market prices. For example, if everyone in town needs water but there is only one well, the owner of the well is not subject to the rigorous competition with which the invisible hand normally keeps self-interest in check. In the presence of externalities or market power, well-designed public policy can enhance economic efficiency.

Now consider the goal of equality. Even when the invisible hand is yielding efficient outcomes, it can nonetheless leave sizable disparities in economic well-being. A market economy rewards people according to their ability to produce things that other people are willing to pay for. The world's best basketball player earns more than the world's best chess player simply because people are willing to pay more to watch basketball than chess. The invisible hand does not ensure that everyone has sufficient food, decent clothing, and adequate healthcare. This inequality may, depending on one's political philosophy, call for government intervention. In practice, many public policies, such as the income tax and the welfare system, aim to achieve a more equal distribution of economic well-being.

To say that the government *can* improve on market outcomes at times does not mean that it always *will*. Public policy is made not by angels but by a political process that is far from perfect. Sometimes policies are designed simply to reward the politically powerful. Sometimes they are made by well-intentioned leaders who are not fully informed. As you study economics, you will become a better judge of when a government policy is justifiable because it promotes efficiency or equality and when it is not.

**QUICK QUIZ** Why is a country better off not isolating itself from all other countries?  
 • Why do we have markets and, according to economists, what roles should government play in them?

## HOW THE ECONOMY AS A WHOLE WORKS

We started by discussing how individuals make decisions and then looked at how people interact with one another. All these decisions and interactions together make up “the economy.” The last three principles concern the workings of the economy as a whole.

### PRINCIPLE 8: A COUNTRY'S STANDARD OF LIVING DEPENDS ON ITS ABILITY TO PRODUCE GOODS AND SERVICES

The differences in living standards around the world are staggering. In 2006, the average American had an income of about \$44,260. In the same year, the average Mexican earned \$11,410, and the average Nigerian earned \$1,050. Not surprisingly, this large variation in average income is reflected in various measures of the quality of life. Citizens of high-income countries have more TV sets, more cars, better nutrition, better healthcare, and a longer life expectancy than citizens of low-income countries.

Changes in living standards over time are also large. In the United States, incomes have historically grown about 2 percent per year (after adjusting for

changes in the cost of living). At this rate, average income doubles every 35 years. Over the past century, average income has risen about eightfold.

What explains these large differences in living standards among countries and over time? The answer is surprisingly simple. Almost all variation in living standards is attributable to differences in countries' **productivity**—that is, the amount of goods and services produced from each unit of labor input. In nations where workers can produce a large quantity of goods and services per unit of time, most people enjoy a high standard of living; in nations where workers are less productive, most people endure a more meager existence. Similarly, the growth rate of a nation's productivity determines the growth rate of its average income.

The fundamental relationship between productivity and living standards is simple, but its implications are far-reaching. If productivity is the primary determinant of living standards, other explanations must be of secondary importance. For example, it might be tempting to credit labor unions or minimum-wage laws for the rise in living standards of American workers over the past century. Yet the real hero of American workers is their rising productivity. As another example, some commentators have claimed that increased competition from Japan and other countries explained the slow growth in U.S. incomes during the 1970s and 1980s. Yet the real villain was not competition from abroad but flagging productivity growth in the United States.

The relationship between productivity and living standards also has profound implications for public policy. When thinking about how any policy will affect living standards, the key question is how it will affect our ability to produce goods and services. To boost living standards, policymakers need to raise productivity by ensuring that workers are well educated, have the tools needed to produce goods and services, and have access to the best available technology.

## PRINCIPLE 9: PRICES RISE WHEN THE GOVERNMENT PRINTS TOO MUCH MONEY

In January 1921, a daily newspaper in Germany cost 0.30 marks. Less than two years later, in November 1922, the same newspaper cost 70,000,000 marks. All other prices in the economy rose by similar amounts. This episode is one of history's most spectacular examples of **inflation**, an increase in the overall level of prices in the economy.

Although the United States has never experienced inflation even close to that in Germany in the 1920s, inflation has at times been an economic problem. During the 1970s, for instance, when the overall level of prices more than doubled, President Gerald Ford called inflation "public enemy number one." By contrast, inflation in the first decade of the 21st century has run about 2½ percent per year; at this rate, it would take almost 30 years for prices to double. Because high inflation imposes various costs on society, keeping inflation at a low level is a goal of economic policymakers around the world.

What causes inflation? In almost all cases of large or persistent inflation, the culprit is growth in the quantity of money. When a government creates large quantities of the nation's money, the value of the money falls. In Germany in the early 1920s, when prices were on average tripling every month, the quantity of money was also tripling every month. Although less dramatic, the economic history of the United States points to a similar conclusion: The high inflation of the 1970s was associated with rapid growth in the quantity of money, and the low

**productivity**  
the quantity of goods and services produced from each unit of labor input

**inflation**  
an increase in the overall level of prices in the economy



"Well it may have been 68 cents when you got in line, but it's 74 cents now!"



## In The News

### Why You Should Study Economics

*In this excerpt from a commencement address, the former president of the Federal Reserve Bank of Dallas makes the case for studying economics.*

#### The Dismal Science? Hardly!

By Robert D. McTeer, Jr.

My take on training in economics is that it becomes increasingly valuable as you move up the career ladder. I can't imagine a better major for corporate CEOs, congressmen, or American presidents. You've learned a systematic, disciplined way of thinking that will serve you well. By contrast, the economically challenged must be perplexed

about how it is that economies work better the fewer people they have in charge. Who does the planning? Who makes decisions? Who decides what to produce? For my money, Adam Smith's invisible hand is the most important thing you've learned by studying economics. You understand how we can each work for our own self-interest and still produce a desirable social outcome. You know how uncoordinated activity gets coordinated by the market to enhance the wealth of nations. You understand the

magic of markets and the dangers of tampering with them too much. You know better what you first learned in kindergarten: that you shouldn't kill or cripple the goose that lays the golden eggs. . . .

Economics training will help you understand fallacies and unintended consequences. In fact, I am inclined to define economics as the study of how to anticipate unintended consequences. . . .

Little in the literature seems more relevant to contemporary economic debates

inflation of more recent experience was associated with slow growth in the quantity of money.

### PRINCIPLE 10: SOCIETY FACES A SHORT-RUN TRADE-OFF BETWEEN INFLATION AND UNEMPLOYMENT

Although a higher level of prices is, in the long run, the primary effect of increasing the quantity of money, the short-run story is more complex and controversial. Most economists describe the short-run effects of monetary injections as follows:

- Increasing the amount of money in the economy stimulates the overall level of spending and thus the demand for goods and services.
- Higher demand may over time cause firms to raise their prices, but in the meantime, it also encourages them to hire more workers and produce a larger quantity of goods and services.
- More hiring means lower unemployment.

This line of reasoning leads to one final economy-wide trade-off: a short-run trade-off between inflation and unemployment.

Although some economists still question these ideas, most accept that society faces a short-run trade-off between inflation and unemployment. This simply means that, over a period of a year or two, many economic policies push inflation and unemployment in opposite directions. Policymakers face this trade-off regardless of whether inflation and unemployment both start out at high levels (as they were in the early 1980s), at low levels (as they were in the late 1990s),

than what usually is called the broken window fallacy. Whenever a government program is justified not on its merits but by the jobs it will create, remember the broken window: Some teenagers, being the little beasts that they are, toss a brick through a bakery window. A crowd gathers and laments, "What a shame." But before you know it, someone suggests a silver lining to the situation: Now the baker will have to spend money to have the window repaired. This will add to the income of the repairman, who will spend his additional income, which will add to another seller's income, and so on. You know the drill. The chain of spending will multiply and generate higher income and employment. If the broken window is large enough, it might produce an economic boom! . . .

Most voters fall for the broken window fallacy, but not economics majors. They will say, "Hey, wait a minute!" If the baker hadn't spent his money on window repair, he would have spent it on the new suit he was saving to buy. Then the tailor would have the new income to spend, and so on. The broken window didn't create net new spending; it just diverted spending from somewhere else. The broken window does not create new activity, just different activity. People see the activity that takes place. They don't see the activity that *would* have taken place.

The broken window fallacy is perpetuated in many forms. Whenever job creation or retention is the primary objective I call it the job-counting fallacy. Economics majors understand the non-intuitive reality that

real progress comes from job destruction. It once took 90 percent of our population to grow our food. Now it takes 3 percent. Pardon me, Willie, but are we worse off because of the job losses in agriculture? The would-have-been farmers are now college professors and computer gurus. . . .

So instead of counting jobs, we should make every job count. We will occasionally hit a soft spot when we have a mismatch of supply and demand in the labor market. But that is temporary. Don't become a Luddite and destroy the machinery, or become a protectionist and try to grow bananas in New York City.

Source: *The Wall Street Journal*, June 4, 2003.

or someplace in between. This short-run trade-off plays a key role in the analysis of the **business cycle**—the irregular and largely unpredictable fluctuations in economic activity, as measured by the production of goods and services or the number of people employed.

Policymakers can exploit the short-run trade-off between inflation and unemployment using various policy instruments. By changing the amount that the government spends, the amount it taxes, and the amount of money it prints, policymakers can influence the overall demand for goods and services. Changes in demand in turn influence the combination of inflation and unemployment that the economy experiences in the short-run. Because these instruments of economic policy are potentially so powerful, how policymakers should use these instruments to control the economy, if at all, is a subject of continuing debate.

**QUICK QUIZ** List and briefly explain the three principles that describe how the economy as a whole works.

### business cycle

fluctuations in economic activity, such as employment and production

## CONCLUSION

You now have a taste of what economics is all about. In the coming chapters, we develop many specific insights about people, markets, and economies. Mastering these insights will take some effort, but it is not an overwhelming task. The field of economics is based on a few big ideas that can be applied in many different situations.





FYI

## How to Read This Book

Economics is fun, but it can also be hard to learn. My aim in writing this text is to make it as enjoyable and easy as possible. But you, the student, also have a role to play. Experience shows that if you are actively involved as you study this book, you will enjoy a better outcome both on your exams and in the years that follow. Here are a few tips about how best to read this book.

1. *Read before class.* Students do better when they read the relevant textbook chapter before attending a lecture. You will understand the lecture better, and your questions will be better focused on where you need extra help.
2. *Summarize, don't highlight.* Running a yellow marker over the text is too passive an activity to keep your mind engaged. Instead, when you come to the end of a section, take a minute and summarize what you just learned in your own words, writing your summary in the wide margins we've provided. When you've finished the chapter, compare your summaries with the one at the end of the chapter. Did you pick up the main points?
3. *Test yourself.* Throughout the book, Quick Quizzes offer instant feedback to find out if you've learned what you are supposed to. Take the opportunity to write down your answer and then check it against the answers provided at this book's website. The quizzes are meant to test your basic comprehension. If your answer is incorrect, you probably need to review the section.
4. *Practice, practice, practice.* At the end of each chapter, Questions for Review test your understanding, and Problems and Applications ask you to apply and extend the material. Perhaps your instructor will assign some of these exercises as homework. If so, do them. If not, do them anyway. The more you use your new knowledge, the more solid it becomes.
5. *Go online.* The publisher of this book maintains an extensive website to help you in your study of economics. It includes additional examples, applications, and problems, as well as quizzes so you can test yourself. Check it out. The website is <http://academic.cengage.com/economics/mankiw>.
6. *Study in groups.* After you've read the book and worked problems on your own, get together with classmates to discuss the material. You will learn from each other—an example of the gains from trade.
7. *Teach someone.* As all teachers know, there is no better way to learn something than to teach it to someone else. Take the opportunity to teach new economic concepts to a study partner, a friend, a parent, or even a pet.
8. *Don't skip the real-world examples.* In the midst of all the numbers, graphs, and strange new words, it is easy to lose sight of what economics is all about. The Case Studies and In the News boxes sprinkled throughout this book should help remind you. They show how the theory is tied to events happening in all our lives.
9. *Apply economic thinking to your daily life.* Once you've read about how others apply economics to the real world, try it yourself! You can use economic analysis to better understand your own decisions, the economy around you, and the events you read about in the newspaper. The world may never look the same again.

Throughout this book, we will refer back to the *Ten Principles of Economics* highlighted in this chapter and summarized in Table 1. Keep these building blocks in mind: Even the most sophisticated economic analysis is founded on the ten principles introduced here.

## TABLE 1

Ten Principles  
of Economics

## How People Make Decisions

- 1: People Face Trade-offs
- 2: The Cost of Something Is What You Give Up to Get It
- 3: Rational People Think at the Margin
- 4: People Respond to Incentives

## How People Interact

- 5: Trade Can Make Everyone Better Off
- 6: Markets Are Usually a Good Way to Organize Economic Activity
- 7: Governments Can Sometimes Improve Market Outcomes

## How the Economy as a Whole Works

- 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services
- 9: Prices Rise When the Government Prints Too Much Money
- 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment

## SUMMARY

- The fundamental lessons about individual decision making are that people face trade-offs among alternative goals, that the cost of any action is measured in terms of forgone opportunities, that rational people make decisions by comparing marginal costs and marginal benefits, and that people change their behavior in response to the incentives they face.
- The fundamental lessons about interactions among people are that trade and interdependence can be mutually beneficial, that markets are usually a good way of coordinating economic activity among people, and that the government can potentially improve market outcomes by remedying a market failure or by promoting greater economic equality.
- The fundamental lessons about the economy as a whole are that productivity is the ultimate source of living standards, that growth in the quantity of money is the ultimate source of inflation, and that society faces a short-run trade-off between inflation and unemployment.

## KEY CONCEPTS

scarcity, *p. 3*  
 economics, *p. 4*  
 efficiency, *p. 5*  
 equality, *p. 5*  
 opportunity cost, *p. 5*  
 rational people, *p. 6*

marginal changes, *p. 6*  
 incentive, *p. 7*  
 market economy, *p. 9*  
 property rights, *p. 10*  
 market failure, *p. 11*  
 externality, *p. 11*

market power, *p. 12*  
 productivity, *p. 13*  
 inflation, *p. 13*  
 business cycle, *p. 15*

## QUESTIONS FOR REVIEW

1. Give three examples of important trade-offs that you face in your life.
2. What is the opportunity cost of seeing a movie?
3. Water is necessary for life. Is the marginal benefit of a glass of water large or small?
4. Why should policymakers think about incentives?
5. Why isn't trade among countries like a game with some winners and some losers?
6. What does the "invisible hand" of the marketplace do?
7. Explain the two main causes of market failure and give an example of each.
8. Why is productivity important?
9. What is inflation and what causes it?
10. How are inflation and unemployment related in the short run?

## PROBLEMS AND APPLICATIONS

1. Describe some of the trade-offs faced by each of the following:
  - a. a family deciding whether to buy a new car
  - b. a member of Congress deciding how much to spend on national parks
  - c. a company president deciding whether to open a new factory
  - d. a professor deciding how much to prepare for class
  - e. a recent college graduate deciding whether to go to graduate school
2. You are trying to decide whether to take a vacation. Most of the costs of the vacation (airfare, hotel, and forgone wages) are measured in dollars, but the benefits of the vacation are psychological. How can you compare the benefits to the costs?
3. You were planning to spend Saturday working at your part-time job, but a friend asks you to go skiing. What is the true cost of going skiing? Now suppose you had been planning to spend the day studying at the library. What is the cost of going skiing in this case? Explain.
4. You win \$100 in a basketball pool. You have a choice between spending the money now or putting it away for a year in a bank account that pays 5 percent interest. What is the opportunity cost of spending the \$100 now?
5. The company that you manage has invested \$5 million in developing a new product, but the development is not quite finished. At a recent meeting, your salespeople report that the introduction of competing products has reduced the expected sales of your new product to \$3 million. If it would cost \$1 million to finish development and make the product, should you go ahead and do so? What is the most that you should pay to complete development?
6. Three managers of the Magic Potion Company are discussing a possible increase in production. Each suggests a way to make this decision.
 

HARRY: We should examine whether our company's productivity—gallons of potion per worker—would rise or fall.

RON: We should examine whether our average cost—cost per worker—would rise or fall.

HERMIONE: We should examine whether the extra revenue from selling the additional potion would be greater or smaller than the extra costs.

Who do you think is right? Why?
7. The Social Security system provides income for people over age 65. If a recipient of Social Security decides to work and earn some income, the amount he or she receives in Social Security benefits is typically reduced.
  - a. How does the provision of Social Security affect people's incentive to save while working?
  - b. How does the reduction in benefits associated with higher earnings affect people's incentive to work past age 65?

8. A recent bill reforming the government's anti-poverty programs limited many welfare recipients to only two years of benefits.
  - a. How does this change affect the incentives for working?
  - b. How might this change represent a trade-off between equality and efficiency?
9. Your roommate is a better cook than you are, but you can clean more quickly than your roommate can. If your roommate did all the cooking and you did all the cleaning, would your chores take you more or less time than if you divided each task evenly? Give a similar example of how specialization and trade can make two countries both better off.
10. Suppose the United States adopted central planning for its economy, and you became the chief planner. Among the millions of decisions that you need to make for next year are how many compact discs to produce, what artists to record, and which consumers should receive the discs. To make these decisions intelligently, what information would you need about the compact disc industry? What information would you need about each of the people in the United States? How well do you think you could do your job?
11. Explain whether each of the following government activities is motivated by a concern about equality or a concern about efficiency. In the case of efficiency, discuss the type of market failure involved.
  - a. regulating cable TV prices
  - b. providing some poor people with vouchers that can be used to buy food
  - c. prohibiting smoking in public places
  - d. breaking up Standard Oil (which once owned 90 percent of all oil refineries) into several smaller companies
  - e. imposing higher personal income tax rates on people with higher incomes
  - f. instituting laws against driving while intoxicated
12. Discuss each of the following statements from the standpoints of equality and efficiency.
  - a. "Everyone in society should be guaranteed the best healthcare possible."
  - b. "When workers are laid off, they should be able to collect unemployment benefits until they find a new job."
13. In what ways is your standard of living different from that of your parents or grandparents when they were your age? Why have these changes occurred?
14. Suppose Americans decide to save more of their incomes. If banks lend this extra savings to businesses, which use the funds to build new factories, how might this lead to faster growth in productivity? Who do you suppose benefits from the higher productivity? Is society getting a free lunch?
15. During the Revolutionary War, the American colonies could not raise enough tax revenue to fully fund the war effort; to make up this difference, the colonies decided to print more money. Printing money to cover expenditures is sometimes referred to as an "inflation tax." Who do you think is being "taxed" when more money is printed? Why?
16. Imagine that you are a policymaker trying to decide whether to reduce the rate of inflation. To make an intelligent decision, what would you need to know about inflation, unemployment, and the trade-off between them?

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