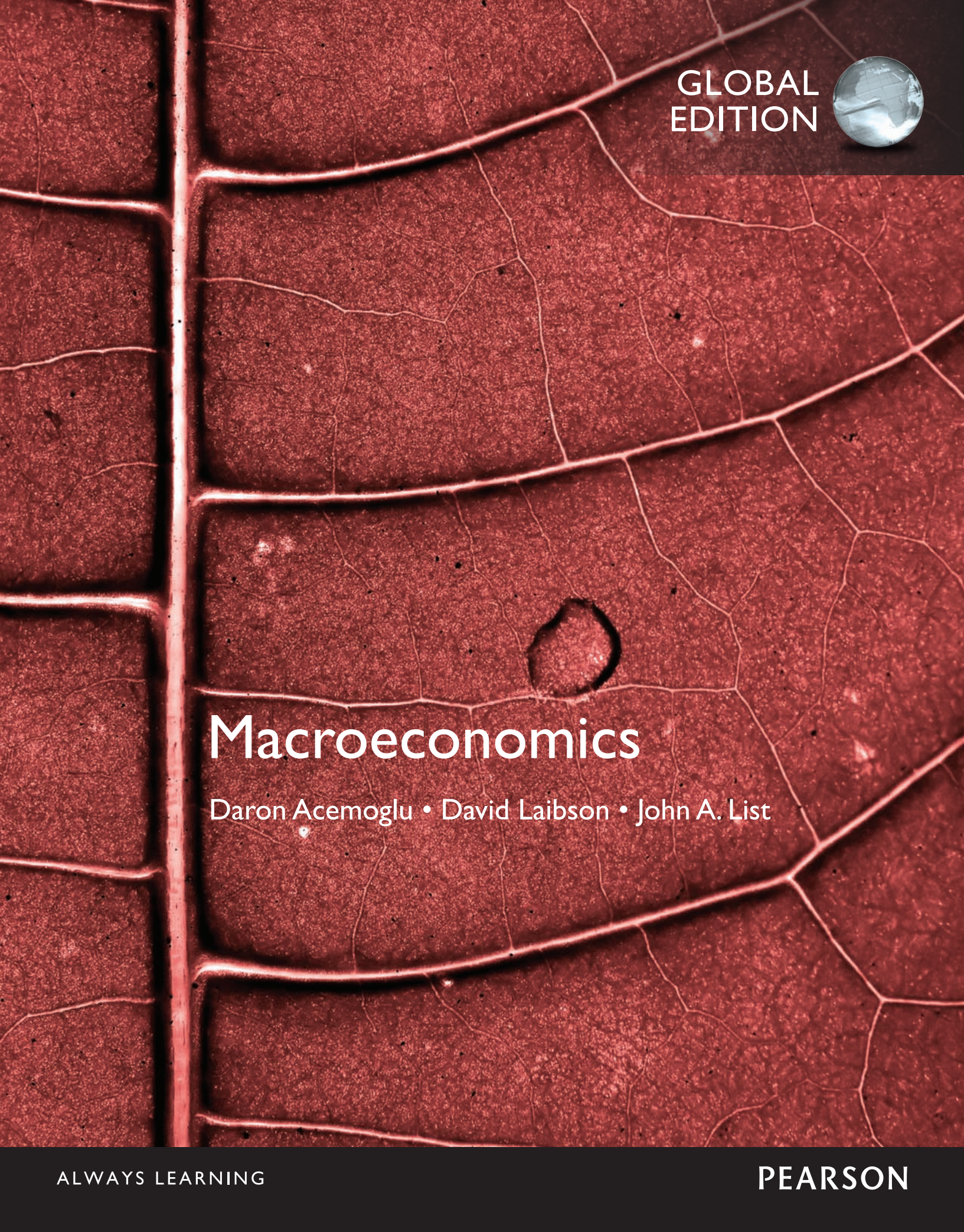
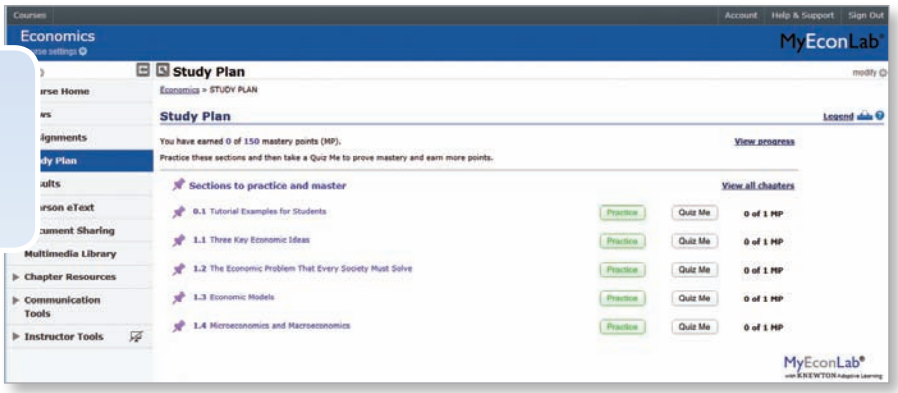

GLOBAL
EDITION
Macroeconomics
Daron Acemoglu • David Laibson • John A. List
ALWAYS LEARNING
PEARSON

MyEconLab® Provides the Power of Practice

Optimize your study time with **MyEconLab's** tutorial and assessment solution that personalizes the learning experience, giving students the practice and immediate feedback they need.

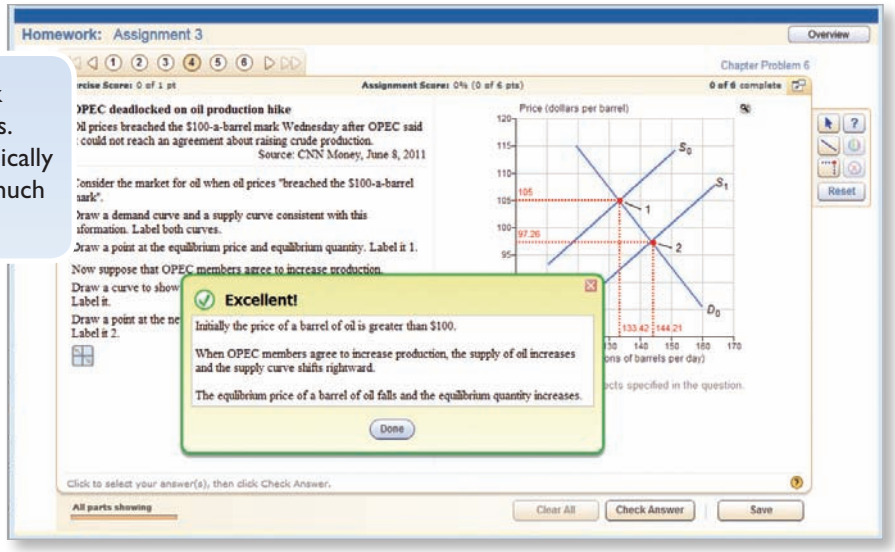
Study Plan

The Study Plan shows you the sections you should study next, gives easy access to practice problems, and provides you with an automatically generated quiz to prove mastery of the course material.



Unlimited Practice

As you work each exercise, instant feedback helps you understand and apply the concepts. Many Study Plan exercises contain algorithmically generated values to ensure that you get as much practice as you need.



Learning Resources

Study Plan problems link to learning resources that further reinforce concepts you need to master.

- **Help Me Solve This** learning aids help you break down a problem much the same way an instructor would do during office hours. Help Me Solve This is available for select problems.
- **eText links** are specific to the problem at hand so that related concepts are easy to review just when they are needed.
- A **graphing tool** enables you to build and manipulate graphs to better understand how concepts, numbers, and graphs connect.

MyEconLab®

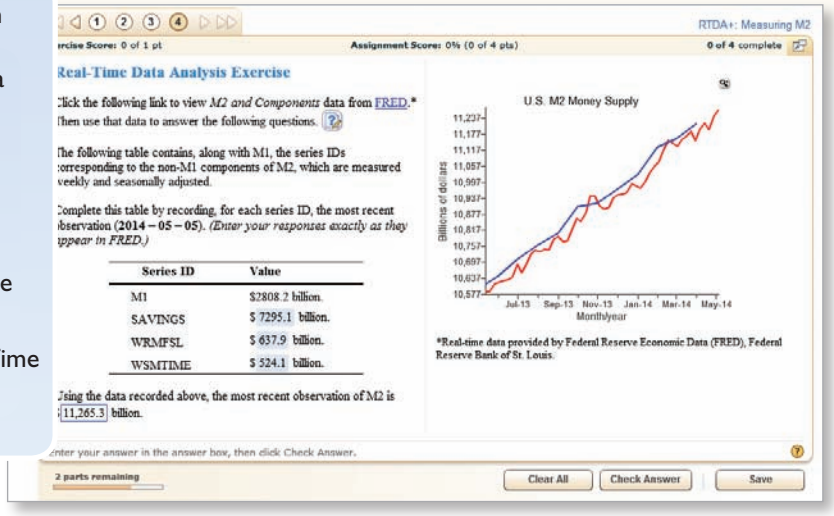
Find out more at www.myeconlab.com

Real-Time Data Analysis Exercises

Up-to-date macro data is a great way to engage in and understand the usefulness of macro variables and their impact on the economy. Real-Time Data Analysis exercises communicate directly with the Federal Reserve Bank of St. Louis's FRED® site, so every time FRED posts new data, students see new data.

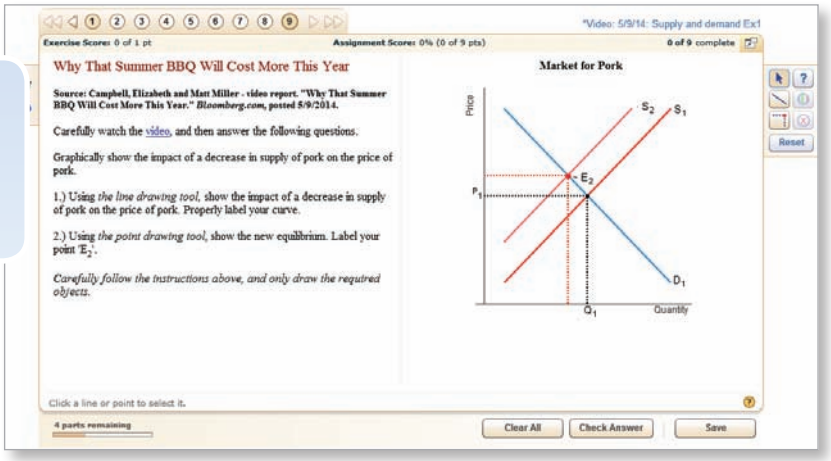
End-of-chapter exercises accompanied by the Real-Time Data Analysis icon include Real-Time Data versions in **MyEconLab**.

Select in-text exhibits labeled **MyEconLab** Real-Time Data update in the electronic version of the text using FRED data.



Current News Exercises

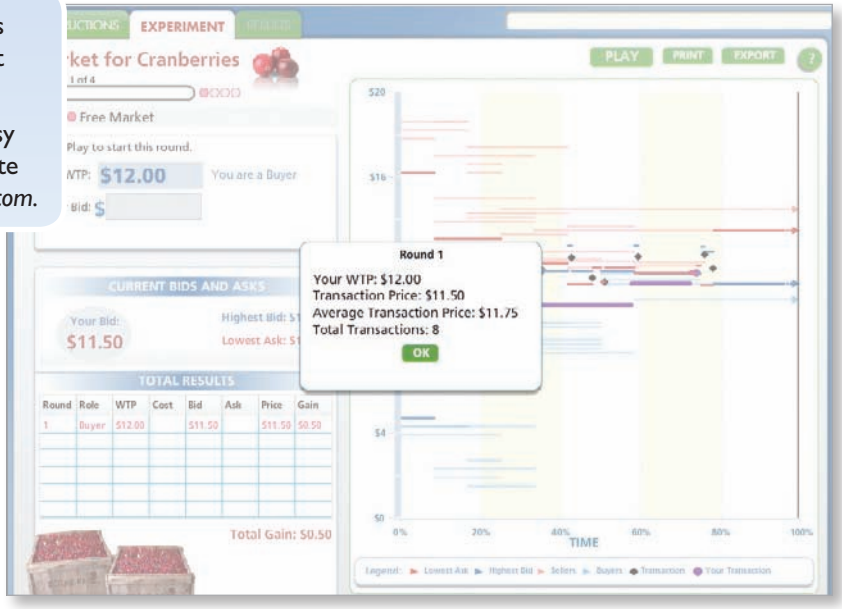
Posted weekly, we find the latest microeconomic and macroeconomic news stories, post them, and write auto-graded multi-part exercises that illustrate the economic way of thinking about the news.



Interactive Homework Exercises

Participate in a fun and engaging activity that helps promote active learning and mastery of important economic concepts.

Pearson's experiments program is flexible and easy for instructors and students to use. For a complete list of available experiments, visit *www.myeconlab.com*.



The Pearson Series in Economics

Abel/Bernanke/Croushore
*Macroeconomics**

Acemoglu/Laibson/List
*Economics**

Bade/Parkin
*Foundations of Economics**

Berck/Helfand
The Economics of the Environment

Bierman/Fernandez
Game Theory with Economic Applications

Blanchard
*Macroeconomics**

Blau/Ferber/Winkler
The Economics of Women, Men, and Work

Boardman/Greenberg/Vining/Weimer
Cost-Benefit Analysis

Boyer
Principles of Transportation Economics

Branson
Macroeconomic Theory and Policy

Bruce
Public Finance and the American Economy

Carlton/Perloff
Modern Industrial Organization

Case/Fair/Oster
*Principles of Economics**

Chapman
Environmental Economics: Theory, Application, and Policy

Cooter/Ulen
Law & Economics

Daniels/VanHoose
International Monetary & Financial Economics

Downs
An Economic Theory of Democracy

Ehrenberg/Smith
Modern Labor Economics

Farnham
Economics for Managers

Folland/Goodman/Stano
The Economics of Health and Health Care

Fort
Sports Economics

Froyen
Macroeconomics

Fusfeld
The Age of the Economist

Gerber
*International Economics**

González-Rivera
Forecasting for Economics and Business

Gordon
*Macroeconomics**

Greene
Econometric Analysis

Gregory
Essentials of Economics

Gregory/Stuart
Russian and Soviet Economic Performance and Structure

Hartwick/Olewiler
The Economics of Natural Resource Use

Heilbroner/Milberg
The Making of the Economic Society

Heyne/Boettke/Prychitko
The Economic Way of Thinking

Holt
Markets, Games, and Strategic Behavior

Hubbard/O'Brien
*Economics**

*Money, Banking, and the Financial System**

Hubbard/O'Brien/Rafferty
*Macroeconomics**

Hughes/Cain
American Economic History

Husted/Melvin
International Economics

Jehle/Reny
Advanced Microeconomic Theory

Johnson-Lans
A Health Economics Primer

Keat/Young/Erfle
Managerial Economics

Klein
Mathematical Methods for Economics

Krugman/Obstfeld/Melitz
*International Economics: Theory & Policy**

Laidler
The Demand for Money

Leeds/von Allmen
The Economics of Sports

Leeds/von Allmen/Schiming
*Economics**

Lynn
Economic Development: Theory and Practice for a Divided World

Miller
*Economics Today**

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**

*The Economics of Money, Banking, and Financial Markets, Business School Edition**

*Macroeconomics: Policy and Practice**

Murray
Econometrics: A Modern Introduction

O'Sullivan/Sheffrin/Perez
*Economics: Principles, Applications and Tools**

Parkin
*Economics**

Perloff
*Microeconomics**

*Microeconomics: Theory and Applications with Calculus**

Perloff/Brander
*Managerial Economics and Strategy**

Phelps
Health Economics

Pindyck/Rubinfeld
*Microeconomics**

Riddell/Shackelford/Stamos/Schneider
Economics: A Tool for Critically Understanding Society

Roberts
The Choice: A Fable of Free Trade and Protection

Rohlf
Introduction to Economic Reasoning

Roland
Development Economics

Scherer
Industry Structure, Strategy, and Public Policy

Schiller
The Economics of Poverty and Discrimination

Sherman
Market Regulation

Stock/Watson
Introduction to Econometrics

Studenmund
Using Econometrics: A Practical Guide

Tietenberg/Lewis
Environmental and Natural Resource Economics
Environmental Economics and Policy

Todaro/Smith
Economic Development

Waldman/Jensen
Industrial Organization: Theory and Practice

Walters/Walters/Appel/Callahan/Centanni/Maex/O'Neill
Econversations: Today's Students Discuss Today's Issues

Weil
Economic Growth

Williamson
Macroeconomics

*denotes MyEconLab titles Visit www.myeconlab.com to learn more.

GLOBAL EDITION

MACROECONOMICS

Daron Acemoglu
Massachusetts Institute of Technology

David Laibson
Harvard University

John A. List
University of Chicago

PEARSON

Boston Columbus Indianapolis New York San Francisco Hoboken
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
Executive Acquisitions Editor: Adrienne D'Ambrosio
Executive Development Editor: Mary Clare McEwing
Editorial Assistant: Courtney Turcotte
Senior Acquisitions Editor, Global Editions: Steven Jackson
Project Editor, Global Editions: Suchismita Ukil
Vice President, Product Marketing: Maggie Moylan
Director of Marketing, Digital Services and Products: Jeanette Koskinas
Senior Product Marketing Manager: Alison Haskins
Executive Field Marketing Manager: Lori DeShazo
Senior Strategic Marketing Manager: Erin Gardner
Product Testing and Learning Validation: Kathleen McLellan
Team Lead, Program Management: Ashley Santora
Program Manager: Nancy Freihofer
Team Lead, Project Management: Jeff Holcomb
Project Manager: Sarah Dumouchelle
Media Production Manager, Global Editions: M. Vikram Kumar
Senior Production Controller, Global Editions: Trudy Kimber
Supplements Project Manager: Andra Skaalrud
Operations Specialist: Carol Melville
Creative Director: Blair Brown
Art Director: Jon 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 Manager: Melissa Honig
Digital Content Team Lead: Noel Lotz
Digital Content Project Lead: Courtney Kamauf
Full-Service Project Management and Composition: S4Carlisle Publishing Services
Interior Designer: Jonathan Boylan
Cover Designer: Lumina Datamatics Pvt. Ltd.

Acknowledgments of third-party content appear on the appropriate page within the text and on pp. 411–412, which constitutes an extension of this copyright page.

Pearson Education Limited
Edinburgh Gate
Harlow
Essex CM20 2JE
England

and Associated Companies throughout the world

Visit us on the World Wide Web at: www.pearsonglobaleditions.com

© Pearson Education Limited 2016

The rights of Daron Acemoglu, David Laibson, and John A. List to be identified as the authors of this work have been asserted by them in accordance with the Copyright, Designs and Patents Act 1988.

Authorized adaptation from the United States edition, entitled Macroeconomics, 1st edition, ISBN 978-0-321-38395-2, by Daron Acemoglu, David Laibson, and John A. List, published by Pearson Education, Inc. © 2015.

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 either the prior written permission of the publisher or a license permitting restricted copying in the United Kingdom issued by the Copyright Licensing Agency Ltd, Saffron House, 6–10 Kirby Street, London EC1N 8TS.

All trademarks used herein are the property of their respective owners. The use of any trademark in this text does not vest in the author or publisher any trademark ownership rights in such trademarks, nor does the use of such trademarks imply any affiliation with or endorsement of this book by such owners.

ISBN 10: 1-292-08063-9
ISBN 13: 978-1-292-08063-5

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

10 9 8 7 6 5 4 3 2 1
14 13 12 11

Typeset in by S4Carlisle Publishing Services

Printed and bound by CPI Digital in the United Kingdom

Dedication

With love for Asu, Nina, and Jennifer,
who inspire us every day.

About the Authors

Daron Acemoglu is Elizabeth and James Killian Professor of Economics in the Department of Economics at the Massachusetts Institute of Technology. He has received a B.A. in economics at the University of York, 1989; M.Sc. in mathematical economics and econometrics at the London School of Economics, 1990; and Ph.D. in economics at the London School of Economics in 1992.

He is an elected fellow of the National Academy of Sciences, the American Academy of Arts and Sciences, the Econometric Society, the European Economic Association, and the Society of Labor Economists. He has received numerous awards and fellowships, including the inaugural T. W. Shultz Prize from the University of Chicago in 2004, the inaugural Sherwin Rosen Award for outstanding contribution to labor economics in 2004, Distinguished Science Award from the Turkish Sciences Association in 2006, and the John von Neumann Award, Rajk College, Budapest in 2007.

He was also the recipient of the John Bates Clark Medal in 2005, awarded every two years to the best economist in the United States under the age of 40 by the American Economic Association, and the Erwin Plein Nemmers prize awarded every two years for work of lasting significance in economics. He holds Honorary Doctorates from the University of Utrecht and Bosporus University.

His research interests include political economy, economic development and growth, human capital theory, growth theory, innovation, search theory, network economics, and learning.

His books include *Economic Origins of Dictatorship and Democracy* (jointly with James A. Robinson), which was awarded the Woodrow Wilson and the William Riker prizes, *Introduction to Modern Economic Growth*, and *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (jointly with James A. Robinson), which has become a *New York Times* bestseller.

David Laibson is the Robert I. Goldman Professor of Economics at Harvard University. He is also a member of the National Bureau of Economic Research, where he is Research Associate in the Asset Pricing, Economic Fluctuations, and Aging Working Groups. His research focuses on the topic of behavioral economics, and he leads Harvard University's Foundations of Human Behavior Initiative. He serves on several editorial boards, as well as the boards of the Health and Retirement Study (National Institutes of Health) and the Pension Research Council (Wharton). He serves on Harvard's Pension Investment Committee and on the Academic Research Council of the Consumer Financial Protection Bureau. He is a recipient of a Marshall Scholarship and a Fellow of the Econometric Society and the American Academy of Arts and Sciences. He is also a recipient of the TIAA-CREF Paul A. Samuelson Award for Outstanding Scholarly Writing on Lifelong Financial Security. Laibson holds degrees from Harvard University (A.B. in Economics, Summa), the London School of Economics (M.Sc. in Econometrics and Mathematical Economics), and the Massachusetts Institute of Technology (Ph.D. in Economics). He received his Ph.D. in 1994 and has taught at Harvard since then. In recognition of his teaching, he has been awarded Harvard's Phi Beta Kappa Prize and a Harvard College Professorship.

John A. List is the Homer J. Livingston Professor in Economics at the University of Chicago, and Chairman of the Department of Economics. List received the Kenneth Galbraith Award, Agricultural and Applied Economics Association, 2010. He is a Member of the American Academy of Arts and Sciences, 2011; Editor, *Journal of Economic Perspectives*; Associate Editor, *American Economic Review*; and Associate Editor, *Journal of Economic Literature*. His research focuses on questions in microeconomics, with a particular emphasis on the use of experimental methods to address both positive and normative issues. Much of his time has been spent developing experimental methods in the field to explore economic aspects of environmental regulations, incentives, preferences, values, and institutions. Recently, he has focused on issues related to the economics of charity, exploring why people give, plus optimal incentive schemes for first-time as well as warm-list donors.

Brief Contents

PART I **Introduction to Economics 34**

Chapter 1 The Principles and Practice of Economics 34

Chapter 2 Economic Methods and Economic Questions 50

Chapter 3 Optimization: Doing the Best You Can 74

Chapter 4 Demand, Supply, and Equilibrium 92

PART II **Introduction to Macroeconomics 118**

Chapter 5 The Wealth of Nations: Defining and Measuring Macroeconomic Aggregates 118

Chapter 6 Aggregate Incomes 146

PART III **Long-Run Growth and Development 170**

Chapter 7 Economic Growth 170

Chapter 8 Why Isn't the Whole World Developed? 204

PART IV **Equilibrium in the Macroeconomy 228**

Chapter 9 Employment and Unemployment 228

Chapter 10 Credit Markets 252

Chapter 11 The Monetary System 274

PART V **Short-Run Fluctuations and Macroeconomic Policy 300**

Chapter 12 Short-Run Fluctuations 300

Chapter 13 Countercyclical Macroeconomic Policy 330

PART VI **Macroeconomics in a Global Economy 356**

Chapter 14 Macroeconomics and International Trade 356

Chapter 15 Open Economy Macroeconomics 378

Contents

PART I **INTRODUCTION TO ECONOMICS** 34

Chapter 1: The Principles and Practice of Economics 34

1.1 The Scope of Economics 35
Economic Agents and Economic Resources 35
Definition of Economics 36
Positive Economics and Normative Economics 37
Microeconomics and Macroeconomics 38
1.2 Three Principles of Economics 38
1.3 The First Principle of Economics: Optimization 39
Trade-offs and Budget Constraints 40
Opportunity Cost 40
Cost-Benefit Analysis 41
Evidence-Based Economics: Is Facebook free? 42
1.4 The Second Principle of Economics: Equilibrium 45
The Free-Rider Problem 46
1.5 The Third Principle of Economics: Empiricism 46
1.6 Is Economics Good for You? 47
Summary 48
Key Terms 48
Questions 49
Problems 49

Chapter 2: Economic Methods and Economic Questions 52

2.1 The Scientific Method 53
Models and Data 53
An Economic Model 55
Evidence-Based Economics: How much more do workers with a college education earn? 56
Means 57
Argument by Anecdote 57
2.2 Causation and Correlation 58
The Red Ad Campaign Blues 58
Causation versus Correlation 59
Experimental Economics and Natural Experiments 60
Evidence-Based Economics: How much do wages increase when an individual is compelled by law to get an extra year of schooling? 61
2.3 Economic Questions and Answers 62
Summary 63
Key Terms 63
Questions 64
Problems 64
Appendix: Constructing and Interpreting Graphs 66
A Study About Incentives 66
Experimental Design 66
Describing Variables 67
Cause and Effect 69
Appendix Key Terms 72
Appendix Problems 73

Chapter 3: Optimization: Doing the Best You Can 74

3.1 Two Kinds of Optimization: A Matter of Focus 75
Choice & Consequence: Do People Really Optimize? 77
3.2 Optimization in Levels 78
Comparative Statics 80
3.3 Optimization in Differences: Marginal Analysis 82
Marginal Cost 82
Evidence-Based Economics: How does location affect the rental cost of housing? 85
Summary 88
Key Terms 88
Questions 89
Problems 89

Chapter 4: Demand, Supply, and Equilibrium 92

4.1 Markets 93
Competitive Markets 94
4.2 How Do Buyers Behave? 95
Demand Curves 96
Willingness to Pay 96
From Individual Demand Curves to Aggregated Demand Curves 97
Building the Market Demand Curve 98
Shifting the Demand Curve 99

Evidence-Based Economics: How much more gasoline would people buy if its price were lower? 101
4.3 How Do Sellers Behave? 103
Supply Curves 103
Willingness to Accept 104
From the Individual Supply Curve to the Market Supply Curve 104
Shifting the Supply Curve 104
4.4 Supply and Demand in Equilibrium 107
Curve Shifting in Competitive Equilibrium 109
4.5 What Would Happen If the Government Tried to Dictate the Price of Gasoline? 111
Choice & Consequence: The Unintended Consequences of Fixing Market Prices 113
Summary 114
Key Terms 115
Questions 115
Problems 116

PART II INTRODUCTION TO MACROECONOMICS 118

Chapter 5: The Wealth of Nations: Defining and Measuring Macroeconomic Aggregates 118

5.1 Macroeconomic Questions 119
5.2 National Income Accounts: Production = Expenditure = Income 121
Production 121
Expenditure 122
Income 122
Circular Flows 123
National Income Accounts: Production 124
National Income Accounts: Expenditure 126
Evidence-Based Economics: In the United States, what is the total market value of annual economic production? 128
National Income Accounting: Income 130
Letting the Data Speak: Saving vs. Investment 130
5.3 What Isn't Measured by GDP? 131
Physical Capital Depreciation 132
Home Production 132
The Underground Economy 133
Negative Externalities 133
Gross Domestic Product vs. Gross National Product 134
Leisure 135
Does GDP Buy Happiness? 135
5.4 Real vs. Nominal 136
The GDP Deflator 138
The Consumer Price Index 140
Inflation 141
Adjusting Nominal Variables 141
Summary 142
Key Terms 143
Questions 143
Problems 143

Chapter 6: Aggregate Incomes 146

6.1 Inequality Around the World 147
Measuring Differences in Income per Capita 147
Letting the Data Speak: The Big Mac Index 149
Inequality in Income per Capita 149
Income per Worker 150
Productivity 151
Incomes and the Standard of Living 152
Choice & Consequence: Dangers of Just Focusing on Income per Capita 152
6.2 Productivity and the Aggregate Production Function 154
Productivity Differences 154
The Aggregate Production Function 155
Labor 155
Physical Capital and Land 156
Representing the Aggregate Production Function 156
6.3 The Role and Determinants of Technology 158
Technology 158
Dimensions of Technology 158
Letting the Data Speak: Moore's Law 159
Letting the Data Speak: Efficiency of Production and Productivity at the Company Level 160
Entrepreneurship 161
Letting the Data Speak: Monopoly and GDP 161
Evidence-Based Economics: Why is the average American so much richer than the average Indian? 162
Summary 164
Key Terms 164
Questions 165
Problems 165
Appendix: The Mathematics of Aggregate Production Functions 168

PART III LONG-RUN GROWTH AND DEVELOPMENT 170

Chapter 7: Economic Growth 170

7.1 The Power of Economic Growth 171
A First Look at U.S. Growth 172
Exponential Growth 172
Choice & Consequence: The Power of Growth 174

Patterns of Growth 175
Letting the Data Speak: Levels versus Growth 177
7.2 How Does a Nation's Economy Grow? 179
Optimization: The Choice Between Saving and Consumption 180
What Brings Sustained Growth? 180
Choice & Consequence: Is Increasing the Saving Rate Always a Good Idea? 181
Knowledge, Technological Change, and Growth 181
Evidence-Based Economics: Why are you so much more prosperous than your great-great-grandparents were? 183
7.3 The History of Growth and Technology 185
Growth Before Modern Times 185
Malthusian Limits to Growth 186
The Industrial Revolution 187
Growth and Technology Since the Industrial Revolution 187
7.4 Growth, Inequality, and Poverty 187
Growth and Inequality 187
Letting the Data Speak: Income Inequality in the United States 188
Choice & Consequence: Inequality versus Poverty 189
Growth and Poverty 189
How Can We Reduce Poverty? 190
Letting the Data Speak: Life Expectancy and Innovation 191
Summary *192*
Key Terms *192*
Questions *192*
Problems *193*
Appendix: The Solow Growth Model 195
Appendix Key Terms *203*
Appendix Problems *203*

Chapter 8: Why Isn't the Whole World Developed? 204

8.1 Proximate Versus Fundamental Causes of Prosperity 205
Geography 206
Culture 207
Institutions 207
A Natural Experiment of History 208
8.2 Institutions and Economic Development 210
Inclusive and Extractive Economic Institutions 210
How Economic Institutions Affect Economic Outcomes 211
Letting the Data Speak: Divergence and Convergence in Eastern Europe 212
The Logic of Extractive Economic Institutions 215
Inclusive Economic Institutions and the Industrial Revolution 216
Letting the Data Speak: Blocking the Railways 216
Evidence-Based Economics: Are tropical and semitropical areas condemned to poverty by their geographies? 217
8.3 Is Foreign Aid the Solution to World Poverty? 222
Choice & Consequence: Foreign Aid and Corruption 223
Summary *224*
Key Terms *225*
Questions *225*
Problems *225*

PART IV **Equilibrium in the Macroeconomy 228**

Chapter 9: Employment and Unemployment 228

9.1 Measuring Employment and Unemployment 229
Classifying Potential Workers 229
Calculating the Unemployment Rate 230
Trends in the Unemployment Rate 231
Who Is Unemployed? 232
9.2 Equilibrium in the Labor Market 233
The Demand for Labor 233
Shifts in the Labor Demand Curve 234
The Supply of Labor 236
Shifts in the Labor Supply Curve 236
Equilibrium in a Competitive Labor Market 237
9.3 Why Is There Unemployment? 238
9.4 Job Search and Frictional Unemployment 238
9.5 Wage Rigidity and Structural Unemployment 239
Minimum Wage Laws 239
Choice & Consequence: The Luddites 240
Labor Unions and Collective Bargaining 241
Efficiency Wages and Unemployment 242
Downward Wage Rigidity and Unemployment Fluctuations 242
The Natural Rate of Unemployment and Cyclical Unemployment 243
Evidence-Based Economics: What happens to employment and unemployment if local employers go out of business? 245
Summary *246*
Key Terms *247*
Questions *248*
Problems *248*

Chapter 10: Credit Markets 252

10.1 What Is the Credit Market? 253
Borrowers and the Demand for Loans 253
Real and Nominal Interest Rates 254
The Credit Demand Curve 255
Saving Decisions 256
The Credit Supply Curve 257
Choice & Consequence: Why Do People Save? 258
Equilibrium in the Credit Market 259
Credit Markets and the Efficient Allocation of Resources 261

10.2 Banks and Financial Intermediation: Putting Supply and Demand Together 261
Assets and Liabilities on the Balance Sheet of a Bank 262

10.3 What Banks Do 264
Identifying Profitable Lending Opportunities 264
Maturity Transformation 264
Management of Risk 265
Bank Runs 266
Bank Regulation and Bank Solvency 267
Evidence-Based Economics: How often do banks fail? 268
Choice & Consequence: Too Big to Fail 269
Choice & Consequence: Asset Price Fluctuations and Bank Failures 270
Summary 270
Key Terms 271
Questions 271
Problems 272

Chapter 11: The Monetary System 274

11.1 Money 275
The Functions of Money 275
Types of Money 276
The Money Supply 276
Choice & Consequence: Non-Convertible Currencies in U.S. History 277

11.2 Money, Prices, and GDP 278
Nominal GDP, Real GDP, and Inflation 278
The Quantity Theory of Money 279

11.3 Inflation 280
What Causes Inflation? 280
The Consequences of Inflation 280
The Social Costs of Inflation 281
The Social Benefits of Inflation 282
Evidence-Based Economics: What caused the German hyperinflation of 1922–1923? 283

11.4 The Federal Reserve 285
The Central Bank and the Objectives of Monetary Policy 285
What Does the Central Bank Do? 286
Bank Reserves 286
The Demand Side of the Federal Funds Market 288
The Supply Side of the Federal Funds Market and Equilibrium in the Federal Funds Market 289
The Fed's Influence on the Money Supply and the Inflation Rate 292
Choice & Consequence: Obtaining Reserves Outside the Federal Funds Market 293
The Relationship Between the Federal Funds Rate and the Long-Term Real Interest Rate 294
Choice & Consequence: Two Models of Inflation Expectations 295
Summary 297
Key Terms 297
Questions 298
Problems 298

PART V Short-Run Fluctuations and Macroeconomic Policy 300

Chapter 12: Short-Run Fluctuations 300

12.1 Economic Fluctuations and Business Cycles 301
Patterns of Economic Fluctuations 303
The Great Depression 305

12.2 Macroeconomic Equilibrium and Economic Fluctuations 307
Labor Demand and Fluctuations 307
Sources of Fluctuations 309
Letting the Data Speak: Unemployment and the Growth Rate of Real GDP: Okun's Law 310
Multipliers and Economic Fluctuations 313
Equilibrium in the Short Run, with Multipliers and Downward Wage Rigidity 315
Equilibrium in the Medium Run: Partial Recovery and Full Recovery 316

12.3 Modeling Expansions 320
Evidence-Based Economics: What caused the recession of 2007–2009? 321
Summary 326
Key Terms 327
Questions 327
Problems 328

Chapter 13: Countercyclical Macroeconomic Policy 330

13.1 The Role of Countercyclical Policies in Economic Fluctuations 331
13.2 Countercyclical Monetary Policy 333
Controlling the Federal Funds Rate 334
Other Tools of the Fed 336
Expectations, Inflation, and Monetary Policy 337
Letting the Data Speak: Managing Expectations 338
Contractionary Monetary Policy: Control of Inflation 338
Zero Lower Bound 340
Choice & Consequence: Policy Mistakes 340
Policy Trade-offs 341
13.3 Countercyclical Fiscal Policy 342
Fiscal Policy Over the Business Cycle: Automatic and Discretionary Components 342
Analysis of Expenditure-Based Fiscal Policy 344
Analysis of Taxation-Based Fiscal Policy 346
Fiscal Policies that Directly Target the Labor Market 347
Policy Waste and Policy Lags 348
Evidence-Based Economics: How much does government expenditure stimulate GDP? 349
13.4 Policies That Blur the Line Between Fiscal and Monetary Policy 351
Summary 352
Key Terms 352
Questions 353
Problems 353

PART VI MACROECONOMICS IN A GLOBAL ECONOMY 356

Chapter 14: Macroeconomics and International Trade 356

14.1 Why and How We Trade 357
Absolute Advantage and Comparative Advantage 357
Comparative Advantage and International Trade 360
Efficiency and Winners and Losers from Trade 361
How We Trade 362
Trade Barriers: Tariffs 363
Letting the Data Speak: Living in an Interconnected World 364
Choice & Consequence: Tariffs and Votes 365
14.2 The Current Account and the Financial Account 365
Trade Surpluses and Trade Deficits 365
International Financial Flows 366
The Workings of the Current Account and the Financial Account 367
14.3 International Trade, Technology Transfer, and Economic Growth 369
Letting the Data Speak: From IBM to LenoVo 371
Evidence-Based Economics: Are companies like Nike harming workers in Vietnam? 372
Summary 374
Key Terms 375
Questions 375
Problems 375

Chapter 15: Open Economy Macroeconomics 378

15.1 Exchange Rates 379
Nominal Exchange Rates 379
Flexible, Managed, and Fixed Exchange Rates 380
15.2 The Foreign Exchange Market 381
How Do Governments Intervene in the Foreign Exchange Market? 384
Defending an Overvalued Exchange Rate 385
Choice & Consequence: Fixed Exchange Rates and Corruption 387
Evidence-Based Economics: How did George Soros make $1 billion? 387
15.3 The Real Exchange Rate and Exports 389
From the Nominal to the Real Exchange Rate 389
Co-Movement Between the Nominal and the Real Exchange Rates 390
The Real Exchange Rate and Net Exports 391
15.4 GDP in the Open Economy 392
Letting the Data Speak: Why Have Chinese Authorities Kept the Yuan Undervalued? 393
Interest Rates, Exchange Rates, and Net Exports 394
Revisiting Black Wednesday 394
Letting the Data Speak: The Costs of Fixed Exchange Rates 395
Summary 396
Key Terms 397
Questions 397
Problems 398

Endnotes 401
Glossary 403
Credits 411
Index 413

CHAPTERS ON THE WEB

Web chapters are available on MyEconLab.

WEB Chapter 1 Financial Decision Making
WEB Chapter 2 Economics of Life, Health, and the Environment
WEB Chapter 3 Political Economy

Preface

We love economics. We marvel at the way economic systems work. When we buy a smartphone, we think about the complex supply chain and the hundreds of thousands of people who played a role in producing an awe-inspiring piece of technology that was assembled from components manufactured across the globe.

The market's ability to do the world's work without anyone being in charge strikes us as a phenomenon no less profound than the existence of consciousness or life itself. We believe that the creation of the market system is one of the greatest achievements of humankind.

We wrote this book to highlight the simplicity of economic ideas and their extraordinary power to explain, predict, and improve what happens in the world. We want students to master the *essential* principles of economic analysis. With that goal in mind, we identify the three key ideas that lie at the heart of the economic approach to understanding human behavior: optimization, equilibrium, and empiricism. These abstract words represent three ideas that are actually highly intuitive.

Our Vision: Three Unifying Themes

The first key principle is that people try to choose the best available option: *optimization*. We don't assume that people always successfully optimize, but we do believe that people try to optimize and often do a relatively good job of it. Because most decision makers try to choose the alternative that offers the greatest net benefit, optimization is a useful tool for predicting human behavior. Optimization is also a useful prescriptive tool. By teaching people how to optimize, we improve their decisions and the quality of their lives. By the end of this course, every student should be a skilled optimizer—without using complicated mathematics, simply by using economic intuition.

The second key principle extends the first: economic systems operate in *equilibrium*, a state in which everybody is simultaneously trying to optimize. We want students to see that they're not the only ones maximizing their well-being. An economic system is in equilibrium when each person feels that he or she cannot do any better by picking another course of action. The principle of equilibrium highlights the connections among economic actors. For example, Apple stores stock millions of iPhones because millions of consumers are going to turn up to buy them. In turn, millions of consumers go to Apple stores because those stores are ready to sell those iPhones. In equilibrium, consumers and producers are simultaneously optimizing and their behaviors are intertwined.

Our first two principles—optimization and equilibrium—are conceptual. The third is methodological: *empiricism*. Economists use *data* to test economic theories, learn about the world, and speak to policymakers. Accordingly, data play a starring role in our book, though we keep the empirical analysis extremely simple. It is this emphasis on matching theories with real data that we think most distinguishes our book from others. We show students how economists use data to answer specific questions, which makes our chapters concrete, interesting, and fun. Modern students demand the evidence behind the theory, and our book supplies it.

For example, we begin every chapter with an empirical question and then answer that question using data. One chapter begins by asking:

Why are you so much more prosperous than your great-great-grandparents were?

Later in the chapter, we demonstrate the central role played by technology in explaining U.S. economic growth and why we are much better off than our relatives a few generations ago.

In our experience, students taking their first economics class often have the impression that economics is a series of theoretical assertions with little empirical basis. By using data, we explain how economists evaluate and improve our scientific insights. Data also make concepts more memorable. Using evidence helps students build intuition, because data move the conversation from abstract principles to concrete facts. Every chapter sheds light on how economists use data to answer questions that directly interest students. Every chapter demonstrates the key role that evidence plays in advancing the science of economics.

Features

All of our features showcase intuitive empirical questions.

- In **Evidence-Based Economics (EBE)**, we show how economists use data to answer the question we pose in the opening paragraph of the chapter. The EBE uses actual data that highlights some of the major concepts discussed within the chapter. This tie-in with the data gives students a substantive look at economics as it plays out in the world around them.

  The questions explored aren't just dry intellectual ideas; they spring to life the minute the student sets foot outside the classroom—*Is Facebook free? Is college worth it? Are tropical and semitropical areas condemned to poverty by their geographies? What caused the recession of 2007–2009? Are companies like Nike harming workers in Vietnam?*

Evidence-Based Economics

Q: Why are you so much more prosperous than your great-great-grandparents were?

The theoretical discussion in the previous section supports the central role of technology in explaining sustained growth. We will now see that empirical evidence also bolsters the conclusion that technology plays a key role.

To evaluate the sources of U.S. economic growth, we follow the same strategy as in the previous chapter. There, we used the aggregate production function and estimates of the physical capital stock and the efficiency units of labor across different countries to evaluate their contributions to cross-country differences in GDP. The only major difference here is that higher-quality U.S. data enable us to conduct the analysis for GDP per hour worked rather than GDP per worker, thus allowing us to measure the labor input more accurately. We start the analysis in 1950.

Exhibit 7.10 records average GDP per hour worked (in 2005 constant dollars), the average value of the physical capital stock per hour worked, and the most important component of the human capital of workers—the average years of schooling—for 10-year periods starting in 1950. (To remove the short-term effects of the last recession from our calculations on long-term growth, the last period is 2000–2007.) The exhibit shows the steady increase in GDP per hour worked, physical capital stock per hour worked, and educational attainment in the United States between 1950 and 2007.

We then use a methodology similar to that in the previous chapter to compute the contribution of physical capital, human capital (efficiency units of labor), and technology to the growth of GDP in the United States. The results are recorded in columns 4, 5, and 6 of the exhibit (in percentages). Column 7 then gives the annual growth rate of GDP per hour worked, which is the sum of the contributions of physical capital, human capital, and technology.

- **Letting the Data Speak** is another feature that analyzes an economic question by using real data as the foundation of the discussion. Among the many issues we explore are such topics as life expectancy and innovation, living in an interconnected world, and why Chinese authorities have historically kept the yuan undervalued.

LETTING THE DATA SPEAK

Life Expectancy and Innovation

Life expectancy around the world was much lower 70 years ago than it is today.[4] In 1940, child and infant mortality rates were so high and adult diseases, such as pneumonia and tuberculosis, were so deadly (and without any cure) that life expectancy at birth in many nations stood at less than 40 years. For example, the life expectancy at birth of an average Indian was an incredibly low 30 years. In Venezuela, it was 33; in Indonesia, 34; in Brazil, 36. Life expectancy at birth in many Western nations was also low but still considerably higher than the corresponding numbers in the poorer nations. Consider that life expectancy at birth in the United States was 64 years.

In the course of the next three or four decades, this picture changed dramatically. As we saw in the previous chapter, while the gap in life expectancy between rich and poor nations still remains today, health conditions have improved significantly all over the world, particularly before the spread of the AIDS epidemic in sub-Saharan Africa starting in the 1980s. Life expectancy at birth in India in 1999 was 60 years. This was twice as large as the same number in 1940. It was also 50 percent higher than life expectancy at birth in Britain in 1820 (40 years), which had approximately the same GDP per capita as India in 1999. How did this tremendous improvement in health conditions in poor nations take place?

The answer lies in scientific breakthroughs and innovations that took place in the United States and Western Europe throughout the twentieth century. First, there was a wave of global drug innovation, most importantly the development of antibiotics, which produced many products that were highly effective against major killers in developing countries. Penicillin, which provided an effective treatment against a range of bacterial infections, became widely available by the early 1950s. Also important during the same period was the development of new vaccines, including ones against yellow fever and smallpox.

The second major factor was the discovery of DDT (Dichlorodiphenyl trichloroethylene). Although eventually the excess use of DDT as an agricultural pesticide would turn out to be an environmental hazard, its initial use in disease control was revolutionary. DDT allowed a breakthrough in attempts to control one of the major killers of children in relatively poor parts of the world—malaria. Finally, with the establishment and help of the World Health Organization (WHO), simple but effective medical and public health practices, such as oral rehydration and boiling water to prevent cholera, spread to poorer countries.

- In keeping with the optimization theme, from time to time we ask students to make a real economic decision or evaluate the consequences of past real decisions in a feature entitled **Choice & Consequence**. We explain how an economist might analyze the same decision. Among the choices investigated are such questions and concepts as the power of growth, foreign aid and corruption, and policies that address the problem of banks that are "too big to fail."

CHOICE & CONSEQUENCE

The Power of Growth

You have two choices. You can either start a job with a salary of $1,000 per month and a 6 percent increase in your salary every month. Or you can start with a salary of $2,000, but never get a raise. Which one of these two options do you prefer?

The answer might naturally vary from person to person. If you have an immediate need for money, you may be attracted by the prospect of a $2,000 paycheck. But before you rush to sign on the dotted line for the $2,000-per-month job, think of the implications of the 6 percent monthly increase. With a 6 percent-per-month increase, your monthly salary will already exceed $2,000 after only a year. After 4 years, it will be approximately $16,400 a month. So if you were thinking of staying in this job for more than a year, starting with a lower salary might be a much better idea.

The first option is attractive, at least for those of you intending to stay with it for a while, precisely because of exponential growth. The 6-percent-per-month increases

in salary do not apply to the base salary (if they did, this would have increased your salary by $60 every month). Rather, they compound, meaning that each 6 percent applies to the amount that has accumulated up to that point. Thus after 1 month, your salary will be $1,060. After 2 months, it is $1,060 × 1.06 = $1,123.60. After 3 months, it is $1,123.60 × 1.06 = $1,191.02, and so on. We will next see that exponential growth plays the same role in countries' growth trajectories as in your potential income in these two hypothetical jobs.

Organization

Part I Introduction to Economics lays the groundwork for understanding the economic way of thinking about the world. In ***Chapter 1***, we show that the principle of *optimization* explains most of our choices. In other words, we make choices based on a consideration of benefits and costs, and to do this we need to consider trade-offs, budget constraints, and opportunity cost. We then explain that *equilibrium* is the situation in which everyone is simultaneously trying to individually optimize. In equilibrium, there isn't any perceived benefit to changing one's own behavior. We introduce the free-rider problem to show that individual optimization and social optimization do not necessarily coincide.

Because data plays such a central role in economics, we devote an entire chapter—***Chapter 2***—to economic models, the scientific method, empirical testing, and the critical distinction between correlation and causation. We show how economists use models and data to answer interesting questions about human behavior. For the students who want to brush up their graphical skills, there is an appendix on constructing and interpreting graphs, which is presented in the context of an actual experiment on incentive schemes.

Chapter 3 digs much more deeply into the concept of optimization, including an intuitive discussion of marginal analysis. We use a single running example of choosing an apartment, which confronts students with a trade-off between the cost of rent and the time spent commuting. We demonstrate two alternative approaches—optimization in levels and optimization in differences—and show why economists often use the latter (marginal) technique.

Chapter 4 introduces the demand and supply framework via a running example of the market for gasoline. We show how the price of gasoline affects the decisions of buyers, like commuters, and sellers, like ExxonMobil. As we develop the model, we explore how individual buyers are added together to produce a market demand curve and how individual sellers are added together to generate a market supply curve. We then show how buyers and sellers jointly determine the equilibrium market price and the equilibrium quantity of goods transacted in a perfectly competitive market. Finally, we show how markets break down when prices aren't allowed to adjust to equate the quantity demanded and the quantity supplied.

Part II Introduction to Macroeconomics provides an introduction to the field. In ***Chapter 5*** we explain the basic measurement tools. Here we explore the derivation of the aggregate output of the economy, or the gross domestic product (GDP), with the production, expenditure, and income methods, explaining why all these methods are equivalent and lead to the same level of total GDP. We also consider what *isn't* measured in GDP, such as production that takes place at home for one's family. Finally, we discuss the measurement of inflation and the concept of a price index.

In ***Chapter 6*** we show how income (GDP) per capita can be compared across countries using two similar techniques—an exchange rate method and a purchasing power method. We explain how the aggregate production function links a country's physical capital stock, labor resources (total labor hours and human capital per worker), and technology to its GDP and thus draw the link between income per capita and a country's physical capital stock per worker, human capital, and technology. We then use these tools to investigate the roles of physical capital, human capital, and technology in accounting for the great differences in prosperity across countries.

In **Part III, Long-Run Growth and Development**, we turn to a comprehensive treatment of growth and development. In ***Chapter 7***, we show that economic growth has transformed many countries over the past 200 years. For example, in the United States today, GDP per capita is about 25 times higher than it was in 1820. In this discussion, we explain the "exponential" nature of economic growth, which results from the fact that new growth builds on past growth, and implies that small differences in growth rates can translate into huge differences in income per capita over several decades. We explain how sustained economic growth relies on advances in technology and why different countries have experienced different long-run growth paths. We also emphasize that economic growth does not benefit all citizens equally. For some citizens, poverty is the unintentional by-product of technological progress. For the instructors who want a more in-depth treatment of growth and the

determinants of GDP, we present a simplified version of the Solow Model in an optional appendix to the chapter.

Why do some nations not invest enough in physical and human capital, adopt the best technologies, and organize their production efficiently? Put another way, why isn't the whole world economically developed? ***Chapter 8*** probes this question and considers the fundamental causes of prosperity. We discuss several potential fundamental causes, in particular, geography, culture, and institutions, and argue why the oft-emphasized geographic factors do not seem to account for much of the wide cross-country gaps in economic prosperity.

In **Part IV, Equilibrium in the Macroeconomy**, we discuss three key markets that play a central role in macroeconomic analysis: the labor market, the credit market, and the market for bank reserves. ***Chapter 9*** begins with the labor market—labor demand and labor supply. We first describe the standard competitive equilibrium, where the wage and the quantity of labor employed are pinned down by the intersection of the labor demand and labor supply curves. We then show how imperfectly flexible wages lead to unemployment. We then use this framework to discuss the many different factors that influence unemployment, including both frictional and structural sources.

Chapter 10 extends our analysis by incorporating the credit market. We explain how the modern financial system circulates funds from savers to borrowers. We describe the different types of shocks that can destabilize a financial system. We look at how banks and other financial intermediaries connect supply and demand in the credit market, and we use banks' balance sheets to explain the risks of taking on short-term liabilities and making long-term investments.

Chapter 11 introduces the monetary system. We begin by explaining the functions of money. The chapter then introduces the Federal Reserve Bank (the Fed) and lays out the basic plumbing of the monetary system, especially the role of supply and demand in the market for bank reserves. We explain in detail the Fed's role in controlling bank reserves and influencing interest rates, especially the interest rate on bank reserves (the federal funds rate). The chapter explains the causes of inflation and its social costs and benefits.

In **Part V, Short-Run Fluctuations and Macroeconomic Policy**, we use a modern framework to analyze and explain short-run fluctuations. Our analysis is inclusive and integrative, enabling us to combine the most relevant and useful insights from many different schools of economic thought. We believe that the labor market is the most informative lens through which first-year economics students can understand economic fluctuations. We therefore put the labor market and unemployment at the center of our analysis. In this part of the book, we also extend our discussion of the role of financial markets and financial crises. We present a balanced perspective that incorporates the diverse range of important insights that have emerged in the last century of theoretical and empirical research.

Chapter 12 lays the foundations of this approach, showing how a wide range of economic shocks cause short-run fluctuations and how these can be studied using the labor market. We trace out the impact of technological shocks, shocks to sentiments (including animal spirits), and monetary and financial shocks that work through their impact on the interest rate or by causing financial crises. In each case, we explain how multipliers amplify the impact of the initial shock. We also explain how wage rigidities affect the labor market response to these shocks. We apply our labor market model to both economic contractions and expansions and look at the problems that arise when the economy grows too slowly or too quickly.

Chapter 13 discusses the wide menu of monetary and fiscal policies that are used to partially offset aggregate fluctuations. We describe the most important strategies that have recently been adopted by central banks. We then discuss the role of fiscal policy and provide an analytic toolkit that students can use to estimate the impact of countercyclical expenditures and taxation.

In **Part VI, Macroeconomics in a Global Economy**, we provide a wide-angle view of the global economy and the relationships that interconnect national economies. In ***Chapter 14*** we show how international trade works, using the key concepts of specialization, comparative advantage, and opportunity cost. We study the optimal allocation of tasks inside a firm and show that firms should allocate their employees to tasks—and individuals should choose their occupations—according to comparative advantage. We then broaden the picture by

focusing on the optimal allocation of tasks across countries and show that here, too, the same principles apply. We analyze international flows of goods and services and the financial consequences of trade deficits. We describe the accounting identities that enable economists to measure the rich patterns of globalized trade. We also discuss the critical role of technology transfer.

Chapter 15 studies the determinants of exchange rates—both nominal and real—between different currencies and how they impact the macroeconomy. We describe the different types of exchange rate regimes and the operation of the foreign exchange market. Finally, we study the impact of changes in the real exchange rate on net exports and GDP.

MyEconLab®

MyEconLab is an extraordinary online course management, homework, quizzing, testing, activity, and tutorial resource.

For Instructors

With comprehensive homework, quiz, test, activity, practice, and tutorial options, instructors can manage all their assessment and online activity needs in one place. MyEconLab saves time by automatically grading questions and activities and tracking results in an online gradebook.

Each chapter contains two preloaded homework exercise sets that can be used to build an individualized study plan for each student. These study plan exercises contain tutorial resources, including instant feedback, links to the appropriate chapter section in the eText, pop-up definitions from the text, and step-by-step guided solutions, where appropriate. Within its rich assignment library, instructors will find a vast array of assessments that ask the students to draw graph lines and shifts, plot equilibrium points, and highlight important graph areas, all with the benefit of instant, personalized feedback. This feedback culminates, when needed, with the correct graph output alongside the student's personal answer, creating a powerful learning moment.

After the initial setup of the MyEconLab course for Acemoglu/Laibson/List, there are two primary ways to begin using this rich online environment. The first path requires no further action by the instructor. Students, on their own, can use MyEconLab's adaptive Study Plan problems and tutorial resources to enhance their understanding of concepts. The online gradebook records each student's performance and time spent on the assessments, activities, and the study plan and generates reports by student or chapter.

Alternatively, instructors can fully customize MyEconLab to match their course exactly: reading assignments, homework assignments, video assignments, current news assignments, digital activities, experiments, quizzes, and tests. Assignable resources include:

- Preloaded exercise assignment sets for each chapter that include the student tutorial resources mentioned earlier
- Preloaded quizzes for each chapter
- *Interactive Reading Assignments* in MyEconLab enable educators to encourage core reading by providing an assessment incentive along the way. These short reading segments feature embedded exercises that prompt students to learn actively. These exercises are automatically graded, so educators can integrate assessment into reading assignments quickly and easily.
- Assignable and gradable exercises that are similar to the end-of-chapter questions and problems and numbered exactly as in the book to make assigning homework easier
- *Real-Time Data Analysis Exercises* allow students and instructors to use the very latest data from the Federal Reserve Bank of St. Louis's FRED site. By completing the exercises, students become familiar with a key data source, learn how to locate data, and develop skills in interpreting data.
- In the eText available in MyEconLab, select exhibits labeled MyEconLab Real-Time Data allow students to display a pop-up graph updated with real-time data from FRED.

- *Current News Exercises* provide a turnkey way to assign gradable news-based exercises in MyEconLab. Each week, Pearson scours the news, finds current economics articles, creates exercises around the news articles, and then automatically adds them to MyEconLab. Assigning and grading current news-based exercises that deal with the latest economics events and policy issues have never been more convenient.
- *Econ Exercise Builder* allows you to build customized exercises. Exercises include multiple-choice, graph drawing, and free-response items, many of which are generated algorithmically so that each time a student works them, a different variation is presented.
- Test Item File questions that allow you to assign quizzes or homework that will look just like your exams

MyEconLab grades every problem type (except essays), even problems with graphs. When working homework exercises, students receive immediate feedback, with links to additional learning tools.

- *Experiments in MyEconLab* are a fun and engaging way to promote active learning and mastery of important economic concepts. Pearson's Experiments program is flexible and easy for instructors and students to use.
  - Single-player experiments allow your students to play against virtual players from anywhere at any time as long as they have an Internet connection.
  - Multiplayer experiments allow you to assign and manage a real-time experiment with your class.

  Pre- and post-questions for each experiment are available for assignment in MyEconLab.

  For a complete list of available experiments, visit **www.myeconlab.com**.

- *Digital Interactives* immerse students in a fundamental economic principle, helping them to learn actively. They can be presented in class as a visually stimulating, highly engaging lecture tool, and can also be assigned with assessment questions for grading. Digital Interactives are designed for use in traditional, online, and hybrid courses, and many incorporate real-time data, as well as data display and analysis tools. To learn more, and for a complete list of digital interactives, visit **www.myeconlab.com**.

Learning Catalytics™ is a bring-your-own-device classroom engagement tool that allows instructors to ask students questions utilizing 18 different question types, allowing students to participate in real time during lectures. With Learning Catalytics you can:

- Engage students in real time, using open-ended tasks to probe student understanding.
- Promote student participation using any modern Web-enabled device they already have—laptop, smartphone, or tablet.
- Address misconceptions before students leave the classroom.
- Understand immediately where students are and adjust your lecture accordingly.
- Improve your students' critical-thinking skills.
- Engage with and record the participation of every student in your classroom.

Learning Catalytics gives you the flexibility to create your own questions to fit your course exactly or choose from a searchable question library Pearson has created.

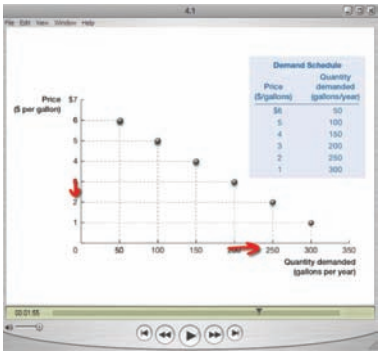
For more information, visit **learningcatalytics.com**.

Customization and Communication MyEconLab in MyLab/Mastering provides additional optional customization and communication tools. Instructors who teach distance-learning courses or very large lecture sections find the MyLab/Mastering format useful because they can upload course documents and assignments, customize the order of chapters, and use communication features such as Document Sharing, Chat, ClassLive, and Discussion Board.

For Students

MyEconLab puts students in control of their learning through a collection of testing, practice, and study tools tied to the online, interactive version of the textbook and other media resources.

In MyEconLab's environment, students practice what they learn, test their understanding, and pursue a personalized and adaptive study plan generated from their performance on sample tests and from quizzes created by their instructor. In Homework or Study Plan mode, students have access to a wealth of tutorial features, including:



- Instant feedback on exercises that helps students understand and apply the concepts
- Links to the eText to promote reading of the text just when the student needs to revisit a concept or an explanation
- Animations of most of the textbook's exhibits provide step-by-step animation and audio to help students develop intuition in reading and interpreting graphs. The animations are accessible directly from the eText or from the Multimedia Library.
- Step-by-step guided solutions that force students to break down a problem in much the same way an instructor would do during office hours
- Pop-up key term definitions from the eText to help students master the vocabulary of economics
- A graphing tool that is integrated into the various exercises to enable students to build and manipulate graphs to better understand how concepts, numbers, and graphs connect

Additional MyEconLab Resources

- *Enhanced eText*—In addition to the portions of eText available as pop-ups or links, a fully searchable enhanced eText is available for students who wish to read and study in a fully electronic environment. The enhanced eText includes all of the animations and embedded links to all of the end-of-chapter questions and problems, enabling students to read, review, and immediately practice their understanding. The embedded exercises are auto-graded exercises and feed directly into MyEconLab's adaptive Study Plan.
- *Print upgrade*—For students who wish to complete assignments in MyEconLab but read in print, Pearson offers registered MyEconLab users a loose-leaf version of the print text at a significant discount.

MyEconLab and Adaptive Learning MyEconLab's Study Plan is now powered by a sophisticated adaptive learning engine that tailors learning material to meet the unique needs of each student. MyEconLab's new Adaptive Learning Study Plan monitors students' performance on homework, quizzes, and tests and continuously makes recommendations based on that performance.

If a student is struggling with a concept such as supply and demand or having trouble calculating a price elasticity of demand, the Study Plan provides customized remediation activities—a pathway based on personal proficiencies, number of attempts, or difficulty of questions—to get the student back on track. Students will also receive recommendations for additional practice in the form of rich multimedia learning aids such as an interactive eText, Help Me Solve This tutorials, and graphing tools.

The Study Plan can identify a student's potential trouble spots and provide learning material and practice to avoid pitfalls. In addition, students who are showing a high degree of success with the assessment material are offered a chance to work on future topics based on the professor's course coverage preferences. This personalized and adaptive feedback and support ensures that students are optimizing their current and future course work and mastering the concepts, rather than just memorizing and guessing answers.

Dynamic Study Modules, which focus on key topic areas and are available from within MyEconLab, are an additional way for students to obtain tailored help. These modules work by continuously assessing student performance and activity on discrete topics and provide personalized content in real time to reinforce concepts that target each student's particular strengths and weaknesses.

Each Dynamic Study Module, accessed by computer, smartphone, or tablet, promotes fast learning and long-term retention. Because MyEconLab and Dynamic Study Modules help students stay on track and achieve a higher level of subject-matter mastery, more class time is available for interaction, discussion, collaboration, and exploring applications to current news and events. Instructors can register, create, and access all of their MyEconLab courses at **www.pearsonmylab.com**.

Instructor Resources

The **Instructor's Manual** for *Macroeconomics* was prepared by Rashid Al-Hmoud of Texas Tech University and includes:

- A chapter-by-chapter outline of the text
- Lecture notes highlighting the big ideas and concepts from each chapter
- Teaching Tips on how to motivate the lecture
- Common Mistakes or Misunderstandings students often make and how to correct them
- Short, real-world Alternative Teaching Examples, different from those in the text

Active Learning Exercises, included online and at the end of each Instructor's Manual chapter, were also prepared by Rashid Al-Hmoud and include:

- 3–5 Active Learning Exercises per chapter that are ideal for in-class discussions and group work

The **Solutions Manual**, prepared by Bruce Watson of Boston University, includes solutions to all end-of-chapter Questions and Problems in the text. It is available in print and downloadable PDFs.

Three flexible **PowerPoint Presentation** packages make it easy for instructors to design presentation slides that best suit their style and needs:

- Lecture notes with animations of key text exhibits, as well as alternative examples with original static exhibits.
- Exhibits from the text with step-by-step animation
- Static versions of all text exhibits

Each presentation maps to the chapter's structure and organization and uses terminology used in the text. Steven Yamarik of California State University, Long Beach created the Lecture PowerPoint presentation. Paul Graf of Indiana University, Bloomington prepared the step-by-step instructions for the animated exhibits.

The **Test Bank** for *Macroeconomics* was written by Anuradha Gupta and Julia Paul, and edited and reviewed by Todd Fitch of University of California, Berkeley; Gregory Gilpin of Montana State University; Grace O of Georgia State University; Nevin Cavusoglu of James Madison University; and Sang Lee of Southeastern Louisiana University. The Test Bank contains approximately 2,100 multiple-choice, numerical, short-answer, and essay questions. These have been edited and reviewed to ensure accuracy and clarity, and include terminology used in the book. Each question can be sorted by difficulty, book topic, concept covered, and AACSB learning standard to enhance ease of use. The Test Bank is available in Word, PDF, and TestGen formats.

The Test Bank is available in test generator software (TestGen with QuizMaster). TestGen's graphical interface enables instructors to view, edit, and add questions; transfer questions to tests; and print different forms of tests. Instructors also have the option to reformat tests with varying fonts and styles, margins, and headers and footers, as in any word-processing document. Search-and-sort features let the instructor quickly locate questions and arrange them in a preferred order. QuizMaster, working with your school's computer network, automatically grades the exams, stores the results on disk, and allows the instructor to view and print a variety of reports.

Instructor's Resource Center

Instructor resources are available online via our centralized supplements Web site, the Instructor Resource Center (**www.pearsonglobaleditions.com**). For access or more information, contact your local Pearson representative or request access online at the Instructor Resource Center.

Acknowledgments

As the three of us worked on this project, we taught each other a lot about economics, teaching, and writing. But we learned even more from the hundreds of other people who helped us along the way. For their guidance, we are thankful and deeply humbled. Their contributions turned out to be critical in ways that we never imagined when we started, and our own ideas were greatly improved by their insights and advice.

Our reviewers, focus group participants, and class testers showed us how to better formulate our ideas and helped us sharpen our writing. Through their frequently brilliant feedback, they corrected our economic misconceptions, improved our conceptual vision, and showed us how to write more clearly. Their contributions appear in almost every paragraph of this book. All of their names are listed below.

Our research assistants—Alec Brandon, Justin Holz, Josh Hurwitz, Xavier Jaravel, Angelina Liang, Daniel Norris , Yana Peysakhovich, and Jan Zilinsky—played a critical role at every phase of the project, from analyzing data to editing prose to generating deep insights about pedagogical principles that are woven throughout the book. These research assistants played many roles. We learned to trust their instincts on every element of the book, and quickly realized that their contributions were indispensable to the project's success. We are especially indebted to Josh, who has earned our eternal gratitude for many late work nights and for his brilliant editorial and economic insights.

We are grateful to Zick Rubin, who advised us as we started to organize the project and encouraged us as the book developed. We are also deeply thankful to the many inspiring economists who contributed major components of the project. Bruce Watson of Boston University, Anuradha Gupta, and Julia Paul contributed extensively to the development of the end-of-chapter questions and problems, which stand out as examples of inspiring pedagogy. Rashid Al-Hmoud of Texas Tech University wrote the innovative and intuitive Instructor's Manual and Active Learning Exercises. Steven Yamarik, California State University, Long Beach and Paul Graf, Indiana University, Bloomington created outstanding PowerPoint slides and animations that illuminate and distill the key lessons of the book. Anuradha Gupta and Julia Paul created the expansive test bank.

Most importantly, we acknowledge the myriad contributions of our editors and all of our amazing colleagues at Pearson. They have marched with us every step of the way. We wouldn't dare count the number of hours that they dedicated to this project–including evenings and weekends. Their commitment, vision, and editorial suggestions touched every sentence of this book. Most of the key decisions about the project were made with the help of our editors, and this collaborative spirit proved to be absolutely essential to our writing. Dozens of people at Pearson played key roles, but the most important contributions were made by Adrienne D'Ambrosio, Executive Acquisitions Editor, Mary Clare McEwing, Executive Development Editor, Nancy Freihofer, Production Manager, Sarah Dumouchelle, Andra Skaalrud, Diane Kohnen, and Ann Francis our Project Managers, Kathleen McLellan, Product Testing and Learner Validation Manager, Lori DeShazo, Executive Field Marketing Manager, Alison Haskins, Senior Product Marketing Manager, Noel Lotz, Digital Content Team Lead, Melissa Honig, Digital Studio Project Manager, and Margaret E. Monahan-Pashall.

We are particularly grateful to Adrienne who has been deeply committed to our project from the first day and has tirelessly worked with us at every key decision. We also wish to thank Denise Clinton, Digital Editor, who first got us started, and Donna Battista, Vice President Product Management, who championed the project along the way. All of these advisers transformed us as writers, teachers, and communicators. This book is a testimony to their perseverance, their dedication, and their brilliant eye for good (and often bad!) writing. Their commitment to this project has been extraordinary and inspirational. We are profoundly grateful for their guidance and collaboration.

Finally, we wish to thank our many other support networks. Our own professors, who first inspired us as economists and showed, through their example, the power of teaching and the joy that one can take from studying economics. Our parents, who nurtured us in so many ways and gave us the initial human capital that made our entire careers possible. Our kids—Annika, Aras, Arda, Eli, Greta, Mason, Max, and Noah—who sacrificed when our long hours on this book ate into family life. And, most profoundly, we thank our spouses, who have been supportive, understanding, and inspirational throughout the project.

This book is the product of many streams that have flowed together and so many people who have contributed their insights and their passion to this project. We are deeply grateful for these myriad collaborations.

Reviewers

The following reviewers, class test participants, and focus group participants provided invaluable insights.

Adel Abadeer, Calvin College
Ahmed Abou-Zaid, Eastern Illinois University
Temisan Agbeyegbe, City University of New York
Carlos Aguilar, El Paso Community College
Rashid Al-Hmoud, Texas Tech University
Sam Allgood, University of Nebraska, Lincoln
Neil Alper, Northeastern University
Farhad Ameen, Westchester Community College
Catalina Amuedo-Dorantes, San Diego State University
Lian An, University of North Florida
Samuel Andoh, Southern Connecticut State University
Brad Andrew, Juniata College
Len Anyanwu, Union County College
Robert Archibald, College of William and Mary
Ali Arshad, New Mexico Highlands University
Robert Baden, University of California, Santa Cruz
Mohsen Bahmani-Oskooee, University of Wisconsin, Milwaukee
Scott L. Baier, Clemson University
Rita Balaban, University of North Carolina
Mihajlo Balic, Harrisburg Area Community College
Sheryl Ball, Virginia Polytechnic Institute and State University
Spencer Banzhaf, Georgia State University
Jim Barbour, Elon University
Hamid Bastin, Shippensburg University
Clare Battista, California State Polytechnic University, San Luis Obispo
Jodi Beggs, Northeastern University
Eric Belasco, Montana State University
Susan Bell, Seminole State University
Valerie Bencivenga, University of Texas, Austin
Pedro Bento, West Virginia University
Derek Berry, Calhoun Community College
Prasun Bhattacharjee, East Tennessee State University
Benjamin Blair, Columbus State University
Douglas Blair, Rutgers University
John Bockino, Suffolk County Community College
Andrea Borchard, Hillsborough Community College
Luca Bossi, University of Pennsylvania
Gregory Brock, Georgia Southern University
Bruce Brown, California State Polytechnic University, Pomona
David Brown, Pennsylvania State University
Jaime Brown, Pennsylvania State University
Laura Bucila, Texas Christian University
Don Bumpass, Sam Houston State University
Chris Burkart, University of West Florida
Colleen Callahan, American University
Fred Campano, Fordham University
Douglas Campbell, University of Memphis
Cheryl Carleton, Villanova University
Scott Carrell, University of California, Davis
Kathleen Carroll, University of Maryland, Baltimore
Regina Cassady, Valencia College, East Campus
Shirley Cassing, University of Pittsburgh
Nevin Cavusoglu, James Madison University
Suparna Chakraborty, University of San Francisco
Catherine Chambers, University of Central Missouri
Chiuping Chen, American River College
Susan Christoffersen, Philadelphia University
Benjamin Andrew Chupp, Illinois State University
David L. Cleeton, Illinois State University
Cynthia Clement, University of Maryland
Marcelo Clerici-Arias, Stanford University
Rachel Connelly, Bowdoin College
William Conner, Tidewater Community College
Patrick Conway, University of North Carolina
Jay Corrigan, Kenyon College
Antoinette Criss, University of South Florida
Sean Crockett, City University of New York
Patrick Crowley, Texas A&M University, Corpus Christi
Kelley Cullen, Eastern Washington University
Scott Cunningham, Baylor University
Muhammed Dalgin, Kutztown University
David Davenport, McLennan Community College
Stephen Davis, Southwest Minnesota State University
John W. Dawson, Appalachian State University
Pierangelo De Pace, California State University, Pomona
David Denslow, University of Florida
Arthur Diamond, University of Nebraska, Omaha
Timothy Diette, Washington and Lee University
Isaac Dilanni, University of Illinois, Urbana-Champaign
Oguzhan Dincer, Illinois State University
Ethan Doetsch, Ohio State University
Murat Doral, Kennesaw State University
Tanya Downing, Cuesta College
Gary Dymski, University of California, Riverside
Kevin Egan, University of Toledo