

MACROECONOMICS

SIXTH EDITION

The Addison-Wesley Series in Economics

Abel/Bernanke/Croushore

Macroeconomics

Bade/Parkin

Foundations of Economics

Bierman/Fernandez

Game Theory with Economic Applications

Binger/Hoffman

Microeconomics with Calculus

Boyer

Principles of Transportation Economics

Branson

Macroeconomic Theory and Policy

Bruce

Public Finance and the American Economy

Byrns/Stone

Economics

Carlton/Perloff

Modern Industrial Organization

Caves/Frankel/Jones

World Trade and Payments: An Introduction

Chapman

Environmental Economics: Theory, Application, and Policy

Cooter/Ulen

Law and Economics

Downs

An Economic Theory of Democracy

Ehrenberg/Smith

Modern Labor Economics

Ekelund/Tollison

Economics

Fusfeld

The Age of the Economist

Gerher

International Economics

Ghiara

Learning Economics

Gordon

Macroeconomics

Gregory

Essentials of Economics

Gregory/Stuart

Russian and Soviet Economic Performance and Structure Hartwick/Olewiler

The Economics of Natural Resource Use

Hoffman/Averett

Women and the Economy: Family, Work, and Pay

Holt

Markets, Games, and Strategic Behavior

Hubbard

Money, the Financial System, and the Economy

Hughes/Cain

American Economic History

Husted/Melvin

International Economics

Jehle/Reny

Advanced Microeconomic Theory

Johnson-Lans

A Health Economics Primer

Klein

Mathematical Methods for Economics

Krugman/Obstfeld

International Economics

Laidler

The Demand for Money

Leeds/von Allmen/Schiming

Economics

Leeds/von Allmen

The Economics of Sports

Lipsey/Courant/Ragan

Economics

Melvin

International Money and Finance

Miller

Economics Today

Miller

Understanding Modern Economics

Miller/Benjamin

The Economics of Macro Issues

Miller/Benjamin/North

The Economics of Public Issues

Mills/Hamilton

Urban Economics

Mishkin

The Economics of Money, Banking, and Financial Markets

Mishkin

The Economics of Money, Banking, and Financial Markets, Alternate Edition

Murray

Econometrics: A Modern Introduction

Parkin

Economics

Perloff

Microeconomics

Perman/Common/McGilvray/Ma

Natural Resources and Environmental Economics

Phelps

Health Economics

Riddell/Shackelford/Stamos/

Schneider

Economics: A Tool for Critically Understanding Society

Ritter/Silber/Udell

Principles of Money, Banking, and Financial Markets

Rohlf

Introduction to Economic Reasoning

Ruffin/Gregory

Principles of Economics

Sargent

Rational Expectations and Inflation

Scherer

Industry Structure, Strategy, and Public Policy

Stock/Watson

Introduction to Econometrics

Studenmund

Using Econometrics

Tietenberg

Environmental and Natural Resource Economics

Tietenherg

Environmental Economics and Policy

Todaro/Smith

Economic Development

Waldman

Microeconomics

Waldman/Jensen

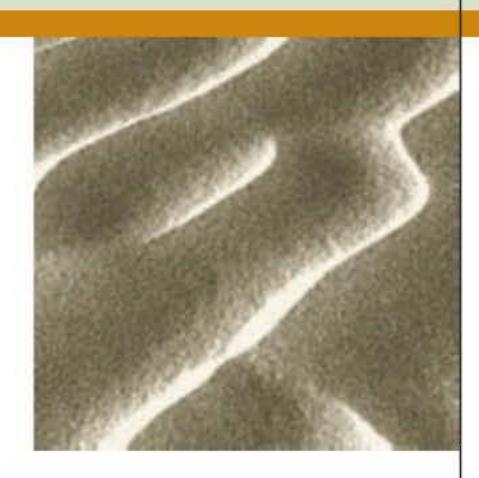
Industrial Organization: Theory and Practice

Weil

Economic Growth

Williamson

Macroeconomics



MACROECONOMICS

SIXTH EDITION

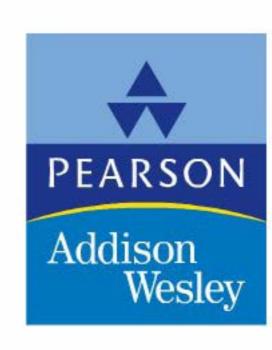
Andrew B. Abel

The Wharton School of the University of Pennsylvania

Ben S. Bernanke

Dean Croushore

Robins School of Business University of Richmond



Boston San Francisco New York

London Toronto Sydney Tokyo Singapore Madrid

Mexico City Munich Paris Cape Town Hong Kong Montreal

Publisher: Greg Tobin
Editor in Chief: Denise Clinton

Senior Acquisitions Editor: Adrienne D'Ambrosio

Director of Development: Kay Ueno Development Editor: Sylvia Mallory **Editorial Assistant:** Meg Beste Managing Editor: Nancy Fenton Senior Production Supervisor: Kathryn Dinovo Senior Design Manager: Chuck Spaulding Supplements Supervisor: Heather McNally Director of Media: Michelle Neil Senior Media Producer: Melissa Honig Content Lead, MyEconLab: Douglas A. Ruby Roxanne Hoch Senior Marketing Manager:

Senior Manufacturing Buyer: Carol Melville Cover Designer: MADA Design, Inc.

Text Design, Art, Composition,

and Production Coordination: Elm Street Publishing Services, Inc.

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book and Addison Wesley was aware of a trademark claim, the designations have been printed in initial caps or all caps.

Library of Congress Cataloging-in-Publication Data

Abel, Andrew B., 1952–

Macroeconomics / Andrew B. Abel, Ben S. Bernanke, Dean Croushore. —6th ed.

p. cm. — (Addison-Wesley series in economics) Includes bibliographical references and indexes. ISBN 0-321-41554-X

1. Macroeconomics. 2. United States—Economic conditions. I. Bernanke, Ben. II. Dean Croushore. III. Title.

HB172.5.A24 2008 339—dc22

2006052451

Copyright © 2008 Pearson Education, Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. Printed in the United States of America. For information on obtaining permission for use of material in this work, please submit a written request to Pearson Education, Inc., Rights and Contracts Department, 75 Arlington Street, Suite 300, Boston, MA 02116, fax your request to 617-848-7047, or e-mail at www.pearsoned.com/legal/permissions.htm.

ISBN 13: 978-0-321-41554-7 ISBN 10: 0-321-41554-X



About the Authors



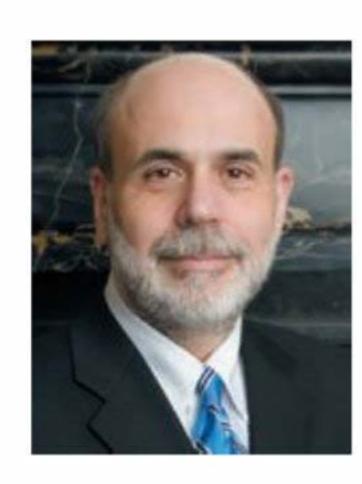
Andrew B. Abel
The Wharton
School of the
University of
Pennsylvania

Ronald A. Rosenfeld Professor of Finance at The Wharton School

and professor of economics at the University of Pennsylvania, Andrew Abel received his A.B. *summa cum laude* from Princeton University and his Ph.D. from the Massachusetts Institute of Technology.

He began his teaching career at the University of Chicago and Harvard University, and has held visiting appointments at both Tel Aviv University and The Hebrew University of Jerusalem.

A prolific researcher, Abel has published extensively on fiscal policy, capital formation, monetary policy, asset pricing, and Social Security—as well as serving on the editorial boards of numerous journals. He has been honored as an Alfred P. Sloan Fellow, a Fellow of the Econometric Society, and a recipient of the John Kenneth Galbraith Award for teaching excellence. Abel has served as a visiting scholar at the Federal Reserve Bank of Philadelphia, as a member of the Panel of Economic Advisers at the Congressional Budget Office, and as a member of the Technical Advisory Panel on Assumptions and Methods for the Social Security Advisory Board. He is also a Research Associate of the National Bureau of Economic Research and a member of the Advisory Board of the Carnegie-Rochester Conference Series.



Ben S. Bernanke

Previously the Howard Harrison and Gabrielle Snyder Beck Pro-

fessor of Economics and Public Affairs at Princeton University, Ben Bernanke received his B.A. in economics from Harvard University summa cum laude—capturing both the Allyn Young Prize for best Harvard undergraduate economics thesis and the John H. Williams prize for outstanding senior in the economics department. Like coauthor Abel, he holds a Ph.D. from the Massachusetts Institute of Technology.

Bernanke began his career at the Stanford Graduate School of Business in 1979. In 1985 he moved to Princeton University, where he served as chair of the Economics Department from 1995 to 2002. He has twice been visiting professor at M.I.T. and once at New York University, and has taught in undergraduate, M.B.A., M.P.A., and Ph.D. programs. He has authored more than 60 publications in macroeconomics, macroeconomic history, and finance.

Bernanke has served as a visiting scholar and advisor to the Federal Reserve System. He is a Guggenheim Fellow and a Fellow of the Econometric Society. He has also been variously honored as an Alfred P. Sloan Research Fellow, a Hoover Institution National Fellow, a National Science Foundation Graduate Fellow, and a Research Associate of the National Bureau of Economic Research. He has served as editor of the American Economic Review. In 2005 he became Chairman of the President's Council of Economic Advisors. He is currently Chairman and a member of the Board of Governors of the Federal Reserve System.



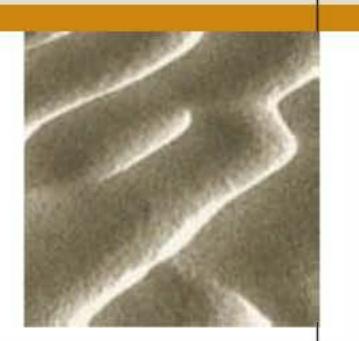
Dean
Croushore
Robins School of
Business, University
of Richmond

Dean Croushore is associate professor of economics and Rigsby Fellow at

the University of Richmond. He received his A.B. from Ohio University and his Ph.D. from Ohio State University.

Croushore began his career at Pennsylvania State University in 1984. After teaching for five years, he moved to the Federal Reserve Bank of Philadelphia, where he was vice president and economist. His duties during his fourteen years at the Philadelphia Fed included heading the macroeconomics section, briefing the bank's president and board of directors on the state of the economy and advising them about formulating monetary policy, writing articles about the economy, administering two national surveys of forecasters, and researching current issues in monetary policy. In his role at the Fed, he created the Survey of Professional Forecasters (taking over the defunct ASA/NBER survey and revitalizing it) and developed the Real-Time Data Set for Macroeconomists.

Croushore returned to academia at the University of Richmond in 2003. The focus of his research in recent years has been on forecasting and on how data revisions affect monetary policy, forecasting, and macroeconomic research. Croushore's publications include articles in many leading economics journals and a textbook on money and banking. He is associate editor of several journals and visiting scholar at the Federal Reserve Bank of Philadelphia.



Brief Contents

Preface xv

DART 1		4.	
PAKI	Introd	uction	1

- 1 Introduction to Macroeconomics 2
- 2 The Measurement and Structure of the National Economy 23

PART 2 Long-Run Economic Performance 61

- 3 Productivity, Output, and Employment 62
- 4 Consumption, Saving, and Investment 110
- 5 Saving and Investment in the Open Economy 173
- 6 Long-Run Economic Growth 212
- 7 The Asset Market, Money, and Prices 247

PART 3 Business Cycles and Macroeconomic Policy 281

- 8 Business Cycles 282
- 9 The *IS–LM/AD–AS* Model: A General Framework for Macroeconomic Analysis 310
- 10 Classical Business Cycle Analysis: Market-Clearing Macroeconomics 360
- 11 Keynesianism: The Macroeconomics of Wage and Price Rigidity 398

PART 4 Macroeconomic Policy: Its Environment and Institutions 443

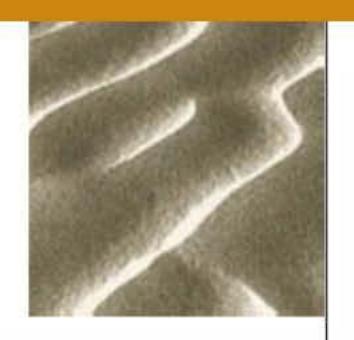
- 12 Unemployment and Inflation 444
- 13 Exchange Rates, Business Cycles, and Macroeconomic Policy in the Open Economy 476
- 14 Monetary Policy and the Federal Reserve System 529
- 15 Government Spending and Its Financing 573

Appendix A: Some Useful Analytical Tools 610

Glossary 617

Name Index 629

Subject Index 631



Detailed Contents

PART 1 Introduction 1

CHAPTER 1

Preface xv

Introduction to Macroeconomics 2

1.1 What Macroeconomics Is About 2

Long-Run Economic Growth 3

Business Cycles 4

Unemployment 5

Inflation 6

The International Economy 8

Macroeconomic Policy 9

Aggregation 10

1.2 What Macroeconomists Do 11

Macroeconomic Forecasting 11

Macroeconomic Analysis 12

Macroeconomic Research 13

BOX 1.1 Developing and Testing an Economic Theory 14

Data Development 14

1.3 Why Macroeconomists Disagree 15

Classicals Versus Keynesians 16

A Unified Approach to Macroeconomics 18

CHAPTER 2

The Measurement and Structure of the National Economy 23

2.1 National Income Accounting: The Measurement of Production, Income, and Expenditure 23

In Touch with the Macroeconomy:

The National Income and Product Accounts 25

Why the Three Approaches Are Equivalent 26

2.2 Gross Domestic Product 27

The Product Approach to Measuring GDP 27

BOX 2.1 Natural Resources, the Environment, and the National Income Accounts 30

The Expenditure Approach to Measuring GDP 31

The Income Approach to Measuring GDP 34

2.3 Saving and Wealth 37

Measures of Aggregate Saving 37

The Uses of Private Saving 39

Relating Saving and Wealth 40

APPLICATION Wealth Versus Saving 42

2.4 Real GDP, Price Indexes, and Inflation 46

Real GDP 46

Price Indexes 48

BOX 2.2 The Computer Revolution and Chain-Weighted GDP 48

BOX 2.3 Does CPI Inflation Overstate Increases in the Cost of Living? 51

2.5 Interest Rates 52

Real Versus Nominal Interest Rates 53

PART 2 Long-Run Economic Performance 61

CHAPTER 3

Productivity, Output, and Employment 62

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

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

The Shape of the Production Function 66
Supply Shocks 71

0 0		D 1		T 1	
マフ	Ihe	Demand	tor	lahor	'/')
J .4	1116	Demand	101	Lavoi	

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

A Change in the Wage 75

The Marginal Product of Labor and the Labor Demand Curve 75

Factors That Shift the Labor Demand Curve 77

Aggregate Labor Demand 79

3.3 The Supply of Labor 79

The Income–Leisure Trade-off 80

Real Wages and Labor Supply 80

The Labor Supply Curve 83

Aggregate Labor Supply 84

APPLICATION Comparing U.S. and European

Labor Markets 85

3.4 Labor Market Equilibrium 87

Full-Employment Output 89

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

APPLICATION Technical Change and Wage Inequality 91

3.5 Unemployment 93

Measuring Unemployment 94

In Touch with the Macroeconomy:

Labor Market Data 95

Changes in Employment Status 95

How Long Are People Unemployed? 96

Why There Always Are Unemployed People 97

3.6 Relating Output and Unemployment: Okun's Law 99

Appendix 3.A The Growth Rate Form of Okun's Law 109

CHAPTER 4

Consumption, Saving, and Investment 110

4.1 Consumption and Saving 111

The Consumption and Saving Decision of an Individual 112

Effect of Changes in Current Income 114

Effect of Changes in Expected Future Income 114

APPLICATION Consumer Sentiment and Forecasts of Consumer Spending 115

Effect of Changes in Wealth 118

Effect of Changes in the Real Interest Rate 119

Fiscal Policy 121

In Touch with the Macroeconomy:

Interest Rates 122

APPLICATION A Ricardian Tax Cut? 125

4.2 Investment 127

The Desired Capital Stock 127

Changes in the Desired Capital Stock 130

APPLICATION Measuring the Effects of Taxes on Investment 134

From the Desired Capital Stock to Investment 135

Investment in Inventories and Housing 137

BOX 4.1 Investment and the Stock Market 138

4.3 Goods Market Equilibrium 139

The Saving–Investment Diagram 140

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

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

CHAPTER 5

Saving and Investment in the Open Economy 173

5.1 Balance of Payments Accounting 174

The Current Account 174

In Touch with the Macroeconomy:

The Balance of Payments Accounts 176

The Capital and Financial Account 177

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

BOX 5.1 Does Mars Have a Current Account Surplus? 181

Net Foreign Assets and the Balance of Payments Accounts 181

APPLICATION The United States as International Debtor 183

5.2	Goods Market Equilib	rium
	in an Open Economy	184

5.3 Saving and Investment in a Small Open Economy 185

The Effects of Economic Shocks in a Small Open Economy 189

5.4 Saving and Investment in Large Open Economies 191

APPLICATION The Impact of Globalization on the U.S. Economy 193

APPLICATION Recent Trends in the U.S. Current Account Deficit 196

5.5 Fiscal Policy and the Current Account 199

The Critical Factor: The Response of National Saving 200

The Government Budget Deficit and National Saving 201

APPLICATION The Twin Deficits 202

CHAPTER 6

Long-Run Economic Growth 212

6.1 The Sources of Economic Growth 213

Growth Accounting 215

APPLICATION The Post-1973 Slowdown in Productivity Growth 217

APPLICATION The Recent Surge in U.S. Productivity Growth 220

6.2 Growth Dynamics: The Solow Model 223

Setup of the Solow Model 224

The Fundamental Determinants of Long-Run Living Standards 231

APPLICATION The Growth of China 236

Endogenous Growth Theory 238

6.3 Government Policies to Raise Long-Run Living Standards 24

Policies to Affect the Saving Rate 240

Policies to Raise the Rate of Productivity Growth 241

CHAPTER 7

The Asset Market, Money, and Prices 247

7.1 What Is Money? 247

BOX 7.1 Money in a Prisoner-of-War Camp 248

The Functions of Money 248

Measuring Money: The Monetary Aggregates 250

In Touch with the Macroeconomy:

The Monetary Aggregates 251

The Money Supply 251

BOX 7.2 Where Have All the Dollars Gone? 252

7.2 Portfolio Allocation and the Demand for Assets 253

Expected Return 254

Risk 254

Liquidity 254

Time to Maturity 255

Asset Demands 256

7.3 The Demand for Money 256

The Price Level 257

Real Income 257

Interest Rates 258

The Money Demand Function 259

Other Factors Affecting Money Demand 260

Elasticities of Money Demand 261

Velocity and the Quantity Theory of Money 262

APPLICATION Financial Regulation, Innovation, and the Instability of Money Demand 264

7.4 Asset Market Equilibrium 266

Asset Market Equilibrium: An Aggregation Assumption 266

The Asset Market Equilibrium Condition 268

7.5 Money Growth and Inflation 269

APPLICATION Money Growth and Inflation in European Countries in Transition 270

The Expected Inflation Rate and the Nominal Interest Rate 272

APPLICATION Measuring Inflation Expectations 273

PART 3 Business Cycles and Macroeconomic Policy 281

CHAPTER 8

Business Cycles 282

- 8.1 What Is a Business Cycle? 283
- 8.2 The American Business Cycle: The Historical Record 285

The Pre-World War I Period 285

The Great Depression and World War II 285

Post-World War II U.S. Business Cycles 287

The "Long Boom" 288

Have American Business Cycles Become Less Severe? 288

8.3 Business Cycle Facts 290

The Cyclical Behavior of Economic Variables: Direction and Timing 290

Production 291

In Touch with the Macroeconomy:

Leading Indicators 292

Expenditure 294

Employment and Unemployment 295

Average Labor Productivity and the

Real Wage 297

Money Growth and Inflation 298

Financial Variables 299

International Aspects of the Business Cycle 300

8.4 Business Cycle Analysis: A Preview 301

BOX 8.1 The Seasonal Cycle and the Business Cycle 301

Aggregate Demand and Aggregate Supply: A Brief Introduction 302

CHAPTER 9

The *IS-LM/AD-AS* Model: A General Framework for Macroeconomic Analysis 310

9.1 The FE Line: Equilibrium in the Labor Market 311

Factors That Shift the FE Line 312

9.2 The IS Curve: Equilibrium in the Goods Market 313

Factors That Shift the IS Curve 315

9.3 The LM Curve: Asset Market Equilibrium 317

The Interest Rate and the Price of a Nonmonetary Asset 318

The Equality of Money Demanded and Money Supplied 318

Factors That Shift the LM Curve 321

9.4 General Equilibrium in the Complete *IS–LM* Model 325

Applying the *IS–LM* Framework: A Temporary Adverse Supply Shock 326

APPLICATION Oil Price Shocks Revisited 328

BOX 9.1 Econometric Models and Macroeconomic Forecasts for Monetary Policy Analysis 329

9.5 Price Adjustment and the Attainment of General Equilibrium 330

The Effects of a Monetary Expansion 330 Classical Versus Keynesian Versions of the *IS–LM* Model 334

9.6 Aggregate Demand and Aggregate Supply 336

The Aggregate Demand Curve 336

The Aggregate Supply Curve 338

Equilibrium in the *AD–AS* Model 341

Monetary Neutrality in the *AD–AS* Model 341

Appendix 9.A Worked-Out Numerical Exercise for Solving the *IS-LM/AD-AS* Model 351

Appendix 9.B Algebraic Versions of the *IS–LM* and *AD–AS* Models 353