

MACROECONOMICS

SEVENTH EDITION



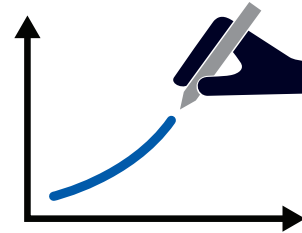
OLIVIER BLANCHARD

Practice, Engage, and Assess



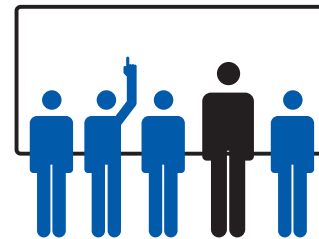
- **Enhanced eText**—The Pearson eText gives students access to their textbook anytime, anywhere. In addition to note-taking, highlighting, and bookmarking, the Pearson eText offers interactive and sharing features. Students actively read and learn, through embedded and auto-graded practice, real-time data-graphs, animations, author videos, and more. Instructors can share comments or highlights, and students can add their own, for a tight community of learners in any class.

- **Practice**—Algorithmically generated homework and study plan exercises with instant feedback ensure varied and productive practice, helping students improve their understanding and prepare for quizzes and tests. Draw-graph exercises encourage students to practice the language of economics.



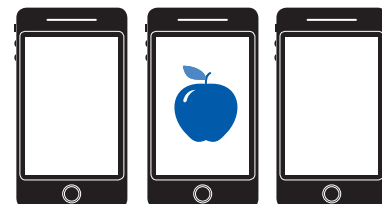
- **Learning Resources**—Personalized learning aids such as Help Me Solve This problem walkthroughs, Teach Me explanations of the underlying concept, and figure Animations provide on-demand help when students need it most.

- **Study Plan**—Shows students sections to study next, gives easy access to practice problems, and provides an automatically generated quiz to prove mastery of the course material.



- **Digital Interactives**—Focused on a single core topic and organized in progressive levels, each interactive immerses students in an assignable and auto-graded activity. Digital Interactives are also engaging lecture tools for traditional, online, and hybrid courses, many incorporating real-time data, data displays, and analysis tools for rich classroom discussions.

- **Learning Catalytics**—Generates classroom discussion, guides lectures, and promotes peer-to-peer learning with real-time analytics. Students can use any device to interact in the classroom, engage with content, and even draw and share graphs.



with MyEconLab[®]

- **Real-Time Data Analysis Exercises**—Using current macro data to help students understand the impact of changes in economic variables, Real-Time Data Analysis Exercises communicate directly with the Federal Reserve Bank of St. Louis's FRED[®] site and update as new data are available.



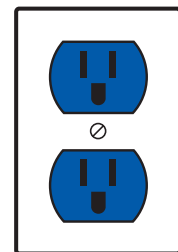
- **Current News Exercises**—Every week, current microeconomic and macroeconomic news stories, with accompanying exercises, are posted to MyEconLab. Assignable and auto-graded, these multi-part exercises ask students to recognize and apply economic concepts to real-world events.

- **Experiments**—Flexible, easy-to-assign, auto-graded, and available in Single and Multiplayer versions, Experiments in MyEconLab make learning fun and engaging.



- **Reporting Dashboard**—View, analyze, and report learning outcomes clearly and easily. Available via the Gradebook and fully mobile-ready, the Reporting Dashboard presents student performance data at the class, section, and program levels in an accessible, visual manner.

- **LMS Integration**—Link from any LMS platform to access assignments, rosters, and resources, and synchronize MyLab grades with your LMS gradebook. For students, new direct, single sign-on provides access to all the personalized learning MyLab resources that make studying more efficient and effective.

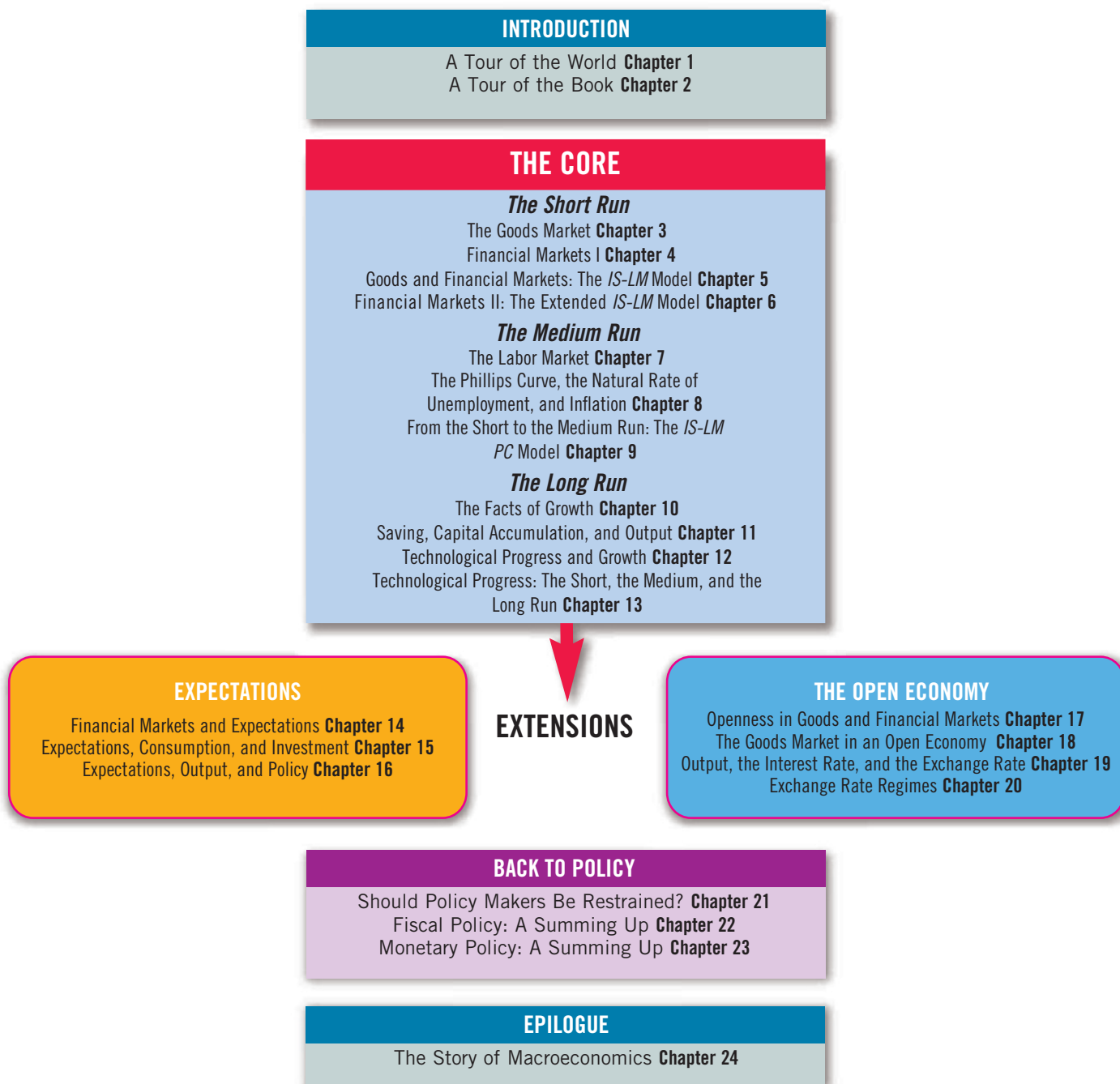


- **Mobile Ready**—Students and instructors can access multimedia resources and complete assessments right at their fingertips, on any mobile device.

Flexible Organization

Macroeconomics, seventh edition is organized around two central parts: A core and a set of two major extensions. The text's **flexible organization** emphasizes an integrated view of macroeconomics, while enabling professors to focus on the theories, models, and applications that they deem central to their particular course.

The flowchart below quickly illustrates how the chapters are organized and fit within the book's overall structure. For a more detailed explanation of the **Organization**, and for an extensive list of **Alternative Course Outlines**, see pages **xiv–xv** in the preface.



Seventh Edition

MACROECONOMICS

Olivier Blanchard

PEARSON

Boston Columbus Indianapolis New York San Francisco Amsterdam
Cape Town Dubai London Madrid Milan Munich Paris Montréal Toronto Delhi
Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo

Vice President, Business Publishing: Donna Battista

Editor-in-Chief: Adrienne D'Ambrosio

Senior Acquisitions Editor: Christina Masturzo

Editorial Assistant: Diana Tetterton

Vice President, Product Marketing: Maggie Moylan

Director of Marketing, Digital Services and Products: Jeanette Koskinas

Field Marketing Manager: Ramona Elmer

Product Marketing Assistant: Jessica Quazza

Team Lead, Program Management: Ashley Santora

Program Manager: Nancy Freihofer

Team Lead, Project Management: Jeff Holcomb

Project Manager: Heather Pagano

Operations Specialist: Carol Melville

Creative Director: Blair Brown

Art Director: Jonathan Boylan

Vice President, Director of Digital Strategy and Assessment: Paul Gentile

Manager of Learning Applications: Paul DeLuca

Digital Editor: Denise Clinton

Director, Digital Studio: Sacha Laustsen

Digital Studio Manager: Diane Lombardo

Digital Studio Project Managers: Melissa Honig, Alana Coles, Robin Lazrus

Digital Content Team Lead: Noel Lotz

Digital Content Project Lead: Courtney Kamauf

Full-Service Project Management

and Composition: Integra Software Services

Cover Designer: Integra Software Services

Cover image: Paul Hardy/Corbis

Printer/Binder: RR Donnelley/Willard

Cover Printer: Phoenix Color/Hagerstown

Copyright © 2017, 2013, 2011 by Pearson Education, Inc. or its affiliates. All Rights Reserved. Manufactured in the United States of America. This publication is protected by copyright, and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise. For information regarding permissions, request forms, and the appropriate contacts within the Pearson Education Global Rights and Permissions department, please visit www.pearsoned.com/permissions/.

Acknowledgments of third-party content appear on the appropriate page within the text.

PEARSON, ALWAYS LEARNING, and MYECONLAB® are exclusive trademarks owned by Pearson Education, Inc. or its affiliates in the U.S. and/or other countries.

Unless otherwise indicated herein, any third-party trademarks, logos, or icons that may appear in this work are the property of their respective owners, and any references to third-party trademarks, logos, icons, or other trade dress are for demonstrative or descriptive purposes only. Such references are not intended to imply any sponsorship, endorsement, authorization, or promotion of Pearson's products by the owners of such marks, or any relationship between the owner and Pearson Education, Inc., or its affiliates, authors, licensees, or distributors.

Library of Congress Cataloging-in-Publication Data

Names: Blanchard, Olivier (Olivier J.), author. | Johnson, David R.,

Title: Macroeconomics/Olivier Blanchard, International Monetary Fund,

Massachusetts Institute of Technology, David R. Johnson, Wilfrid Laurier University.

Description: Seventh edition. | Boston: Pearson, [2017]

Identifiers: LCCN 2016001144 | ISBN 9780133780581 (casebound)

Subjects: LCSH: Macroeconomics.

Classification: LCC HB172.5 .B573 2017 | DDC 339—dc23

LC record available at <http://lccn.loc.gov/2016001144>

10 9 8 7 6 5 4 3 2 1

PEARSON

ISBN 10: 0-13-378058-9

ISBN 13: 978-0-13-378058-1

To Noelle



About the Authors



A citizen of France, **Olivier Blanchard** has spent most of his professional life in Cambridge, U.S.A. After obtaining his Ph.D. in economics at the Massachusetts Institute of Technology in 1977, he taught at Harvard University, returning to MIT in 1982. He was chair of the economics department from 1998 to 2003. In 2008, he took a leave of absence to be the Economic Counsellor and Director of the Research Department of the International Monetary Fund. Since October 2015, he is the Fred Bergsten Senior Fellow at the Peterson Institute for International Economics, in Washington. He also remains Robert M. Solow Professor of Economics emeritus at MIT.

He has worked on a wide set of macroeconomic issues, from the role of monetary policy, to the nature of speculative bubbles, to the nature of the labor market and the determinants of unemployment, to transition in former communist countries, and to forces behind the recent global crisis. In the process, he has worked with numerous countries and international organizations. He is the author of many books and articles, including a graduate level textbook with Stanley Fischer.

He is a past editor of the *Quarterly Journal of Economics*, of the *NBER Macroeconomics Annual*, and founding editor of the *AEJ Macroeconomics*. He is a fellow and past council member of the *Econometric Society*, a past vice president of the *American Economic Association*, and a member of the *American Academy of Sciences*.

Brief Contents

THE CORE

Introduction 1

- Chapter 1 A Tour of the World 3
- Chapter 2 A Tour of the Book 21

The Short Run 45

- Chapter 3 The Goods Market 47
- Chapter 4 Financial Markets I 67
- Chapter 5 Goods and Financial Markets; The *IS-LM* Model 89
- Chapter 6 Financial Markets II: The Extended *IS-LM* Model 111

The Medium Run 135

- Chapter 7 The Labor Market 137
- Chapter 8 The Phillips Curve, the Natural Rate of Unemployment, and Inflation 157
- Chapter 9 From the Short to the Medium Run: The *IS-LM-PC* Model 177

The Long Run 197

- Chapter 10 The Facts of Growth 199
- Chapter 11 Saving, Capital Accumulation, and Output 217
- Chapter 12 Technological Progress and Growth 241
- Chapter 13 Technological Progress: The Short, the Medium, and the Long Run 263

EXTENSIONS

Expectations 283

- Chapter 14 Financial Markets and Expectations 285
- Chapter 15 Expectations, Consumption, and Investment 311
- Chapter 16 Expectations, Output, and Policy 331

The Open Economy 347

- Chapter 17 Openness in Goods and Financial Markets 349
- Chapter 18 The Goods Market in an Open Economy 369
- Chapter 19 Output, the Interest Rate, and the Exchange Rate 391
- Chapter 20 Exchange Rate Regimes 411

Back to Policy 433

- Chapter 21 Should Policy Makers Be Restrained? 435
- Chapter 22 Fiscal Policy: A Summing Up 453
- Chapter 23 Monetary Policy: A Summing Up 477
- Chapter 24 Epilogue: The Story of Macroeconomics 497

Contents

Preface xiii

THE CORE

Introduction 1

Chapter 1 A Tour of the World 3

- 1-1 The Crisis 4
- 1-2 The United States 6
 - Low Interest Rates and the Zero Lower Bound 7 • How Worrisome Is Low Productivity Growth? 8
- 1-3 The Euro Area 9
 - Can European Unemployment Be Reduced? 11 • What Has the Euro Done for Its Members? 12
- 1-4 China 13
- 1-5 Looking Ahead 15
- Appendix: Where to Find the Numbers 18

Chapter 2 A Tour of the Book 21

- 2-1 Aggregate Output 22
 - GDP: Production and Income 22
 - Nominal and Real GDP 24 •
 - GDP: Level versus Growth Rate 26
- 2-2 The Unemployment Rate 27
 - Why Do Economists Care about Unemployment? 29
- 2-3 The Inflation Rate 31
 - The GDP Deflator 31 • The Consumer Price Index 31 • Why Do Economists Care about Inflation? 33
- 2-4 Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve 33
 - Okun's Law 34 • The Phillips Curve 34
- 2-5 The Short Run, the Medium Run, and the Long Run 35
- 2-6 A Tour of the Book 36
 - The Core 36 • Extensions 37 • Back to Policy 38 • Epilogue 38
- Appendix: The Construction of Real GDP and Chain-Type Indexes 42

The Short Run 45

Chapter 3 The Goods Market 47

- 3-1 The Composition of GDP 48
- 3-2 The Demand for Goods 50
 - Consumption (C) 50 • Investment (I) 52 • Government Spending (G) 52
- 3-3 The Determination of Equilibrium Output 53
 - Using Algebra 54 • Using a Graph 55 • Using Words 57 • How Long Does It Take for Output to Adjust? 58
- 3-4 Investment Equals Saving: An Alternative Way of Thinking about Goods-Market Equilibrium 60
- 3-5 Is the Government Omnipotent? A Warning 62

Chapter 4 Financial Markets I 67

- 4-1 The Demand for Money 68
 - Deriving the Demand for Money 69
- 4-2 Determining the Interest Rate: I 71
 - Money Demand, Money Supply, and the Equilibrium Interest Rate 71
 - Monetary Policy and Open Market Operations 74 • Choosing Money or Choosing the Interest Rate? 76
- 4-3 Determining the Interest Rate: II 76
 - What Banks Do 76 • The Demand and Supply for Central Bank Money 78 • The Federal Funds Market and the Federal Funds Rate 79
- 4-4 The Liquidity Trap 80
 - Appendix: The Determination of the Interest Rate When People Hold Both Currency and Checkable Deposits 85

Chapter 5 Goods and Financial Markets; The IS-LM Model 89

- 5-1 The Goods Market and the IS Relation 90

Investment, Sales, and the Interest Rate 90 • Determining Output 91
• Deriving the *IS* Curve 93 • Shifts of the *IS* Curve 93

5-2 Financial Markets and the *LM* Relation 94

Real Money, Real Income, and the Interest Rate 94 • Deriving the *LM* Curve 95

5-3 Putting the *IS* and the *LM* Relations Together 96

Fiscal Policy 96 • Monetary Policy 98

5-4 Using a Policy Mix 99

5-5 How Does the *IS-LM* Model Fit the Facts? 104

Chapter 6

Financial Markets II: The Extended *IS-LM* Model 111

6-1 Nominal versus Real Interest Rates 112

Nominal and Real Interest Rates in the United States since 1978 114 • Nominal and Real Interest Rates: The Zero Lower Bound and Deflation 115

6-2 Risk and Risk Premia 116

6-3 The Role of Financial Intermediaries 117

The Choice of Leverage 118 • Leverage and Lending 119

6-4 Extending the *IS-LM* 121

Financial Shocks and Policies 122

6-5 From a Housing Problem to a Financial Crisis 123

Housing Prices and Subprime Mortgages 123 • The Role of Financial Intermediaries 125
• Macroeconomic Implications 127 • Policy Responses 127

The Medium Run 135

Chapter 7 The Labor Market 137

7-1 A Tour of the Labor Market 138

The Large Flows of Workers 138

7-2 Movements in Unemployment 141

7-3 Wage Determination 143

Bargaining 144 • Efficiency Wages 144
• Wages, Prices, and Unemployment 146
• The Expected Price Level 146 • The Unemployment Rate 146 • The Other Factors 147

7-4 Price Determination 147

7-5 The Natural Rate of Unemployment 148

The Wage-Setting Relation 148 • The Price-Setting Relation 149 • Equilibrium Real Wages and Unemployment 150

7-6 Where We Go from Here 151

Appendix: Wage- and Price-Setting Relations versus Labor Supply and Labor Demand 155

Chapter 8

The Phillips Curve, the Natural Rate of Unemployment, and Inflation 157

8-1 Inflation, Expected Inflation, and Unemployment 158

8-2 The Phillips Curve and Its Mutations 160

The Early Incarnation 160 • The Apparent Trade-Off and Its Disappearance 160

8-3 The Phillips Curve and the Natural Rate of Unemployment 163

8-4 A Summary and Many Warnings 165

Variations in the Natural Rate across Countries 166 • Variations in the Natural Rate over Time 166 • High Inflation and the Phillips Curve Relation 168 • Deflation and the Phillips Curve Relation 170

Appendix: Derivation of the Relation to a Relation between Inflation, Expected Inflation, and Unemployment 175

Chapter 9

From the Short to the Medium Run: The *IS-LM-PC* Model 177

9-1 The *IS-LM-PC* model 178

9-2 Dynamics and the Medium Run Equilibrium 181

The Role of Expectations Revisited 183 • The Zero Lower Bound and Debt Spirals 183

9-3 Fiscal Consolidation Revisited 186

9-4 The Effects of an Increase in the Price of Oil 187

Effects on the Natural Rate of Unemployment 189

9-5 Conclusions 192

The Short Run versus the Medium Run 192 • Shocks and Propagation Mechanisms 192

The Long Run 197

Chapter 10 The Facts of Growth 199

- 10-1 Measuring the Standard of Living 200
- 10-2 Growth in Rich Countries since 1950 203
 - The Large Increase in the Standard of Living since 1950 205
 - The Convergence of Output per Person 206
- 10-3 A Broader Look across Time and Space 207
 - Looking across Two Millennia 207
 - Looking across Countries 207
- 10-4 Thinking about Growth: A Primer 209
 - The Aggregate Production Function 210
 - Returns to Scale and Returns to Factors 210
 - Output per Worker and Capital per Worker 211
 - The Sources of Growth 211

Chapter 11 Saving, Capital Accumulation, and Output 217

- 11-1 Interactions between Output and Capital 218
 - The Effects of Capital on Output 218
 - The Effects of Output on Capital Accumulation 219
 - Output and Investment 219
 - Investment and Capital Accumulation 220
 - 11-2 The Implications of Alternative Saving Rates 221
 - Dynamics of Capital and Output 221
 - The Saving Rate and Output 223
 - The Saving Rate and Consumption 227
 - 11-3 Getting a Sense of Magnitudes 228
 - The Effects of the Saving Rate on Steady-State Output 230
 - The Dynamic Effects of an Increase in the Saving Rate 231
 - The U.S. Saving Rate and the Golden Rule 233
 - 11-4 Physical versus Human Capital 234
 - Extending the Production Function 234
 - Human Capital, Physical Capital, and Output 235
 - Endogenous Growth 236
- Appendix: The Cobb-Douglas Production Function and the Steady State 239

Chapter 12 Technological Progress and Growth 241

- 12-1 Technological Progress and the Rate of Growth 242
 - Technological Progress and the Production Function 242

- Interactions between Output and Capital 244
- Dynamics of Capital and Output 246
- The Effects of the Saving Rate 247

12-2 The Determinants of Technological Progress 248

- The Fertility of the Research Process 249
- The Appropriability of Research Results 250
- Management, Innovation, and Imitation 252

12-3 Institutions, Technological Progress, and Growth 252

12-4 The Facts of Growth Revisited 256

- Capital Accumulation versus Technological Progress in Rich Countries since 1985 256
- Capital Accumulation versus Technological Progress in China 257

Appendix: Constructing a Measure of Technological Progress 261

Chapter 13 Technological Progress: The Short, the Medium, and the Long Run 263

- 13-1 Productivity, Output, and Unemployment in the Short Run 264
 - The Empirical Evidence 266

13-2 Productivity and the Natural Rate of Unemployment 267

- Price Setting and Wage Setting Revisited 267
- The Natural Rate of Unemployment 268
- The Empirical Evidence 269

13-3 Technological Progress, Churning, and Inequality 271

- The Increase in Wage Inequality 272
- The Causes of Increased Wage Inequality 274
- Inequality and the Top 1% 277

EXTENSIONS

Expectations 283

Chapter 14 Financial Markets and Expectations 285

- 14-1 Expected Present Discounted Values 286

- Computing Expected Present Discounted Values 286
- A General Formula 287

- Using Present Values: Examples 288
- Constant Interest Rates 288
- Constant Interest Rates and Payments 288
- Constant Interest Rates and Payments Forever 289
- Zero Interest Rates 289
- Nominal versus Real Interest Rates and Present Values 289

14-2 Bond Prices and Bond Yields 290

- Bond Prices as Present Values 292
- Arbitrage and Bond Prices 293
- From Bond Prices to Bond Yields 294
- Reintroducing Risk 295
- Interpreting the Yield Curve 296

14-3 The Stock Market and Movements in Stock Prices 298

- Stock Prices as Present Values 298
- The Stock Market and Economic Activity 301
- A Monetary Expansion and the Stock Market 301
- An Increase in Consumer Spending and the Stock Market 302

14-4 Risk, Bubbles, Fads, and Asset Prices 304

- Stock Prices and Risk 304
- Asset Prices, Fundamentals, and Bubbles 304

Appendix: Deriving the Expected Present Discounted Value Using Real or Nominal Interest Rates 310

Chapter 15 Expectations, Consumption, and Investment 311

15-1 Consumption 312

- The Very Foresighted Consumer 312
- An Example 313
- Toward a More Realistic Description 314
- Putting Things Together: Current Income, Expectations, and Consumption 317

15-2 Investment 318

- Investment and Expectations of Profit 318
- Depreciation 319
- The Present Value of Expected Profits 319
- The Investment Decision 320
- A Convenient Special Case 320
- Current versus Expected Profit 322
- Profit and Sales 324

15-3 The Volatility of Consumption and Investment 326

Appendix: Derivation of the Expected Present Value of Profits under Static Expectations 330

Chapter 16 Expectations, Output, and Policy 331

16-1 Expectations and Decisions: Taking Stock 332

- Expectations, Consumption, and Investment Decisions 332
- Expectations and the *IS* Relation 332

16-2 Monetary Policy, Expectations, and Output 335

- Monetary Policy Revisited 335

16-3 Deficit Reduction, Expectations, and Output 338

- The Role of Expectations about the Future 339
- Back to the Current Period 339

The Open Economy 347

Chapter 17 Openness in Goods and Financial Markets 349

17-1 Openness in Goods Markets 350

- Exports and Imports 350
- The Choice between Domestic Goods and Foreign Goods 352
- Nominal Exchange Rates 352
- From Nominal to Real Exchange Rates 354
- From Bilateral to Multilateral Exchange Rates 357

17-2 Openness in Financial Markets 358

- The Balance of Payments 359
- The Choice between Domestic and Foreign Assets 361
- Interest Rates and Exchange Rates 363

17-3 Conclusions and a Look Ahead 365

Chapter 18 The Goods Market in an Open Economy 369

18-1 The *IS* Relation in the Open Economy 370

- The Demand for Domestic Goods 370
- The Determinants of *C*, *I*, and *G* 370
- The Determinants of Imports 371
- The Determinants of Exports 371
- Putting the Components Together 371

18-2 Equilibrium Output and the Trade Balance 373

18-3 Increases in Demand—Domestic or Foreign 374

- Increases in Domestic Demand 374
- Increases in Foreign Demand 376
- Fiscal Policy Revisited 377

- 18-4 Depreciation, the Trade Balance, and Output 379
 Depreciation and the Trade Balance:
 The Marshall-Lerner Condition 380
- The Effects of a Real Depreciation 380
 - Combining Exchange Rate and Fiscal Policies 381
- 18-5 Looking at Dynamics: The J-Curve 384
- 18-6 Saving, Investment, and the Current Account Balance 386
- Appendix: Derivation of the Marshall-Lerner Condition 390

Chapter 19

Output, the Interest Rate, and the Exchange Rate 391

- 19-1 Equilibrium in the Goods Market 392
- 19-2 Equilibrium in Financial Markets 393
 Domestic Bonds versus Foreign Bonds 393
- 19-3 Putting Goods and Financial Markets Together 397
- 19-4 The Effects of Policy in an Open Economy 399
 The Effects of Monetary Policy in an Open Economy 399 • The Effects of Fiscal Policy in an Open Economy 399
- 19-5 Fixed Exchange Rates 403
 Pegs, Crawling Pegs, Bands, the EMS, and the Euro 403 • Monetary Policy when the Exchange Rate Is Fixed 404 • Fiscal Policy when the Exchange Rate Is Fixed 404
- Appendix: Fixed Exchange Rates, Interest Rates, and Capital Mobility 409

Chapter 20

Exchange Rate Regimes 411

- 20-1 The Medium Run 412
 The *IS* Relation under Fixed Exchange Rates 413 • Equilibrium in the Short and the Medium Run 413 • The Case for and against a Devaluation 414
- 20-2 Exchange Rate Crises under Fixed Exchange Rates 416
- 20-3 Exchange Rate Movements under Flexible Exchange Rates 419
 Exchange Rates and the Current Account 420 • Exchange Rates and Current and Future Interest Rates 421 • Exchange Rate Volatility 421

- 20-4 Choosing between Exchange Rate Regimes 422
 Common Currency Areas 423
- Hard Pegs, Currency Boards, and Dollarization 425

Appendix 1: Deriving the *IS* relation under Fixed Exchange Rates 431

Appendix 2: The Real Exchange Rate and Domestic and Foreign Real Interest Rates 431

Back to Policy 433

Chapter 21

Should Policy Makers Be Restrained? 435

- 21-1 Uncertainty and Policy 436
 How Much Do Macroeconomists Actually Know? 436 • Should Uncertainty Lead Policy Makers to Do Less? 438 • Uncertainty and Restraints on Policy Makers 438
- 21-2 Expectations and Policy 439
 Hostage Takings and Negotiations 440
 • Inflation and Unemployment Revisited 440 • Establishing Credibility 441 • Time Consistency and Restraints on Policy Makers 443
- 21-3 Politics and Policy 443
 Games between Policy Makers and Voters 443 • Games between Policy Makers 445 • Politics and Fiscal Restraints 448

Chapter 22

Fiscal Policy: A Summing Up 453

- 22-1 What We Have Learned 454
- 22-2 The Government Budget Constraint: Deficits, Debt, Spending, and Taxes 455
 The Arithmetic of Deficits and Debt 455 • Current versus Future Taxes 457 • The Evolution of the Debt-to-GDP Ratio 459
- 22-3 Ricardian Equivalence, Cyclical Adjusted Deficits, and War Finance 462
 Ricardian Equivalence 462 • Deficits, Output Stabilization, and the Cyclically Adjusted Deficit 463 • Wars and Deficits 464
- 22-4 The Dangers of High Debt 466
 High Debt, Default Risk, and Vicious Cycles 466 • Debt Default 468
 • Money Finance 468

Chapter 23 **Monetary Policy: A Summing Up 477**

- 23-1 What We Have Learned 478
- 23-2 From Money Targeting to Inflation Targeting 479
 - Money Targeting 479 • Inflation Targeting 481 • The Interest Rate Rule 482
- 23-3 The Optimal Inflation Rate 483
 - The Costs of Inflation 483 • The Benefits of Inflation 486 • The Optimal Inflation Rate: The State of the Debate 487
- 23-4 Unconventional Monetary Policy 488
- 23-5 Monetary Policy and Financial Stability 490
 - Liquidity Provision and Lender of Last Resort 490 • Macroprudential Tools 490

Chapter 24 **Epilogue: The Story of Macroeconomics 497**

- 24-1 Keynes and the Great Depression 498
- 24-2 The Neoclassical Synthesis 498
 - Progress on All Fronts 499 • Keynesians versus Monetarists 500

- 24-3 The Rational Expectations Critique 501
 - The Three Implications of Rational Expectations 502 • The Integration of Rational Expectations 503
- 24-4 Developments in Macroeconomics up to the 2009 Crisis 504
 - New Classical Economics and Real Business Cycle Theory 505 • New Keynesian Economics 505 • New Growth Theory 506 • Toward an Integration 507
- 24-5 First Lessons for Macroeconomics after the Crisis 508

Appendix 1 **An Introduction to National Income and Product Accounts A-1**

Appendix 2 **A Math Refresher A-7**

Appendix 3 **An Introduction to Econometrics A-12**

Glossary G-1

Index I-1

Credits C-1

Focus Boxes

- Real GDP, Technological Progress, and the Price of Computers 27
- Unemployment and Happiness 30
- The Lehman Bankruptcy, Fears of Another Great Depression, and Shifts in the Consumption Function 59
- The Paradox of Saving 63
- Semantic Traps: Money, Income, and Wealth 69
- Who Holds U.S. Currency? 71
- The Liquidity Trap in Action 81
- Focus: The U.S. Recession of 2001 100
- Deficit Reduction: Good or Bad for Investment? 103
- Bank Runs 120
- The Current Population Survey 140
- Henry Ford and Efficiency Wages 145
- Theory ahead of Facts: Milton Friedman and Edmund Phelps 164
- What Explains European Unemployment? 167
- Changes in the U.S. Natural Rate of Unemployment since 1990 169
- Okun's Law across Time and Countries 180
- Deflation in the Great Depression 185
- Oil Price Increases: Why Were the 2000s So Different from the 1970s? 191
- The Construction of PPP Numbers 202
- Does Money Lead to Happiness? 204
- Capital Accumulation and Growth in France in the Aftermath of World War II 224
- Social Security, Saving, and Capital Accumulation in the United States 229
- The Diffusion of New Technology: Hybrid Corn 250
- Management Practices: Another Dimension of Technological Progress 252
- The Importance of Institutions: North Korea and South Korea 254
- What Is behind Chinese Growth? 255
- Job Destruction, Churning, and Earnings Losses 273
- The Long View: Technology, Education, and Inequality 275
- The Vocabulary of Bond Markets 292
- The Yield Curve, the Zero Lower Bound, and Liftoff 297
- Making (Some) Sense of (Apparent) Nonsense: Why the Stock Market Moved Yesterday and Other Stories 303
- Famous Bubbles: From Tulipmania in 17th-Century Holland to Russia in 1994 305
- The Increase in U.S. Housing Prices: Fundamentals or Bubble? 306
- Up Close and Personal: Learning from Panel Data Sets 313
- Do People Save Enough for Retirement? 316
- Investment and the Stock Market 321
- Profitability versus Cash Flow 324
- Rational Expectations 337
- Can a Budget Deficit Reduction Lead to an Output Expansion? Ireland in the 1980s 341
- Can Exports Exceed GDP? 352
- GDP versus GNP: The Example of Kuwait 362
- Buying Brazilian Bonds 364
- The G20 and the 2009 Fiscal Stimulus 378
- The Disappearance of Current Account Deficits in Euro Periphery Countries: Good News or Bad News? 382
- Sudden Stops, Safe Havens, and the Limits to the Interest Parity Condition 394
- Monetary Contraction and Fiscal Expansion: The United States in the Early 1980s 402
- German Reunification, Interest Rates, and the EMS 405
- The Return of Britain to the Gold Standard: Keynes versus Churchill 415
- The 1992 EMS Crisis 418
- The Euro: A Short History 425
- Lessons from Argentina's Currency Board 426
- Was Alan Blinder Wrong in Speaking the Truth? 443
- Euro Area Fiscal Rules: A Short History 446
- Inflation Accounting and the Measurement of Deficits 456
- How Countries Decreased Their Debt Ratios after World War II 461
- Deficits, Consumption, and Investment in the United States during World War II 465
- Money Financing and Hyperinflations 470
- Should You Worry about U.S. Public Debt? 471
- Money Illusion 485
- LTV Ratios and Housing Price Increases from 2000 to 2007 492
- A Guide to Understanding Econometric Results A-14

Preface

I had two main goals in writing this book:

- To make close contact with current macroeconomic events. What makes macroeconomics exciting is the light it sheds on what is happening around the world, from the major economic crisis which has engulfed the world since 2008, to monetary policy in the United States, to the problems of the Euro area, to growth in China. These events—and many more—are described in the book, not in footnotes, but in the text or in detailed boxes. Each box shows how you can use what you have learned to get an understanding of these events. My belief is that these boxes not only convey the “life” of macroeconomics, but also reinforce the lessons from the models, making them more concrete and easier to grasp.
- To provide an integrated view of macroeconomics. The book is built on one underlying model, a model that draws the implications of equilibrium conditions in three sets of markets: the goods market, the financial markets, and the labor market. Depending on the issue at hand, the parts of the model relevant to the issue are developed in more detail while the other parts are simplified or lurk in the background. But the underlying model is always the same. This way, you will see macroeconomics as a coherent whole, not a collection of models. And you will be able to make sense not only of past macroeconomic events, but also of those that unfold in the future.

New to this Edition

The crisis that started in 2008, and is still lingering, forced macroeconomists to rethink much of macroeconomics. They clearly had understated the role of the financial system. They also had too optimistic a view of how the economy returned to equilibrium. Eight years later, I believe the main lessons have been absorbed, and this edition reflects the deep rethinking that has taken place. Nearly all chapters have been rewritten, and the main changes are as follows:

- A modified Chapter 5, and a modified presentation of the IS-LM. The traditional treatment of monetary policy assumed that the central bank chose the money supply and then let the interest rate adjust. In fact, modern central banks choose the interest rate and then let the money supply adjust. In terms of the IS-LM model used to describe the short run, the LM curve, instead of being upward sloping, should be treated as flat. This makes for a more realistic and a simpler model.
- A new Chapter 6. The chapter focuses on the role of the financial system in the economy. It extends the IS-LM model to allow for two interest rates, the interest rate set by monetary policy and the cost of borrowing for people or firms, with the state of the financial system determining the relation between the two.
- A new Chapter 9. The traditional aggregate supply-aggregate demand model was cumbersome and gave too optimistic a view of the return of output to potential. The model has been replaced by an IS-LM-PC model (where PC stands for Phillips curve), which gives a simpler and more accurate description of the role of monetary policy, and of output and inflation dynamics.
- The constraints on monetary policy, coming from the zero lower bound, and the constraints on fiscal policy, coming from the high levels of public debt, are recurring themes throughout the book.
- Many Focus boxes are new or extended. Among them: “Unemployment and Happiness” in Chapter 2; “The Liquidity Trap in Action” in Chapter 4; Bank Runs in Chapter 6; “Changes in the U.S. Natural Rate of Unemployment since 1990” in Chapter 8; “Okun’s Law” and “Deflation in the Great Depression” in Chapter 9; “The Construction of PPP Numbers” in Chapter 10; “The Long View: Technology, Education, and Inequality” in Chapter 13; “The Yield Curve, the Zero Lower Bound, and Lift-off” in Chapter 14; “The Disappearance of Current Account Deficits in Euro Periphery Countries: Good News or Bad News?” in Chapter 18; “Euro Area Fiscal Rules: A Short History” in Chapter 21; and “Money Financing and Hyperinflations” and “Should You Worry about U.S. Public Debt?” in Chapter 22.
- Figures and tables have been updated using the latest data available.

In short, I see this edition as the first true post-crisis macroeconomics textbook. I hope it gives a clear guide not only to what has happened, and also to what may happen in the future.

Organization

The book is organized around two central parts: A core, and a set of two major extensions. An introduction precedes the core. The two extensions are followed by a review of the role of policy. The book ends with an epilogue. A flowchart on the front endpaper makes it easy to see how the chapters are organized, and fit within the book's overall structure.

- Chapters 1 and 2 introduce the basic facts and issues of macroeconomics. Chapter 1 focuses first on the crisis, and then takes a tour of the world, from the United States, to Europe, to China. Some instructors will prefer to cover Chapter 1 later, perhaps after Chapter 2, which introduces basic concepts, articulates the notions of short run, medium run, and long run, and gives the reader a quick tour of the book.

While Chapter 2 gives the basics of national income accounting, I have put a detailed treatment of national income accounts to Appendix 1 at the end of the book. This decreases the burden on the beginning reader, and allows for a more thorough treatment in the appendix.

- Chapters 3 through 13 constitute the **core**.

Chapters 3 through 6 focus on the **short run**. These four chapters characterize equilibrium in the goods market and in the financial markets, and they derive the basic model used to study short-run movements in output, the *IS-LM* model. Chapter 6 is new, and extends the basic *IS-LM* model to take into account the role of the financial system. It then uses it to describe what happened during the initial phase of the crisis.

Chapters 7 through 9 focus on the **medium run**. Chapter 7 focuses on equilibrium in the labor market and introduces the notion of the natural rate of unemployment. Chapter 8 derives and discusses the relation between unemployment and inflation, known as the Phillips curve. Chapter 9 develops the *IS-LM-PC* (*PC* for Phillips curve) model which takes into account equilibrium in the goods market, in the financial markets, and in the labor market. It shows how this model can be used to understand movements in activity and movements in inflation, both in the short and in the medium run.

Chapters 10 through 13 focus on the long run. Chapter 10 describes the facts, showing the evolution of output across countries and over long periods of time. Chapters 11

and 12 develop a model of growth and describe how capital accumulation and technological progress determine growth. Chapter 13 focuses on the effects of technological progress on unemployment and on inequality, not only in the long run, but also in the short run and in the medium run.

- Chapters 14 through 20 cover the two major **extensions**.

Chapters 14 through 16 focus on the role of **expectations** in the short run and in the medium run. Expectations play a major role in most economic decisions, and, by implication, play a major role in the determination of output.

Chapters 17 through 20 focus on the implications of **openness** of modern economies. Chapter 20 focuses on the implications of different exchange rate regimes, from flexible exchange rates, to fixed exchange rates, currency boards, and dollarization.

- Chapters 21 through 23 return to **macroeconomic policy**. Although most of the first 20 chapters constantly discuss macroeconomic policy in one form or another, the purpose of Chapters 21 through 23 is to tie the threads together. Chapter 21 looks at the role and the limits of macroeconomic policy in general. Chapters 22 and 23 review fiscal and monetary policy. Some instructors may want to use parts of these chapters earlier. For example, it is easy to move forward the discussion of the government budget constraint in Chapter 22 or the discussion of inflation targeting in Chapter 23.

- Chapter 24 serves as an **epilogue**; it puts macroeconomics in historical perspective by showing the evolution of macroeconomics in the last 70 years, discussing current directions of research, and the lessons of the crisis for macroeconomics.

Alternative Course Outlines

Within the book's broad organization, there is plenty of opportunity for alternative course organizations. I have made the chapters shorter than is standard in textbooks, and, in my experience, most chapters can be covered in an hour and a half. A few (Chapters 5 and 9 for example) might require two lectures to sink in.

- Short courses. (15 lectures or less)

A short course can be organized around the two introductory chapters and the core (Chapter 13 can be excluded at no cost in continuity). Informal presentations of one or two of the extensions, based, for example, on Chapter 16 for expectations (which can be taught as a stand alone), and on Chapter 17 for the open economy, can then follow, for a total of 14 lectures.

A short course might leave out the study of growth (the long run). In this case, the course can be organized around the introductory chapters and Chapters 3 through 9 in the core; this gives a total of 9 lectures, leaving enough time to cover, for example, Chapter 16 on expectations, Chapters 17 through 19 on the open economy, for a total of 13 lectures.

■ Longer courses (20 to 25 lectures)

A full semester course gives more than enough time to cover the core, plus one or both of the two extensions, and the review of policy.

The extensions assume knowledge of the core, but are otherwise mostly self-contained. Given the choice, the order in which they are best taught is probably the order in which they are presented in the book. Having studied the role of expectations first helps students to understand the interest parity condition, and the nature of exchange rate crises.

Features

I have made sure never to present a theoretical result without relating it to the real world. In addition to discussions of facts in the text itself, I have written a large number of Focus boxes, which discuss particular macroeconomic events or facts, from the United States or from around the world.

I have tried to re-create some of the student–teacher interactions that take place in the classroom by the use of margin notes, which run parallel to the text. The margin notes create a dialogue with the reader and, in so doing, smooth the more difficult passages and give a deeper understanding of the concepts and the results derived along the way.

For students who want to explore macroeconomics further, I have introduced the following two features:

- Short appendixes to some chapters, which expand on points made within the chapter.
- A Further Readings section at the end of most chapters, indicating where to find more information, including a number of key Internet addresses.

Each chapter ends with three ways of making sure that the material in the chapter has been digested:

- A summary of the chapter’s main points.
- A list of key terms.
- A series of end-of-chapter exercises. “Quick Check” exercises are easy. “Dig Deeper” exercises are a bit harder, and “Explore Further” typically require either access to the Internet or the use of a spreadsheet program.
- A list of symbols on the back endpapers makes it easy to recall the meaning of the symbols used in the text.

MyEconLab

MyEconLab is a powerful assessment and tutorial system that works hand-in-hand with Macroeconomics. It includes comprehensive homework, quiz, test, and tutorial options, allowing students to test their knowledge and instructors to manage all assessment needs in one program. Students and instructors can register, create, and access all of their MyLab courses, regardless of discipline, from one convenient online location: <http://www.pearsonmylab.com>.

Key innovations in the MyEconLab course for Macroeconomics, seventh edition, include the following resources for students and instructors:

- **MyEconLab Animation**—The key figures in the seventh edition have been converted to digital figure animations where the figures from the textbook are presented in step-by-step animations with audio explanations of the action. The goal of this digital resource is to help students understand shifts in curves, movements along curves, and changes in equilibrium values. Having animated versions of a graph helps students who have difficulty interpreting the static version found in the printed text.
- **MyEconLab Video**—There are approximately 100 videos featured in the new enhanced eText for the seventh edition. They provide real world explanations of key concepts with videos from the International Monetary Fund’s “World Economic Outlook” press conferences and interviews with author Olivier Blanchard. The videos include in depth market analysis and are accompanied by graded practice exercises to ensure mastery. These new videos are embedded in the eText and are accessible through MyEconLab
- **Enhanced eText**—The Pearson eText gives students access to their textbook anytime, anywhere. In addition to notetaking, highlighting, and bookmarking, the Pearson eText offers interactive and sharing features. Students actively read and learn, through embedded and auto-graded practice, real-time data-graphs, animations, author videos, and more. Instructors can share comments or highlights, and students can add their own, for a tight community of learners in any class.
- **NEW: Math Review Exercises in MyEconLab.** MyEconLab now offers a rich array of assignable and auto-graded exercises covering fundamental math concepts geared for macroeconomics students. Aimed at increasing student confidence and success, the new math skills review in Chapter R is accessible from the assignment manager and contains over 150 graphing, algebra, and calculus exercises for homework, quiz, and test use.

- **Practice.** Algorithmically generated homework and study plan exercises with instant feedback ensure varied and productive practice that helps students improve their understanding and prepare for quizzes and tests. Exercises that require drawing figures encourage students to practice the language of economics.
- **Learning Resources.** Personalized learning aids such as Help Me Solve This Problem walkthroughs, Teach Me explanations of the underlying concept, and figure animations provide on-demand help when students need it most.
- **Study Plan.** Customized study plans show students which sections to study next, give easy access to practice problems, and provide an automatically generated quiz to prove mastery of the course material.
- **Current News Exercises.** These exercises provide a turnkey approach to assign gradable news-based exercises in MyEconLab. Every week, Pearson scours the news, finds a current article appropriate for a macroeconomics course, creates an exercise based on this news article, and then automatically adds it to MyEconLab.
- **MyEconLab Real-time data**—Real-time data figures and exercises allow students and instructors to use the very latest data from the Federal Reserve Bank of St. Louis's FRED site. These figures and exercises communicate directly with the FRED® site and update as new data are available.
- **Digital Interactives.** Focused on a single core topic and organized in progressive levels, each interactive immerses students in an assignable and auto-graded activity. Digital Interactives are lecture tools for traditional, online, and hybrid courses, many incorporating real-time data, data displays, and analysis tools for rich classroom discussions.
- **Experiments in MyEconLab.** Flexible, easy to assign, auto-graded, and available in Single and Multiplayer versions, the Experiments in MyEconLab make learning fun and engaging.
- **Learning Catalytics.** Learning Catalytics™ is a “bring your own device” student engagement, assessment, and classroom intelligence system that lets learners use their smartphone, tablet, or laptop to participate in and stay engaged in lecture. It allows instructors to generate classroom discussion, guides lectures, and promotes peer-to-peer learning with real-time analytics. Now students can use any device to interact in the classroom, engage with content and even draw and share graphs.

Instructors can divide classes into pairs or groups based on learners' response patterns, and learners with greater proficiency help motivate other learners while allowing instructors time to provide individualized and focused attention to learners who will benefit from it.

- **Reporting Dashboard.** Faculty can view, analyze, and report learning outcomes clearly and easily using the Reporting Dashboard. It is available via the Gradebook and fully mobile-ready. The Reporting Dashboard presents student performance data at the class, section, and program levels in an accessible, visual manner.
- **LMS Integration.** Faculty can link from any LMS platform to access assignments, rosters, and resources, and synchronize MyLab grades with your LMS gradebook. For students, a new direct, single sign-on provides easier access to all the personalized learning MyLab resources.
- **Mobile Ready.** Students and instructors can access multimedia resources and complete assessments from any mobile device.

For more information, visit <http://www.myeconlab.com>.

Supplements

The book comes with a number of supplements that support teaching and learning.

- **Instructor's Manual.** The Online Instructor's Manual, prepared by LaTanya Brown-Robertson, discusses pedagogical choices, alternative ways of presenting the material, and ways of reinforcing students' understanding. Chapters in the manual include six main sections: objectives, in the form of a motivating question; why the answer matters; key tools, concepts, and assumptions; summary; and pedagogy. Many chapters also include sections focusing on extensions and observations. The Instructor's Manual also includes the answers to all end-of-chapter questions and exercises. The Instructor's Manual is available for download as Word files or as PDFs from the Instructor Resource Center at www.pearsonhighered.com/irc.
- **Test Bank.** The online test bank, updated by Liping Zheng is completely revised with additional new multiple-choice questions for each chapter. The Test Item File can be downloaded from the Instructor Resource Center at www.pearsonhighered.com/irc.
- **Computerized Test Bank**—The Computerized Test Item File is designed for use with the computerized Test-Gen package, which allows instructors to customize, save, and generate classroom tests. The test program permits instructors to edit, add, or delete questions from the test bank; edit existing graphics and create new

graphics; analyze test results; and organize a database of tests and student results. This software allows for extensive flexibility and ease of use. It provides many options for organizing and displaying tests, along with search and sort features. The software and the Test Item File can be downloaded from the Instructor's Resource Center at www.pearsonhighered.com/irc, and all questions can be assigned via MyEconLab.

- **PowerPoint Lecture Slides**—These electronic slides, prepared by Jim Lee provide section lecture notes including tables, equations, and graphs for each chapter and can be downloaded from the Instructor's Resource Center at www.pearsonhighered.com/irc.

Acknowledgments and Thanks

This book owes much to many. I thank Adam Ashcraft, Peter Berger, Peter Benczur, Efe Cakarel, Francesco Furno, Harry Gakidis, Ava Hong, David Hwang, Kevin Nazemi, David Reichsfeld, Jianlong Tan, Stacy Tevlin, Gaurav Tewari, Corissa Thompson, John Simon, and Jeromin Zettelmeyer for their research assistance over the years. I thank the generations of students in 14.02 at MIT who have freely shared their reactions to the book over the years.

I have benefited from comments from many colleagues and friends. Among them are John Abell, Daron Acemoglu, Tobias Adrian, Chuangxin An, Roland Benabou, Samuel Bentolila, and Juan Jimeno (who have adapted the book for a Spanish edition); Francois Blanchard, Roger Brinner, Ricardo Caballero, Wendy Carlin, Martina Copelman, Henry Chappell, Ludwig Chincarini, and Daniel Cohen (who has adapted the book for a French edition); Larry Christiano, Bud Collier, Andres Conesa, Peter Diamond, Martin Eichenbaum, Gary Fethke, David Findlay, Francesco Giavazzi, and Alessia Amighini (who adapted the book first for an Italian edition, and then for a European edition); Andrew Healy, Steinar Holden, and Gerhard Illing (who has adapted the book for a German edition); Yannis Ioannides, Angelo Melino (who has adapted the book for a Canadian edition); P. N. Junankar, Sam Keeley, Bernd Kueimmel, Paul Krugman, Antoine Magnier, Peter Montiel, Bill Nordhaus, Tom Michl, Dick Oppermann, Athanasios Orphanides, and Daniel Pirez Enri (who has adapted the book for a Latin American edition); Michael Plouffe, Zoran Popovic, Jim Poterba, and Jeff Sheen (who has adapted the book for an Australasian edition); Ronald Schettkat, and Watanabe Shinichi (who has adapted the book for a Japanese edition); Francesco Sisci, Brian Simboli, Changyong Rhee, Julio Rotemberg, Robert Solow, Andre Watteyne (who kindly agreed to be the first reader of this edition), and Michael Woodford. Particular thanks go to David Johnson, who

coauthored the sixth edition while I was the chief economist at the IMF and did not have enough time to do it alone, and wrote the end of chapter exercises for this edition, and to Francesco Giavazzi, with whom I worked closely in preparing this edition.

I have benefited from comments from many readers, reviewers, and class testers. Among them:

- John Abell, Randolph, Macon Woman's College
- Carol Adams, Cabrillo College
- Gilad Aharonovitz, School of Economic Sciences
- Terence Alexander, Iowa State University
- Roger Aliaga-Diaz, Drexel University
- Robert Archibald, College of William & Mary
- John Baffoe-Bonnie, La Salle University
- Fatolla Bagheri, University of North Dakota
- Stephen Baker, Capital University
- Erol Balkan, Hamilton College
- Jennifer Ball, Washburn University
- Richard Ballman, Augustana College
- King Banaian, St. Cloud State University
- Charles Bean, London School of Economics and Political Science
- Scott Benson, Idaho State University
- Gerald Bialka, University of North Florida
- Robert Blecker, American University
- Scott Bloom, North Dakota State University
- Pim Borren, University of Canterbury, New Zealand
- LaTanya Brown-Robertson, Bowie State University
- James Butkiewicz, University of Delaware
- Colleen Callahan, American University
- Bruce Carpenter, Mansfield University
- Kyongwook Choi, Ohio University College
- Michael Cook, William Jewell College
- Nicole Crain, Lafayette College
- Rosemary Cunningham, Agnes Scott College
- Evren Damar, Pacific Lutheran University
- Dale DeBoer, University of Colorado at Colorado Springs

- Adrian de Leon-Arias, Universidad de Guadalajara
- Brad DeLong, UC Berkeley
- Firat Demir, University of Oklahoma
- Wouter Denhaan, UC San Diego
- John Dodge, King College
- F. Trenerly Dolbear, Brandeis University
- Patrick Dolenc, Keene State College
- Brian Donhauser, University of Washington
- Michael Donihue, Colby College
- Vincent Dropsy, California State University
- Justin Dubas, St. Norbert College
- Amitava Dutt, University of Notre Dame
- John Edgren, Eastern Michigan University
- Eric Elder, Northwestern College
- Sharon J. Erenburg, Eastern Michigan University
- Antonina Espiritu, Hawaii Pacific University
- J. Peter Federer, Clark University
- Rendigs Fels, Vanderbilt University
- John Flanders, Central Methodist University
- Marc Fox, Brooklyn College
- Yee-Tien (Ted) Fu, Stanford University
- Yee-Tien Fu, National Cheng-Chi University, Taiwan
- Scott Fullwiler, Wartburg College
- Julie Gallaway, University of Missouri–Rolla
- Bodhi Ganguli, Rutgers, The State University of NJ
- Fabio Ghironi, Boston College
- Alberto Gomez-Rivas, University of Houston–Downtown
- Fidel Gonzalez, Sam Houston State University
- Harvey Gram, Queen College, City University of New York
- Randy Grant, Linfield College
- Alan Gummerson, Florida International University
- Reza Hamzaee, Missouri Western State College
- Michael Hannan, Edinboro University
- Kenneth Harrison, Richard Stockton College
- Mark Hayford, Loyola University
- Thomas Havrilesky, Duke University
- George Heitmann, Muhlenberg College
- Ana Maria Herrera, Michigan State University
- Peter Hess, Davidson College
- Eric Hilt, Wellesley College
- John Holland, Monmouth College
- Mark Hopkins, Gettysburg College
- Takeo Hoshi, University of California, San Diego
- Ralph Husby, University of Illinois, Urbana–Champaign
- Yannis Ioannides, Tufts University
- Aaron Jackson, Bentley College
- Bonnie Johnson, California Lutheran University
- Louis Johnston, College of St. Benedict
- Barry Jones, SUNY Binghamton
- Fred Joutz, George Washington University
- Cem Karayalcin, Florida International University
- Okan Kavuncu, University of California
- Miles Kimball, University of Michigan
- Paul King, Denison University
- Michael Klein, Tufts University
- Mark Klinedinst, University of Southern Mississippi
- Shawn Knabb, Western Washington University
- Todd Knoop, Cornell College
- Paul Koch, Olivet Nazarene University
- Ng Beoy Kui, Nanyang Technical University, Singapore
- Leonard Lardaro, University of Rhode Island
- James Leady, University of Notre Dame
- Charles Leathers, University of Alabama
- Hsien-Feng Lee, National Taiwan University
- Jim Lee, Texas A&M University–Corpus Christi
- John Levendis, Loyola University New Orleans
- Frank Lichtenberg, Columbia University
- Mark Lieberman, Princeton University
- Shu Lin, Florida Atlantic University
- Maria Luengo-Prado, Northeastern University

- Mathias Lutz, University of Sussex
 - Bernard Malamud, University of Nevada, Las Vegas
 - Ken McCormick, University of Northern Iowa
 - William McLean, Oklahoma State University
 - B. Starr McMullen, Oregon State University
 - Mikhail Melnik, Niagara University
 - O. Mikhail, University of Central Florida
 - Fabio Milani, University of California, Irvine
 - Rose Milbourne, University of New South Wales
 - Roger Morefield, University of Saint Thomas
 - Shahriar Mostashari, Campbell University
 - Eshragh Motahar, Union College
 - Nick Noble, Miami University
 - Ilan Noy, University of Hawaii
 - John Olson, College of St. Benedict
 - Brian O’Roark, Robert Morris University
 - Jack Osman, San Francisco State University
 - Emiliano Pagnotta, Northwestern University
 - Biru Paksha Paul, SUNY Cortland
 - Andrew Parkes, Mesa State College
 - Allen Parkman, University of Mexico
 - Jim Peach, New Mexico State University
 - Gavin Peebles, National University of Singapore
 - Michael Quinn, Bentley College
 - Charles Revier, Colorado State University
 - Jack Richards, Portland State University
 - Raymond Ring, University of South Dakota
 - Monica Robayo, University of North Florida
 - Malcolm Robinson, Thomas Moore College
 - Brian Rosario, University of California, Davis
 - Kehar Sangha, Old Dominion University
 - Ahmad Saranjam, Bridgewater State College
 - Carol Scotese, Virginia Commonwealth University
 - John Seater, North Carolina State University
 - Peter Sephton, University of New Brunswick
 - Ruth Shen, San Francisco State University
 - Kwanho Shin, University of Kansas
 - Tara Sinclair, The George Washington University
 - Aaron Smallwood, University of Texas, Arlington
 - David Sollars, Auburn University
 - Liliana Stern, Auburn University
 - Edward Stuart, Northeastern Illinois University
 - Abdulhanid Sukaar, Cameron University
 - Peter Summers, Texas Tech University
 - Mark Thomas, University of Maryland Baltimore County
 - Brian Trinque, The University of Texas at Austin
 - Marie Truesdell, Marian College
 - David Tufte, Southern Utah University
 - Abdul Turay, Radford University
 - Frederick Tyler, Fordham University
 - Pinar Uysal, Boston College
 - Evert Van Der Heide, Calvin College
 - Kristin Van Gaasbeck, California State University, Sacramento
 - Lee Van Scyoc, University of Wisconsin, Oshkosh
 - Paul Wachtel, New York University Stern Business School
 - Susheng Wang, Hong Kong University
 - Donald Westerfield, Webster University
 - Christopher Westley, Jacksonville State University
 - David Wharton, Washington College
 - Jonathan Willner, Oklahoma City University
 - Mark Wohar, University of Nebraska, Omaha
 - Steven Wood, University of California, Berkeley
 - Michael Woodford, Princeton University
 - Ip Wing Yu, University of Hong Kong
 - Chi-Wa Yuen, Hong Kong University of Science and Technology
 - Christian Zimmermann, University of Connecticut
 - Liping Zheng, Drake University
- They have helped us beyond the call of duty, and each has made a difference to the book.

I have many people to thank at Pearson Christina Masturzo, senior acquisitions editor; Nancy Freihofer, program manager; Diana Tetterton, editorial assistant; Heather Pagano, project manager; and Maggie Moylan, VP, product marketing.

Finally, I want to single out Steve Rigolosi, the editor for the first edition; Michael Elia, the editor to the second and third editions. Steve forced me to clarify. Michael forced me to simplify. Together, they have made all the difference to the

process and to the book. I thank them deeply. I thank John Arditi for his absolute reliability and his help, from the first edition to this one. I have also benefited from often-stimulating suggestions from my daughters, Serena, Giulia, and Marie: I did not, however, follow all of them. At home, I continue to thank Noelle for preserving my sanity.

Olivier Blanchard
Washington,
December 2015

Introduction

The first two chapters of this book introduce you to the issues and the approach of macroeconomics.

Chapter 1

Chapter 1 takes you on a macroeconomic tour of the world. It starts with a look at the economic crisis that has shaped the world economy since the late 2000s. The tour then stops at each of the world's major economic powers: the United States, the Euro area, and China.

Chapter 2

Chapter 2 takes you on a tour of the book. It defines the three central variables of macroeconomics: output, unemployment, and inflation. It then introduces the three time periods around which the book is organized: the short run, the medium run, and the long run.

This page intentionally left blank

A Tour of the World

What is macroeconomics? The best way to answer is not to give you a formal definition, but rather to take you on an economic tour of the world, to describe both the main economic evolutions and the issues that keep macroeconomists and macroeconomic policy makers awake at night.

At the time of this writing (the fall of 2015), policy makers are sleeping better than they did just a few years ago. In 2008, the world economy entered a major macroeconomic crisis, the deepest since the Great Depression. World output growth, which typically runs at 4 to 5% a year, was actually negative in 2009. Since then, growth has turned positive, and the world economy is slowly recovering. But the crisis has left a number of scars, and some worries remain.

My goal in this chapter is to give you a sense of these events and of some of the macroeconomic issues confronting different countries today. I shall start with an overview of the crisis, and then focus on the three main economic powers of the world: the United States, the Euro area, and China.

Section 1-1 looks at the crisis.

Section 1-2 looks at the United States.

Section 1-3 looks at the Euro area.

Section 1-4 looks at China.

Section 1-5 concludes and looks ahead.

Read this chapter as you would read an article in a newspaper. Do not worry about the exact meaning of the words or about understanding the arguments in detail: The words will be defined, and the arguments will be developed in later chapters. Think of this chapter as background, intended to introduce you to the issues of macroeconomics. If you enjoy reading this chapter, you will probably enjoy reading this book. Indeed, once you have read it, come back to this chapter; see where you stand on the issues, and judge how much progress you have made in your study of macroeconomics. ●

[MyEconLab](#) Video

◀ If you do not, please accept my apologies...

1-1 The Crisis

Figure 1-1 shows output growth rates for the world economy, for advanced economies, and for other economies, separately, since 2000. As you can see, from 2000 to 2007 the world economy had a sustained expansion. Annual average world output growth was 4.5%, with advanced economies (the group of 30 or so richest countries in the world) growing at 2.7% per year, and other economies (the other 150 or so countries in the world) growing at an even faster 6.6% per year.

In 2007 however, signs that the expansion might be coming to an end started to appear. U.S. housing prices, which had doubled since 2000, started declining. Economists started to worry. Optimists believed that, although lower housing prices might lead to lower housing construction and to lower spending by consumers, the Fed (the short name for the U.S. central bank, formally known as the *Federal Reserve Board*) could lower interest rates to stimulate demand and avoid a recession. Pessimists believed that the decrease in interest rates might not be enough to sustain demand and that the United States may go through a short recession.

Even the pessimists turned out not to be pessimistic enough. As housing prices continued to decline, it became clear that the problems were deeper. Many of the mortgages that had been given out during the previous expansion were of poor quality. Many of the borrowers had taken too large a loan and were increasingly unable to make the monthly payments on their mortgages. And, with declining housing prices, the value of their mortgage often exceeded the price of the house, giving them an incentive to default. This was not the worst of it: The banks that had issued the mortgages had often bundled and packaged them together into new securities and then sold these securities to other banks and investors. These securities had often been repackaged into yet new securities, and so on. The result is that many banks, instead of holding the mortgages themselves, held these securities, which were so complex that their value was nearly impossible to assess.

This complexity and opaqueness turned a housing price decline into a major financial crisis, a development that few economists had anticipated. Not knowing the quality of the assets that other banks had on their balance sheets, banks became reluctant to lend to each other for fear that the bank to which they lent might not be able to repay.

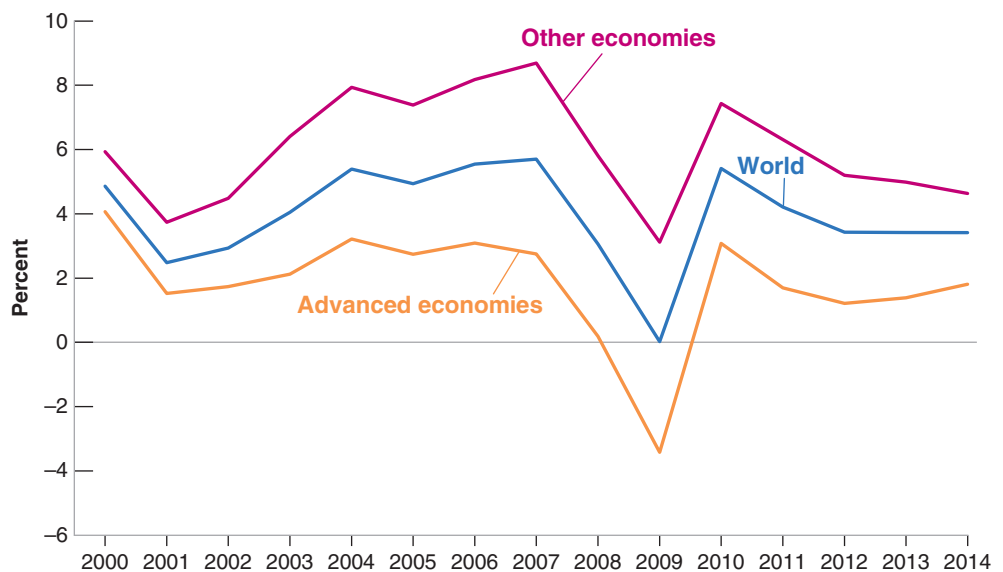
“Banks” here actually means “banks and other financial institutions.” But this is too long to write and I do not want to go into these complications in Chapter 1.

Figure 1-1

Output Growth Rates for the World Economy, for Advanced Economies, and for Emerging and Developing Economies, 2000–2014

Source: World Economic Outlook Database, July 2015. NGDP_RPCH.A.

MyEconLab Real-time data



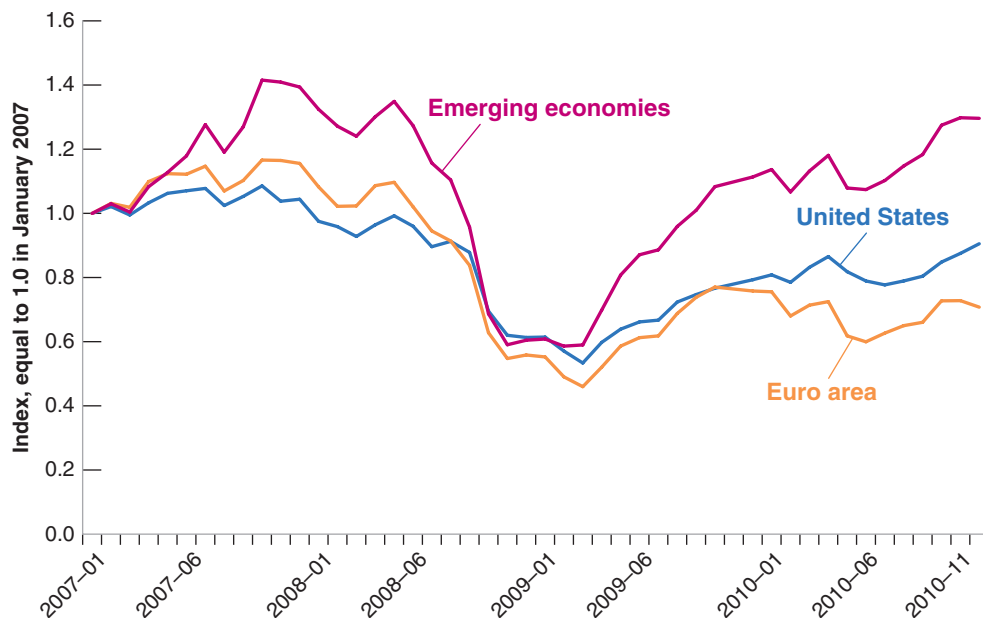


Figure 1-2

Stock Prices in the United States, the Euro Area, and Emerging Economies, 2007–2010

Source: Haver Analytics USA (S111ACD), Eurogroup (S023ACD), all emerging markets (S200ACD), all monthly averages.

Unable to borrow, and with assets of uncertain value, many banks found themselves in trouble. On September 15, 2008, a major bank, Lehman Brothers, went bankrupt. The effects were dramatic. Because the links between Lehman and other banks were so opaque, many other banks appeared at risk of going bankrupt as well. For a few weeks, it looked as if the whole financial system might collapse.

This financial crisis quickly turned into a major economic crisis. Stock prices collapsed. Figure 1-2 plots the evolution of three stock price indexes, for the United States, for the Euro area, and for emerging economies, from the beginning of 2007 to the end of 2010. The indexes are set equal to 1 in January 2007. Note how, by the end of 2008, stock prices had lost half or more of their value from their previous peak. Note also that, despite the fact that the crisis originated in the United States, European and emerging market stock prices decreased by as much as their U.S. counterparts; I shall return to this later.

Hit by the decrease in housing prices and the collapse in stock prices, and worried that this might be the beginning of another Great Depression, people sharply cut their consumption. Worried about sales and uncertain about the future, firms sharply cut back their investment. With housing prices dropping and many vacant homes on the market, very few new homes were built. Despite strong actions by the Fed, which cut interest rates all the way down to zero, and by the U.S. government, which cut taxes and increased spending, demand decreased, and so did output. In the third quarter of 2008, U.S. output growth turned negative and remained so in 2009.

One might have hoped that the crisis would remain largely contained in the United States. As Figures 1-1 and 1-2 both show, this was not the case. The U.S. crisis quickly became a world crisis. Other countries were affected through two channels. The first channel was trade. As U.S. consumers and firms cut spending, part of the decrease fell on imports of foreign goods. Looking at it from the viewpoint of countries exporting to the United States, their exports went down, and so, in turn, did their output. The second channel was financial. U.S. banks, badly needing funds in the United States, repatriated funds from other countries, creating problems for banks in those countries as well. As those banks got in trouble, lending came to a halt, leading to a decrease in spending and in output. Also, in a number of European countries, governments had accumulated high levels of debt and were now running large deficits. Investors began to worry about

I started my job as chief economist at the International Monetary Fund two weeks before the Lehman bankruptcy. I faced a steep learning curve.

whether debt could be repaid and asked for much higher interest rates. Confronted with those high interest rates, governments drastically reduced their deficits, through a combination of lower spending and higher taxes. This led in turn to a further decrease in demand, and in output. In Europe, the decline in output was so bad that this particular aspect of the crisis acquired its own name, the *Euro Crisis*. In short, the U.S. recession turned into a world recession. By 2009, average growth in advanced economies was -3.4% , by far the lowest annual growth rate since the Great Depression. Growth in emerging and developing economies remained positive but was 3.5 percentage points lower than the 2000–2007 average.

MyEconLab Video

Since then, thanks to strong monetary and fiscal policies and to the slow repair of the financial system, most economies have turned around. As you can see from Figure 1-1, growth in advanced countries turned positive in 2010 and has remained positive since. The recovery is however both unimpressive and uneven. In some advanced countries, most notably the United States, unemployment has nearly returned to its pre-crisis level. The Euro area however is still struggling. Growth is positive, but it is low, and unemployment remains high. Growth in emerging and developing economies has also recovered, but, as you can see from Figure 1-1, it is lower than it was before the crisis and has steadily declined since 2010.

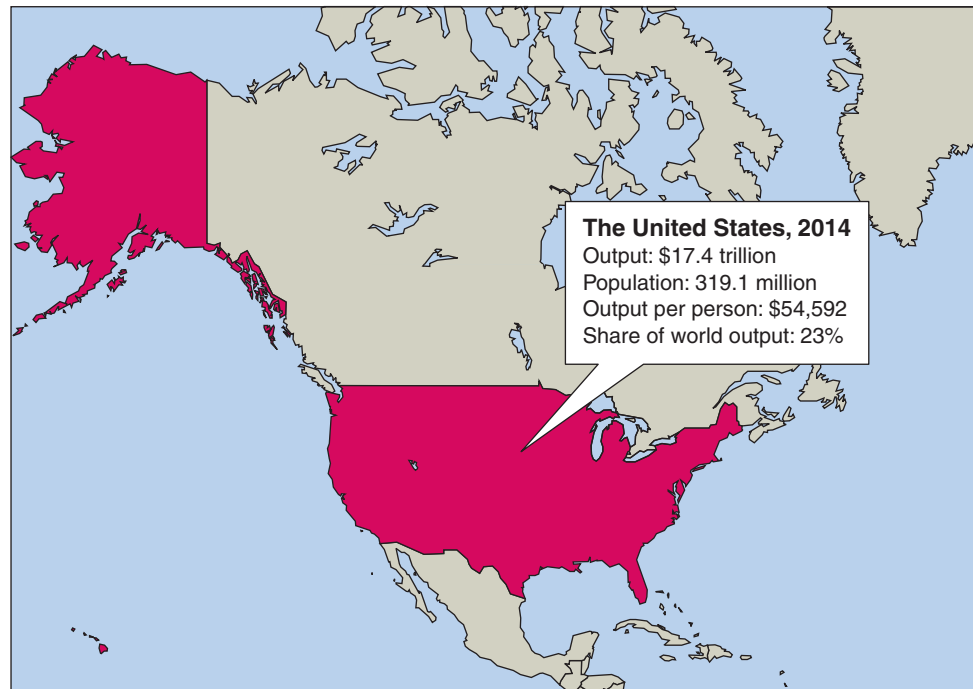
Having set the stage, let me now take you on a tour of the three main economic powers in the world, the United States, the Euro area, and China.

1-2 The United States

When economists look at a country, the first two questions they ask are: How big is the country from an economic point of view? And what is its standard of living? To answer the first, they look at output—the level of production of the country as a whole. To answer the second, they look at output per person. The answers, for the United States, are given in Figure 1-3: The United States is big, with an output of \$17.4 trillion in 2014,

Figure 1-3

The United States, 2014



accounting for 23% of world output. This makes it the largest country in the world in economic terms. And the standard of living in the United States is high: Output per person is \$54,600. It is not the country with the highest output per person in the world, but it is close to the top.

When economists want to dig deeper and look at the state of health of the country, they look at three basic variables:

- *Output growth*—the rate of change of output
- The *unemployment rate*—the proportion of workers in the economy who are not employed and are looking for a job
- The *inflation rate*—the rate at which the average price of goods in the economy is increasing over time

Numbers for these three variables for the U.S. economy are given in Table 1-1. To put current numbers in perspective, the first column gives the average value of each of the three variables for the period 1990 up to 2007, the year before the crisis. The second column shows numbers for the acute part of the crisis, the years 2008 and 2009. The third column shows the numbers from 2010 to 2014, and the last column gives the numbers for 2015 (or more accurately, the forecasts for 2015 as of the fall of 2015).

By looking at the numbers for 2015, you can see why economists are reasonably optimistic about the U.S. economy at this point. Growth in 2015 is forecast to be above 2.5%, just a bit below the 1990–2007 average. Unemployment, which increased during the crisis and its aftermath (it reached 10% during 2010), is decreasing and, at 5.4%, is now back to its 1990–2007 average. Inflation is low, substantially lower than the 1990–2007 average. In short, the U.S. economy seems to be in decent shape, having largely left the effects of the crisis behind.

Not everything is fine however. To make sure demand was strong enough to sustain growth, the Fed has had to maintain interest rates very low, indeed, too low for comfort. And productivity growth appears to have slowed, implying mediocre growth in the future. Let's look at both issues in turn.

Low Interest Rates and the Zero Lower Bound

When the crisis started, the Fed tried to limit the decrease in spending by decreasing the interest rate it controls, the so-called *federal funds rate*. As you can see from Figure 1-4, on page 8 the federal funds rate went from 5.2% in July 2007 to nearly 0% (0.16% to be precise) in December 2008.

Why did the Fed stop at zero? Because the interest rate cannot be negative. If it were, then nobody would hold bonds, everybody would want to hold cash instead—because cash pays a zero interest rate. This constraint is known in macroeconomics as the *zero lower bound*, and this is the bound the Fed ran into in December 2008.

Can you guess some of the countries with a higher standard of living than the United States? *Hint*: Think of oil producers and financial centers. For answers, look for “Gross Domestic Product per capita, in current prices” at <http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/weoselgr.aspx>

Because keeping cash in large sums is inconvenient and dangerous, people might be willing to hold some bonds even if those pay a small negative interest rate. But there is a clear limit to how negative the interest rate can go before people find ways to switch to cash.

MyEconLab Real-time data

Percent	1990–2007 (average)	2008–2009 (average)	2010–2014 (average)	2015
Output growth rate	3.0	–1.5	2.2	2.5
Unemployment rate	5.4	7.5	8.0	5.4
Inflation rate	2.3	1.4	1.6	0.7

Output growth rate: annual rate of growth of output (GDP). Unemployment rate: average over the year. Inflation rate: annual rate of change of the price level (GDP deflator).

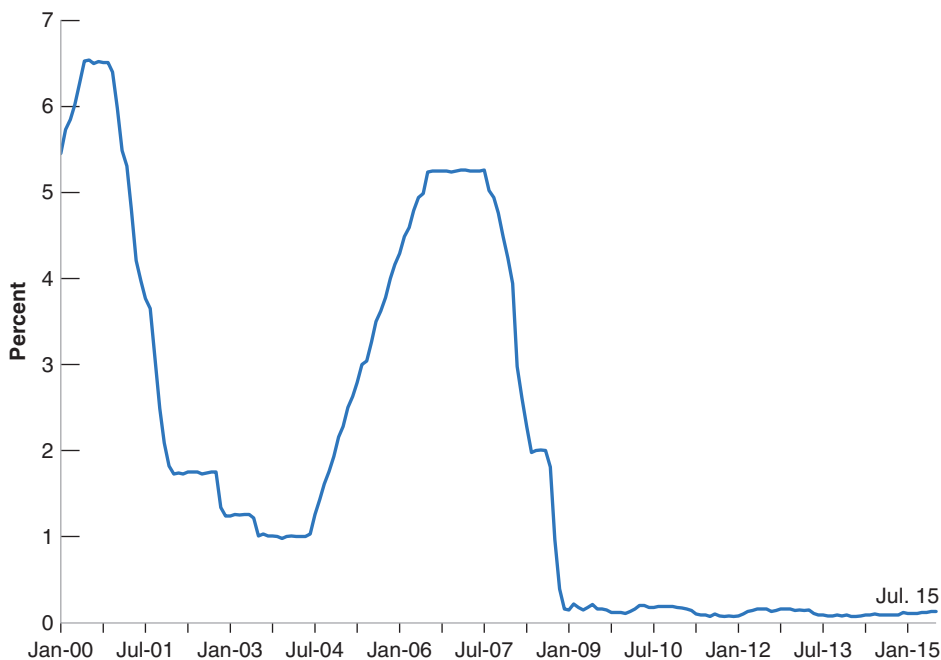
Source: IMF, *World Economic Outlook*, July 2015.

Figure 1-4

The U.S. Federal Funds Rate since 2000

Source: Haver Analytics.

MyEconLab Real-time data



This sharp decrease in the interest rate, which made it cheaper for consumers to borrow, and for firms to invest, surely limited the fall in demand and the fall in output. But, as we saw earlier and you can see from Table 1-1, this was not enough to avoid a deep recession: U.S. growth was negative in both 2008 and 2009. To help the economy recover, the Fed then kept the interest rate close to zero, where it has remained until now (the fall of 2015). The Fed's plan is to start increasing the interest rate soon, so when you read this book, it is likely that the rate will have increased, but it will still be very low by historical standards.

As you will see later in the book, central banks like the Fed can use a few other tools to increase demand. These tools are known as "unconventional monetary policy." But they do not work as well as the interest rate.

Why are low interest rates a potential issue? For two reasons: The first is that low interest rates limit the ability of the Fed to respond to further negative shocks. If the interest rate is at or close to zero, and demand further decreases, there is little the Fed can do to increase demand. The second is that low interest rates appear to lead to excessive risk taking by investors. Because the return from holding bonds is so low, investors are tempted to take too much risk to increase their returns. And too much risk taking can in turn give rise to financial crises of the type we just experienced. Surely, we do not want to experience another crisis like the one we just went through.

How Worrisome Is Low Productivity Growth?

Although the Fed has to worry about maintaining enough demand to achieve growth in the short run, over longer periods of time, growth is determined by other factors, the main one being productivity growth: Without productivity growth, there just cannot be a sustained increase in income per person. And, here, the news is worrisome. Table 1-2 shows average U.S. productivity growth by decade since 1990 for the private sector as a whole and for the manufacturing sector. As you can see, productivity growth in the 2010s has so far been about half as high as it was in the 1990s.

How worrisome is this? Productivity growth varies a lot from year to year, and some economists believe that it may just be a few bad years and not much to worry about. Others believe that measurement issues make it difficult to measure output and that productivity growth may be underestimated. For example, how do you measure

Table 1-2 Labor Productivity Growth, by Decade			
Percent change; year on year (average)	1990s	2000s	2010–2014
Nonfarm Business Sector	2.0	2.6	1.2
Business Sector	2.1	2.6	1.2
Manufacturing	4.0	3.1	2.4

Source: Haver Analytics.

the real value of a new smartphone relative to an older model? Its price may be higher, but it probably does many things that the older model could not do. Yet others believe that the United States has truly entered a period of lower productivity growth, that the major gains from the current IT innovations may already have been obtained, and that progress is likely to be less rapid, at least for some time.

◀ IT stands for information technology.

One particular reason to worry is that this slowdown in productivity growth is happening in the context of growing inequality. When productivity growth is high, most everybody is likely to benefit, even if inequality increases. The poor may benefit less than the rich, but they still see their standard of living increase. This is not the case today in the United States. Since 2000, the real earnings of workers with a high school education or less have actually decreased. If policy makers want to invert this trend, they need either to raise productivity growth or limit the rise of inequality, or both. These are two major challenges facing U.S. policy makers today.

1-3 The Euro Area

In 1957, six European countries decided to form a common European market—an economic zone where people and goods could move freely. Since then, 22 more countries have joined, bringing the total to 28. This group is now known as the **European Union**, or EU for short.

Until a few years ago, the official name was the *European Community*, or EC. You may still encounter that name.

In 1999, the EU decided to go a step further and started the process of replacing national currencies with one common currency, called the *euro*. Only 11 countries participated at the start; since then, 8 more have joined. Some countries, in particular, the United Kingdom, have decided not to join, at least for the time being. The official name for the group of member countries is the **Euro area**. The transition took place in steps. On January 1, 1999, each of the 11 countries fixed the value of its currency to the euro. For example, 1 euro was set equal to 6.56 French francs, to 166 Spanish pesetas, and so on. From 1999 to 2002, prices were quoted both in national currency units and in euros, but the euro was not yet used as currency. This happened in 2002, when euro notes and coins replaced national currencies. Nineteen countries now belong to this *common currency area*.

The area also goes by the names of “Euro zone” or “Euroland.” The first sounds too technocratic, and the second reminds one of Disneyland. I shall avoid them.

Table 1-3 Growth, Unemployment, and Inflation in the Euro Area, 1990–2015				
Percent	1990–2007 (average)	2008–2009 (average)	2010–2014 (average)	2015
Output growth rate	2.1	−2.0	0.7	1.5
Unemployment rate	9.4	8.6	11.1	11.1
Inflation rate	2.1	1.5	1.0	1.1

Output growth rate: annual rate of growth of output (GDP). Unemployment rate: average over the year.
Inflation rate: annual rate of change of the price level (GDP deflator).

Source: IMF, *World Economic Outlook*, July 2015.

MyEconLab Real-time data