

MACROECONOMICS

SECOND EDITION

Olivier Blanchard

Massachusetts Institute of Technology

CONTENTS

Preface xix

Introduction 1

Chapter 1 A Tour of the World 3

- 1-1 The United States 4
 - Is Unemployment Too Low? 5 • Is the Stock Market Too High? 5 • Why Has Growth Slowed Down? 6 • Why Has Wage Inequality Increased? 7
 - 1-2 The European Union 7
 - How to Reduce High Unemployment? 7 • What Will the Euro Do for Europe? 9
 - 1-3 Japan and East Asia 10
 - Why Has Japan Done So Poorly in the 1990s? 10 • What Was the Cause of the Asian Crisis of 1997? 12
 - 1-4 Looking Ahead 14
- Appendix: Where to Find the Numbers 17

Chapter 2 A Tour of the Book 19

- 2-1 Aggregate Output 20
 - GDP, Value Added, and Income 20 • Nominal and Real GDP 22
 - 2-2 The Other Major Macroeconomic Variables 24
 - The Unemployment Rate 24 • The Inflation Rate 27
 - 2-3 A Road Map 30
 - A Tour of the Book 31
- Appendix: The Construction of Real GDP, and Chain-Type Indexes 36

THE CORE 39

The Short Run 39

Chapter 3 The Goods Market 41

- 3-1 The Composition of GDP 42
- 3-2 The Demand for Goods 43
 - Consumption (C) 44 • Investment (I) 45 • Government Spending (G) 46
- 3-3 The Determination of Equilibrium Output 46
 - Using Algebra 47 • Using a Graph 47 • Using Words 49 • How Long Does It Take for Output to Adjust? 50
- 3-4 Investment Equals Saving: An Alternative Way of Thinking About Goods-Market Equilibrium 52

- 3-5 Is the Government Omnipotent? A Warning 54

Chapter 4 Financial Markets 59

- 4-1 The Demand for Money 60
 - Money Demand and the Interest Rate: The Evidence 62
- 4-2 The Determination of the Interest Rate: I 64
 - Money Demand, Money Supply, and the Equilibrium Interest Rate 64 • Monetary Policy and Open Market Operations 66
- 4-3 The Determination of Interest Rates: II 68
 - What Banks Do 68 • The Supply and Demand for Central Bank Money 69 • Two Alternative Ways of Looking at the Equilibrium 73 • Open Market Operations Revisited 74

Chapter 5 Goods and Financial Markets: The *IS-LM* Model 79

- 5-1 The Goods Market and the *IS* Relation 80
 - Investment, Sales, and the Interest Rate 80 • The *IS* Curve 80 • Shifts in the *IS* Curve 83
- 5-2 Financial Markets and the *LM* Relation 83
 - Real Money, Real Income, and the Interest Rate 84 • The *LM* Curve 84 • Shifts in the *LM* Curve 86
- 5-3 The *IS-LM* Model: Exercises 86
 - Fiscal Policy, Activity, and the Interest Rate 87 • Monetary Policy, Activity, and the Interest Rate 91
- 5-4 Using a Policy Mix 93
- 5-5 Adding Dynamics 95
- 5-6 Does the *IS-LM* Model Actually Capture What Happens in the Economy? 96

The Medium Run 103

Chapter 6 The Labor Market 105

- 6-1 A Tour of the Labor Market 106
 - The Large Flows of Workers 106 • Differences across Workers 108
- 6-2 Movements in Unemployment 109
- 6-3 Wage Determination 111

Bargaining 112 • Efficiency
Wages 112 • Wages and
Unemployment 114

6-4 Price Determination 115

6-5 The Natural Rate of
Unemployment 116
The Wage-Setting Relation 116 • The
Price-Setting Relation 117 • Equilibrium
Real Wages, Employment, and
Unemployment 117 • From
Unemployment to Output 118

6-6 Where We Go From Here 120

Chapter 7 Putting All Markets Together. The AS-AD Model 125

7-1 Aggregate Supply 126
The Derivation of the Aggregate Supply
Relation 126

7-2 Aggregate Demand 128

7-3 Equilibrium Output in the Short
and the Medium Run 130
The Dynamics of Output and the Price
Level 131

7-4 The Effects of a Monetary
Expansion 133
The Dynamics of Adjustment 133 •
Looking Behind the Scene 134 • The
Neutrality of Money 135

7-5 A Decrease in the Budget
Deficit 137
The Budget Deficit, Output, and the
Interest Rate 138 • Budget Deficits,
Output, and Investment 139

7-6 Changes in the Price of Oil 140
Effects on the Natural Rate of
Unemployment 141 • The Dynamics of
Adjustment 141

7-7 Conclusions 144
The Short Run versus the Medium
Run 144 • Shocks and Propagation
Mechanisms 145 • Output,
Unemployment, and Inflation 145

Chapter 8 The Phillips Curve 149

8-1 Inflation, Expected Inflation, and
Unemployment 150

8-2 The Phillips Curve 151
The Early Incarnation 151 •
Mutations 152 • Back to the Natural
Rate of Unemployment 154

8-3 A Summary and Many
Warnings 157
The Inflation Process and the Phillips
Curve 157 • Differences in the Natural
Rate Across Countries 158 • Variations
in the Natural Rate Over Time 159 • The
Limits of Our Understanding 159

Appendix: From the Aggregate Supply
Relation to the Phillips Curve 165

Chapter 9 Inflation, Activity, and Money Growth 167

9-1 Output, Unemployment, and
Inflation 168

*Okun's Law: Output Growth and Changes
in Unemployment* 168 • The Phillips
Curve: Unemployment and the Change in
Inflation 170 • The Aggregate Demand
Relation: Money, Growth, Inflation, and
Output Growth 171

9-2 The Medium Run 171

9-3 Disinflation: A First Pass 173
How Much Unemployment? And for How
Long? 173 • Working Out the Required
Path of Money Growth 175

9-4 Expectations, Credibility, and
Nominal Contracts 177
Expectations and Credibility: The Lucas
Critique 177 • Nominal Rigidities and
Contracts 178

9-5 The U.S. Disinflation, 1979 to
1985 180

The Long Run 187

Chapter 10 The Facts of Growth 189

10-1 Growth in Rich Countries Since
1950 190

10-2 A Broader Look Across Time and
Space 194
Looking Across Two Millennia 194 •
Looking Across Countries 196

10-3 Thinking About Growth:
A Primer 198
The Aggregate Production Function 198
• The Sources of Growth 200

Chapter 11 Saving, Capital Accumulation, and Output 205

11-1 Interactions between Output and
Capital 206
The Effects of Capital on Output 206 •
The Effects of Output on Capital
Accumulation 207

11-2 Implications of Alternative Saving
Rates 208
Dynamics of Capital and Output 208 •
Steady-State Capital and Output 210 •
The Saving Rate and Output 211 • The
Saving Rate and the Golden Rule 214

11-3 Getting a Sense of
Magnitudes 216
The Effects of the Saving Rate on Steady-
State Output 217 • The Dynamic Effects
of an Increase in the Saving Rate 218 •
The U.S. Saving Rate and the Golden
Rule 219

11-4 Physical versus Human
Capital 220

Extending the Production Function 221
• Human Capital, Physical Capital, and
Output 221 • Endogenous Growth 222

Chapter 12 Technological Progress and Growth 227

- 12-1 Technological Progress and the
Rate of Growth 228
Technological Progress and the
Production Function 228 • Interactions
between Output and Capital 230 •
Dynamics of Capital and Output 231 •
The Effects of the Saving Rate 233
- 12-2 The Determinants of Technological
Progress 234
The Fertility of the Research Process
235 • The Appropriability of Research
Results 235
- 12-3 The Facts of Growth
Revisited 237
Capital Accumulation versus
Technological Progress 237 • Why Has
Technological Progress Slowed Since the
Mid-1970s? 239
- 12-4 Epilogue: The Secrets
of Growth 241
- Appendix: Constructing a Measure of
Technological Progress 246

Chapter 13 Technological Progress, Wages, and Unemployment 249

- 13-1 Productivity, Output, and Unem-
ployment in the Short Run 251
Technological Progress, Aggregate Supply,
and Aggregate Demand 251 • The
Empirical Evidence 253
- 13-2 Productivity and the Natural Rate
of Unemployment 254
Price Setting and Wage Setting Revis-
ited 254 • The Natural Rate of Unemploy-
ment 255 • The Empirical Evidence 256
- 13-3 Technological Progress and
Distribution Effects 258
The Increase in Wage Inequality 258 •
The Causes of Increased Wage
Inequality 261

EXTENSIONS 265

Expectations 265

Chapter 14 Expectations: The Basic Tools 267

- 14-1 Nominal versus Real Interest
Rates 268
Computing the Real Interest Rate 269 •
Nominal and Real Interest Rates in the
United States Since 1978 270
- 14-2 Expected Present Discounted
Values 271
Computing Expected Present Discounted

Values 271 • Using Present Values:
Examples 273 • Nominal versus Real
Interest Rates, and Present Values 275

14-3 Nominal and Real Interest Rates,
and the *IS-LM* Model 276

14-4 Money Growth, Inflation, and
Nominal and Real Interest
Rates 277
Nominal and Real Interest Rates in the
Short Run 277 • Nominal and Real
Interest Rates in the Medium Run 279 •
From the Short to the Medium Run 280
• Evidence on the Fisher Hypothesis 281

Appendix: Deriving the Expected Present
Discounted Value Using Real or Nominal
Interest Rates 286

Chapter 15 Financial Markets and Expectations 287

- 15-1 Bond Prices and the Yield
Curve 288
Bond Prices as Present Values 288 •
Arbitrage and Bond Prices 290 • From
Bond Prices to Bond Yields 291 • The
Yield Curve and Economic Activity 292
- 15-2 The Stock Market and Movements
in Stock Prices 296
Stock Prices as Present Values 297 • The
Stock Market and Economic Activity 298
- 15-3 Bubbles, Fads, and Stock
Prices 301
- Appendix: Arbitrage and Stock
Prices 307

Chapter 16 Expectations, Consumption, and Investment 309

- 16-1 Consumption 310
The Very Foresighted Consumer 310 •
An Example 311 • Toward A More
Realistic Description 312 • Putting
Things Together: Current Income,
Expectations, and Consumption 314
- 16-2 Investment 315
Investment and Expectations of
Profit 315 • A Convenient Special
Case 318 • Current versus Expected
Profit 318 • Profit and Sales 320
- 16-3 The Volatility of Consumption and
Investment 321

Appendix: Derivation of the Expected
Present Value of Profits when Future
Profits and Interest Rates Are Expected
to Be the Same as Today 326

Chapter 17 Expectations, Output, and Policy 327

- 17-1 Expectations and Decisions:
Taking Stock 328
Expectations and the *IS* Relation 328 •
The *LM* Relation Revisited 330

- 17-2 Monetary Policy, Expectations, and Output 331
- 17-3 Deficit Reduction, Expectations, and Output 334
 - The Role of Expectations About the Future 334
 - Back to the Current Period 335

Money versus Bonds 383 •
Domestic Bonds versus Foreign Bonds 383

- 20-3 Putting Goods and Financial Markets Together 386
- 20-4 The Effects of Policy in an Open Economy 387
 - The Effects of Fiscal Policy in an Open Economy 387
 - The Effects of Monetary Policy in an Open Economy 389
- 20-5 Fixed Exchange Rates 390
 - Pegs, Crawling Pegs, Bands, the EMS, and the Euro 390
 - Pegging the Exchange Rate, and Monetary Control 391
 - Fiscal Policy under Fixed Exchange Rates 392

Appendix: Fixed Exchange Rates, Interest Rates, and Capital Mobility 396

The Open Economy 341

Chapter 18 Openness in Goods and Financial Markets 343

- 18-1 Openness in Goods Markets 344
 - The Choice between Domestic and Foreign Goods 345
 - Nominal Exchange Rates 346
 - Real Exchange Rates 347
- 18-2 Openness in Financial Markets 352
 - The Balance of Payments 352
 - The Choice between Domestic and Foreign Assets 353
- 18-3 Conclusions and a Look Ahead 358

Chapter 19 The Goods Market in an Open Economy 361

- 19-1 The IS Relation in the Open Economy 362
 - The Demand for Domestic Goods 362
 - The Determinants of the Demand for Domestic Goods 362
- 19-2 Equilibrium Output and the Trade Balance 365
- 19-3 Increases in Demand, Domestic or Foreign 366
 - Increases in Domestic Demand 366
 - Increases in Foreign Demand 367
 - Games That Countries Play 370
- 19-4 Depreciation, the Trade Balance, and Output 372
 - Depreciation and the Trade Balance: The Marshall–Lerner Condition 372
 - The Effects of a Depreciation 372
 - Combining Exchange-Rate and Fiscal Policies 373
- 19-5 Looking at Dynamics: The J-Curve 374
- 19-6 Saving, Investment, and Trade Deficits 376
- Appendix: Derivation of the Marshall–Lerner Condition 380

Chapter 20 Output, the Interest Rate, and the Exchange Rate 381

- 20-1 Equilibrium in the Goods Market 382
- 20-2 Equilibrium in Financial Markets 383

Chapter 21 Exchange Rates: Adjustments, Crises, and Regimes 399

- 21-1 Fixed Exchange Rates and the Adjustment of the Real Exchange Rate 400
 - Aggregate Demand Under Fixed Exchange Rates 400
 - Aggregate Demand and Aggregate Supply 402
- 21-2 Exchange Rate Crises 406
 - Crises in the European Monetary System 408
- 21-3 Choosing Between Exchange Rate Regimes 409
 - The Problems of Flexible Exchange Rates 410
 - The Limited Costs of Fixed Exchange Rates 410
 - The Benefits of Fixed Exchange Rates 411

Appendix: Exchange Rate Movements 415

Pathologies 423

Chapter 22 Pathologies I: High Unemployment 425

- 22-1 The Great Depression 426
 - The Fall in Spending 426
 - The Contraction in Nominal Money 427
 - The Adverse Effects of Deflation 429
 - The Recovery 430
- 22-2 Unemployment in Europe 432
 - Labor Market Rigidities 434
 - Hysteresis 438
 - Eurosclerosis or Hysteresis? 442
- 22-3 Conclusions 442

Chapter 23 Pathologies II: High Inflation 447

- 23-1 Budget Deficits and Money Creation 448

- 23-2 Inflation and Real Money Balances 450
- 23-3 Deficits, Seignorage, and Inflation 452
 - The Case of Constant Money Growth* 452 • Dynamics and Increasing Inflation 454 • Hyperinflations and Economic Activity 455
- 23-4 How Do Hyperinflations End? 456
 - The Elements of a Stabilization Program 456 • Can Stabilization Programs Fail? 457 • The Costs of Stabilization 457
- 23-5 Conclusions 460

Chapter 24 Pathologies III: Transition in Eastern Europe, and the Asian Crisis 463

- 24-1 Transition in Eastern Europe 464
 - By How Much Has Output Declined? 466 • Why Did Output Decline? 467 • Why Have Some Countries Recovered and Not Others? 469
- 24-2 The Asian Crisis 472
 - Why the Crisis? 474 • Why Did the Exchange Rate Crisis Lead to a Recession? 476 • What Are the Lessons from the Asian Crisis? 477

BACK TO POLICY 481

Chapter 25 Should Policy Makers Be Restrained? 483

- 25-1 Uncertainty and Policy 484
 - How Much Do Macroeconomists Actually Know? 484 • Should Uncertainty Lead Policy Makers to Do Less? 486 • Uncertainty and Restraints on Policy Makers 487
- 25-2 Expectations and Policy 487
 - Hijackings and Negotiations* 488 • Inflation and Unemployment Revisited 488 • Establishing Credibility 489 • Time Consistency and Restraints on Policy Makers 490
- 25-3 Politics and Policy 491
 - Games between Policy Makers and Voters 491 • Games between Policy Makers 493 • Back to the Balanced-Budget Amendment 494

Chapter 26 Monetary Policy: A Summing Up 501

- 26-1 The Optimal Inflation Rate 503
 - The Costs of Inflation 503 • The Benefits of Inflation 504 • The Optimal Inflation Rate: The Current Debate 506

- 26-2 The Design of Monetary Policy 507
 - Money Growth and Inflation Revisited 507 • From Money to Monetary Aggregates 508 • Taylor's Rule 509
- 26-3 The Fed in Action 510
 - The Mandate of the Fed 510 • The Organization of the Fed 511 • The Instruments of Monetary Policy 511 • The Practice of Policy 512 • Could the Conduct of U.S. Monetary Policy Be Improved? 513

Chapter 27 Fiscal Policy. A Summing Up 517

- 27-1 The Government Budget Constraint 518
 - Current versus Future Taxes 519 • Debt and Primary Surpluses 522 • The Evolution of the Debt-to-GDP Ratio 523
- 27-2 Four Issues in Fiscal Policy 525
 - Ricardian Equivalence 525 • Deficits, Output Stabilization, and the Cyclically Adjusted Deficit 526 • Wars and Deficits 527 • The Dangers of Very High Debt 528
- 27-3 The U.S. Budget Deficit 530
 - The Budget Outlook Until 2009 531 • Surpluses and the Low U.S. Saving Rate 532 • Surpluses and The Aging of America 532

EPILOGUE 537

Chapter 28 Epilogue: The Story of Macroeconomics 537

- 28-1 Keynes and the Great Depression 538
- 28-2 The Neoclassical Synthesis 538
 - Progress on All Fronts 539 • Keynesians versus Monetarists 539
- 28-3 The Rational Expectations Critique 541
 - The Three Implications of Rational Expectations 541 • The Integration of Rational Expectations 543
- 28-4 Current Developments 544
 - New Classical Economics and Real Business Cycle Theory 544 • New Keynesian Economics 545 • New Growth Theory 545
- 28-5 Common Beliefs 546

Appendix 1 An Introduction to National Income and Product Accounts A1

Appendix 2 A Math Refresher A6

Appendix 3 An Introduction to Econometrics A10

Glossary G1

Index I-1