

Macroeconomics

FIFTH EDITION



N. GREGORY MANKIW

HARVARD UNIVERSITY

/o SOUTH-WESTERN
««» CENGAGE Learning-

Australia • Brazil • Japan • Korea • Mexico • Singapore • Spain • United Kingdom • United States

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

Why Economists Disagree 34

- Differences in Scientific Judgments 34
- Differences in Values 34
- Perception versus Reality 35

Let's Get Going 36

IN THE NEWS Environmental Economics 37

Summary 38

Key Concepts 38

Questions for Review 38

Problems and Applications 38

APPENDIX Graphing: A Brief Review 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 49

A Parable for the Modern Economy 50

Production Possibilities	50
Specialization and Trade	52

Comparative Advantage: The Driving Force of Specialization 54

Absolute Advantage	54
Opportunity Cost and Comparative Advantage	54
Comparative Advantage and Trade	55
The Price of the Trade	56

Applications of Comparative Advantage 57

FYI 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
IN THE NEWS The Changing Face of International Trade.	59

Conclusion 60

Summary 60

Key Concepts 60

Questions for Review 61

Problems and Applications 61



PART II

HOW MARKETS WORK 63

CHAPTER 4

THE MARKET FORCES OF SUPPLY AND DEMAND 65

Markets and Competition 66

What Is a Market?	66
What Is Competition?	66

Demand 67

The Demand Curve: The Relationship between Price and Quantity Demanded	67
Market Demand versus Individual Demand	68
Shifts in the Demand Curve	69
CASE STUDY Two Ways to Reduce the Quantity of Smoking Demanded	71

Supply 73

The Supply Curve: The Relationship between Price and Quantity Supplied	73
Market Supply versus Individual Supply	73
Shifts in the Supply Curve	74

Supply and Demand Together 77

Equilibrium	77
Three Steps to Analyzing Changes in Equilibrium	79

Conclusion: How Prices Allocate Resources 83

IN THE NEWS The Helium Market	83
IN THE NEWS Price Increases after Natural Disasters	84

Summary 85

Key Concepts 86

Questions for Review 86

Problems and Applications 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
CASE STUDY Should There Be a Market in Organs? 150
IN THE NEWS Ticket Scalping 151
Conclusion: Market Efficiency and Market Failure 152
IN THE NEWS The Miracle of the Market 153

Summary 154
Key Concepts 155
Questions for Review 155
Problems and Applications 155

CHAPTER 8
APPLICATION: THE COSTS OF TAXATION 159
The Deadweight Loss of Taxation 160
 How a Tax Affects Market Participants 161
 Deadweight Losses and the Gains from Trade 163

The Determinants of the Deadweight Loss 164
CASE STUDY The Deadweight Loss Debate 166
 Deadweight Loss and Tax Revenue as Taxes Vary 167
 FYI Henry George and the Land Tax 169
 CASE STUDY The Laffer Curve and Supply-Side Economics 169
IN THE NEWS On the Way to France 170

Conclusion 172
Summary 172
Key Concepts 173
Questions for Review 173
Problems and Applications 173

CHAPTER 9
APPLICATION: INTERNATIONAL TRADE 177
The Determinants of Trade 178
 The Equilibrium without Trade 178
 The World Price and Comparative Advantage 179
The Winners and Losers from Trade 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
FYI Import Quotas: Another Way to Restrict Trade	185
Other Benefits of International Trade	186
IN THE NEWS Should the Winners from Free Trade Compensate the Losers?	187
The Arguments for Restricting Trade	188
The Jobs Argument	188
IN THE NEWS 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
IN THE NEWS Second Thoughts about Free Trade	192
CASE STUDY Trade Agreements and the World Trade Organization	192
Conclusion	194
Summary	195
Key Concepts	196
Questions for Review	196
Problems and Applications	196



PART IV

THE DATA OF

MACROECONOMICS 201

CHAPTER 10

MEASURING A NATION'S INCOME 203

The Economy's Income and Expenditure 204

The Measurement of Gross Domestic Product 206

"GDP Is the Market Value ..." 206

"... of All..." 206

"... Final..." 207

"... J Goods and Services ..." 207

\$ "A Produced ..." 207

"... Within a Country ..." 207

"... In a Given Period of Time." 207

The Components of GDP 208

Consumption 209

Investment 209

FYI Other Measures of Income 209

Government Purchases 210

Net Exports 210

CASE STUDY The Components of U.S. GDP 211

Real versus Nominal GDP 211

A Numerical Example 212

The GDP Deflator 213

CASE STUDY Real GDP Over Recent History 214

Is GDP a Good Measure of Economic Well-Being? 215

IN THE NEWS The Underground Economy 216

CASE STUDY International Differences in GDP and the Quality of Life 218

Conclusion 219

FYI Who Wins at the Olympics? 220

Summary 220

Key Concepts 221

Questions for Review 221

Problems and Applications 221

CHAPTER 11

MEASURING THE COST OF LIVING 225

The Consumer Price Index 226

How the Consumer Price Index Is Calculated 226

Problems in Measuring the Cost of Living 228

FYI What Is In the CPI's Basket? 229

IN THE NEWS Accounting for Quality Change 230

The GDP Deflator versus the Consumer Price Index 232

Correcting Economic Variables for the Effects of Inflation 233

Dollar Figures from Different Times 234

Indexation 234

Real and Nominal Interest Rates 235

FYI Mr. Index Goes to Hollywood 235

CASE STUDY Interest Rates in the U.S. Economy 237

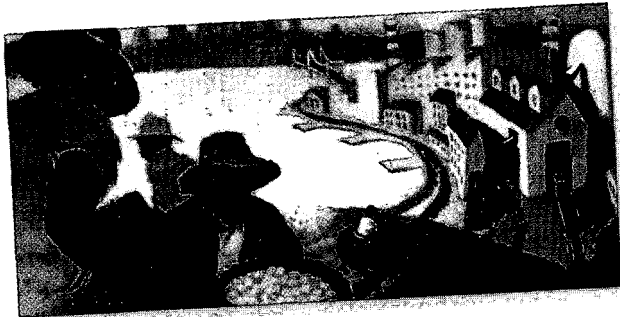
Conclusion 238

Summary 238

Key Concepts 239

Questions for Review 239

Problems and Applications 239



PART V

THE REAL ECONOMY IN THE LONG RUN 243

CHAPTER 12

PRODUCTION AND GROWTH 245

Economic Growth around the World 246

FYI A Picture Is Worth a Thousand Statistics 248

FYI Are You Richer Than the Richest American? 250

Productivity: Its Role and Determinants 250

Why Productivity Is So Important 250

How Productivity Is Determined 251

FYI The Production Function 253

IN THE NEWS Measuring Capital 254

CASE STUDY Are Natural Resources a Limit to Growth? 254

Economic Growth and Public Policy 256

Saving and Investment 256

Diminishing Returns and the Catch-Up Effect 257

Investment from Abroad 258

Education 259

IN THE NEWS Promoting Human Capital 260

Health and Nutrition 261

Property Rights and Political Stability 262

Free Trade 263

Research and Development 264

Population Growth 264

IN THE NEWS Escape from Malthus 266

Conclusion: The Importance of Long-Run Growth 268

Summary 269

Key Concepts 269

Questions for Review 269

Problems and Applications 270

CHAPTER 13

SAVING, INVESTMENT, AND THE FINANCIAL SYSTEM 271

Financial Institutions in the U.S. Economy 272

Financial Markets 272

Financial Intermediaries 274

FYI Key Numbers for Stock Watchers 275

Summing Up 276

Saving and Investment in the National Income Accounts 277

Some Important Identities 277

The Meaning of Saving and Investment 279

The Market for Loanable Funds 279

Supply and Demand for Loanable Funds 280

Policy 1: Saving Incentives 282

Policy 2: Investment Incentives 283

IN THE NEWS In Praise of Misers 284

Policy 3: Government Budget Deficits and Surpluses 285

CASE STUDY The History of U.S. Government Debt 287

Conclusion 289

Summary 290

Key Concepts 290

Questions for Review 290

Problems and Applications 291

CHAPTER 14

THE BASIC TOOLS OF FINANCE 293

Present Value: Measuring the Time Value of Money 294

FYI The Magic of Compounding' and the Rule of 70 296

Managing Risk 296

Risk Aversion 297

The Markets for Insurance 297

FYI The Peculiarities of Health Insurance 298

Diversification of Firm-Specific Risk 299

The Trade-off between Risk and Return 300

Asset Valuation 302

Fundamental Analysis 302

CASE STUDY Random Walks and Index Funds 303

The Efficient Markets Hypothesis 302

IN THE NEWS Neurofinance 304

Market Irrationality 305



Conclusion	306
Summary	307
Key Concepts	307
Questions for Review	307
Problems and Applications	307

CHAPTER 15

UNEMPLOYMENT 309

Identifying Unemployment	310
How Is Unemployment Measured?	310
CASE STUDY Labor-Force Participation of Men and Women in the U.S. Economy	313
IN THE NEWS The Rise of Adult Male Joblessness	314
Does the Unemployment Rate Measure What We Want It To?	315
How Long Are the Unemployed without Work?	317
Why Are There Always Some People Unemployed?	318
Job Search	319
Why Some Frictional Unemployment Is Inevitable	319
FYI The Jobs Number	319
Public Policy and Job Search	320
Unemployment Insurance	321
IN THE NEWS Unemployment Policy At Home and Abroad	322
Minimum-Wage Laws	323
Unions and Collective Bargaining	325
FYI Who Earns the Minimum Wage?	325
The Economics of Unions	326
Are Unions Good or Bad for the Economy?	327
The Theory of Efficiency Wages	328
Worker Health	328
Worker Turnover	328
Worker Quality	329
Worker Effort	329
CASE STUDY Henry Ford and the Very Generous \$5-A-Day Wage	330
Conclusion	330
Summary	331
Key Concepts	331
Questions for Review	332
Problems and Applications	332

PART VI

MONEY AND PRICES IN THE LONG RUN 335

CHAPTER 16	THE MONETARY SYSTEM 337
The Meaning of Money	338
The Functions of Money	338
The Kinds of Money	339
IN THE NEWS Monetary Lessons from Iraq	340
Money in the U.S. Economy	341
FYI Credit Cards, Debit Cards, and Money	343
CASE STUDY Where Is All the Currency?	343
The Federal Reserve System	344
The Fed's Organization	344
The Federal Open Market Committee	344
Banks and the Money Supply	345
The Simple Case of 100-Percent-Reserve Banking	346
Money Creation with Fractional-Reserve Banking	346
The Money Multiplier	347
The Fed's Tools of Monetary Control	349
IN THE NEWS The Financial Crisis of 2008	350
Problems in Controlling the Money Supply	352
CASE STUDY Bank Runs and the Money Supply	353
The Federal Funds Rate	353
Conclusion	354
Summary	355
Key Concepts	355
Questions for Review	356
Problems and Applications	356
CHAPTER 17	MONEY GROWTH AND INFLATION 359
The Classical Theory of Inflation	360
The Level of Prices and the Value of Money	360
Money Supply, Money Demand, and Monetary Equilibrium	361

The Effects of a Monetary Injection 362
 A Brief Look at the Adjustment Process 363
 The Classical Dichotomy and Monetary Neutrality 365
 Velocity and the Quantity Equation 366

**CASE STUDY Money and Prices During Four
 Hyperinflations 368**

The Inflation Tax 369
 The Fisher Effect 370

IN THE NEWS A Recipe for Economic Disaster 371

The Costs of Inflation 372

A Fall in Purchasing Power? The Inflation Fallacy 373
 Shoeleather Costs 374

Menu Costs 375

Relative-Price Variability and the Misallocation of
 Resources 375

Inflation-Induced Tax Distortions 376

Confusion and Inconvenience 377

A Special Cost of Unexpected Inflation: Arbitrary
 Redistributions of Wealth 378

**CASE STUDY *The Wizard of Oz* and the Free-Silver
 Debate 378**

Conclusion 380

Summary 381

Key Concepts 381

Questions for Review 381

Problems and Applications 382



PART VII THE MACROECONOMICS OF OPEN ECONOMIES 385

CHAPTER 18

**OPEN-ECONOMY MACROECONOMICS: BASIC
 CONCEPTS 387**

The International Flows of Goods and Capital 388

The Flow of Goods: Exports, Imports, and Net
 Exports 388

**CASE STUDY The Increasing Openness of the U.S.
 Economy 389**

**IN THE NEWS Breaking Up the Chain of
 Production 390**

The Flow of Financial Resources: Net Capital
 Outflow 392

The Equality of Net Exports and Net Capital
 Outflow 393

Saving, Investment, and Their Relationship to
 the International Flows 394

Summing Up 396

**CASE STUDY Is the U.S. Trade Deficit a National
 Problem? 396**

**The Prices for International Transactions: Real and
 Nominal Exchange Rates 399**

Nominal Exchange Rates 399

FYI The Euro 400

Real Exchange Rates 400

IN THE NEWS How a Weak Dollar Boosts Exports 402

**A First Theory of Exchange-Rate Determination:
 Purchasing-Power Parity 403**

The Basic Logic of Purchasing-Power Parity 403

Implications of Purchasing-Power Parity 404

**CASE STUDY The Nominal Exchange Rate During a
 Hyperinflation 405**

Limitations of Purchasing-Power Parity 406

CASE STUDY The Hamburger Standard 407

Conclusion 408

Summary 408

Key Concepts 409

Questions for Review 409

Problems and Applications 409

CHAPTER 19

**A MACROECONOMIC THEORY OF THE OPEN
 ECONOMY 411**

**Supply and Demand for Loanable Funds and for
 Foreign-Currency Exchange 412**

The Market for Loanable Funds 412

The Market for Foreign-Currency Exchange 414

FYI Purchasing-Power Parity as a Special Case 416

Equilibrium in the Open Economy 417

Net Capital Outflow: The Link between the Two
 Markets 417

Simultaneous Equilibrium in Two Markets 418

FYI Disentangling Supply and Demand 420

How Policies and Events Affect an Open Economy 420

Government Budget Deficits 420

- IN THE NEWS** What Causes the U.S. Trade Deficit? 422
 Trade Policy 424
 Political Instability and Capital Flight 426
CASE STUDY Capital Flows from China 428

- Conclusion** 429
Summary 430
Key Concepts 430
Questions for Review 430
Problems and Applications 431



PART VIII

SHORT-RUN ECONOMIC FLUCTUATIONS 433

CHAPTER 20

AGGREGATE DEMAND AND AGGREGATE SUPPLY 435

- Three Key Facts about Economic Fluctuations** 436
 Fact 1: Economic Fluctuations Are Irregular and Unpredictable 436
 Fact 2: Most Macroeconomic Quantities Fluctuate Together 436
 Fact 3: As Output Falls, Unemployment Rises 438

Explaining Short-Run Economic Fluctuations 438

- The Assumptions of Classical Economics 438
IN THE NEWS Offbeat Indicators 439
 The Reality of Short-Run Fluctuations 440
 The Model of Aggregate Demand and Aggregate Supply 441

The Aggregate-Demand Curve 442

- Why the Aggregate-Demand Curve Slopes Downward 442
 Why the Aggregate-Demand Curve Might Shift 445
IN THE NEWS The 2008 Fiscal Stimulus 446

The Aggregate-Supply Curve 447

- Why the Aggregate-Supply Curve Is Vertical in the Long Run 448

- Why the Long-Run Aggregate-Supply Curve Might Shift 449
 Using Aggregate Demand and Aggregate Supply to Depict Long-Run Growth and Inflation 451
 Why the Aggregate-Supply Curve Slopes Upward in the Short Run 451
 Why the Short-Run Aggregate-Supply Curve Might Shift 456

Two Causes of Economic Fluctuations 457

- The Effects of a Shift in Aggregate Demand 458
FYI Monetary Neutrality Revisited 460
CASE STUDY Two Big Shifts in Aggregate Demand: The Great Depression and World War II 461
CASE STUDY The Recession of 2001 463
 The Effects of a Shift in Aggregate Supply 463
FYI The Origins of Aggregate Demand and Aggregate Supply 466
CASE STUDY Oil and the Economy 466

Conclusion 467

- Summary** 468
Key Concepts 469
Questions for Review 469
Problems and Applications 469

CHAPTER 21

THE INFLUENCE OF MONETARY AND FISCAL POLICY ON AGGREGATE DEMAND 473

How Monetary Policy Influences Aggregate Demand 474

- The Theory of Liquidity Preference 475
 The Downward Slope of the Aggregate-Demand Curve 477
FYI Interest Rates in the Long Run and the Short Run 478

- Changes in the Money Supply 479
 The Role of Interest-Rate Targets in Fed Policy 481

- IN THE NEWS** The FOMC Explains Itself 482
CASE STUDY Why the Fed Watches the Stock Market (and Vice Versa) 482

How Fiscal Policy Influences Aggregate Demand 483

- Changes in Government Purchases 483
 The Multiplier Effect 484
 A Formula for the Spending Multiplier 484
 Other Applications of the Multiplier Effect 486
 The Crowding-Out Effect 487
 Changes in Taxes 488

Using Policy to Stabilize the Economy 489

- FYI** How Fiscal Policy Might Affect Aggregate Supply 489

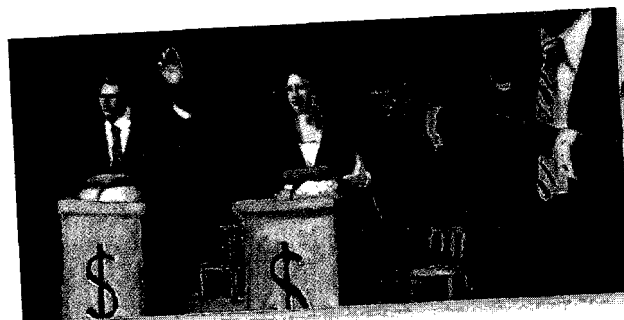
- The Case for Active Stabilization Policy 490
CASE STUDY Keynesians in the White House 491
 The Case against Active Stabilization Policy 491
 Automatic Stabilizers 493

- Conclusion 493**
Summary 494
Key Concepts 494
Questions for Review 495
Problems and Applications 495

CHAPTER 22

THE SHORT-RUN TRADE-OFF BETWEEN INFLATION AND UNEMPLOYMENT 497

- The Phillips Curve 498**
 Origins of the Phillips Curve 498
 Aggregate Demand, Aggregate Supply, and the Phillips
 Curve 499
- Shifts in the Phillips Curve: The Role of Expectations 501**
 The Long-Run Phillips Curve 501
 The Meaning of "Natural" 503
 Reconciling Theory and Evidence 504
 The Short-Run Phillips Curve 505
 The Natural Experiment for the Natural-Rate
 Hypothesis 506
- Shifts in the Phillips Curve: The Role of Supply
Shocks 508**
IN THE NEWS Will Stagflation Return? 511
- The Cost of Reducing Inflation 512**
 The Sacrifice Ratio 512
 Rational Expectations and the Possibility of Costless
 Disinflation 513
 The Volcker Disinflation 514
 The Greenspan Era 516
 Bernanke's Challenges 517
IN THE NEWS Managing Expectations 518
- Conclusion 518**
Summary 520
Key Concepts 520
Questions for Review 520
Problems and Applications 521



PART IX FINAL THOUGHTS 219

CHAPTER 23

FIVE DEBATES OVER MACROECONOMIC POLICY 221

- Should Monetary and Fiscal Policymakers Try to Stabilize
the Economy? 526**
 Pro: Policymakers Should Try to Stabilize the ,
 Economy 526
 Con: Policymakers Should Not Try to Stabilize the
 Economy 526
- Should Monetary Policy Be Made by Rule Rather Than
by Discretion? 528**
 Pro: Monetary Policy Should Be Made by Rule 528
 Con: Monetary Policy Should Not Be Made by Rule 529
IN THE NEWS Inflation Targeting 530
- Should the Central Bank Aim for Zero Inflation? 531**
 Pro: The Central Bank Should Aim for Zero
 Inflation 532
 Con: The Central Bank Should Not Aim for Zero
 Inflation 533
- Should the Government Balance Its Budget? 534**
 Pro: The Government Should Balance Its Budget 535
 Con: The Government Should Not Balance Its
 Budget 536
- Should the Tax Laws Be Reformed to Encourage
Saving? 537**
 Pro: The Tax Laws Should Be Reformed to Encourage
 Saving 537
IN THE NEWS Dealing with Deficits 538
 Con: The Tax Laws Should Not Be Reformed to
 Encourage Saving 540
- Conclusion 541**
Summary 542
Questions for Review 542
Problems and Applications 543

- Glossary 545**
Index 549