#### Preface xvi

Part 1	40.00	Introduction	1
	400	IIILIOUUCUUII	- 1

- 1 Introduction to Macroeconomics 2
- 2 The Measurement and Structure of the National Economy 24

#### Part 2 Long-Run Economic Performance 61

- 3 Productivity, Output, and Employment 62
- 4 Consumption, Saving, and Investment 111
- 5 Saving and Investment in the Open Economy 173
- 6 Long-Run Economic Growth 210
- 7 The Asset Market, Money, and Prices 245

#### Part 3 Business Cycles and Macroeconomic Policy 275

- 8 Business Cycles 276
- 9 The IS-LM/AD-AS Model: A General Framework for Macroeconomic Analysis 308
- 10 Classical Business Cycle Analysis: Market-Clearing Macroeconomics 355
- 11 Keynesianism: The Macroeconomics of Wage and Price Rigidity 393

# Part 4 Macroeconomic Policy: Its Environment and Institutions 433

- 12 Unemployment and Inflation 434
- 13 Exchange Rates, Business Cycles, and Macroeconomic Policy in the Open Economy 468
- 14 Monetary Policy and the Federal Reserve System 521
- 15 Government Spending and Its Financing 565

Appendix A: Some Useful Analytical Tools 602

Glossary 609

Name Index 621

Subject Index 623

Preface xvi

Chapter 1

Part 1 Introduction 1

Chapter 1	2.1 National Income Accounting: The
Introduction to Macroeconomics 2	Measurement of Production, Income, and Expenditure 24
1.1 What Macroeconomics Is About 2 Long-Run Economic Growth 3 Business Cycles 5 Unemployment 6	In Touch with the Macroeconomy: The National Income and Product Accounts 26 Why the Three Approaches Are Equivalent 27
Inflation 6 The International Economy 8 Macroeconomic Policy 10 Aggregation 11	2.2 Gross Domestic Product 28  The Product Approach to Measuring GDP 28  Box 2.1 Natural Resources, the Environment, and the National Income Accounts 31  The Expenditure Approach to Measuring GDP 3
<ul> <li>1.2 What Macroeconomists Do 12</li> <li>Macroeconomic Forecasting 12</li> <li>Macroeconomic Analysis 12</li> <li>Macroeconomic Research 13</li> </ul>	The Income Approach to Measuring GDP 35  2.3 Saving and Wealth 37  Measures of Aggregate Saving 38  The Uses of Private Saving 40
Box 1.1 Developing and Testing an Economic Theory 15 Data Development 15  1.3 Why Macroeconomists Disagree 16 Classicals Versus Keynesians 17 A Unified Approach to Macroeconomics 19	Application Surprise, Surprise, Surprise! Fourth-Quarter 2001 GDP Figures Defy Expectations 41 Relating Saving and Wealth 43  2.4 Real GDP, Price Indexes, and Inflation 45 Real GDP 45 Price Indexes 46  Box 2.2 The Computer Revolution and Chain-Weighted GDP 48  Box 2.3 Does CPI Inflation Overstate Increases in the Cost of Living? 50
	2.5 Interest Rates 51 Real Versus Nominal Interest Rates 52

**Chapter 2** 

The Measurement and Structure

of the National Economy 24

32

# Part 2 Long-Run Economic Performance 61

#### **Chapter 3**

Productivity, Output, and Employment 62

3.1 How Much Does the Economy Produce? The Production Function 63

**Application** The Production Function of the U.S. Economy and U.S. Productivity Growth 64

The Shape of the Production Function 66 Supply Shocks 70

#### 3.2 The Demand for Labor 72

The Marginal Product of Labor and Labor Demand: An Example 73

A Change in the Wage 75

The Marginal Product of Labor and the Labor Demand Curve 75

Factors That Shift the Labor Demand Curve 77 Aggregate Labor Demand 79

#### 3.3 The Supply of Labor 79

The Income-Leisure Trade-off 80

Real Wages and Labor Supply 81

The Labor Supply Curve 83

Aggregate Labor Supply 84

**Application** Weekly Hours of Work and the Wealth of Nations 86

#### 3.4 Labor Market Equilibrium 88

Full-Employment Output 89

**Application** Output, Employment, and the Real Wage During Oil Price Shocks 90

**Application** Technical Change and Wage Inequality 91

#### 3.5 Unemployment 94

Measuring Unemployment 94

Changes in Employment Status 95

In Touch with the Macroeconomy:

Labor Market Data 96

How Long Are People Unemployed? 97

Why There Always Are Unemployed People 97

#### 3.6 Relating Output and Unemployment: Okun's Law 99

Appendix 3.A The Growth Rate Form of Okun's Law 110

#### Chapter 4

Consumption, Saving, and Investment 111

#### 4.1 Consumption and Saving 112

The Consumption and Saving Decision of an Individual 113

Effect of Changes in Current Income 114

Effect of Changes in Expected Future Income 115

**Application** Consumer Sentiment and the 1990–1991 Recession 116

Effect of Changes in Wealth 118

Effect of Changes in the Real Interest Rate 119

Fiscal Policy 121

In Touch with the Macroeconomy:

Interest Rates 122

Application A Ricardian Tax Cut? 126

#### 4.2 Investment 127

The Desired Capital Stock 127

Changes in the Desired Capital Stock 130

Box 4.1 Investment and the Stock Market 131

**Application** Measuring the Effects of Taxes on Investment 134

From the Desired Capital Stock to Investment 135

Investment in Inventories and Housing 137

#### 4.3 Goods Market Equilibrium 138

The Saving-Investment Diagram 140

Application Macroeconomic Consequences of the Boom and Bust in Stock Prices 144

Appendix 4.A A Formal Model of Consumption and Saving 156

# Saving and Investment in the Open Economy 173

5.1 Balance of Payments Accounting 174

The Current Account 174

In Touch with the Macroeconomy:

The Balance of Payments Accounts 176

The Capital and Financial Account 177

The Relationship Between the Current Account and the Capital and Financial Account 179

**Box 5.1** Does Mars Have a Current Account Surplus? 181

Net Foreign Assets and the Balance of Payments Accounts 181

**Application** The United States as International Debtor 183

- 5.2 Goods Market Equilibrium in an Open Economy 184
- 5.3 Saving and Investment in a Small Open Economy 185

The Effects of Economic Shocks in a Small Open Economy 188

**Application** The LDC Debt Crisis 191 **Application** The 1994 Mexican Crisis 194

- 5.4 Saving and Investment in Large Open Economies 195
- 5.5 Fiscal Policy and the Current Account 198

The Critical Factor: The Response of National Saving 198

The Government Budget Deficit and National Saving 199

Application The Twin Deficits 200

#### **Chapter 6**

#### Long-Run Economic Growth 210

- 6.1 The Sources of Economic Growth 211
  Growth Accounting 213
  Application The Post–1973 Slowdown in Productivity Growth 215
  Application A U.S. Productivity Miracle? 219
- 6.2 Growth Dynamics: The Solow Model 221
  Setup of the Solow Model 222
  The Fundamental Determinants of Long-Run
  Living Standards 229
  Application Do Economies Converge? 234
  Endogenous Growth Theory 236
- 6.3 Government Policies to Raise Long-Run Living Standards 238

Policies to Affect the Saving Rate 238
Policies to Raise the Rate of Productivity
Growth 239

The Asset Market, Money, and Prices 245

#### 7.1 What Is Money? 245

Box 7.1 Money in a Prisoner-of-War Camp 246

The Functions of Money 246

Measuring Money: The Monetary Aggregates 247

In Touch with the Macroeconomy:

The Monetary Aggregates 249

Box 7.2 Where Have All the Dollars Gone? 250

The Money Supply 251

### 7.2 Portfolio Allocation and the Demand for Assets 252

Expected Return 252

Risk 253

Liquidity 253

Asset Demands 253

#### 7.3 The Demand for Money 253

The Price Level 254

Real Income 254

Interest Rates 255

The Money Demand Function 256

Other Factors Affecting Money Demand 257

Elasticities of Money Demand 258

Velocity and the Quantity Theory of Money 259

**Application** Financial Regulation, Innovation, and the Instability of Money Demand 261

#### 7.4 Asset Market Equilibrium 263

Asset Market Equilibrium: An Aggregation Assumption 263

The Asset Market Equilibrium Condition 265

#### 7.5 Money Growth and Inflation 266

**Application** Money Growth and Inflation in European Countries in Transition 267

The Expected Inflation Rate and the Nominal Interest Rate 269

# Part 3 Business Cycles and Macroeconomic Policy 275

#### Chapter 8

**Business Cycles** 276

#### 8.1 What Is a Business Cycle? 277

#### 8.2 The American Business Cycle: The Historical Record 279

The Pre-World War I Period 279

The Great Depression and World War II 279

Post-World War II U.S. Business Cycles 281

The "Long Boom" 282

### **Application** Dating the Peak of the 2001 Recession 282

Have American Business Cycles Become Less Severe? 285

#### 8.3 Business Cycle Facts 287

The Cyclical Behavior of Economic Variables: Direction and Timing 288

Production 288

#### In Touch with the Macroeconomy:

Leading Indicators 289

Expenditure 291

Employment and Unemployment 292

Average Labor Productivity and the Real Wage 293

Money Growth and Inflation 295

Financial Variables 295

International Aspects of the Business Cycle 296

#### 8.4 Business Cycle Analysis: A Preview 297

### **Box 8.1** The Seasonal Cycle and the Business Cycle 299

Aggregate Demand and Aggregate Supply: A Brief Introduction 299

# The IS-LM/AD-AS Model: A General Framework for Macroeconomic Analysis 308

#### 9.1 The FE Line: Equilibrium in the Labor Market 309

Factors That Shift the FE Line 310

#### 9.2 The IS Curve: Equilibrium in the Goods Market 310

Factors That Shift the IS Curve 313

#### 9.3 The LM Curve: Asset Market Equilibrium 315

The Interest Rate and the Price of a Nonmonetary Asset 316

The Equality of Money Demanded and Money Supplied 316

Factors That Shift the LM Curve 319

## 9.4 General Equilibrium in the Complete IS-LM Model 322

Applying the *IS-LM* Framework: A Temporary Adverse Supply Shock 323

Application Oil Price Shocks Revisited 326

### 9.5 Price Adjustment and the Attainment of General Equilibrium 326

**Box 9.1** Econometric Models and Macroeconomic Forecasts 327

The Effects of a Monetary Expansion 328 Classical Versus Keynesian Versions of the IS-LM Model 332

#### 9.6 Aggregate Demand and Aggregate Supply 333

The Aggregate Demand Curve 334

The Aggregate Supply Curve 337

Equilibrium in the *AD–AS* Model 338

Monetary Neutrality in the *AD–AS* Model 339

Appendix 9.A Algebraic Versions of the *IS-LM* and *AD-AS* Models 348

#### Chapter 10

#### Classical Business Cycle Analysis: Market-Clearing Macroeconomics 355

#### 10.1 Business Cycles in the Classical Model 356

The Real Business Cycle Theory 356

**Application** Calibrating the Business Cycle 359 Fiscal Policy Shocks in the Classical Model 366 Unemployment in the Classical Model 370

#### 10.2 Money in the Classical Model 373

Household Production 373

Monetary Policy and the Economy 374
Monetary Nonneutrality and Reverse
Causation 374
The Nonneutrality of Money: Additional
Evidence 375

#### 10.3 The Misperceptions Theory and the Nonneutrality of Money 376

Monetary Policy and the Misperceptions Theory 379

Rational Expectations and the Role of Monetary Policy 382

Box 10.1 Are Price Forecasts Rational? 383

Appendix 10.A An Algebraic Version of the Classical AD-AS Model with Misperceptions 391

# Keynesianism: The Macroeconomics of Wage and Price Rigidity 393

#### 11.1 Real-Wage Rigidity 394

Some Reasons for Real-Wage Rigidity 394

The Efficiency Wage Model 395

Wage Determination in the Efficiency

Wage Model 396

Employment and Unemployment in the

Efficiency Wage Model 397

Efficiency Wages and the FE Line 399

Box 11.1 Henry Ford's Efficiency Wage 400

#### 11.2 Price Stickiness 400

Sources of Price Stickiness: Monopolistic Competition and Menu Costs 401

#### 11.3 Monetary and Fiscal Policy in the Keynesian Model 406

Monetary Policy 407 Fiscal Policy 411

### 11.4 The Keynesian Theory of Business Cycles and Macroeconomic Stabilization 414

Keynesian Business Cycle Theory 414

Macroeconomic Stabilization 416

**Box 11.2** Japanese Macroeconomic Policy in the 1990s 419

Supply Shocks in the Keynesian Model 421

#### Appendix 11.A Labor Contracts and Nominal-Wage Rigidity 428

Appendix 11.B The Multiplier in the Keynesian Model 431

# Part 4 Macroeconomic Policy: Its Environment and Institutions 433

#### Chapter 12

Unemployment and Inflation 434

### 12.1 Unemployment and Inflation: Is There a Trade-Off? 435

The Expectations-Augmented Phillips Curve 437

The Shifting Phillips Curve 441

Macroeconomic Policy and the Phillips Curve 445

Box 12.1 The Lucas Critique 446

The Long-Run Phillips Curve 447

#### 12.2 The Problem of Unemployment 448

The Costs of Unemployment 448

The Long-Term Behavior of the Unemployment Rate 449

**Box 12.2** The Effect of Unemployment Insurance on Unemployment 454

Policies to Reduce the Natural Rate of Unemployment 454

#### 12.3 The Problem of Inflation 455

The Costs of Inflation 456

Box 12.3 Indexed Contracts 458

Fighting Inflation: The Role of Inflationary Expectations 459

Box 12.4 The Sacrifice Ratio 461

# Exchange Rates, Business Cycles, and Macroeconomic Policy in the Open Economy 468

#### 13.1 Exchange Rates 469

Nominal Exchange Rates 469

Real Exchange Rates 470

Appreciation and Depreciation 472

Purchasing Power Parity 472

Box 13.1 McParity 474

The Real Exchange Rate and Net Exports 474

**Application** The Value of the Dollar and U.S. Net Exports 477

#### 13.2 How Exchange Rates Are Determined: A Supply-and-Demand Analysis 478

In Touch with the Macroeconomy:

Exchange Rates 479

Macroeconomic Determinants of the Exchange Rate and Net Export Demand 481

#### 13.3 The IS-LM Model for an Open Economy 483

The Open-Economy IS Curve 484

Factors That Shift the Open-Economy IS Curve 486

The International Transmission of Business Cycles 489

## 13.4 Macroeconomic Policy in an Open Economy with Flexible Exchange Rates 490

A Fiscal Expansion 491

A Monetary Contraction 493

#### 13.5 Fixed Exchange Rates 496

Fixing the Exchange Rate 496

Application The Asian Crisis 499

Monetary Policy and the Fixed Exchange Rate 501

Application Policy Coordination Failure and the Collapse of Fixed Exchange Rates: The Cases of Bretton Woods and the EMS 503

Fixed Versus Flexible Exchange Rates 505

Currency Unions 505

Application European Monetary Unification 506

Application Crisis in Argentina 509

# Appendix 13.A An Algebraic Version of the Open-Economy IS-LM Model 518

#### Chapter 14

#### Monetary Policy and the Federal Reserve System 521

#### 14.1 Principles of Money Supply Determination 522

The Money Supply in an All-Currency Economy 522

The Money Supply Under Fractional Reserve Banking 523

Bank Runs 526

The Money Supply With Both Public Holdings of Currency and Fractional Reserve Banking 527

Open-Market Operations 529

**Application** The Money Multiplier During the Great Depression 530

#### 14.2 Monetary Control in the United States 533

The Federal Reserve System 533

The Federal Reserve's Balance Sheet and

Open-Market Operations 534

Other Means of Controlling the Money Supply 535

Intermediate Targets 539

Making Monetary Policy in Practice 540

#### 14.3 The Conduct of Monetary Policy: Rules Versus Discretion 543

**Box 14.1** The Credit Channel of Monetary Policy 544

Box 14.2 The Taylor Rule 545

The Monetarist Case for Rules 546

Rules and Central Bank Credibility 548

**Application** Money-Growth Targeting and Inflation Targeting 554

Other Ways to Achieve Central Bank Credibility 557

**Application** How the Federal Reserve's Response to the 2001 Recession Affected Short-Term and Long-Term Interest Rates 559

#### xiv

#### Chapter 15

#### Government Spending and Its Financing 565

#### 15.1 The Government Budget: Some Facts and Figures 565

Government Outlays 565

Taxes 567

Deficits and Surpluses 571

#### 15.2 Government Spending, Taxes, and the Macroeconomy 572

Fiscal Policy and Aggregate Demand 573

Government Capital Formation 575

Incentive Effects of Fiscal Policy 576

Application Labor Supply and Tax Reform in the 1980s 577

#### 15.3 Government Deficits and Debt 580

The Growth of the Government Debt 580

The Burden of the Government Debt on Future Generations 582

Box 15.1 Social Security and the Federal Budget 583

#### Box 15.2 Generational Accounts 584

Budget Deficits and National Saving: Ricardian Equivalence Revisited 585

Departures from Ricardian Equivalence 588

#### 15.4 Deficits and Inflation 589

The Deficit and the Money Supply 589

Real Seignorage Collection and Inflation 591

Application Hyperinflation in the United States 594

Appendix 15.A The Debt-GDP Ratio 601

#### Appendix A

#### Some Useful Analytical Tools 602

A.1 Functions and Graphs 602

A.2 Slopes of Functions 603

A.3 Elasticities 604

A.4 Functions of Several Variables 605

A.5 Shifts of a Curve 605

A.6 Exponents 606

A.7 Growth Rate Formulas 606

Problems 607

#### Glossary 609

Name Index 621

Subject Index 623