Seventh Edition

Global Edition

MACROECONOMICS

Olivier Blanchard



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

Brief Contents

THE CORE

Introduction 21

Chapter 1	A Tour of the World 23
Chapter 2	A Tour of the Book 41

The Short Run 65

Chapter 3	The Goods Market 67
Chapter 4	Financial Markets 87
Chapter 5	Goods and Financial Markets; The <i>IS-LM</i> Model 109
Chapter 6	Financial Markets II: The Extended IS-LM Model 131

The Medium Run 155

Chapter 7	The Labor Market 157				
Chapter 8	The Phillips Curve, the Natural Rate				
	of Unemployment, and				
	Inflation 177				
Chapter 9	From the Short to the Medium Run:				
-	The IS-LM-PC Model 197				

The Long Run 217

Chapter 10	The Facts of Growth 219
Chapter 11	Saving, Capital Accumulation, and Output 237
Chapter 12	Technological Progress and Growth 261

Chapter 13 Technological Progress: The Short, the Medium, and the Long Run 283

EXTENSIONS

Expectations 303

Chapter 14	Financial Markets and Expectations 305
Chapter 15	Expectations, Consumption, and Investment 331
Chapter 16	Expectations, Output, and Policy 351

The Open Economy 367

Chapter 17	Openness in Goods and Financial Markets 369
Chapter 18	The Goods Market in an Open Economy 389
Chapter 19	Output, the Interest Rate, and the Exchange Rate 411
Chapter 20	Exchange Rate Regimes 431

Back to Policy 453

Chapter 21	Should Policy Makers Be Restrained? 455
Chapter 22	Fiscal Policy: A Summing Up 473
Chapter 23	Monetary Policy: A Summing Up 497
Chapter 24	Epilogue: The Story of Macroeconomics 517

Contents

Preface 13

THE CORE

Introduction 21

Chapter 1	A Tour of the World 23				
	1-1	The Crisis 24			
	1-2	The United States 26			
		Low Interest Rates and the Zero Lower Bound 27 • How Worrisome Is Low Productivity Growth? 28			
	1-3	The Euro Area 29			
		Can European Unemployment Be Reduced? 31 • What Has the Euro Done for Its Members? 32			
	1-4	China 33			
	1-5	Looking Ahead 35			
	Арр	endix: Where to Find the Numbers 38			
Chapter 2	ΑT	our of the Book 41			
	2-1	Aggregate Output 42			
		GDP: Production and Income 42 • Nominal and Real GDP 44 • GDP: Level versus Growth Rate 46			
	2-2	The Unemployment Rate 47			
		Why Do Economists Care about Unemployment? 49			
	2-3	The Inflation Rate 51			
		The GDP Deflator 51 • The Consumer Price Index 51 • Why Do Economists Care about Inflation? 53			
	2-4	Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve 53			
		Okun's Law 54 • The Phillips Curve 54			
	2-5	The Short Run, the Medium Run, and the Long Run 55			
	2-6	A Tour of the Book 56			
		The Core 56 • Extensions 57 • Back to Policy 58 • Epilogue 58			
		endix: The Construction of Real GDP Chain-Type Indexes 62			

The Short Run 65

Chapter 3 The Goods Market 67

- 3-1 The Composition of GDP 68
- 3-2 The Demand for Goods 70
 Consumption (C) 70 Investment
 (1) 72 Government Spending (G) 72
- 3-3 The Determination of Equilibrium Output 73

Using Algebra 74 • Using a Graph 75 • Using Words 77 • How Long Does It Take for Output to Adjust? 78

- 3-4 Investment Equals Saving: An Alternative Way of Thinking about Goods-Market Equilibrium 80
- 3-5 Is the Government Omnipotent? A Warning 82

Chapter 4 Financial Markets I 87

4-1 The Demand for Money 88 Deriving the Demand for Money 89

- 4-2 Determining the Interest Rate: I 91 Money Demand, Money Supply, and the Equilibrium Interest Rate 91
 Monetary Policy and Open Market Operations 94
 Choosing Money or Choosing the Interest Rate? 96
- 4-3 Determining the Interest Rate: II 96
 What Banks Do 96 The Demand and Supply for Central Bank
 Money 98 • The Federal Funds Market and the Federal Funds Rate 99

4-4 The Liquidity Trap 100 Appendix: The Determination of the Interest Rate When People Hold Both Currency and Checkable Deposits 105

Chapter 5 Goods and Financial Markets; The *IS-LM* Model 109

5-1 The Goods Market and the IS Relation 110 Investment, Sales, and the InterestRate 110 • Determining Output 111• Deriving the *IS* Curve 113 • Shifts of the *IS* Curve 113

- 5-2 Financial Markets and the LM Relation 114
 Real Money, Real Income, and the Interest Rate 114 • Deriving the LM Curve 115
- 5-3 Putting the IS and the LM Relations Together 116
 Fiscal Policy 116 • Monetary Policy 118
- 5-4 Using a Policy Mix 119
- 5-5 How Does the *IS-LM* Model Fit the Facts? 124

Chapter 6 Financial Markets II: The Extended IS-LM Model 131

6-1 Nominal versus Real Interest Rates 132

> Nominal and Real Interest Rates in the United States since 1978 134 • Nominal and Real Interest Rates: The Zero Lower Bound and Deflation 135

- 6-2 Risk and Risk Premia 136
- 6-3 The Role of Financial Intermediaries 137
 The Choice of Leverage 138 • Leverage and Lending 139
- 6-4 Extending the IS-LM 141 Financial Shocks and Policies 142
- 6-5 From a Housing Problem to a Financial Crisis 143

Housing Prices and Subprime Mortgages 143 • The Role of Financial Intermediaries 145 • Macroeconomic Implications 147 • Policy Responses 147

The Medium Run 155

Chapter 7 The Labor Market 157

- 7-1 A Tour of the Labor Market 158 The Large Flows of Workers 158
- 7-2 Movements in Unemployment 161
- 7-3 Wage Determination 163
 - Bargaining 164 Efficiency Wages 164
 - Wages, Prices, and Unemployment 166
 The Expected Price Level 166
 - The Expected Frice Level 166
 The Unemployment Rate 166
 The Other Factors 167
- 7-4 Price Determination 167

7-5 The Natural Rate of Unemployment 168

> The Wage-Setting Relation 168 • The Price-Setting Relation 169 • Equilibrium Real Wages and Unemployment 170

7-6 Where We Go from Here 171

Appendix: Wage- and Price-Setting Relations versus Labor Supply and Labor Demand 175

Chapter 8 The Phillips Curve, the Natural Rate of Unemployment, and Inflation 177

- 8-1 Inflation, Expected Inflation, and Unemployment 178
- 8-2 The Phillips Curve and Its Mutations 180

The Early Incarnation 180 • The Apparent Trade-Off and its Disappearance 180

- 8-3 The Phillips Curve and the Natural Rate of Unemployment 183
- 8-4 A Summary and Many Warnings 185

Variations in the Natural Rate across Countries 186 • Variations in the Natural Rate over Time 186 • High Inflation and the Phillips Curve Relation 188 • Deflation and the Phillips Curve Relation 190

Appendix: Derivation of the Relation to a Relation between Inflation, Expected Inflation, and Unemployment 195

Chapter 9 From the Short to the Medium Run: The IS-LM-PC Model 197

- 9-1 The IS-LM-PC model 178
- 9-2 Dynamics and the Medium Run Equilibrium 201

The Role of Expectations Revisited 203 • The Zero Lower Bound and Debt Spirals 203

- 9-3 Fiscal Consolidation Revisited 206
- 9-4 The Effects of an Increase in the Price of Oil 207

Effects on the Natural Rate of Unemployment 209

9-5 Conclusions 212

The Short Run versus the Medium Run 212 • Shocks and Propagation Mechanisms 212

The Long Run 217

Chapter 10 The Facts of Growth 219

- 10-1 Measuring the Standard of Living 220
- 10-2 Growth in Rich Countries since 1950 223

The Large Increase in the Standard of Living since 1950–225 • The Convergence of Output per Person 226

10-3 A Broader Look across Time and Space 227
Looking across Two Millennia 227
Looking across Countries 227

10-4 Thinking about Growth: A Primer 229 The Aggregate Production Function 229 • Returns to Scale and Returns to

229 • Returns to Scale and Returns to Factors 230 • Output per Worker and Capital per Worker 231 • The Sources of Growth 231

Chapter 11 Saving, Capital Accumulation, and Output 237

11-1 Interactions between Output and Capital 238

> The Effects of Capital on Output 238 • The Effects of Output on Capital Accumulation 239 • Output and Investment 239 • Investment and Capital Accumulation 240

11-2 The Implications of Alternative Saving Rates 241

> Dynamics of Capital and Output 241 • The Saving Rate and Output 243 • The Saving Rate and Consumption 247

11-3 Getting a Sense of Magnitudes 248

The Effects of the Saving Rate on Steady-State Output 250 • The Dynamic Effects of an Increase in the Saving Rate 251 • The U.S. Saving Rate and the Golden Rule 253

- 11-4 Physical versus Human Capital 254
 - Extending the Production Function 254 • Human Capital, Physical Capital, and Output 255 • Endogenous Growth 256

Appendix: The Cobb-Douglas Production Function and the Steady State 259

Chapter 12 Technological Progress and Growth 261

12-1 Technological Progress and the Rate of Growth 262

Technological Progress and the Production Function 262

 Interactions between Output and Capital 264
 Dynamics of Capital and Output 266
 The Effects of the Saving Rate 267

12-2 The Determinants of Technological Progress 268 The Fertility of the Research Process 269 • The Appropriability

of Research Results 270

Management, Innovation, and Imitation 272

- 12-3 Institutions, Technological Progress, and Growth 273
- 12-4 The Facts of Growth Revisited 276

Capital Accumulation versus Technological Progress in Rich Countries since 1985 276 • Capital Accumulation versus Technological Progress in China 277

Appendix: Constructing a Measure of Technological Progress 281

Chapter 13 Technological Progress: The Short, the Medium, and the Long Run 283

13-1 Productivity, Output, and Unemployment in the Short Run 284

The Empirical Evidence 286

13-2 Productivity and the Natural Rate of Unemployment 287

> Price Setting and Wage Setting Revisited 287 • The Natural Rate of Unemployment 288 • The Empirical Evidence 289

13-3 Technological Progress, Churning, and Inequality 291

The Increase in Wage Inequality 292

The Causes of Increased Wage

Inequality 294 • Inequality and the Top 1% 297

EXTENSIONS

Expectations 303

Chapter 14 Financial Markets and Expectations 305

14-1 Expected Present Discounted Values 306

Computing Expected Present Discounted Values 306 • A General Formula 307

 Using Present Values: Examples 308
 Constant Interest Rates 308
 Constant Interest Rates and Payments 308
 Constant Interest Rates and Payments Forever 309
 Zero Interest Rates 309
 Nominal versus Real Interest Rates and Present Values 309
 14-2 Bond Prices and Bond Yields 310 Bond Prices as Present Values 312

- Arbitrage and Bond Prices 313
- From Bond Prices to Bond Yields 314
- Reintroducing Risk 315
- Interpreting the Yield Curve 316
- 14-3 The Stock Market and Movements in Stock Prices 318

Stock Prices as Present Values 318

- The Stock Market and Economic Activity 321 • A Monetary Expansion and the Stock Market 321 • An Increase in Consumer Spending and the Stock Market 322
- 14-4 Risk, Bubbles, Fads, and Asset Prices 324

Stock Prices and Risk 324 • Asset Prices, Fundamentals, and Bubbles 324

Appendix: Deriving the Expected Present Discounted Value Using Real or Nominal Interest Rates 330

Chapter 15 Expectations, Consumption, and Investment 331

- 15-1 Consumption 332
 - The Very Foresighted Consumer 332
 - An Example 333 Toward
 - a More Realistic Description 334
 - Putting Things Together: Current Income, Expectations, and Consumption 337
- 15-2 Investment 338

Investment and Expectations of Profit 338 • Depreciation 339 • The Present Value of Expected Profits 339 • The Investment Decision 340 • A Convenient Special Case 340 • Current versus Expected Profit 342 • Profit and Sales 344

15-3 The Volatility of Consumption and Investment 346Appendix: Derivation of the Expected Present Value of Profits under Static

Expectations 350

Chapter 16 Expectations, Output, and Policy 351

- 16-1 Expectations and Decisions: Taking Stock 352
 Expectations, Consumption, and Investment Decisions 352
 Expectations and the *IS* Relation 352
- 16-2 Monetary Policy, Expectations, and Output 355

Monetary Policy Revisited 355

16-3 Deficit Reduction, Expectations, and Output 358

The Role of Expectations about the Future 359 • Back to the Current Period 359

The Open Economy 367

Chapter 17 Openness in Goods and Financial Markets 369

17-1 Openness in Goods Markets 370

Exports and Imports 370 • The Choice between Domestic Goods and Foreign Goods 372 • Nominal Exchange Rates 372 • From Nominal to Real Exchange Rates 374 • From Bilateral to Multilateral Exchange Rates 377

17-2 Openness in Financial Markets 378

The Balance of Payments 379 • The Choice between Domestic and Foreign Assets 381 • Interest Rates and Exchange Rates 383

17-3 Conclusions and a Look Ahead 385

Chapter 18 The Goods Market in an Open Economy 389

18-1 The IS Relation in the Open Economy 390

The Demand for Domestic Goods 390

- The Determinants of C, I, and G 390
- The Determinants of Imports 391
- The Determinants of Exports 391
- Putting the Components Together 391
- 18-2 Equilibrium Output and the Trade Balance 393
- 18-3 Increases in Demand—Domestic or Foreign 394

Increases in Domestic Demand 394

- Increases in Foreign Demand 396
- Fiscal Policy Revisited 397

	18-5 18-6	Depreciation, the Trade Balance, and Output 399 Depreciation and the Trade Balance: The Marshall-Lemer Condition 400 • The Effects of a Real Depreciation 400 • Combining Exchange Rate and Fiscal Policies 401 Looking at Dynamics: The J-Curve 404 Saving, Investment, and the Current Account Balance 406 ndix: Derivation of the Marshall-		Appe Fixed Appe Dome Rates	 20-4 Choosing between Exchange Rate Regimes 442 Common Currency Areas 443 Hard Pegs, Currency Boards, and Dollarization 445 Appendix 1: Deriving the <i>IS</i> Relation und Fixed Exchange Rates 451 Appendix 2: The Real Exchange Rate and Domestic and Foreign Real Interest Rates 451 	
Chapter 19		er Condition 410 out, the Interest Rate, and the	Back to F	Sho	uld Policy Makers Be	
-	Exc	nange Rate 411		Rest	trained? 455	
	19-1	Equilibrium in the Goods Market 412		21-1	Uncertainty and Policy 456 How Much Do Macroeconomists	
	19-2	Equilibrium in Financial Markets 413 Domestic Bonds versus Foreign			Actually Know? 456 • Should Uncertainty Lead Policy Makers to Do Less? 458 • Uncertainty and Restraints on Policy Makers 458	
		Bonds 413		21.2	Expectations and Policy 459	
	19-3	Putting Goods and Financial Markets Together 417		2152	 Hostage Takings and Negotiations 460 Inflation and Unemployment 	
	19-4	The Effects of Policy in an Open Economy 419			Revisited 460 • Establishing Credibility 461 • Time Consistency and Restraints on Policy Makers 463	
		The Effects of Monetary Policy in an Open Economy 419 • The Effects of		21-3	Politics and Policy 463	
19-		Fiscal Policy in an Open Economy 419		2. 3	Games between Policy Makers and	
	19-5	Fixed Exchange Rates 423			Voters 463 • Games between Policy Makers 465 • Politics and Fiscal	
		Pegs, Crawling Pegs, Bands, the			Restraints 468	
		EMS, and the Euro 423 • Monetary Policy when the Exchange Rate Is Fixed 424 • Fiscal Policy when the	Chapter 22		al Policy: A Summing Up 473	
		Exchange Rate Is Fixed 424			What We Have Learned 474	
	-	ndix: Fixed Exchange Rates, Interest . and Capital Mobility 429		22-2	The Government Budget Constraint: Deficits, Debt, Spending, and Taxes 475	
Chapter 20	Excl	nange Rate Regimes 431				
•		The Medium Run 432			The Arithmetic of Deficits and Debt 475 • Current versus Future	
2		The IS Relation under Fixed Exchange Rates 433 • Equilibrium in the Short		22-3	Taxes 477 • The Evolution of the Debt-to-GDP Ratio 479	
		and the Medium Run 433 • The Case for and against a Devaluation 434			Ricardian Equivalence, Cyclical Adjusted Deficits, and War	
	20-2	Exchange Rate Crises under Fixed			Finance 482	
	20-3	Exchange Rates 436 Exchange Rate Movements under Flexible Exchange Rates 439			Ricardian Equivalence 482 • Deficits, Output Stabilization, and the Cyclically Adjusted Deficit 483 • Wars and	
		Exchange Rates and the Current			Deficits 484	
		Account 440 • Exchange Rates and Current and Future Interest Rates 441 • Exchange Rate Volatility 441		22-4	The Dangers of High Debt 486 High Debt, Default Risk, and Vicious Cycles 486 • Debt Default 488 • Money Finance 488	

Chapter 23	Monetary Policy: A Summing Up: 497			24-3	The Rational Expectations Critique 521	
	23-1	What We Have Learned 498			The Three Implications of Rational	
	23-2	From Money Targeting to Inflation Targeting 499 Money Targeting 499 • Inflation Targeting 501 • The Interest Rate		24-4	Expectations 522 • The Integration of Rational Expectations 523	
					Developments in Macroeconomics up to the 2009 Crisis 524	
		Rule 502			New Classical Economics and Real	
	23-3	1			Business Cycle Theory 525 • New Keynesian Economics 525 • New	
		The Costs of Inflation 503 • The Benefits of Inflation 506 • The Optimal Inflation Rate: The State of the Debate 507 Unconventional Monetary Policy 508			Growth Theory 526 • Toward an Integration 527	
			Appendix 1	An í Inco	First Lessons for Macroeconomics after the Crisis 528	
					Introduction to National ome and Product counts A-1	
		Monetary Policy and Financial Stability 510				
		Liquidity Provision and Lender of	Appendix 2	A Math Refresher A-7		
		Last Resort 510 • Macroprudential Tools 510	Appendix 3		ntroduction to nometrics A-12	
Chapter 24	Epilogue: The Story of		Glossary	G-1		
		oeconomics 517	-			
	24-1	Keynes and the Great	Index	[-]		
	24.2	Depression 518 The Napalageical Sumthasis 518	Credits	C-1		
	24-2	The Neoclassical Synthesis 518				
		Progress on All Fronts 519 • Keynesians versus Monetarists 520				

Ţ

2