

N. GREGORY MANKIW

PRINCIPLES OF MACROECONOMICS

Eighth Edition



THE REAL ECONOMY IN THE LONG RUN

- 12 Production and Growth
- 13 Saving, Investment, and the Financial System
- 14 The Basic Tools of Finance
- 15 Unemployment

These chapters describe the forces that in the long run determine key real variables, including GDP growth, saving, investment, real interest rates, and unemployment.

MONEY AND PRICES IN THE LONG RUN

- 16 The Monetary System
- 17 Money Growth and Inflation

The monetary system is crucial in determining the long-run behavior of the price level, the inflation rate, and other nominal variables.

THE MACROECONOMICS OF OPEN ECONOMIES

- 18 Open-Economy Macroeconomics: Basic Concepts
- 19 A Macroeconomic Theory of the Open Economy

A nation's economic interactions with other nations are described by its trade balance, net foreign investment, and exchange rate.

A long-run model of the open economy explains the determinants of the trade balance, the real exchange rate, and other real variables.

SHORT-RUN ECONOMIC FLUCTUATIONS

- 20 Aggregate Demand and Aggregate Supply
- 21 The Influence of Monetary and Fiscal Policy on Aggregate Demand
- 22 The Short-Run Trade-off between Inflation and Unemployment

The model of aggregate demand and aggregate supply explains short-run economic fluctuations, the short-run effects of monetary and fiscal policy, and the short-run linkage between real and nominal variables.

FINAL THOUGHTS

- 23 Six Debates over Macroeconomic Policy

A capstone chapter presents both sides of six major debates over economic policy.

PRINCIPLES OF MACROECONOMICS

Eighth Edition

N. GREGORY MANKIW

HARVARD UNIVERSITY



Australia • Brazil • Mexico • Singapore • United Kingdom • United States

Principles of Macroeconomics, 8e
N. Gregory Mankiw

Vice President, General Manager, Social Science
& Qualitative Business: Erin Joyner

Product Director: Jason Fremder

Senior Product Manager: Michael Parthenakis

Developmental Editor: Jane Tufts

Senior Digital Content Designer: Kasie Jean

Senior Content Developer: Anita Verma

Content Development Manager: Clara
Goosman

Product Assistant: Emily Lehmann

Executive Marketing Manager: John Carey

Senior Content Project Manager:
Colleen A. Farmer

Senior Digital Production Project Manager:
Derek Drifmeyer

Manufacturing Planner: Kevin Kluck

Marketing Coordinator: Casey Binder

Senior Learning Design Author: Eugenia Belova

Learning Design Author: Brian A. Rodriguez

Production Service: Lumina

Intellectual Property

Analyst: Jennifer Bowes

Project Manager: Sarah Shainwald

Senior Art Director: Michelle Kunkler

Internal and Cover Designer: Harasymczuk
Design

Cover Image: Library of Congress Prints and
Photographs Division Washington, DC
20540 USA [LC-USZC4-4637];

© AIMSTOCK/Getty Images; © Buena Vista
Images/Getty Images

Chapter Opener Photo: © samsonovs/Getty
Images

Custom Internal Illustrations: Bruce Morser

© 2018, 2015 Cengage Learning

ALL RIGHTS RESERVED. No part of this work covered by the copyright herein may be reproduced or distributed in any form or by any means, except as permitted by U.S. copyright law, without the prior written permission of the copyright owner.

For product information and technology assistance, contact us at
Cengage Learning Customer & Sales Support, 1-800-354-9706

For permission to use material from this text or product,
submit all requests online at **www.cengage.com/permissions**

Further permissions questions can be emailed to
permissionrequest@cengage.com

Unless otherwise noted, all items © Cengage Learning.

Library of Congress Control Number: 2016947884

ISBN 13: 978-1-305-97150-9

ISBN 10: 1-305-97150-7

Cengage Learning

20 Channel Center Street
Boston, MA 02210
USA

Cengage Learning is a leading provider of customized learning solutions with employees residing in nearly 40 different countries and sales in more than 125 countries around the world. Find your local representative at **www.cengage.com**.

Cengage Learning products are represented in Canada by Nelson Education, Ltd.

To learn more about Cengage Learning Solutions, visit **www.cengage.com**

Purchase any of our products at your local college store or at our preferred online store **www.cengagebrain.com**

*To Catherine, Nicholas, and Peter,
my other contributions to the next generation*



About the Author



Jordi Cabré

N. Gregory Mankiw is the Robert M. Beren Professor of Economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught macroeconomics, microeconomics, statistics, and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.

Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals, such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums, such as the *New York Times* and *The Wall Street Journal*. He is also author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishers). In addition to his teaching, research, and writing, Professor Mankiw has been a research associate of the National Bureau of Economic Research, an adviser to the Congressional Budget Office and the Federal Reserve Banks of Boston and New York, and a member of the ETS test development committee for the Advanced Placement exam in economics. From 2003 to 2005, he served as chairman of the President's Council of Economic Advisers.

Professor Mankiw lives in Wellesley, Massachusetts, with his wife, Deborah, three children, Catherine, Nicholas, and Peter, and their border terrier, Tobin.

Brief Contents



PART I Introduction 1

- 1 Ten Principles of Economics 3
- 2 Thinking Like an Economist 19
- 3 Interdependence and the Gains from Trade 47

PART II How Markets Work 63

- 4 The Market Forces of Supply and Demand 65
- 5 Elasticity and Its Application 89
- 6 Supply, Demand, and Government Policies 111

PART III Markets and Welfare 131

- 7 Consumers, Producers, and the Efficiency of Markets 133
- 8 Application: The Costs of Taxation 153
- 9 Application: International Trade 167

PART IV The Data of Macroeconomics 187

- 10 Measuring a Nation's Income 189
- 11 Measuring the Cost of Living 211

PART V The Real Economy in the Long Run 229

- 12 Production and Growth 231
- 13 Saving, Investment, and the Financial System 257
- 14 The Basic Tools of Finance 279
- 15 Unemployment 293

PART VI Money and Prices in the Long Run 317

- 16 The Monetary System 319
- 17 Money Growth and Inflation 343

PART VII The Macroeconomics of Open Economies 367

- 18 Open-Economy Macroeconomics: Basic Concepts 369
- 19 A Macroeconomic Theory of the Open Economy 393

PART VIII Short-Run Economic Fluctuations 415

- 20 Aggregate Demand and Aggregate Supply 417
- 21 The Influence of Monetary and Fiscal Policy on Aggregate Demand 453
- 22 The Short-Run Trade-off between Inflation and Unemployment 479

PART IX Final Thoughts 503

- 23 Six Debates over Macroeconomic Policy 505



Preface: To the Student

“**E**conomics is a study of mankind in the ordinary business of life.” So wrote Alfred Marshall, the great 19th-century economist, in his textbook, *Principles of Economics*. We have learned much about the economy since Marshall’s time, but this definition of economics is as true today as it was in 1890, when the first edition of his text was published.

Why should you, as a student in the 21st century, embark on the study of economics? There are three reasons.

The first reason to study economics is that it will help you understand the world in which you live. There are many questions about the economy that might spark your curiosity. Why are apartments so hard to find in New York City? Why do airlines charge less for a round-trip ticket if the traveler stays over a Saturday night? Why is Robert Downey, Jr., paid so much to star in movies? Why are living standards so meager in many African countries? Why do some countries have high rates of inflation while others have stable prices? Why are jobs easy to find in some years and hard to find in others? These are just a few of the questions that a course in economics will help you answer.

The second reason to study economics is that it will make you a more astute participant in the economy. As you go about your life, you make many economic decisions. While you are a student, you decide how many years to stay in school. Once you take a job, you decide how much of your income to spend, how much to save, and how to invest your savings. Someday you may find yourself running a small business or a large corporation, and you will decide what prices to charge for your products. The insights developed in the coming chapters will give you a new perspective on how best to make these decisions. Studying economics will not by itself make you rich, but it will give you some tools that may help in that endeavor.

The third reason to study economics is that it will give you a better understanding of both the potential and the limits of economic policy. Economic questions are always on the minds of policymakers in mayors’ offices, governors’ mansions, and the White House. What are the burdens associated with alternative forms of taxation? What are the effects of free trade with other countries? What is the best way to protect the environment? How does a government budget deficit affect the economy? As a voter, you help choose the policies that guide the allocation of society’s resources. An understanding of economics will help you carry out that responsibility. And who knows: Perhaps someday you will end up as one of those policymakers yourself.

Thus, the principles of economics can be applied in many of life’s situations. Whether the future finds you following the news, running a business, or sitting in the Oval Office, you will be glad that you studied economics.

N. Gregory Mankiw
December 2016

Video Application

Video application features the book's author **introducing chapter content.** Author Greg Mankiw introduces the important themes in every chapter by delivering a highly relevant deposition on the real-world context to the economic principles that will be appearing in the upcoming chapter. These videos are intended to motivate students to better understand how economics relates to their day-to-day lives and in the world around them.



ConceptClip Videos

ConceptClip videos help students master economics terms. These high-energy videos, embedded throughout the interactive book, address the known student challenge of understanding economics terminology when initially introduced to the subject matter. Developed by Professor Mike Brandl of The Ohio State University, these concept-based animations provide students with memorable context to the key terminology required for your introductory economics course.

"I have always wanted supplemental material such as this to help me understand certain concepts in economics."

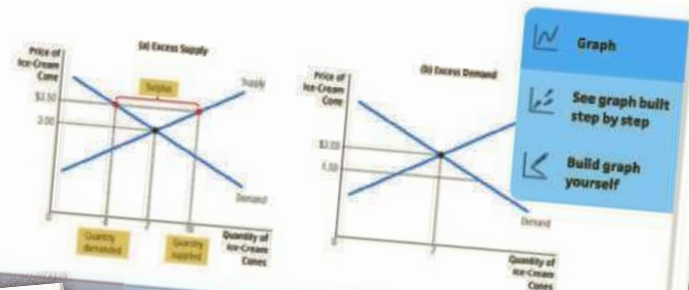


Graph Builder

Graph Builder allows students to move step-by-step through complex graphical figures. Designed specifically for introductory economics students, Graph Builder interactive exercises help students first understand complex graphs by deconstructing a graph into finite steps that build upon one another, then practice graphing by drawing out a similar scenario from scratch. This drawing method supports the kinesthetic learning approach valued by instructors, like you— all within the context of the interactive book!

Figure 9 Markets Not in Equilibrium

Consider the market for ice-cream cones. Notice that the equilibrium quantity is 7 cones, and the equilibrium price is \$2.00 per cone. Suppose the market price is set at \$2.50 per cone. Because the market price of \$2.50 is above the equilibrium price, the quantity supplied (10 cones) exceeds the quantity demanded (4 cones), so there is a surplus in this market. Suppliers try to increase sales by cutting the price of a cone, and this moves the price toward its equilibrium level. **Instead of the market price being set too high, suppose it starts below the equilibrium price.**

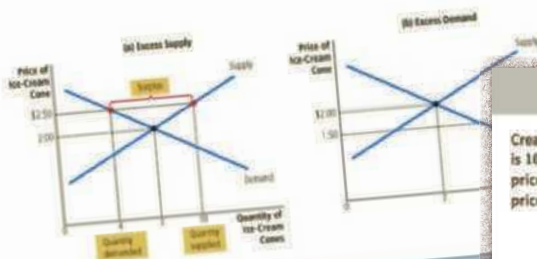


Graph
See graph built step by step
Build graph yourself

Steps: 1 2 3 4 5

Figure 9 Markets Not in Equilibrium

Consider the market for ice-cream cones. Notice that the equilibrium quantity is 7 cones, and the equilibrium price is \$2.00 per cone. Suppose the market price is set at \$2.50 per cone. Because the market price of \$2.50 is above the equilibrium price, the quantity supplied (10 cones) exceeds the quantity demanded (4 cones), so there is a surplus in this market. Suppliers try to increase sales by cutting the price of a cone, and this moves the price toward its equilibrium level. **Instead of the market price being set too high, suppose it starts below the equilibrium price.**



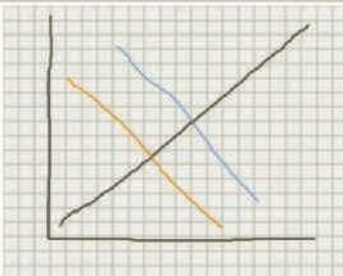
Steps: 1 2 3 4 5

Now YOU build it!

Create the supply and demand curves that describe the following market for golf balls. The equilibrium quantity is 100 golf balls, and the equilibrium price is \$1.00 per ball. Suppose that the market price is set at \$1.50. At that price, the quantity demanded is 60 balls and the quantity supplied is 140 balls. Draw the effect of this market price, and label the shortage or surplus.

Show Correct Graph

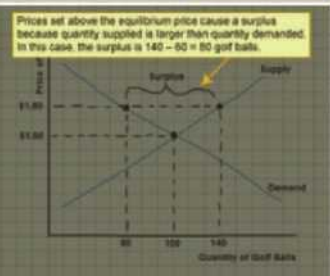
Your Graph



Try Again

Correct Graph

Hide Explanation



I'm Done, Submit!

"I have not used anything like this before."

"The Graph Builder is amazing! This would help me a lot and the concept is great. I think all students should have access to this feature because it would better their knowledge of how to make graphs."

Study and Test Prep

The Mankiw Study Guide is now a part of MindTap!

The study guide by David Hakes for Mankiw's *Principles of Economics* has long been the standard of what a print study guide could be. Students like how it reinforces the text and improves understanding of the chapter content. Now for the eighth edition, the study guide is integrated right into the MindTap course at no additional charge!

For each chapter, students get the same great resources that users of the print Study Guide have always received:

- The Chapter Overview
- Problems and Short Answers
- Self-Test
- Advanced Critical Thinking
- Solutions for All Study Guide Questions



David Hakes and Greg Mankiw

MindTap®

"Additional practice with problems is extremely helpful, especially when combined with the immediate feedback that I received via the online server."

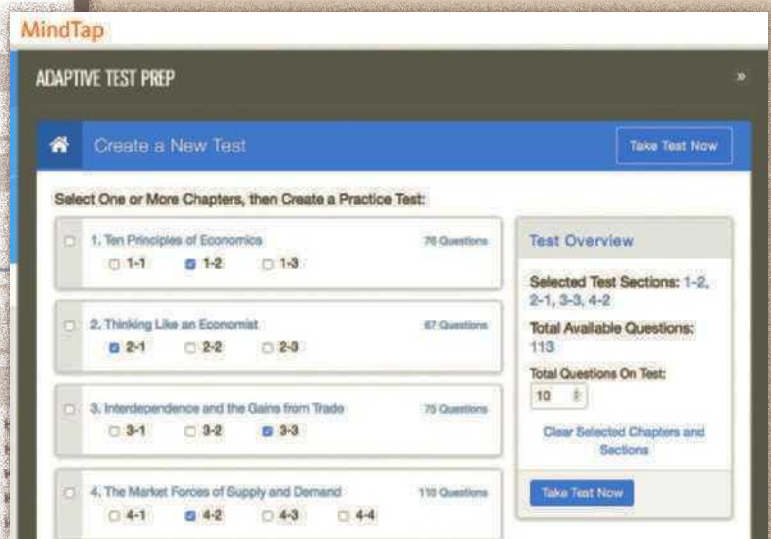
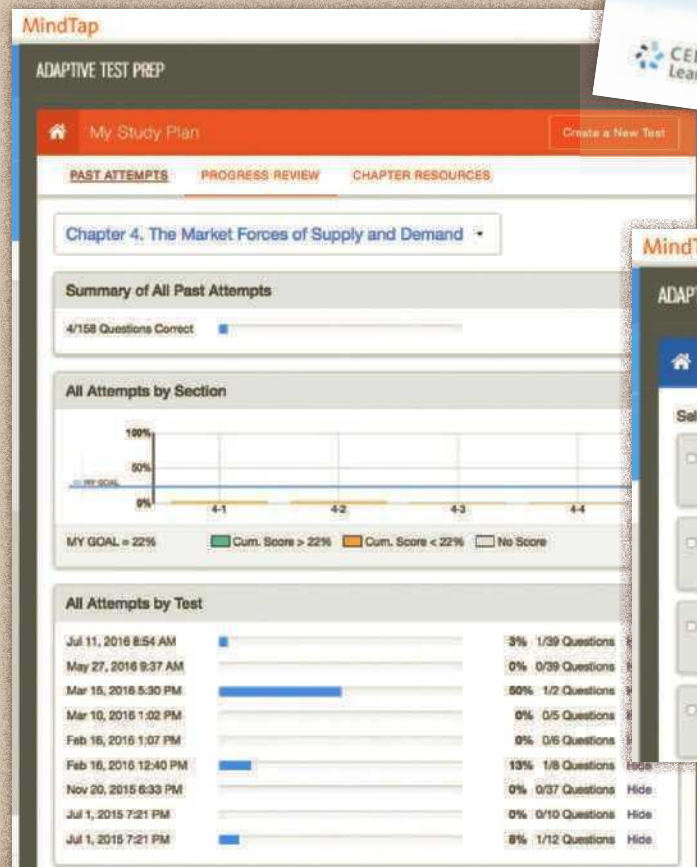
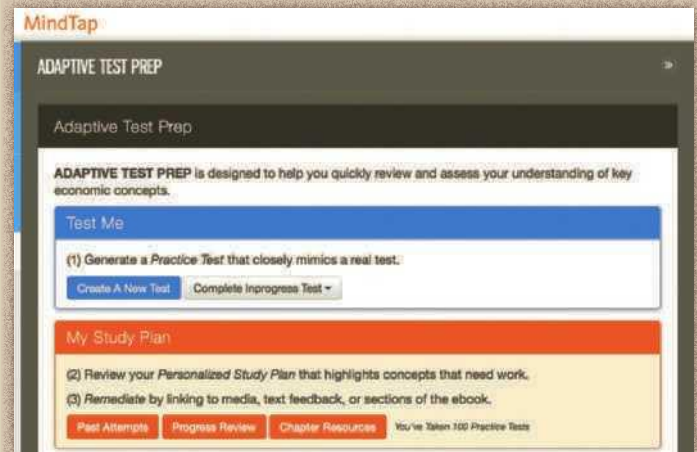
"The adaptive feedback system was incredibly useful, because by the time the test rolled around I didn't always remember what I had struggled with in previous weeks."

Adaptive Test Prep Prepares Your Students for High-Stakes Testing

Are your students constantly asking you for more practice questions as exam time comes closer? Do your students complain because the test bank-type questions in the exam do not have the same look and feel as their homework assignments?

Adaptive Test Prep is a powerful tool that uses 4,000 new test bank-like questions to give students almost unlimited practice for each chapter and section. They can take as many tests as they like that are immediately graded for them. Students see how they did and the program gives them immediate remediation in the form of very robust feedback, a link right back into the text where the question topic resides, and for about 2,000 questions, they get a brief Quick Coach video with an instructor walking them through the exact question they missed!

Students can generate reports that show them which chapters and sections they need the most help on so they can tailor future practice tests just on the areas they are struggling with.





Acknowledgments

In writing this book, I benefited from the input of many talented people. Indeed, the list of people who have contributed to this project is so long, and their contributions so valuable, that it seems an injustice that only a single name appears on the cover.

Let me begin with my colleagues in the economics profession. The many editions of this text and its supplemental materials have benefited enormously from their input. In reviews and surveys, they have offered suggestions, identified challenges, and shared ideas from their own classroom experience. I am indebted to them for the perspectives they have brought to the text. Unfortunately, the list has become too long to thank those who contributed to previous editions, even though students reading the current edition are still benefiting from their insights.

Most important in this process has been David Hakes (University of Northern Iowa). David, a dedicated teacher, has served as a reliable sounding board for ideas and is a hardworking partner with me in putting together the superb package of supplements. In addition, a special thanks to Ron Cronovich, an insightful instructor and trusted advisor, for his many years of consultation.

A special thanks to the team of teaching economists who worked on the test bank and ancillaries for this edition, many of whom have been working on the Mankiw ancillaries from the beginning. To Ken McCormick for vetting the entire test bank (with 17,000 questions) for correctness, and to Ken Brown, Sarah Cosgrove, Harold Elder, Michael Enz, Lisa Jepsen, Bryce Kanago, Daniel Marburger, Amanda Nguyen, Alicia Rosburg, Forrest Spence, and Kelvin Wong for authoring new questions and updating existing ones.

The following reviewers of the seventh edition provided suggestions for refining the content, organization, and approach in the eighth.

Mark Abajian, *San Diego Mesa College*

Rahi Abouk, *University of Wisconsin Milwaukee*

Mathew Abraham, *Indiana University – Purdue University Indianapolis*

Nathanael Adams, *Cardinal Stritch University*

Seemi Ahmad, *Dutchess Community College*

May Akabogu-Collins, *Mira Costa College–Oceanside*

Ercument Aksoy, *Los Angeles Valley College*

Basil Al-Hashimi, *Mesa Community College*

Rashid Al-Hmoud, *Texas Tech University*

William Aldridge, *University of Alabama–Tuscaloosa*

Donald L. Alexander, *Western Michigan University*

Hassan Aly, *Ohio State University*

Michelle Amaral, *University of the Pacific*

Shahina Amin, *University of Northern Iowa*

Catalina Amuedo-Dorantes, *San Diego State University*

Vivette Ancona, *Hunter College–CUNY*

Aba Anil, *University of Utah*

Diane Anstine, *North Central College*

Carolyn Arcand, *University of Massachusetts Boston*

Becca Arnold, *San Diego Community College*

Ali Ataiifar, *Delaware County Community College*

Shannon Aucoin, *University of Louisiana Lafayette*

Lisa Augustyniak, *Lake Michigan College*

Wesley Austin, *University of Louisiana Lafayette*

Dennis Avola, *Framingham State University*

Regena M. Aye, *Allen Community College*

Sang Hoo Bae, *Clark University*

Karen Baehler, *Hutchinson Community College*

Sahar Bahmani, *University of Wisconsin–Parkside*

Mohsen Bahmani-Oskooee, *University of Wisconsin Milwaukee*

- Richard Baker, *Copiah-Lincoln Community College*
 Stephen Baker, *Capital University*
 Tannista Banerjee, *Auburn University*
 Bob Barnes, *DePaul University*
 Hamid Bastin, *Shippensburg University*
 James Bathgate, *Western Nevada College*
 Leon Battista, *Albertus Magnus College*
 Gerald Baumgardner, *Susquehanna University*
 Christoph Bauner, *University of Massachusetts-Amherst*
 Elizabeth Bayley, *University of Delaware*
 Ergin Bayrak, *University of Southern California*
 Nihal Bayraktar, *Pennsylvania State University*
 Mike Belleman, *St. Clair County Community College*
 Audrey Benavidez, *Del Mar College*
 Cynthia Benelli, *University of California Santa Barbara*
 Charles Bennett, *Gannon University*
 Bettina Berch, *Borough of Manhattan Community College*
 Stacey Bertke, *Owensboro Community & Technical College*
 Tibor Besedes, *Georgia Institute of Technology*
 Abhijeet Bhattacharya, *Illinois Valley Community College*
 Ronald Bishop, *Lake Michigan College*
 Thomas Bishop, *California State Channel Islands*
 Nicole Bissessar, *Kent State University-Ashtabula*
 Janet Blackburn, *San Jacinto South College*
 Jeanne Boeh, *Augsburg College*
 Natalia Boliari, *Manhattan College*
 Antonio Bos, *Tusculum College*
 Jennifer Bossard, *Doane College*
 James Boudreau, *University of Texas-Pan American*
 Mike Bowyer, *Montgomery Community College*
 William Brennan, *Minnesota State University-Mankato*
 Genevieve Briand, *Washington State University*
 Scott Broadbent, *Western Kentucky University*
 Greg Brock, *Georgia Southern University*
 Ivy Broder, *American University*
 Todd Broker, *Murray State University*
 Stacey Brook, *University of Iowa*
 Keith Brouhle, *Grinnell College*
 Byron Brown, *Michigan State University*
 Crystal Brown, *Anderson University*
 Kris Bruckerhoff, *University of Minnesota-Crookston*
 Christopher Brunt, *Lake Superior State University*
 Laura Bucila, *Texas Christian University*
 Donna Bueckman, *University of Tennessee-Knoxville*
 Don Bumpass, *Sam Houston State University*
 Joe Bunting, *St. Andrews University*
 Benjamin Burden, *Temple College*
 Mariya Burdina, *University of Central Oklahoma*
 Rob Burrus, *University of North Carolina-Wilmington*
 James Butkiewicz, *University of Delaware*
 William Byrd, *Troy University*
 Anna Cai, *University of Alabama-Tuscaloosa*
 Samantha Cakir, *Macalester College*
 Michael Carew, *Baruch College*
 William Carner, *Westminster College*
 Craig Carpenter, *Albion College*
 John Carter, *California State University-Stanislaus*
 Ginette Carvalho, *Fordham University*
 Onur Celik, *Quinnipiac University*
 Avik Chakrabarti, *University of Wisconsin-Milwaukee*
 Kalyan Chakraborty, *Emporia State University*
 Suparna Chakraborty, *Baruch College-CUNY*
 Dustin Chambers, *Salisbury University*
 Silvana Chambers, *Salisbury University*
 Krishnamurti Chandrasekar, *New York Institute of Technology*
 Yong Chao, *University of Louisville*
 David Chaplin, *Northwest Nazarene University*
 Xudong Chen, *Baldwin-Wallace College*
 Yi-An Chen, *University of Washington, Seattle*
 Kirill Chernomaz, *San Francisco State University*
 Ron Cheung, *Oberlin College*
 Hui-Chu Chiang, *University of Central Oklahoma*
 Mainul Chowdhury, *Northern Illinois University*
 Dmitriy Chulkov, *Indiana University Kokomo*
 Lawrence Cima, *John Carroll University*
 Cindy Clement, *University of Maryland*
 Matthew Clements, *St. Edward's University*
 Sondra Collins, *University of Southern Mississippi*
 Tina Collins, *San Joaquin Valley College*
 Scott Comparato, *Southern Illinois University*
 Kathleen Conway, *Carnegie Mellon University*
 Stephen Cotten, *University of Houston Clear Lake*
 Jim Cox, *Georgia Perimeter College*
 Michael Craig, *University of Tennessee-Knoxville*
 Matt Critcher, *University of Arkansas Community College at Batesville*
 George Crowley, *Troy University, Troy*
 David Cullipher, *Arkansas State University-Mountain Home*
 Dusan Curcic, *University of Virginia*
 Norman Cure, *Macomb Community College*
 Maria DaCosta, *University of Wisconsin-Eau Claire*
 Bruce Dalgaard, *St. Olaf College*
 Anusua Datta, *Philadelphia University*
 Earl Davis, *Nicholls State University*
 Amanda Dawsey, *University of Montana*
 Prabal De, *City College of New York*
 Rooj Debasis, *Kishwaukee College*
 Dennis Debrecht, *Carroll University*
 William DeFrance, *University of Michigan-Flint*
 Theresa J. Devine, *Brown University*
 Paramita Dhar, *Central Connecticut State University*
 Ahrash Dianat, *George Mason University*
 Stephanie Dieringer, *University of South Florida St. Petersburg*
 Du Ding, *Northern Arizona University*
 Liang Ding, *Macalester College*
 Parks Dodd, *Georgia Institute of Technology*
 Veronika Dolar, *Long Island University*
 Zachary Donohew, *University of Central Arkansas*
 Kirk Doran, *University of Notre Dame*
 Craig Dorsey, *College of DuPage*

- Caf Dowlah, *Queensborough Community College–CUNY*
 Tanya Downing, *Cuesta College*
 Michael J. Driscoll, *Adelphi University*
 Ding Du, *Northern Arizona University*
 Kevin Dunagan, *Oakton community college*
 Nazif Durmaz, *University of Houston–Victoria*
 Tomas Dvorak, *Union College*
 Eva Dziadula, *Lake Forest College*
 Dirk Early, *Southwestern University*
 Ann Eike, *University of Kentucky*
 Harold Elder, *University of Alabama–Tuscaloosa*
 Lynne Elkes, *Loyola University Maryland*
 Diantha Ellis, *Abraham Baldwin College*
 Noha Emara, *Columbia University*
 Michael Enz, *Framingham State University*
 David Epstein, *The College of New Jersey*
 Lee Erickson, *Taylor University*
 Sarah Estelle, *Hope College*
 Pat Euzent, *University of Central Florida–Orlando*
 Timothy Ewest, *Wartburg College*
 Yang Fan, *University of Washington*
 Amir Farmanesh, *University of Maryland*
 MohammadMahdi Farsiabi, *Wayne State University*
 Julie Finnegan, *Mendocino College*
 Ryan Finseth, *University of Montana*
 Donna Fisher, *Georgia Southern University*
 Nikki Follis, *Chadron State College*
 Joseph Franklin, *Newberry College*
 Matthew Freeman, *Mississippi State University*
 Gary Frey, *City College of New York*
 Ted Fu, *Shenandoah University*
 Winnie Fung, *Wheaton College*
 Marc Fusaro, *Arkansas Tech University*
 Todd Gabe, *University of Maine*
 Mary Gade, *Oklahoma State University*
 Jonathan Gafford, *Columbia State Community College*
 Iris Geisler, *Austin Community College*
 Jacob Gelber, *University of Alabama at Birmingham*
 Robert Gentenaar, *Pima Downtown Community College*
 Soma Ghosh, *Albright College*
 Edgar Ghossoub, *University of Texas at San Antonio*
 Alex Gialanella, *Manhattanville College*
 Bill Gibson, *University of Vermont*
 Kenneth Gillingham, *Yale University*
 Gregory Gilpin, *Montana State University*
 Robert Godby, *University of Wyoming*
 Jayendra Gokhale, *Oregon State University*
 Joel Goldhar, *IIT/Stuart School of Business*
 Michael Goode, *Central Piedmont Community College*
 Michael J Gootzeit, *University of Memphis*
 Jackson Grant, *US Air Force Academy*
 Jeremy Groves, *Northern Illinois University*
 Ilhami Gunduz, *Brooklyn College–CUNY*
 Roberts Halsey, *Indiana University*
 Michele Hampton, *Cuyahoga Community College Eastern*
 James Hartley, *Mount Holyoke College*
 Mike Hauptert, *University of Wisconsin LaCrosse*
 David Hedrick, *Central Washington University*
 Evert Van Der Heide, *Calvin College*
 Sara Helms, *Samford University*
 Jessica Hennessey, *Furman University*
 Thomas Henry, *Mississippi State University*
 Alexander Hill, *University of Colorado–Boulder*
 Bob Holland, *Purdue University*
 Paul Holmes, *Ashland University*
 Kim Hoolda, *Fordham University*
 Aaron Hoshide, *University of Maine*
 Michael Hoyte, *York College*
 Glenn Hsu, *University of Central Oklahoma*
 Kuang-Chung Hsu, *University of Central Oklahoma*
 Jim Hubert, *Seattle Central Community College*
 George Hughes, *University of Hartford*
 Andrew Hussey, *University of Memphis*
 Christopher Hyer, *University of New Mexico*
 Kent Hymel, *California State University–Northridge*
 Miren Ivankovic, *Anderson University*
 Eric Jacobson, *University of Delaware*
 Bolormaa Jamiyansuren, *Augsburg College*
 Justin Jarvis, *Orange Coast College*
 Andres Jauregui, *Columbus State University*
 Ricot Jean, *Valencia College*
 Michal Jerzmanowski, *Clemson University*
 Bonnie Johnson, *California Lutheran University*
 Bruce Johnson, *Centre College*
 Paul Johnson, *University of Alaska Anchorage*
 Philipp Jonas, *KV Community College*
 Adam Jones, *University of North Carolina–Wilmington*
 Jason Jones, *Furman University*
 Roger Jordan, *Baker College*
 James Jozefowicz, *Indiana University of Pennsylvania*
 Sujana Kabiraj, *Louisiana State University*
 Simran Kahai, *John Carroll University*
 Leo Kahane, *Providence College*
 Venoo Kakar, *San Francisco State University*
 David Kalist, *Shippensburg University*
 Lillian Kamal, *University of Hartford*
 Willie Kamara, *North Lake College*
 Robert Kane, *State University of New York–Fredonia*
 David Karemera, *St. Cloud State University*
 Logan Kelly, *University of Wisconsin*
 Craig Kerr, *California State Polytechnic University–Pomona*
 Wahhab Khandker, *University of Wisconsin–LaCrosse*
 Jongsung Kim, *Bryant University*
 Kihwan Kim, *Rutgers*
 Elsy Kizhakethalackal, *Bowling Green State University*
 Todd Knoop, *Cornell College*
 Fred Kolb, *University of Wisconsin–EauClaire*
 Oleg Korenok, *Virginia Commonwealth University*
 Janet Koscianski, *Shippensburg University*
 Kafui Kouakou, *York College*
 Mikhail Kouliavtsev, *Stephen F. Austin State University*
 Maria Kula, *Roger Williams University*
 Nakul Kumar, *Bloomsburg University*
 Ben Kyer, *Francis Marion University*

- Yuxing Lan, *Auburn Montgomery*
 Daniel Lawson, *Oakland Community College*
 Elena Lazzari, *Marygrove College*
 Quan Le, *Seattle University*
 Chun Lee, *Loyola Marymount University*
 Daniel Lee, *Shippensburg University*
 Jihoon Lee, *Northeastern University*
 Jim Lee, *Texas A&M–Corpus Christi*
 Junghoon Lee, *Emory University*
 Ryan Lee, *Indiana University*
 Sang Lee, *Southeastern Louisiana University*
 James Leggette, *Belhaven University*
 Bozena Leven, *The College of New Jersey*
 Qing Li, *College of the Mainland*
 Zhen Li, *Albion College*
 Carlos Liard-Muriente, *Central Connecticut State University*
 Larry Lichtenstein, *Canisius College*
 Jenny Liu, *Portland State University*
 Jialu Liu, *Allegheny College*
 Sam Liu, *West Valley College*
 Xuepeng Liu, *Kennesaw State University*
 Jie Ma, *Indiana University*
 Michael Machiorlatti, *Oklahoma City Community College*
 Bruce Madariaga, *Montgomery College and Northwestern University*
 Brinda Mahalingam, *University of Alabama-Huntsville*
 C. Lucy Malakar, *Lorain County Community College*
 Paula Manns, *Atlantic Cape Community College*
 Gabriel Manrique, *Winona State University*
 Dan Marburger, *Arizona State University*
 Hardik Marfatia, *Northeastern Illinois University*
 Christina Marsh, *Wake Forest University*
 William McAndrew, *Gannon University*
 Katherine McClain, *University of Georgia*
 Michael McIlhon, *Century College*
 Steven McMullen, *Hope College*
 Jennifer McNiece, *Howard Payne University*
 Robert Menafee, *Sinclair Community College*
 Fabio Mendez, *Loyola University Maryland*
 Charles Meyrick, *Housatonic Community College*
 Heather Micelli, *Mira Costa College*
 Laura Middlesworth, *University of Wisconsin–Eau Claire*
 Meghan Mihal, *St. Thomas Aquinas College*
 Eric Miller, *Oakton Community College*
 Phillip Mixon, *Troy University–Troy*
 Evan Moore, *Auburn University–Montgomery*
 Francis Mummery, *California State University–Fullerton*
 John Mundy, *St. Johns River State University*
 Charles Murray, *The College of Saint Rose*
 James Murray, *University of Wisconsin–LaCrosse*
 Christopher Mushrush, *Illinois State University*
 John Nader, *Davenport University*
 Max Grunbaum Nagiel, *Daytona State College*
 Mihai Nica, *University of Central Oklahoma*
 Scott Niederjohn, *Lakeland College*
 Mark Nixon, *Fordham University*
 George Norman, *Tufts University*
 David O'Hara, *Metropolitan State University*
 Brian O'Roark, *Robert Morris University*
 Yanira Ogrodnik, *Post University*
 Wafa Orman, *University of Alabama in Huntsville*
 Glenda Orosco, *Oklahoma State University Institute of Technology*
 Orgul Ozturk, *University of South Carolina*
 Jennifer Pakula, *Saddleback College*
 Maria Papapavlou, *San Jacinto Central College*
 Nitin Paranjpe, *Wayne State University*
 Irene Parietti, *Felician College*
 Jooyoun Park, *Kent State University*
 Dodd Parks, *Georgia Institute of Technology*
 Jason Patalinghug, *University of New Haven*
 Michael Patton, *St. Louis Community College–Wildwood*
 Wesley Pech, *Wofford College*
 Josh Phillips, *Iowa Central Community College*
 Germain Pichop, *Oklahoma City Community College*
 Lodovico Pizzati, *University of Southern California*
 Florenz Plassmann, *Binghamton University*
 Lana Podolak, *Community College of Beaver County*
 Gyan Pradhan, *Eastern Kentucky University*
 Curtis Price, *University of Southern Indiana*
 Silvia Prina, *Case Western Reserve University*
 Thomas Prusa, *Rutgers University*
 Conrad Puzos, *University of Mississippi*
 John Stuart Rabon, *Missouri State University*
 Mark Reavis, *Arkansas Tech University*
 Robert Rebelein, *Vassar College*
 Agne Reizgevicute, *California State University–Chico*
 Matt Rendleman, *Southern Illinois University*
 Judith Ricks, *Onondaga Community College*
 Chaurey Ritam, *Binghamton University*
 Jared Roberts, *North Carolina State University*
 Josh Robinson, *University of Alabama–Birmingham*
 Kristen Roche, *Mount Mary College*
 Antonio Rodriguez, *Texas A&M International University*
 Debasis Rooj, *Kishwaukee College*
 Larry Ross, *University of Alaska*
 Subhasree Basu Roy, *Missouri State University*
 Jeff Rubin, *Rutgers University–New Brunswick*
 Jason C. Rudbeck, *University of Georgia*
 Jeff Ruggiero, *University of Dayton*
 Robert Rycroft, *University of Mary Washington*
 Allen Sanderson, *University of Chicago*
 Malkiat Sandhu, *San Jose City College*
 Lisle Sanna, *Ursinus College*
 Nese Sara, *University of Cincinnati*
 Naveen Sarna, *Northern Virginia Community College–Alexandria*
 Eric Sartell, *Whitworth University*
 Martin Schonger, *Princeton University*
 Andy Schuchart, *Iowa Central Community College*

- Michael Schultz, *Menlo College*
 Jessica Schuring, *Central College*
 Danielle Schwarzmann, *Towson University*
 Gerald Scott, *Florida Atlantic University*
 Elan Segarra, *San Francisco State University*
 Bhaswati Sengupta, *Iona College*
 Reshmi Sengupta, *Northern Illinois University*
 Dan Settlage, *University of Arkansas-Fort Smith*
 David Shankle, *Blue Mountain College*
 Alex Shiu, *McLennan Community College*
 Robert Shoffner, *Central Piedmont Community College*
 Mark Showalter, *Brigham Young University*
 Sanchit Shrivastava, *University of Utah*
 Johnny Shull, *Wake Tech Community College*
 Suann Shumaker, *Las Positas College*
 Nicholas Shunda, *University of Redlands*
 Milan Sigetich, *Southern Oregon University*
 Jonathan Silberman, *Oakland University*
 Joe Silverman, *Mira Costa College-Oceanside*
 Silva Simone, *Murray State University*
 Harmeet Singh, *Texas A&M University-Kingsville*
 Catherine Skura, *Sandhills Community College*
 Gary Smith, *Canisius College*
 Richard Smith, *University of South Florida-St. Petersburg*
 Joe Sobieralski, *Southwestern Illinois College-Belleville*
 Mario Solis-Garcia, *Macalester College*
 Arjun Sondhi, *Wayne State University*
 Soren Soumbatiants, *Franklin University*
 Matt Souza, *Indiana University – Purdue University Columbus*
 Nekeisha Spencer, *Binghamton University*
 Dean Stansel, *Florida Gulf Coast University*
 Sylwia Starnawska, *D'Youville College*
 Keva Steadman, *Augustana College*
 Rebecca Stein, *University of Pennsylvania*
 Dale Steinreich, *Drury University*
 Paul Stock, *University of Mary Hardin-Baylor*
 Michael Stroup, *Stephen F. Austin State University*
 Edward Stuart, *Northeastern Illinois University*
 Yang Su, *University of Washington*
 Yu-hsuan Su, *University of Washington*
 Samanta Subarna, *The College of New Jersey*
 Abdul Sukar, *Cameron University*
 Burak Sungu, *Miami University*
 John Susenburger, *Utica College*
 James Swofford, *University of South Alabama*
 Vera Tabakova, *East Carolina University*
 Ariuna Taivan, *University of Minnesota-Duluth*
 Eftila Tanellari, *Radford University*
 Eric Taylor, *Central Piedmont Community College*
 Erdal Tekin, *Georgia State University*
 Noreen Templin, *Butler Community College*
 Thomas Tenerelli, *Central Washington University*
 Anna Terzyan, *California State University-Los Angeles*
 Petros Tesfazion, *Ithaca College*
 Charles Thompson, *Brunswick Community College*
 Flint Thompson, *Chippewa Valley Technical College*
 Deborah Thorsen, *Palm Beach State College-Central*
 James Tierney, *University of California Irvine*
 Julie Trivitt, *Arkansas Tech University*
 Arja Turunen-Red, *University of New Orleans*
 Mark Tuttle, *Sam Houston State University*
 Jennifer VanGilder, *Ursinus College*
 Ross vanWassenhove, *University of Houston*
 Ben Vaughan, *Trinity University*
 Roumen Vesselinov, *Queens College, City University of New York*
 Rubina Vohra, *St. Peter's College*
 Will Walsh, *Samford University*
 Chih-Wei Wang, *Pacific Lutheran University*
 Jingjing Wang, *University of New Mexico*
 Chad Wassell, *Central Washington University*
 Christine Wathen, *Middlesex Community College*
 J. Douglas Wellington, *Husson University*
 Adam Werner, *California Polytechnic State University*
 Sarah West, *Macalester College*
 Elizabeth Wheaton, *Southern Methodist University*
 Oxana Wieland, *University of Minnesota, Crookston*
 Christopher Wimer, *Bowling Green State University-Firelands College*
 Do Youn Won, *University of Utah*
 Kelvin Wong, *University of Minnesota*
 Ken Woodward, *Saddleback College*
 Irena Xhurxhi, *York College*
 Xu Xu, *Mississippi state university*
 Ying Yang, *University of Rhode Island*
 Young-Ro Yoon, *Wayne State University*
 Eric Zemjic, *Kent State University*
 Yongchen Zhao, *Towson University*
 Zhen Zhu, *University of Central Oklahoma*
 Kent Zirlott, *University of Alabama-Tuscaloosa*
 Joseph Zwiller, *Lake Michigan College*

The team of editors who worked on this book improved it tremendously. Jane Tufts, developmental editor, provided truly spectacular editing—as she always does. Michael Parthenakis, senior product manager, did a splendid job of overseeing the many people involved in such a large project. Anita Verma, senior content developer, was crucial in assembling an extensive and thoughtful group of reviewers to give me feedback on the previous edition, while putting together an excellent team to revise the supplements. Colleen Farmer, senior content project manager, had the patience and dedication necessary to turn my manuscript into this book. Kasie Jean, digital content designer and a trained economist, designed and implemented all of the valuable student resources in MindTap. Michelle Kunkler, senior art director, gave this book its clean, friendly look. Bruce Morser, the illustrator, helped make the book more visually appealing and the economics in it less abstract. Pamela Rockwell, copyeditor, refined my prose, and Lumina Datamatic’s indexer, prepared a careful and thorough index. John Carey, executive marketing manager, worked long hours getting the word out to potential users of this book. The rest of the Cengage team has, as always, been consistently professional, enthusiastic, and dedicated.

I am grateful also to Denis Fedin and Nina Vendhan, two star Harvard undergraduates, who helped me refine the manuscript and check the page proofs for this edition.

As always, I must thank my “in-house” editor Deborah Mankiw. As the first reader of most things I write, she continued to offer just the right mix of criticism and encouragement.

Finally, I would like to mention my three children Catherine, Nicholas, and Peter. Their contribution to this book was putting up with a father spending too many hours in his study. The four of us have much in common—not least of which is our love of ice cream (which becomes apparent in Chapter 4).

N. Gregory Mankiw
December 2016



Contents

Preface: To the Student ix

Acknowledgments xv



PART I Introduction 1

CHAPTER 1

Ten Principles of Economics 3

1-1 How People Make Decisions 4

- 1-1a Principle 1: People Face Trade-offs 4
- 1-1b Principle 2: The Cost of Something Is What You Give Up to Get It 5
- 1-1c Principle 3: Rational People Think at the Margin 6
- 1-1d Principle 4: People Respond to Incentives 7

1-2 How People Interact 8

- 1-2a Principle 5: Trade Can Make Everyone Better Off 8
- 1-2b Principle 6: Markets Are Usually a Good Way to Organize Economic Activity 9
 - FYI:** Adam Smith and the Invisible Hand 10
 - CASE STUDY:** Adam Smith Would Have Loved Uber 11
- 1-2c Principle 7: Governments Can Sometimes Improve Market Outcomes 11

1-3 How the Economy as a Whole Works 13

- 1-3a Principle 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services 13
- 1-3b Principle 9: Prices Rise When the Government Prints Too Much Money 13

- 1-3c Principle 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment 14

1-4 Conclusion 15

Summary 16

Key Concepts 16

Questions for Review 16

Problems and Applications 17

CHAPTER 2

Thinking Like an Economist 19

2-1 The Economist as Scientist 20

- 2-1a The Scientific Method: Observation, Theory, and More Observation 20
- 2-1b The Role of Assumptions 21
- 2-1c Economic Models 22
- 2-1d Our First Model: The Circular-Flow Diagram 22
- 2-1e Our Second Model: The Production Possibilities Frontier 24
- 2-1f Microeconomics and Macroeconomics 26

2-2 The Economist as Policy Adviser 27

- 2-2a Positive versus Normative Analysis 27
- 2-2b Economists in Washington 28
- 2-2c Why Economists' Advice Is Not Always Followed 29

2-3 Why Economists Disagree 30

- 2-3a Differences in Scientific Judgments 30
- 2-3b Differences in Values 30
- 2-3c Perception versus Reality 31

ASK THE EXPERTS: Ticket Resale 32

2-4 Let's Get Going 32

IN THE NEWS: Why You Should Study Economics 33

Summary 34

Key Concepts 34

Questions for Review 35

Problems and Applications 35

Appendix Graphing: A Brief Review 37

CHAPTER 3

Interdependence and the Gains from Trade 47

3-1 A Parable for the Modern Economy 48

- 3-1a Production Possibilities 49
- 3-1b Specialization and Trade 50

3-2 Comparative Advantage: The Driving Force of Specialization 52

- 3-2a Absolute Advantage 52
- 3-2b Opportunity Cost and Comparative Advantage 52
- 3-2c Comparative Advantage and Trade 53
- 3-2d The Price of the Trade 54

FYI: The Legacy of Adam Smith and David Ricardo 55

3-3 Applications of Comparative Advantage 55

- 3-3a Should Serena Williams Mow Her Own Lawn? 55

IN THE NEWS: Economics within a Marriage 56

- 3-3b Should the United States Trade with Other Countries? 56

ASK THE EXPERTS: Trade between China and the United States 58

3-4 Conclusion 58

Summary 59

Key Concepts 59

Questions for Review 60

Problems and Applications 60



PART II How Markets Work 63

CHAPTER 4

The Market Forces of Supply and Demand 65

4-1 Markets and Competition 66

- 4-1a What Is a Market? 66
- 4-1b What Is Competition? 66

4-2 Demand 67

- 4-2a The Demand Curve: The Relationship between Price and Quantity Demanded 67
- 4-2b Market Demand versus Individual Demand 68
- 4-2c Shifts in the Demand Curve 69

CASE STUDY: Two Ways to Reduce the Quantity of Smoking Demanded 71

4-3 Supply 73

- 4-3a The Supply Curve: The Relationship between Price and Quantity Supplied 73
- 4-3b Market Supply versus Individual Supply 74
- 4-3c Shifts in the Supply Curve 75

4-4 Supply and Demand Together 76

- 4-4a Equilibrium 76
- 4-4b Three Steps to Analyzing Changes in Equilibrium 78

4-5 Conclusion: How Prices Allocate Resources 83

ASK THE EXPERTS: Price Gouging 83

IN THE NEWS: Price Increases after Disasters 84

Summary 86

Key Concepts 86

Questions for Review 87

Problems and Applications 87

CHAPTER 5

Elasticity and Its Application 89

5-1 The Elasticity of Demand 90

- 5-1a The Price Elasticity of Demand and Its Determinants 90
- 5-1b Computing the Price Elasticity of Demand 91
- 5-1c The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities 92
- 5-1d The Variety of Demand Curves 93
- FYI:** A Few Elasticities from the Real World 93
- 5-1e Total Revenue and the Price Elasticity of Demand 95
- 5-1f Elasticity and Total Revenue along a Linear Demand Curve 96
- 5-1g Other Demand Elasticities 98

5-2 The Elasticity of Supply 99

- 5-2a The Price Elasticity of Supply and Its Determinants 99
- 5-2b Computing the Price Elasticity of Supply 99
- 5-2c The Variety of Supply Curves 100

5-3 Three Applications of Supply, Demand, and Elasticity 102

- 5-3a Can Good News for Farming Be Bad News for Farmers? 102
- 5-3b Why Did OPEC Fail to Keep the Price of Oil High? 104
- 5-3c Does Drug Interdiction Increase or Decrease Drug-Related Crime? 105

5-4 Conclusion 107

Summary 108

Key Concepts 108

Questions for Review 109

Problems and Applications 109

CHAPTER 6

Supply, Demand, and Government Policies 111

6-1 Controls on Prices 112

- 6-1a How Price Ceilings Affect Market Outcomes 112
- CASE STUDY:** Lines at the Gas Pump 114

CASE STUDY: Rent Control in the Short Run and the Long Run 115

6-1b How Price Floors Affect Market Outcomes 116

ASK THE EXPERTS: Rent Control 116

CASE STUDY: The Minimum Wage 118

ASK THE EXPERTS: The Minimum Wage 119

6-1c Evaluating Price Controls 120

6-2 Taxes 120

6-2a How Taxes on Sellers Affect Market Outcomes 121

6-2b How Taxes on Buyers Affect Market Outcomes 122

CASE STUDY: Can Congress Distribute the Burden of a Payroll Tax? 124

6-2c Elasticity and Tax Incidence 124

CASE STUDY: Who Pays the Luxury Tax? 126

6-3 Conclusion 127

Summary 128

Key Concepts 128

Questions for Review 128

Problems and Applications 129



PART III Markets and Welfare 131

CHAPTER 7

Consumers, Producers, and the Efficiency of Markets 133

7-1 Consumer Surplus 134

7-1a Willingness to Pay 134

7-1b Using the Demand Curve to Measure Consumer Surplus 135

7-1c How a Lower Price Raises Consumer Surplus 136

7-1d What Does Consumer Surplus Measure? 137

7-2 Producer Surplus 139

7-2a Cost and the Willingness to Sell 139

7-2b Using the Supply Curve to Measure Producer Surplus 140

7-2c How a Higher Price Raises Producer Surplus 141

7-3 Market Efficiency 142

7-3a The Benevolent Social Planner 143

7-3b Evaluating the Market Equilibrium 144

IN THE NEWS: The Invisible Hand Can Park Your Car 146

CASE STUDY: Should There Be a Market for Organs? 147

ASK THE EXPERTS: Supplying Kidneys 148

7-4 Conclusion: Market Efficiency and Market Failure 148

Summary 150

Key Concepts 150

Questions for Review 150

Problems and Applications 150

CHAPTER 8

Application: The Costs of Taxation 153

8-1 The Deadweight Loss of Taxation 154

8-1a How a Tax Affects Market Participants 155

8-1b Deadweight Losses and the Gains from Trade 157

8-2 The Determinants of the Deadweight Loss 158

CASE STUDY: The Deadweight Loss Debate 160

8-3 Deadweight Loss and Tax Revenue as Taxes Vary 161

CASE STUDY: The Laffer Curve and Supply-Side Economics 162

ASK THE EXPERTS: The Laffer Curve 163

8-4 Conclusion 164

Summary 165

Key Concept 165

Questions for Review 165

Problems and Applications 165

CHAPTER 9

Application: International Trade 167

9-1 The Determinants of Trade 168

9-1a The Equilibrium without Trade 168

9-1b The World Price and Comparative Advantage 169

9-2 The Winners and Losers from Trade 170

9-2a The Gains and Losses of an Exporting Country 170

9-2b The Gains and Losses of an Importing Country 171

9-2c Effects of a Tariff 173

FYI: Import Quotas: Another Way to Restrict Trade 175

9-2d The Lessons for Trade Policy 175

9-2e Other Benefits of International Trade 176

IN THE NEWS: Trade as a Tool for Economic Development 177

9-3 The Arguments for Restricting Trade 178

9-3a The Jobs Argument 178

IN THE NEWS: Should the Winners from Free Trade Compensate the Losers? 179

9-3b The National-Security Argument 180

9-3c The Infant-Industry Argument 180

9-3d The Unfair-Competition Argument 181

9-3e The Protection-as-a-Bargaining-Chip Argument 181

CASE STUDY: Trade Agreements and the World Trade Organization 181

ASK THE EXPERTS: Trade Deals 182

9-4 Conclusion 182

Summary 184

Key Concepts 184

Questions for Review 184

Problems and Applications 185



PART IV The Data of Macroeconomics 187

CHAPTER 10

Measuring a Nation's Income 189

10-1 The Economy's Income and Expenditure 190

10-2 The Measurement of GDP 192

10-2a "GDP Is the Market Value . . ." 192

10-2b " . . . of All . . ." 192

10-2c " . . . Final . . ." 192

10-2d " . . . Goods and Services . . ." 193

10-2e " . . . Produced . . ." 193

10-2f " . . . Within a Country . . ." 193

10-2g " . . . In a Given Period of Time." 193

FYI: Other Measures of Income 194

10-3 The Components of GDP 195

10-3a Consumption 195

10-3b Investment 195

IN THE NEWS: Sex, Drugs, and GDP 196

10-3c Government Purchases 196

10-3d Net Exports 196

CASE STUDY: The Components of U.S. GDP 197

10-4 Real versus Nominal GDP 198

10-4a A Numerical Example 198

10-4b The GDP Deflator 200

CASE STUDY: A Half Century of Real GDP 201

IN THE NEWS: Gauging the High-Tech Economy 202

10-5 Is GDP a Good Measure of Economic Well-Being? 202

IN THE NEWS: Measuring Macroeconomic Well-Being 204

CASE STUDY: International Differences in GDP and the Quality of Life 206

10-6 Conclusion 207

Summary 208

Key Concepts 208

Questions for Review 208

Problems and Applications 209

CHAPTER 11

Measuring the Cost of Living 211

11-1 The Consumer Price Index 212

11-1a How the CPI Is Calculated 212

FYI: What's in the CPI's Basket? 214

11-1b Problems in Measuring the Cost of Living 215

IN THE NEWS: Monitoring Inflation in the Internet Age 216

11-1c The GDP Deflator versus the Consumer Price Index 218

11-2 Correcting Economic Variables for the Effects of Inflation 219

11-2a Dollar Figures from Different Times 219

FYI: Mr. Index Goes to Hollywood 220

CASE STUDY: Regional Differences in the Cost of Living 221

11-2b Indexation 222

11-2c Real and Nominal Interest Rates 222

CASE STUDY: Interest Rates in the U.S. Economy 224

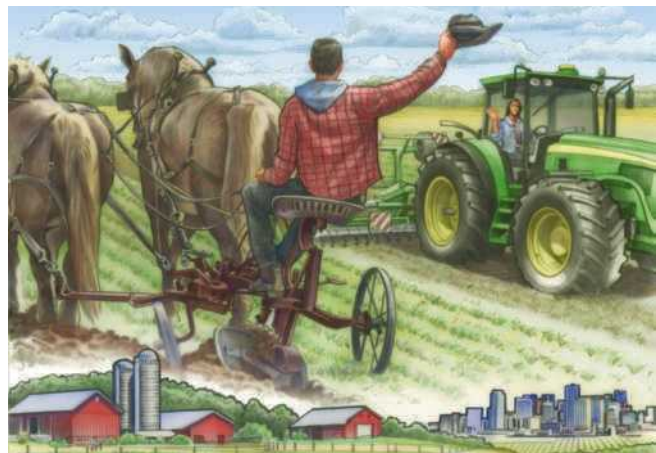
11-3 Conclusion 224

Summary 226

Key Concepts 226

Questions for Review 226

Problems and Applications 227



PART V The Real Economy in the Long Run 229

CHAPTER 12

Production and Growth 231

12-1 Economic Growth around the World 232

12-2 Productivity: Its Role and Determinants 234

12-2a Why Productivity Is So Important 234

FYI: Are You Richer Than the Richest American? 234

12-2b How Productivity Is Determined 235

FYI: A Picture Is Worth a Thousand Statistics 236

FYI: The Production Function 239

CASE STUDY: Are Natural Resources a Limit to Growth? 240

12-3 Economic Growth and Public Policy 241

12-3a Saving and Investment 241

12-3b Diminishing Returns and the Catch-Up Effect 241

12-3c Investment from Abroad 243

12-3d Education 244

12-3e Health and Nutrition 244

12-3f Property Rights and Political Stability 245

12-3g Free Trade 246

12-3h Research and Development 247

ASK THE EXPERTS: Innovation and Growth 247

IN THE NEWS: Curmudgeon versus Optimist 248

12-3i Population Growth 250

IN THE NEWS: Using Experiments to Evaluate Aid 252

12-4 Conclusion: The Importance of Long-Run Growth 254

Summary 255

Key Concepts 255

Questions for Review 255

Problems and Applications 256

CHAPTER 13

Saving, Investment, and the Financial System 257

13-1 Financial Institutions in the U.S. Economy 258

13-1a Financial Markets 258

13-1b Financial Intermediaries 260

FYI: Key Numbers for Stock Watchers 261

13-1c Summing Up 262

13-2 Saving and Investment in the National Income Accounts 263

13-2a Some Important Identities 263

13-2b The Meaning of Saving and Investment 265

13-3 The Market for Loanable Funds 265

13-3a Supply and Demand for Loanable Funds 266

13-3b Policy 1: Saving Incentives 267

13-3c Policy 2: Investment Incentives 269

13-3d Policy 3: Government Budget Deficits and Surpluses 270

ASK THE EXPERTS: Fiscal Policy and Saving 271

CASE STUDY: The History of U.S. Government Debt 272

FYI: Financial Crises 274

13-4 Conclusion 274

Summary 275

Key Concepts 276

Questions for Review 276

Problems and Applications 276

CHAPTER 14

The Basic Tools of Finance 279

14-1 Present Value: Measuring the Time Value of Money 280

FYI: The Magic of Compounding and the Rule of 70 282

14-2 Managing Risk 282

14-2a Risk Aversion 282

14-2b The Markets for Insurance 283

14-2c Diversification of Firm-Specific Risk 284

14-2d The Trade-off between Risk and Return 285

14-3 Asset Valuation 287

14-3a Fundamental Analysis 287

14-3b The Efficient Markets Hypothesis 287

CASE STUDY: Random Walks and Index Funds 288

ASK THE EXPERTS: Diversification 289

14-3c Market Irrationality 289

14-4 Conclusion 290

Summary 291

Key Concepts 291

Questions for Review 291

Problems and Applications 292

CHAPTER 15

Unemployment 293

15-1 Identifying Unemployment 294

15-1a How Is Unemployment Measured? 294

CASE STUDY: Labor-Force Participation of Men and Women in the U.S. Economy 297

15-1b Does the Unemployment Rate Measure What We Want It To? 298

15-1c How Long Are the Unemployed without Work? 300

15-1d Why Are There Always Some People Unemployed? 300

FYI: The Jobs Number 301

15-2 Job Search 302

15-2a Why Some Frictional Unemployment Is Inevitable 302

15-2b Public Policy and Job Search 302

15-2c Unemployment Insurance 303

15-3 Minimum-Wage Laws 304

CASE STUDY: Who Earns the Minimum Wage? 305

IN THE NEWS: Should the Minimum Wage be Raised to \$15 an Hour? 306

15-4 Unions and Collective Bargaining 308

15-4a The Economics of Unions 308

15-4b Are Unions Good or Bad for the Economy? 309

15-5 The Theory of Efficiency Wages 310

15-5a Worker Health 310

15-5b Worker Turnover 310

15-5c Worker Quality 311

15-5d Worker Effort 311

CASE STUDY: Henry Ford and the Very Generous \$5-a-Day Wage 311**15-6 Conclusion 312****Summary 313****Key Concepts 314****Questions for Review 314****Problems and Applications 314**

PART VI Money and Prices in the Long Run 317

CHAPTER 16

The Monetary System 319

16-1 The Meaning of Money 320

16-1a The Functions of Money 321

16-1b The Kinds of Money 321

IN THE NEWS: Why Gold? 322

16-1c Money in the U.S. Economy 323

CASE STUDY: Where Is All the Currency? 324**FYI:** Why Credit Cards Aren't Money 325**16-2 The Federal Reserve System 325**

16-2a The Fed's Organization 325

16-2b The Federal Open Market Committee 326

16-3 Banks and the Money Supply 327

16-3a The Simple Case of 100-Percent-Reserve Banking 327

16-3b Money Creation with Fractional-Reserve Banking 328

16-3c The Money Multiplier 329

16-3d Bank Capital, Leverage, and the Financial Crisis of 2008–2009 331

16-4 The Fed's Tools of Monetary Control 332

16-4a How the Fed Influences the Quantity of Reserves 333

16-4b How the Fed Influences the Reserve Ratio 334

16-4c Problems in Controlling the Money Supply 335

CASE STUDY: Bank Runs and the Money Supply 335**IN THE NEWS:** A Trip to Jekyll Island 336

16-4d The Federal Funds Rate 337

16-5 Conclusion 338**Summary 339****Key Concepts 340****Questions for Review 340****Problems and Applications 340**

CHAPTER 17

Money Growth and Inflation 343

17-1 The Classical Theory of Inflation 345

17-1a The Level of Prices and the Value of Money 345

17-1b Money Supply, Money Demand, and Monetary Equilibrium 346

17-1c The Effects of a Monetary Injection 347

17-1d A Brief Look at the Adjustment Process 348

17-1e The Classical Dichotomy and Monetary Neutrality 349

17-1f Velocity and the Quantity Equation 350

CASE STUDY: Money and Prices during Four Hyperinflations 352

17-1g The Inflation Tax 353

FYI: Hyperinflation in Zimbabwe 354

17-1h The Fisher Effect 355

17-2 The Costs of Inflation 356

17-2a A Fall in Purchasing Power? The Inflation Fallacy 357

17-2b Shoeleather Costs 357

17-2c Menu Costs 358

17-2d Relative-Price Variability and the Misallocation of Resources 358

17-2e Inflation-Induced Tax Distortions 359

17-2f Confusion and Inconvenience 360

17-2g A Special Cost of Unexpected Inflation: Arbitrary Redistributions of Wealth 361

17-2h Inflation Is Bad, but Deflation May Be Worse 362

CASE STUDY: *The Wizard of Oz* and the Free-Silver Debate 362**17-3 Conclusion 363****Summary 365****Key Concepts 365****Questions for Review 365****Problems and Applications 365**



PART VII The Macroeconomics of Open Economies 367

CHAPTER 18

Open-Economy Macroeconomics: Basic Concepts 369

18-1 The International Flows of Goods and Capital 370

18-1a The Flow of Goods: Exports, Imports, and Net Exports 370

CASE STUDY: The Increasing Openness of the U.S. Economy 371

IN THE NEWS: The Complicated Politics of Trade Agreements 372

18-1b The Flow of Financial Resources: Net Capital Outflow 374

18-1c The Equality of Net Exports and Net Capital Outflow 375

18-1d Saving, Investment, and Their Relationship to the International Flows 376

18-1e Summing Up 377

CASE STUDY: Is the U.S. Trade Deficit a National Problem? 378

ASK THE EXPERTS: Trade Balances and Trade Negotiations 380

18-2 The Prices for International Transactions: Real and Nominal Exchange Rates 380

18-2a Nominal Exchange Rates 381

18-2b Real Exchange Rates 381

FYI: The Euro 382

18-3 A First Theory of Exchange-Rate Determination: Purchasing-Power Parity 383

18-3a The Basic Logic of Purchasing-Power Parity 384

18-3b Implications of Purchasing-Power Parity 384

CASE STUDY: The Nominal Exchange Rate during a Hyperinflation 386

18-3c Limitations of Purchasing-Power Parity 387

CASE STUDY: The Hamburger Standard 387

18-4 Conclusion 388

Summary 389

Key Concepts 389

Questions for Review 390

Problems and Applications 390

CHAPTER 19

A Macroeconomic Theory of the Open Economy 393

19-1 Supply and Demand for Loanable Funds and for Foreign-Currency Exchange 394

19-1a The Market for Loanable Funds 394

19-1b The Market for Foreign-Currency Exchange 396

FYI: Purchasing-Power Parity as a Special Case 398

19-2 Equilibrium in the Open Economy 399

19-2a Net Capital Outflow: The Link between the Two Markets 399

19-2b Simultaneous Equilibrium in Two Markets 400

FYI: Disentangling Supply and Demand 401

19-3 How Policies and Events Affect an Open Economy 402

19-3a Government Budget Deficits 402

19-3b Trade Policy 404

19-3c Political Instability and Capital Flight 406

IN THE NEWS: Is a Strong Currency Always in a Nation's Interest? 408

CASE STUDY: Capital Flows from China 410

ASK THE EXPERTS: Currency Manipulation 411

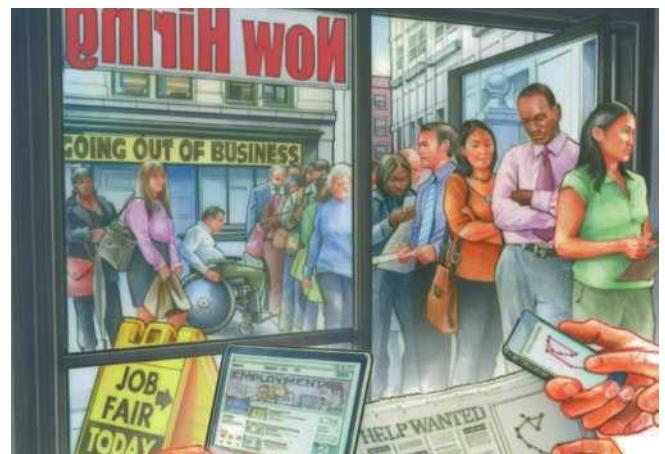
19-4 Conclusion 411

Summary 412

Key Concepts 412

Questions for Review 412

Problems and Applications 413



PART VIII Short-Run Economic Fluctuations 415

CHAPTER 20

Aggregate Demand and Aggregate Supply 417

20-1 Three Key Facts about Economic Fluctuations 418

- 20-1a Fact 1: Economic Fluctuations Are Irregular and Unpredictable 418
- 20-1b Fact 2: Most Macroeconomic Quantities Fluctuate Together 420
- 20-1c Fact 3: As Output Falls, Unemployment Rises 420

20-2 Explaining Short-Run Economic Fluctuations 421

- 20-2a The Assumptions of Classical Economics 421
- 20-2b The Reality of Short-Run Fluctuations 421
- 20-2c The Model of Aggregate Demand and Aggregate Supply 422

20-3 The Aggregate-Demand Curve 423

- 20-3a Why the Aggregate-Demand Curve Slopes Downward 423
- 20-3b Why the Aggregate-Demand Curve Might Shift 426

20-4 The Aggregate-Supply Curve 428

- 20-4a Why the Aggregate-Supply Curve Is Vertical in the Long Run 428
- 20-4b Why the Long-Run Aggregate-Supply Curve Might Shift 429
- 20-4c Using Aggregate Demand and Aggregate Supply to Depict Long-Run Growth and Inflation 431
- 20-4d Why the Aggregate-Supply Curve Slopes Upward in the Short Run 432
- 20-4e Why the Short-Run Aggregate-Supply Curve Might Shift 436

20-5 Two Causes of Economic Fluctuations 437

- 20-5a The Effects of a Shift in Aggregate Demand 438
 - FYI:** Monetary Neutrality Revisited 440
 - CASE STUDY:** Two Big Shifts in Aggregate Demand: The Great Depression and World War II 441
 - CASE STUDY:** The Great Recession of 2008–2009 442
 - IN THE NEWS:** What Have We Learned? 444
- 20-5b The Effects of a Shift in Aggregate Supply 444
 - CASE STUDY:** Oil and the Economy 447
 - FYI:** The Origins of the Model of Aggregate Demand and Aggregate Supply 448

20-6 Conclusion 449

Summary 450

Key Concepts 450

Questions for Review 451

Problems and Applications 451

CHAPTER 21

The Influence of Monetary and Fiscal Policy on Aggregate Demand 453

21-1 How Monetary Policy Influences Aggregate Demand 454

- 21-1a The Theory of Liquidity Preference 455
- 21-1b The Downward Slope of the Aggregate-Demand Curve 457
 - FYI:** Interest Rates in the Long Run and the Short Run 458
- 21-1c Changes in the Money Supply 459
- 21-1d The Role of Interest-Rate Targets in Fed Policy 461
 - CASE STUDY:** Why the Fed Watches the Stock Market (and Vice Versa) 461
- 21-1e The Zero Lower Bound 462

21-2 How Fiscal Policy Influences Aggregate Demand 463

- 21-2a Changes in Government Purchases 463
- 21-2b The Multiplier Effect 464
- 21-2c A Formula for the Spending Multiplier 464
- 21-2d Other Applications of the Multiplier Effect 466
- 21-2e The Crowding-Out Effect 466
 - 21-2e Changes in Taxes 468
 - FYI:** How Fiscal Policy Might Affect Aggregate Supply 468

21-3 Using Policy to Stabilize the Economy 469

- 21-3a The Case for Active Stabilization Policy 469
 - IN THE NEWS:** How Large Is the Fiscal Policy Multiplier? 470
 - CASE STUDY:** Keynesians in the White House 472
 - ASK THE EXPERTS:** Economic Stimulus 472
- 21-3b The Case against Active Stabilization Policy 472
- 21-3c Automatic Stabilizers 474

21-4 Conclusion 474

Summary 475

Key Concepts 476

Questions for Review 476

Problems and Applications 476

CHAPTER 22

The Short-Run Trade-off between Inflation and Unemployment 479

22-1 The Phillips Curve 480

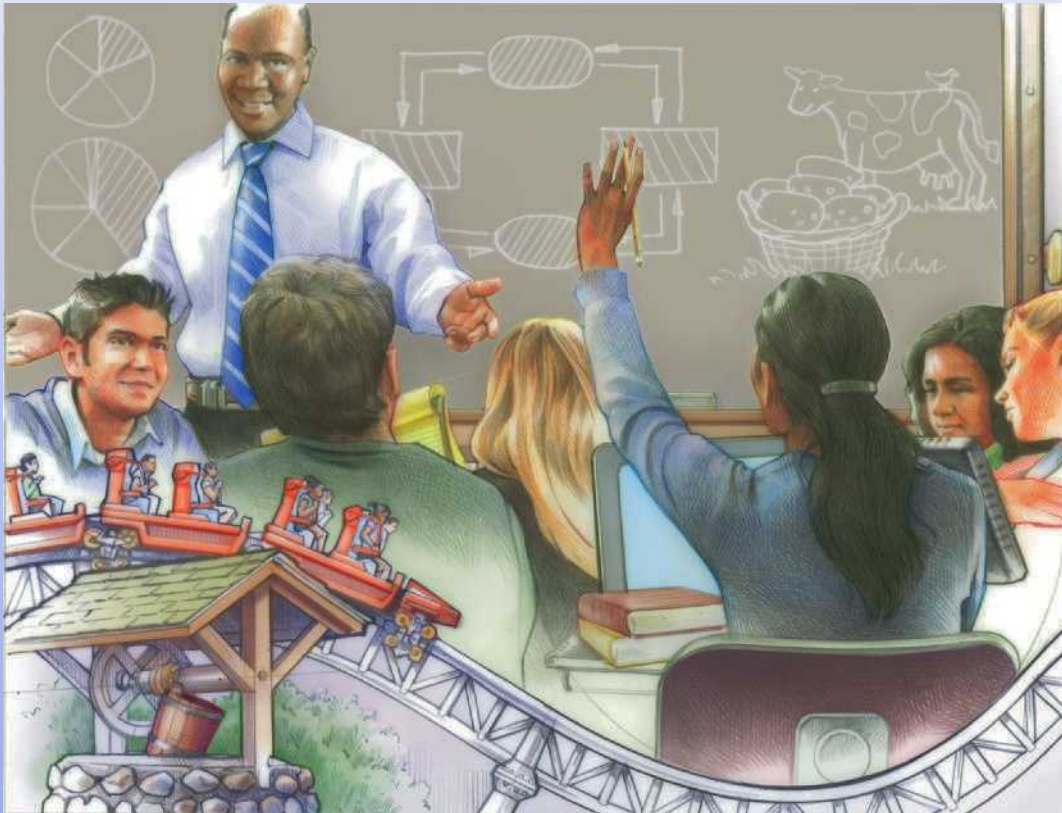
- 22-1a Origins of the Phillips Curve 480
- 22-1b Aggregate Demand, Aggregate Supply, and the Phillips Curve 481

22-2 Shifts in the Phillips Curve: The Role of Expectations 483

- 22-2a The Long-Run Phillips Curve 483
- 22-2b The Meaning of “Natural” 485
- 22-2c Reconciling Theory and Evidence 486
- 22-2d The Short-Run Phillips Curve 487
- 22-2e The Natural Experiment for the Natural-Rate Hypothesis 488

PART I

Introduction



© SAMSONOVS/GETTY IMAGES



1

Like a household, a society faces many decisions. It must find some way to decide what jobs will be done and who will do them. It needs some people to grow food, other people to make clothing, and still others to design computer software. Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must also allocate the goods and services they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Tesla and who will take the bus.

scarcity

the limited nature of society's resources

The management of society's resources is important because resources are scarce. **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything she wants, each individual in a society cannot attain the highest standard of living to which she might aspire.

economics

the study of how society manages its scarce resources

Economics is the study of how society manages its scarce resources. In most societies, resources are allocated not by an all-powerful dictator but through the combined choices of millions of households and firms. Economists, therefore, study how people make decisions: how much they work, what they buy, how much they save, and how they invest their savings. Economists also study how people interact with one another. For instance, they examine how the multitude of buyers and sellers of a good together determine the price at which the good is sold and the quantity that is sold. Finally, economists analyze the forces and trends that affect the economy as a whole, including the growth in average income, the fraction of the population that cannot find work, and the rate at which prices are rising.

The study of economics has many facets, but it is unified by several central ideas. In this chapter, we look at *Ten Principles of Economics*. Don't worry if you don't understand them all at first or if you aren't completely convinced. We explore these ideas more fully in later chapters. The ten principles are introduced here to give you an overview of what economics is all about. Consider this chapter a "preview of coming attractions."

1-1 How People Make Decisions

There is no mystery to what an economy is. Whether we are talking about the economy of Los Angeles, the United States, or the whole world, an economy is just a group of people dealing with one another as they go about their lives. Because the behavior of an economy reflects the behavior of the individuals who make up the economy, we begin our study of economics with four principles about individual decision making.

1-1a Principle 1: People Face Trade-offs

You may have heard the old saying, "There ain't no such thing as a free lunch." Grammar aside, there is much truth to this adage. To get something that we like, we usually have to give up something else that we also like. Making decisions requires trading off one goal against another.

Consider a student who must decide how to allocate her most valuable resource—her time. She can spend all of her time studying economics, spend all of it studying psychology, or divide it between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour she could have spent napping, bike riding, watching TV, or working at her part-time job for some extra spending money.

Consider parents deciding how to spend their family income. They can buy food, clothing, or a family vacation. Or they can save some of the family income for retirement or the children's college education. When they choose to spend an extra dollar on one of these goods, they have one less dollar to spend on some other good.

When people are grouped into societies, they face different kinds of trade-offs. One classic trade-off is between “guns and butter.” The more a society spends on national defense (guns) to protect its shores from foreign aggressors, the less it can spend on consumer goods (butter) to raise the standard of living at home. Also important in modern society is the trade-off between a clean environment and a high level of income. Laws that require firms to reduce pollution raise the cost of producing goods and services. Because of these higher costs, the firms end up earning smaller profits, paying lower wages, charging higher prices, or some combination of these three. Thus, while pollution regulations yield the benefit of a cleaner environment and the improved health that comes with it, they come at the cost of reducing the incomes of the regulated firms' owners, workers, and customers.

Another trade-off society faces is between efficiency and equality. **Efficiency** means that society is getting the maximum benefits from its scarce resources. **Equality** means that those benefits are distributed uniformly among society's members. In other words, efficiency refers to the size of the economic pie, and equality refers to how the pie is divided into individual slices.

When government policies are designed, these two goals often conflict. Consider, for instance, policies aimed at equalizing the distribution of economic well-being. Some of these policies, such as the welfare system or unemployment insurance, try to help the members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Though they achieve greater equality, these policies reduce efficiency. When the government redistributes income from the rich to the poor, it reduces the reward for working hard; as a result, people work less and produce fewer goods and services. In other words, when the government tries to cut the economic pie into more equal slices, the pie gets smaller.

Recognizing that people face trade-offs does not by itself tell us what decisions they will or should make. A student should not abandon the study of psychology just because doing so would increase the time available for the study of economics. Society should not stop protecting the environment just because environmental regulations reduce our material standard of living. The poor should not be ignored just because helping them distorts work incentives. Nonetheless, people are likely to make good decisions only if they understand the options that are available to them. Our study of economics, therefore, starts by acknowledging life's trade-offs.

1-1b Principle 2: The Cost of Something Is What You Give Up to Get It

Because people face trade-offs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of an action is not as obvious as it might first appear.

Consider the decision to go to college. The main benefits are intellectual enrichment and a lifetime of better job opportunities. But what are the costs? To answer this question, you might be tempted to add up the money you spend on tuition, books, room, and board. Yet this total does not truly represent what you give up to spend a year in college.

There are two problems with this calculation. First, it includes some things that are not really costs of going to college. Even if you quit school, you need a place

efficiency

the property of society getting the most it can from its scarce resources

equality

the property of distributing economic prosperity uniformly among the members of society

opportunity cost

whatever must be given up to obtain some item

rational people

people who systematically and purposefully do the best they can to achieve their objectives

marginal change

a small incremental adjustment to a plan of action

to sleep and food to eat. Room and board are costs of going to college only to the extent that they are more expensive at college than elsewhere. Second, this calculation ignores the largest cost of going to college—your time. When you spend a year listening to lectures, reading textbooks, and writing papers, you cannot spend that time working at a job. For most students, the earnings they give up to attend school are the single largest cost of their education.

The **opportunity cost** of an item is what you give up to get that item. When making any decision, decision makers should be aware of the opportunity costs that accompany each possible action. In fact, they usually are. College athletes who can earn millions if they drop out of school and play professional sports are well aware that their opportunity cost of attending college is very high. It is not surprising that they often decide that the benefit of a college education is not worth the cost.

1-1c Principle 3: Rational People Think at the Margin

Economists normally assume that people are rational. **Rational people** systematically and purposefully do the best they can to achieve their objectives, given the available opportunities. As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture and sell to maximize profits. You will also encounter individuals who decide how much time to spend working and what goods and services to buy with the resulting income to achieve the highest possible level of satisfaction.

Rational people know that decisions in life are rarely black and white but usually involve shades of gray. At dinnertime, the question you face is not “Should I fast or eat like a pig?” More likely, you will be asking yourself “Should I take that extra spoonful of mashed potatoes?” When exams roll around, your decision is not between blowing them off and studying 24 hours a day but whether to spend an extra hour reviewing your notes instead of watching TV. Economists use the term **marginal change** to describe a small incremental adjustment to an existing plan of action. Keep in mind that *margin* means “edge,” so marginal changes are adjustments around the edges of what you are doing. Rational people often make decisions by comparing *marginal benefits* and *marginal costs*.

For example, suppose you are considering calling a friend on your cell phone. You decide that talking with her for 10 minutes would give you a benefit that you value at about \$7. Your cell phone service costs you \$40 per month plus \$0.50 per minute for whatever calls you make. You usually talk for 100 minutes a month, so your total monthly bill is \$90 (\$0.50 per minute times 100 minutes, plus the \$40 fixed fee). Under these circumstances, should you make the call? You might be tempted to reason as follows: “Because I pay \$90 for 100 minutes of calling each month, the average minute on the phone costs me \$0.90. So a 10-minute call costs \$9. Because that \$9 cost is greater than the \$7 benefit, I am going to skip the call.” That conclusion is wrong, however. Although the *average* cost of a 10-minute call is \$9, the *marginal* cost—the amount your bill increases if you make the extra call—is only \$5. You will make the right decision only by comparing the marginal benefit and the marginal cost. Because the marginal benefit of \$7 is greater than the marginal cost of \$5, you should make the call. This is a principle that people innately understand: Cell phone users with unlimited minutes (that is, minutes that are free at the margin) are often prone to making long and frivolous calls.

Thinking at the margin works for business decisions as well. Consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane across the United States costs the airline \$100,000. In this case, the

average cost of each seat is $\$100,000/200$, which is $\$500$. One might be tempted to conclude that the airline should never sell a ticket for less than $\$500$. But a rational airline can increase its profits by thinking at the margin. Imagine that a plane is about to take off with 10 empty seats and a standby passenger waiting at the gate is willing to pay $\$300$ for a seat. Should the airline sell the ticket? Of course it should. If the plane has empty seats, the cost of adding one more passenger is tiny. The *average* cost of flying a passenger is $\$500$, but the *marginal* cost is merely the cost of the can of soda that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling the ticket is profitable.

Marginal decision making can help explain some otherwise puzzling economic phenomena. Here is a classic question: Why is water so cheap, while diamonds are so expensive? Humans need water to survive, while diamonds are unnecessary. Yet people are willing to pay much more for a diamond than for a cup of water. The reason is that a person's willingness to pay for a good is based on the marginal benefit that an extra unit of the good would yield. The marginal benefit, in turn, depends on how many units a person already has. Water is essential, but the marginal benefit of an extra cup is small because water is plentiful. By contrast, no one needs diamonds to survive, but because diamonds are so rare, people consider the marginal benefit of an extra diamond to be large.

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost. This principle explains why people use their cell phones as much as they do, why airlines are willing to sell tickets below average cost, and why people are willing to pay more for diamonds than for water. It can take some time to get used to the logic of marginal thinking, but the study of economics will give you ample opportunity to practice.

1-1d Principle 4: People Respond to Incentives

An **incentive** is something (such as the prospect of a punishment or reward) that induces a person to act. Because rational people make decisions by comparing costs and benefits, they respond to incentives. You will see that incentives play a central role in the study of economics. One economist went so far as to suggest that the entire field could be summarized as simply "People respond to incentives. The rest is commentary."

Incentives are key to analyzing how markets work. For example, when the price of an apple rises, people decide to eat fewer apples. At the same time, apple orchards decide to hire more workers and harvest more apples. In other words, a higher price in a market provides an incentive for buyers to consume less and an incentive for sellers to produce more. As we will see, the influence of prices on the behavior of consumers and producers is crucial to how a market economy allocates scarce resources.

Public policymakers should never forget about incentives: Many policies change the costs or benefits that people face and, as a result, alter their behavior. A tax on gasoline, for instance, encourages people to drive smaller, more fuel-efficient cars. That is one reason people drive smaller cars in Europe, where gasoline taxes are high, than in the United States, where gasoline taxes are low. A higher gasoline tax also encourages people to carpool, take public transportation, and live closer to where they work. If the tax were larger, more people would be driving hybrid cars, and if it were large enough, they would switch to electric cars.

When policymakers fail to consider how their policies affect incentives, they often end up facing unintended consequences. For example, consider public policy regarding auto safety. Today, all cars have seat belts, but this was not true



BLEND IMAGES / ALAMY

"Is the marginal benefit of this call greater than the marginal cost?"

incentive
something that induces a person to act

60 years ago. In 1965, Ralph Nader's book *Unsafe at Any Speed* generated much public concern over auto safety. Congress responded with laws requiring seat belts as standard equipment on new cars.

How does a seat belt law affect auto safety? The direct effect is obvious: When a person wears a seat belt, the probability of surviving an auto accident rises. But that's not the end of the story because the law also affects behavior by altering incentives. The relevant behavior here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare, perhaps unconsciously, the marginal benefit from safer driving to the marginal cost. As a result, they drive more slowly and carefully when the benefit of increased safety is high. For example, when road conditions are icy, people drive more attentively and at lower speeds than they do when road conditions are clear.

Consider how a seat belt law alters a driver's cost-benefit calculation. Seat belts make accidents less costly because they reduce the likelihood of injury or death. In other words, seat belts reduce the benefits of slow and careful driving. People respond to seat belts as they would to an improvement in road conditions—by driving faster and less carefully. The result of a seat belt law, therefore, is a larger number of accidents. The decline in safe driving has a clear, adverse impact on pedestrians, who are more likely to find themselves in an accident but (unlike the drivers) don't have the benefit of added protection.

At first, this discussion of incentives and seat belts might seem like idle speculation. Yet in a classic 1975 study, economist Sam Peltzman argued that auto-safety laws have had many of these effects. According to Peltzman's evidence, these laws give rise to fewer deaths per accident but also to more accidents. He concluded that the net result is little change in the number of driver deaths and an increase in the number of pedestrian deaths.

Peltzman's analysis of auto safety is an offbeat and controversial example of the general principle that people respond to incentives. When analyzing any policy, we must consider not only the direct effects but also the less obvious indirect effects that work through incentives. If the policy changes incentives, it will cause people to alter their behavior.

QuickQuiz

- Describe an important trade-off you recently faced.* • *Give an example of some action that has both a monetary and nonmonetary opportunity cost.*
- *Describe an incentive your parents offered to you in an effort to influence your behavior.*

1-2 How People Interact

The first four principles discussed how individuals make decisions. As we go about our lives, many of our decisions affect not only ourselves but other people as well. The next three principles concern how people interact with one another.

1-2a Principle 5: Trade Can Make Everyone Better Off

You may have heard on the news that the Chinese are our competitors in the world economy. In some ways, this is true because American and Chinese firms produce many of the same goods. Companies in the United States and China compete for the same customers in the markets for clothing, toys, solar panels, automobile tires, and many other items.

Yet it is easy to be misled when thinking about competition among countries. Trade between the United States and China is not like a sports contest in which

one side wins and the other side loses. In fact, the opposite is true: Trade between two countries can make each country better off.

To see why, consider how trade affects your family. When a member of your family looks for a job, she competes against members of other families who are looking for jobs. Families also compete against one another when they go shopping because each family wants to buy the best goods at the lowest prices. In a sense, each family in an economy competes with all other families.

Despite this competition, your family would not be better off isolating itself from all other families. If it did, your family would need to grow its own food, make its own clothes, and build its own home. Clearly, your family gains much from its ability to trade with others. Trade allows each person to specialize in the activities she does best, whether it is farming, sewing, or home building. By trading with others, people can buy a greater variety of goods and services at lower cost.

Like families, countries also benefit from the ability to trade with one another. Trade allows countries to specialize in what they do best and to enjoy a greater variety of goods and services. The Chinese, as well as the French, Egyptians, and Brazilians, are as much our partners in the world economy as they are our competitors.

1-2b Principle 6: Markets Are Usually a Good Way to Organize Economic Activity

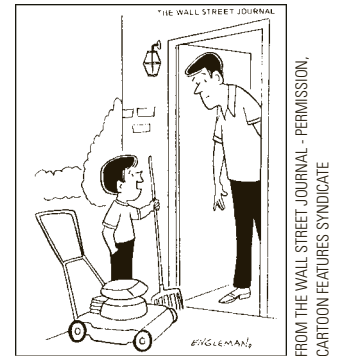
The collapse of communism in the Soviet Union and Eastern Europe in the late 1980s and early 1990s was one of the last century's most transformative events. Communist countries operated on the premise that government officials were in the best position to allocate the economy's scarce resources. These central planners decided what goods and services were produced, how much was produced, and who produced and consumed these goods and services. The theory behind central planning was that only the government could organize economic activity in a way that promoted economic well-being for the country as a whole.

Most countries that once had centrally planned economies have abandoned the system and are instead developing market economies. In a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

At first glance, the success of market economies is puzzling. In a market economy, no one is looking out for the economic well-being of society as a whole. Free markets contain many buyers and sellers of numerous goods and services, and all of them are interested primarily in their own well-being. Yet despite decentralized decision making and self-interested decision makers, market economies have proven remarkably successful in organizing economic activity to promote overall economic well-being.

In his 1776 book *An Inquiry into the Nature and Causes of the Wealth of Nations*, economist Adam Smith made the most famous observation in all of economics: Households and firms interacting in markets act as if they are guided by an “invisible hand” that leads them to desirable market outcomes. One of our goals in this book is to understand how this invisible hand works its magic.

As you study economics, you will learn that prices are the instrument with which the invisible hand directs economic activity. In any market, buyers look at



“For \$5 a week you can watch baseball without being nagged to cut the grass!”

market economy

an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services

the price when determining how much to demand, and sellers look at the price when deciding how much to supply. As a result of the decisions that buyers and sellers make, market prices reflect both the value of a good to society and the cost to society of making the good. Smith's great insight was that prices adjust to guide these individual buyers and sellers to reach outcomes that, in many cases, maximize the well-being of society as a whole.

Smith's insight has an important corollary: When a government prevents prices from adjusting naturally to supply and demand, it impedes the invisible hand's ability to coordinate the decisions of the households and firms that make up an economy. This corollary explains why taxes adversely affect the allocation of resources: They distort prices and thus the decisions of households and firms. It also explains the great harm caused by policies that directly control prices, such as rent control. And it explains the failure of communism. In communist countries, prices were not determined in the marketplace but were dictated by central planners. These planners lacked the necessary information about consumers' tastes and producers' costs, which in a market economy is reflected in prices. Central planners failed because they tried to run the economy with one hand tied behind their backs—the invisible hand of the marketplace.

FYI

Adam Smith and the Invisible Hand

It may be only a coincidence that Adam Smith's great book *The Wealth of Nations* was published in 1776, the exact year in which American revolutionaries signed the Declaration of Independence. But the two documents share a point of view that was prevalent at the time: Individuals are usually best left to their own devices, without the heavy hand of government guiding their actions. This political philosophy provides the intellectual basis for the market economy and for free society more generally.

Why do decentralized market economies work so well? Is it because people can be counted on to treat one another with love and kindness? Not at all. Here is Adam Smith's description of how people interact in a market economy:

Man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more



Adam Smith

BETTMANN/CORBIS

likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. . . . Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that we obtain from one another the far greater part of those good offices which we stand in need of.

It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not

to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow-citizens. . . .

Every individual . . . neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.

Smith is saying that participants in the economy are motivated by self-interest and that the “invisible hand” of the marketplace guides this self-interest into promoting general economic well-being.

Many of Smith's insights remain at the center of modern economics. Our analysis in the coming chapters will allow us to express Smith's conclusions more precisely and to analyze more fully the strengths and weaknesses of the market's invisible hand. ■



CASE STUDY

ADAM SMITH WOULD HAVE LOVED UBER

You have probably never lived in a centrally planned economy, but if you have ever tried to hail a cab in a major city, you have likely experienced a highly regulated market. In many cities, the local government imposes strict controls in the market for taxis. The rules usually go well beyond regulation of insurance and safety. For example, the government may limit entry into the market by approving only a certain number of taxi medallions or permits. It may determine the prices that taxis are allowed to charge. The government uses its police powers—that is, the threat of fines or jail time—to keep unauthorized drivers off the streets and to prevent all drivers from charging unauthorized prices.

Recently, however, this highly controlled market has been invaded by a disruptive force: Uber. Launched in 2009, this company provides an app for smartphones that connects passengers and drivers. Because Uber cars do not roam the streets looking for taxi-hailing pedestrians, they are technically not taxis and so are not subject to the same regulations. But they offer much the same service. Indeed, rides from Uber cars are often more convenient. On a cold and rainy day, who wants to stand on the side of the road waiting for an empty cab to drive by? It is more pleasant to remain inside, use your smartphone to arrange for a ride, and stay warm and dry until the car arrives.

Uber cars often charge less than taxis, but not always. Uber allows drivers to raise their prices significantly when there is a surge in demand, such as during a sudden rainstorm or late on New Year's Eve, when numerous tipsy partiers are looking for a safe way to get home. By contrast, regulated taxis are typically prevented from surge pricing.

Not everyone is fond of Uber. Drivers of traditional taxis complain that this new competition eats into their source of income. This is hardly a surprise: Suppliers of goods and services usually dislike new competitors. But vigorous competition among producers makes a market work well for consumers.

That is why economists love Uber. A 2014 survey of several dozen prominent economists asked whether car services such as Uber increased consumer well-being. Yes, said every single economist. The economists were also asked whether surge pricing increased consumer well-being. Yes, said 85 percent of them. Surge pricing makes consumers pay more at times, but because Uber drivers respond to incentives, it also increases the quantity of car services supplied when they are most needed. Surge pricing also helps allocate the services to those consumers who value them most highly and reduces the costs of searching and waiting for a car.

If Adam Smith were alive today, he would surely have the Uber app on his phone. ●



RICHARD LEVINE / ALAMY

Technology can improve this market.

1-2c Principle 7: Governments Can Sometimes Improve Market Outcomes

If the invisible hand of the market is so great, why do we need government? One purpose of studying economics is to refine your view about the proper role and scope of government policy.

One reason we need government is that the invisible hand can work its magic only if the government enforces the rules and maintains the institutions that are key to a market economy. Most important, market economies need institutions to enforce **property rights** so individuals can own and control scarce resources.

property rights

the ability of an individual to own and exercise control over scarce resources

A farmer won't grow food if she expects her crop to be stolen; a restaurant won't serve meals unless it is assured that customers will pay before they leave; and a film company won't produce movies if too many potential customers avoid paying by making illegal copies. We all rely on government-provided police and courts to enforce our rights over the things we produce—and the invisible hand counts on our ability to enforce those rights.

Another reason we need government is that, although the invisible hand is powerful, it is not omnipotent. There are two broad rationales for a government to intervene in the economy and change the allocation of resources that people would choose on their own: to promote efficiency or to promote equality. That is, most policies aim either to enlarge the economic pie or to change how the pie is divided.

Consider first the goal of efficiency. Although the invisible hand usually leads markets to allocate resources to maximize the size of the economic pie, this is not always the case. Economists use the term **market failure** to refer to a situation in which the market on its own fails to produce an efficient allocation of resources. As we will see, one possible cause of market failure is an **externality**, which is the impact of one person's actions on the well-being of a bystander. The classic example of an externality is pollution. When the production of a good pollutes the air and creates health problems for those who live near the factories, the market left to its own devices may fail to take this cost into account. Another possible cause of market failure is **market power**, which refers to the ability of a single person or firm (or a small group) to unduly influence market prices. For example, if everyone in town needs water but there is only one well, the owner of the well is not subject to the rigorous competition with which the invisible hand normally keeps self-interest in check; she may take advantage of this opportunity by restricting the output of water so she can charge a higher price. In the presence of externalities or market power, well-designed public policy can enhance economic efficiency.

Now consider the goal of equality. Even when the invisible hand yields efficient outcomes, it can nonetheless leave sizable disparities in economic well-being. A market economy rewards people according to their ability to produce things that other people are willing to pay for. The world's best basketball player earns more than the world's best chess player simply because people are willing to pay more to watch basketball than chess. The invisible hand does not ensure that everyone has sufficient food, decent clothing, and adequate health-care. This inequality may, depending on one's political philosophy, call for government intervention. In practice, many public policies, such as the income tax and the welfare system, aim to achieve a more equal distribution of economic well-being.

To say that the government *can* improve on market outcomes does not mean that it always *will*. Public policy is made not by angels but by a political process that is far from perfect. Sometimes policies are designed simply to reward the politically powerful. Sometimes they are made by well-intentioned leaders who are not fully informed. As you study economics, you will become a better judge of when a government policy is justifiable because it promotes efficiency or equality and when it is not.

market failure

a situation in which a market left on its own fails to allocate resources efficiently

externality

the impact of one person's actions on the well-being of a bystander

market power

the ability of a single economic actor (or small group of actors) to have a substantial influence on market prices

QuickQuiz

Why is a country better off not isolating itself from all other countries?

- Why do we have markets, and according to economists, what roles should government play in them?

1-3 How the Economy as a Whole Works

We started by discussing how individuals make decisions and then looked at how people interact with one another. All these decisions and interactions together make up “the economy.” The last three principles concern the workings of the economy as a whole.

1-3a Principle 8: A Country’s Standard of Living Depends on Its Ability to Produce Goods and Services

The differences in living standards around the world are staggering. In 2014, the average American had an income of about \$55,000. In the same year, the average Mexican earned about \$17,000, the average Chinese about \$13,000, and the average Nigerian only \$6,000. Not surprisingly, this large variation in average income is reflected in various measures of quality of life. Citizens of high-income countries have more TV sets, more cars, better nutrition, better healthcare, and a longer life expectancy than citizens of low-income countries.

Changes in living standards over time are also large. In the United States, incomes have historically grown about 2 percent per year (after adjusting for changes in the cost of living). At this rate, average income doubles every 35 years. Over the past century, average U.S. income has risen about eightfold.

What explains these large differences in living standards among countries and over time? The answer is surprisingly simple. Almost all variation in living standards is attributable to differences in countries’ **productivity**—that is, the amount of goods and services produced by each unit of labor input. In nations where workers can produce a large quantity of goods and services per hour, most people enjoy a high standard of living; in nations where workers are less productive, most people endure a more meager existence. Similarly, the growth rate of a nation’s productivity determines the growth rate of its average income.

productivity

the quantity of goods and services produced from each unit of labor input

The fundamental relationship between productivity and living standards is simple, but its implications are far-reaching. If productivity is the primary determinant of living standards, other explanations must be of secondary importance. For example, it might be tempting to credit labor unions or minimum-wage laws for the rise in living standards of American workers over the past century. Yet the real hero of American workers is their rising productivity. As another example, some commentators have claimed that increased competition from Japan and other countries explained the slow growth in U.S. incomes during the 1970s and 1980s. Yet the real villain was not competition from abroad but flagging productivity growth in the United States.

The relationship between productivity and living standards also has profound implications for public policy. When thinking about how any policy will affect living standards, the key question is how it will affect our ability to produce goods and services. To boost living standards, policymakers need to raise productivity by ensuring that workers are well educated, have the tools they need to produce goods and services, and have access to the best available technology.

1-3b Principle 9: Prices Rise When the Government Prints Too Much Money

In January 1921, a daily newspaper in Germany cost 0.30 marks. Less than two years later, in November 1922, the same newspaper cost 70,000,000 marks. All other prices in the economy rose by similar amounts. This episode is one of history’s most spectacular examples of **inflation**, an increase in the overall level of prices in the economy.

inflation

an increase in the overall level of prices in the economy



"Well it may have been 68 cents when you got in line, but it's 74 cents now!"

Although the United States has never experienced inflation even close to that of Germany in the 1920s, inflation has at times been an economic problem. During the 1970s, for instance, when the overall level of prices more than doubled, President Gerald Ford called inflation "public enemy number one." By contrast, inflation in the first decade of the 21st century ran about 2½ percent per year; at this rate, it would take almost 30 years for prices to double. Because high inflation imposes various costs on society, keeping inflation at a low level is a goal of economic policymakers around the world.

What causes inflation? In almost all cases of large or persistent inflation, the culprit is growth in the quantity of money. When a government creates large quantities of the nation's money, the value of the money falls. In Germany in the early 1920s, when prices were on average tripling every month, the quantity of money was also tripling every month. Although less dramatic, the economic history of the United States points to a similar conclusion: The high inflation of the 1970s was associated with rapid growth in the quantity of money, and the return of low inflation in the 1980s was associated with slower growth in the quantity of money.

1-3c Principle 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment

Although a higher level of prices is, in the long run, the primary effect of increasing the quantity of money, the short-run story is more complex and controversial. Most economists describe the short-run effects of monetary injections as follows:

- Increasing the amount of money in the economy stimulates the overall level of spending and thus the demand for goods and services.
- Higher demand may over time cause firms to raise their prices, but in the meantime, it also encourages them to hire more workers and produce a larger quantity of goods and services.
- More hiring means lower unemployment.

This line of reasoning leads to one final economy-wide trade-off: a short-run trade-off between inflation and unemployment.

Although some economists still question these ideas, most accept that society faces a short-run trade-off between inflation and unemployment. This simply means that, over a period of a year or two, many economic policies push inflation and unemployment in opposite directions. Policymakers face this trade-off regardless of whether inflation and unemployment both start out at high levels (as they did in the early 1980s), at low levels (as they did in the late 1990s), or someplace in between. This short-run trade-off plays a key role in the analysis of the **business cycle**—the irregular and largely unpredictable fluctuations in economic activity, as measured by the production of goods and services or the number of people employed.

Policymakers can exploit the short-run trade-off between inflation and unemployment using various policy instruments. By changing the amount that the government spends, the amount it taxes, and the amount of money it prints, policymakers can influence the overall demand for goods and services. Changes in demand in turn influence the combination of inflation and unemployment that the economy experiences in the short run. Because these instruments of economic policy are potentially so powerful, how policymakers should use them to control the economy, if at all, is a subject of continuing debate.

This debate heated up in the early years of Barack Obama's presidency. In 2008 and 2009, the U.S. economy, as well as many other economies around the world, experienced a deep economic downturn. Problems in the financial system, caused by bad

business cycle

fluctuations in economic activity, such as employment and production

bets on the housing market, spilled over into the rest of the economy, causing incomes to fall and unemployment to soar. Policymakers responded in various ways to increase the overall demand for goods and services. President Obama's first major initiative was a stimulus package of reduced taxes and increased government spending. At the same time, the nation's central bank, the Federal Reserve, increased the supply of money. The goal of these policies was to reduce unemployment. Some feared, however, that these policies might over time lead to an excessive level of inflation.

QuickQuiz

List and briefly explain the three principles that describe how the economy as a whole works.

1-4 Conclusion

You now have a taste of what economics is all about. In the coming chapters, we develop many specific insights about people, markets, and economies. Mastering these insights will take some effort, but it is not an overwhelming task. The field of economics is based on a few big ideas that can be applied in many different situations.

Throughout this book, we will refer back to the *Ten Principles of Economics* highlighted in this chapter and summarized in Table 1. Keep these building blocks in mind: Even the most sophisticated economic analysis is founded on the ten principles introduced here.

TABLE 1

Ten Principles of Economics

How People Make Decisions

- 1: People Face Trade-offs
- 2: The Cost of Something Is What You Give Up to Get It
- 3: Rational People Think at the Margin
- 4: People Respond to Incentives

How People Interact

- 5: Trade Can Make Everyone Better Off
- 6: Markets Are Usually a Good Way to Organize Economic Activity
- 7: Governments Can Sometimes Improve Market Outcomes

How the Economy as a Whole Works

- 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services
- 9: Prices Rise When the Government Prints Too Much Money
- 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment

CHAPTER QuickQuiz

1. Economics is best defined as the study of
 - a. how society manages its scarce resources.
 - b. how to run a business most profitably.
 - c. how to predict inflation, unemployment, and stock prices.
 - d. how the government can stop the harm from unchecked self-interest.
2. Your opportunity cost of going to a movie is
 - a. the price of the ticket.
 - b. the price of the ticket plus the cost of any soda and popcorn you buy at the theater.
 - c. the total cash expenditure needed to go to the movie plus the value of your time.
 - d. zero, as long as you enjoy the movie and consider it a worthwhile use of time and money.

3. A marginal change is one that
 - a. is not important for public policy.
 - b. incrementally alters an existing plan.
 - c. makes an outcome inefficient.
 - d. does not influence incentives.
4. Adam Smith's "invisible hand" refers to
 - a. the subtle and often hidden methods that businesses use to profit at consumers' expense.
 - b. the ability of free markets to reach desirable outcomes, despite the self-interest of market participants.
 - c. the ability of government regulation to benefit consumers, even if the consumers are unaware of the regulations.
 - d. the way in which producers or consumers in unregulated markets impose costs on innocent bystanders.
5. Governments may intervene in a market economy in order to
 - a. protect property rights.
 - b. correct a market failure due to externalities.
 - c. achieve a more equal distribution of income.
 - d. All of the above.
6. If a nation has high and persistent inflation, the most likely explanation is
 - a. the central bank creating excessive amounts of money.
 - b. unions bargaining for excessively high wages.
 - c. the government imposing excessive levels of taxation.
 - d. firms using their monopoly power to enforce excessive price hikes.

SUMMARY

- The fundamental lessons about individual decision making are that people face trade-offs among alternative goals, that the cost of any action is measured in terms of forgone opportunities, that rational people make decisions by comparing marginal costs and marginal benefits, and that people change their behavior in response to the incentives they face.
- The fundamental lessons about interactions among people are that trade and interdependence can be mutually beneficial, that markets are usually a good

way of coordinating economic activity among people, and that the government can potentially improve market outcomes by remedying a market failure or by promoting greater economic equality.

- The fundamental lessons about the economy as a whole are that productivity is the ultimate source of living standards, that growth in the quantity of money is the ultimate source of inflation, and that society faces a short-run trade-off between inflation and unemployment.

KEY CONCEPTS

scarcity, p. 4
 economics, p. 4
 efficiency, p. 5
 equality, p. 5
 opportunity cost, p. 6
 rational people, p. 6

marginal change, p. 6
 incentive, p. 7
 market economy, p. 9
 property rights, p. 11
 market failure, p. 12
 externality, p. 12

market power, p. 12
 productivity, p. 13
 inflation, p. 13
 business cycle, p. 14

QUESTIONS FOR REVIEW

1. Give three examples of important trade-offs that you face in your life.
2. What items would you include to figure out the opportunity cost of a vacation to Disney World?
3. Water is necessary for life. Is the marginal benefit of a glass of water large or small?
4. Why should policymakers think about incentives?
5. Why isn't trade among countries like a game with some winners and some losers?
6. What does the "invisible hand" of the marketplace do?

7. What are the two main causes of market failure? Give an example of each.
8. Why is productivity important?
9. What is inflation and what causes it?
10. How are inflation and unemployment related in the short run?

PROBLEMS AND APPLICATIONS

1. Describe some of the trade-offs faced by each of the following:
 - a. a family deciding whether to buy a new car
 - b. a member of Congress deciding how much to spend on national parks
 - c. a company president deciding whether to open a new factory
 - d. a professor deciding how much to prepare for class
 - e. a recent college graduate deciding whether to go to graduate school
2. You are trying to decide whether to take a vacation. Most of the costs of the vacation (airfare, hotel, and forgone wages) are measured in dollars, but the benefits of the vacation are psychological. How can you compare the benefits to the costs?
3. You were planning to spend Saturday working at your part-time job, but a friend asks you to go skiing. What is the true cost of going skiing? Now suppose you had been planning to spend the day studying at the library. What is the cost of going skiing in this case? Explain.
4. You win \$100 in a basketball pool. You have a choice between spending the money now and putting it away for a year in a bank account that pays 5 percent interest. What is the opportunity cost of spending the \$100 now?
5. The company that you manage has invested \$5 million in developing a new product, but the development is not quite finished. At a recent meeting, your salespeople report that the introduction of competing products has reduced the expected sales of your new product to \$3 million. If it would cost \$1 million to finish development and make the product, should you go ahead and do so? What is the most that you should pay to complete development?
6. A 1996 bill reforming the federal government's anti-poverty programs limited many welfare recipients to only two years of benefits.
 - a. How does this change affect the incentives for working?
 - b. How might this change represent a trade-off between equality and efficiency?
7. Explain whether each of the following government activities is motivated by a concern about equality or a concern about efficiency. In the case of efficiency, discuss the type of market failure involved.
 - a. regulating cable TV prices
 - b. providing some poor people with vouchers that can be used to buy food
 - c. prohibiting smoking in public places
 - d. breaking up Standard Oil (which once owned 90 percent of all oil refineries) into several smaller companies
 - e. imposing higher personal income tax rates on people with higher incomes
 - f. instituting laws against driving while intoxicated
8. Discuss each of the following statements from the standpoints of equality and efficiency.
 - a. "Everyone in society should be guaranteed the best healthcare possible."
 - b. "When workers are laid off, they should be able to collect unemployment benefits until they find a new job."
9. In what ways is your standard of living different from that of your parents or grandparents when they were your age? Why have these changes occurred?
10. Suppose Americans decide to save more of their incomes. If banks lend this extra saving to businesses, which use the funds to build new factories, how might this lead to faster growth in productivity? Who do you suppose benefits from the higher productivity? Is society getting a free lunch?
11. During the Revolutionary War, the American colonies could not raise enough tax revenue to fully fund the war effort. To make up the difference, the colonies decided to print more money. Printing money to cover expenditures is sometimes referred to as an "inflation tax." Who do you think is being "taxed" when more money is printed? Why?

To find additional study resources, visit cengagebrain.com, and search for "Mankiw."



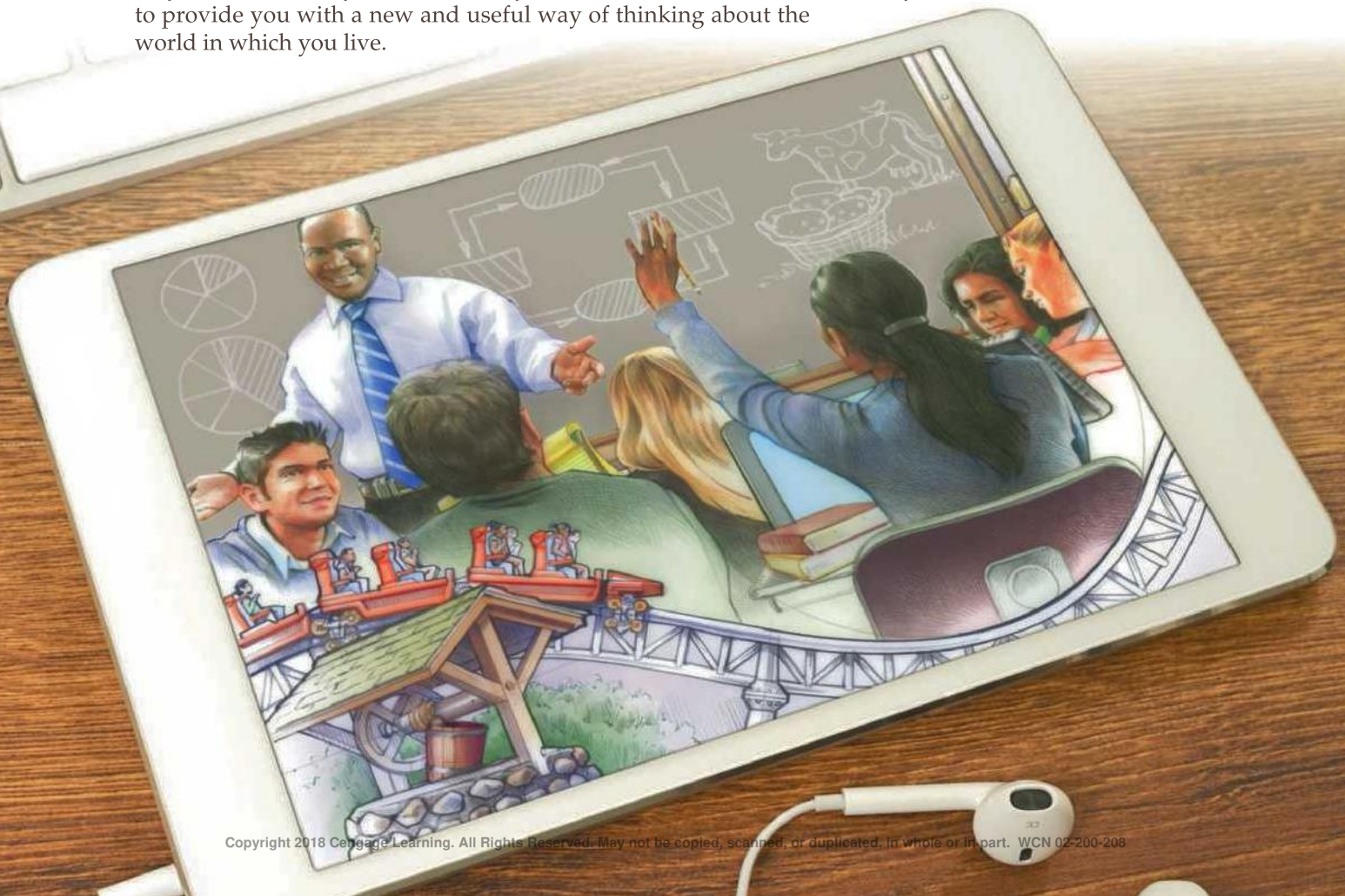
Thinking Like an Economist

CHAPTER

2

Every field of study has its own language and its own way of thinking. Mathematicians talk about axioms, integrals, and vector spaces. Psychologists talk about ego, id, and cognitive dissonance. Lawyers talk about venue, torts, and promissory estoppel.

Economics is no different. Supply, demand, elasticity, comparative advantage, consumer surplus, deadweight loss—these terms are part of the economist's language. In the coming chapters, you will encounter many new terms and some familiar words that economists use in specialized ways. At first, this new language may seem needlessly arcane. But as you will see, its value lies in its ability to provide you with a new and useful way of thinking about the world in which you live.



The purpose of this book is to help you learn the economist's way of thinking. Just as you cannot become a mathematician, psychologist, or lawyer overnight, learning to think like an economist will take some time. Yet with a combination of theory, case studies, and examples of economics in the news, this book will give you ample opportunity to develop and practice this skill.

Before delving into the substance and details of economics, it is helpful to have an overview of how economists approach the world. This chapter discusses the field's methodology. What is distinctive about how economists confront a question? What does it mean to think like an economist?

2-1 The Economist as Scientist

Economists try to address their subject with a scientist's objectivity. They approach the study of the economy in much the same way a physicist approaches the study of matter and a biologist approaches the study of life: They devise theories, collect data, and then analyze these data in an attempt to verify or refute their theories.

To beginners, the claim that economics is a science can seem odd. After all, economists do not work with test tubes or telescopes. The essence of science, however, is the *scientific method*—the dispassionate development and testing of theories about how the world works. This method of inquiry is as applicable to studying a nation's economy as it is to studying the earth's gravity or a species' evolution. As Albert Einstein once put it, "The whole of science is nothing more than the refinement of everyday thinking."

Although Einstein's comment is as true for social sciences such as economics as it is for natural sciences such as physics, most people are not accustomed to looking at society through a scientific lens. Let's discuss some of the ways economists apply the logic of science to examine how an economy works.

© J.B. HANDELSMAN/ THE NEW YORKER COLLECTION/
WWW.CARTOONBANK.COM



"I'm a social scientist, Michael. That means I can't explain electricity or anything like that, but if you ever want to know about people, I'm your man."

2-1a The Scientific Method: Observation, Theory, and More Observation

Isaac Newton, the famous 17th-century scientist and mathematician, allegedly became intrigued one day when he saw an apple fall from a tree. This observation motivated Newton to develop a theory of gravity that applies not only to an apple falling to the earth but to any two objects in the universe. Subsequent testing of Newton's theory has shown that it works well in many circumstances (albeit not in all circumstances, as Einstein would later show). Because Newton's theory has been so successful at explaining observation, it is still taught in undergraduate physics courses around the world.

This interplay between theory and observation also occurs in economics. An economist might live in a country experiencing rapidly increasing prices and be moved by this observation to develop a theory of inflation. The theory might assert that high inflation arises when the government prints too much money. To test this theory, the economist could collect and analyze data on prices and money from many different countries. If growth in the quantity of money were completely unrelated to the rate of price increase, the economist would start to doubt the validity of this theory of inflation. If money growth and inflation were strongly correlated in international data, as in fact they are, the economist would become more confident in the theory.

Although economists use theory and observation like other scientists, they face an obstacle that makes their task especially challenging: In economics,

conducting experiments is often impractical. Physicists studying gravity can drop many objects in their laboratories to generate data to test their theories. By contrast, economists studying inflation are not allowed to manipulate a nation's monetary policy simply to generate useful data. Economists, like astronomers and evolutionary biologists, usually have to make do with whatever data the world happens to give them.

To find a substitute for laboratory experiments, economists pay close attention to the natural experiments offered by history. When a war in the Middle East interrupts the supply of crude oil, for instance, oil prices skyrocket around the world. For consumers of oil and oil products, such an event depresses living standards. For economic policymakers, it poses a difficult choice about how best to respond. But for economic scientists, the event provides an opportunity to study the effects of a key natural resource on the world's economies. Throughout this book, therefore, we consider many historical episodes. These episodes are valuable to study because they give us insight into the economy of the past and, more important, because they allow us to illustrate and evaluate economic theories of the present.

2-1b The Role of Assumptions

If you ask a physicist how long it would take a marble to fall from the top of a ten-story building, he will likely answer the question by assuming that the marble falls in a vacuum. Of course, this assumption is false. In fact, the building is surrounded by air, which exerts friction on the falling marble and slows it down. Yet the physicist will point out that the friction on the marble is so small that its effect is negligible. Assuming the marble falls in a vacuum simplifies the problem without substantially affecting the answer.

Economists make assumptions for the same reason: Assumptions can simplify the complex world and make it easier to understand. To study the effects of international trade, for example, we might assume that the world consists of only two countries and that each country produces only two goods. In reality, there are numerous countries, each of which produces thousands of different types of goods. But by considering a world with only two countries and two goods, we can focus our thinking on the essence of the problem. Once we understand international trade in this simplified imaginary world, we are in a better position to understand international trade in the more complex world in which we live.

The art in scientific thinking—whether in physics, biology, or economics—is deciding which assumptions to make. Suppose, for instance, that instead of dropping a marble from the top of the building, we were dropping a beach ball of the same weight. Our physicist would realize that the assumption of no friction is less accurate in this case: Friction exerts a greater force on the beach ball because it is much larger than a marble. The assumption that gravity works in a vacuum is reasonable when studying a falling marble but not when studying a falling beach ball.

Similarly, economists use different assumptions to answer different questions. Suppose that we want to study what happens to the economy when the government changes the number of dollars in circulation. An important piece of this analysis, it turns out, is how prices respond. Many prices in the economy change infrequently: The newsstand prices of magazines, for instance, change only once every few years. Knowing this fact may lead us to make different assumptions when studying the effects of the policy change over different time horizons. For studying the short-run effects of the policy, we may assume that prices do not change much. We may even make the extreme and artificial assumption that

all prices are completely fixed. For studying the long-run effects of the policy, however, we may assume that all prices are completely flexible. Just as a physicist uses different assumptions when studying falling marbles and falling beach balls, economists use different assumptions when studying the short-run and long-run effects of a change in the quantity of money.

2-1c Economic Models

High school biology teachers teach basic anatomy with plastic replicas of the human body. These models have all the major organs—the heart, the liver, the kidneys, and so on—which allow teachers to show their students very simply how the important parts of the body fit together. Because these plastic models are stylized and omit many details, no one would mistake one of them for a real person. Despite this lack of realism—indeed, because of this lack of realism—studying these models is useful for learning how the human body works.

Economists also use models to learn about the world, but unlike plastic manikins, their models mostly consist of diagrams and equations. Like a biology teacher's plastic model, economic models omit many details to allow us to see what is truly important. Just as the biology teacher's model does not include all the body's muscles and capillaries, an economist's model does not include every feature of the economy.

As we use models to examine various economic issues throughout this book, you will see that all the models are built with assumptions. Just as a physicist begins the analysis of a falling marble by assuming away the existence of friction, economists assume away many details of the economy that are irrelevant to the question at hand. All models—in physics, biology, and economics—simplify reality to improve our understanding of it.

2-1d Our First Model: The Circular-Flow Diagram

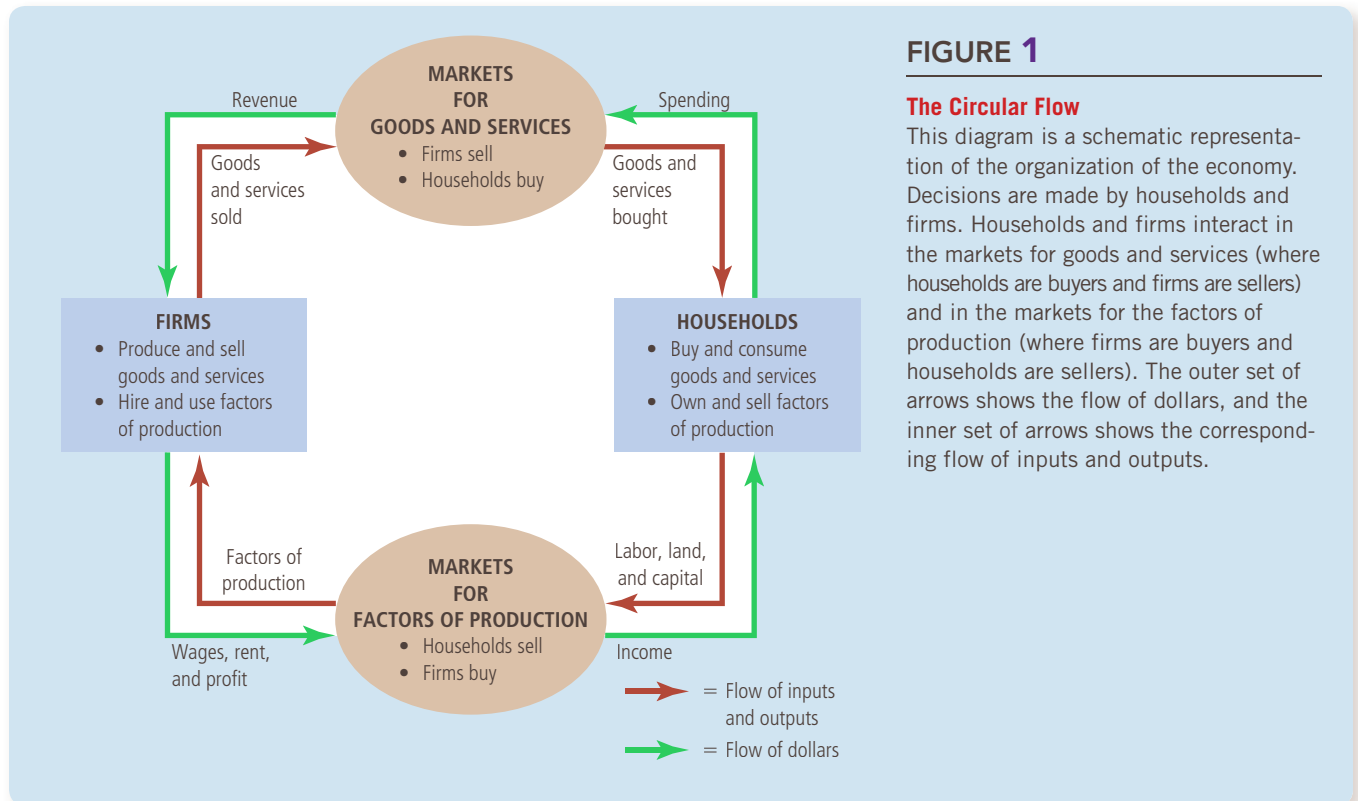
The economy consists of millions of people engaged in many activities—buying, selling, working, hiring, manufacturing, and so on. To understand how the economy works, we must find some way to simplify our thinking about all these activities. In other words, we need a model that explains, in general terms, how the economy is organized and how participants in the economy interact with one another.

Figure 1 presents a visual model of the economy called a **circular-flow diagram**. In this model, the economy is simplified to include only two types of decision makers—firms and households. Firms produce goods and services using inputs, such as labor, land, and capital (buildings and machines). These inputs are called the *factors of production*. Households own the factors of production and consume all the goods and services that the firms produce.

Households and firms interact in two types of markets. In the *markets for goods and services*, households are buyers, and firms are sellers. In particular, households buy the output of goods and services that firms produce. In the *markets for the factors of production*, households are sellers, and firms are buyers. In these markets, households provide the inputs that firms use to produce goods and services. The circular-flow diagram offers a simple way of organizing the economic transactions that occur between households and firms in the economy.

The two loops of the circular-flow diagram are distinct but related. The inner loop represents the flows of inputs and outputs. The households sell the use of their labor, land, and capital to the firms in the markets for the factors of production. The firms then use these factors to produce goods and services, which in turn are sold to households in the markets for goods and services. The outer

circular-flow diagram
a visual model of the economy that shows how dollars flow through markets among households and firms



loop of the diagram represents the corresponding flow of dollars. The households spend money to buy goods and services from the firms. The firms use some of the revenue from these sales to pay for the factors of production, such as the wages of their workers. What's left is the profit of the firm owners, who are themselves members of households.

Let's take a tour of the circular flow by following a dollar bill as it makes its way from person to person through the economy. Imagine that the dollar begins at a household—say, in your wallet. If you want to buy a cup of coffee, you take the dollar (along with a few of its brothers and sisters) to one of the economy's markets for goods and services, such as your local Starbucks coffee shop. There, you spend it on your favorite drink. When the dollar moves into the Starbucks cash register, it becomes revenue for the firm. The dollar doesn't stay at Starbucks for long, however, because the firm uses it to buy inputs in the markets for the factors of production. Starbucks might use the dollar to pay rent to its landlord for the space it occupies or to pay the wages of its workers. In either case, the dollar enters the income of some household and, once again, is back in someone's wallet. At that point, the story of the economy's circular flow starts once again.

The circular-flow diagram in Figure 1 is a very simple model of the economy. A more complex and realistic circular-flow model would include, for instance, the roles of government and international trade. (A portion of that dollar you gave to Starbucks might be used to pay taxes or to buy coffee beans from a farmer in Brazil.) Yet these details are not crucial for a basic understanding of how the economy is organized. Because of its simplicity, this circular-flow

diagram is useful to keep in mind when thinking about how the pieces of the economy fit together.

2-1e Our Second Model: The Production Possibilities Frontier

Most economic models, unlike the circular-flow diagram, are built using the tools of mathematics. Here we use one of the simplest such models, called the production possibilities frontier, to illustrate some basic economic ideas.

Although real economies produce thousands of goods and services, let's consider an economy that produces only two goods—cars and computers. Together, the car industry and the computer industry use all of the economy's factors of production. The **production possibilities frontier** is a graph that shows the various combinations of output—in this case, cars and computers—that the economy can possibly produce given the available factors of production and the available production technology that firms use to turn these factors into output.

Figure 2 shows this economy's production possibilities frontier. If the economy uses all its resources in the car industry, it produces 1,000 cars and no computers. If it uses all its resources in the computer industry, it produces 3,000 computers and no cars. The two endpoints of the production possibilities frontier represent these extreme possibilities.

More likely, the economy divides its resources between the two industries, producing some cars and some computers. For example, it can produce 600 cars and 2,200 computers, shown in the figure by point A. Or, by moving some of the factors of production to the car industry from the computer industry, the economy can produce 700 cars and 2,000 computers, represented by point B.

Because resources are scarce, not every conceivable outcome is feasible. For example, no matter how resources are allocated between the two industries, the economy cannot produce the amount of cars and computers represented by point C. Given the technology available for manufacturing cars and computers, the economy does not have enough of the factors of production to support that level of output. With the resources it has, the economy can produce at any point on or

production possibilities frontier

a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology

FIGURE 2

The Production Possibilities Frontier

The production possibilities frontier shows the combinations of output—in this case, cars and computers—that the economy can possibly produce. The economy can produce any combination on or inside the frontier. Points outside the frontier are not feasible given the economy's resources. The slope of the production possibilities frontier measures the opportunity cost of a car in terms of computers. This opportunity cost varies, depending on how much of the two goods the economy is producing.

