# THE MICROECONOMY TODAY

15th Edition

Bradley R. Schiller
Karen Gebhardt

Mc Graw Hill Education

# THE MICROECONOMY TODAY

FIFTEENTH EDITION

Mc Graw Hill Education

## The McGraw-Hill Series Economics

### Essentials of Economics

Brue, McConnell, and Flynn
**Essentials of Economics**
*Fourth Edition*

Mandel
**M: Economics: The Basics**
*Third Edition*

Schiller
**Essentials of Economics**
*Tenth Edition*

### Principles of Economics

Asarta and Butters
**Principles of Economics, Principles of Microeconomics, and Principles of Macroeconomics**

Colander
**Economics, Microeconomics, and Macroeconomics**
*Ninth Edition*

Frank, Bernanke, Antonovics, and Heffetz
**Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics**
*Sixth Edition*

Frank and Bernanke
**Streamlined Editions: Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics**
*Third Edition*

Karlan and Morduch
**Economics, Microeconomics, and Macroeconomics**
*Second Edition*

McConnell, Brue, and Flynn
**Economics, Microeconomics, and Macroeconomics**
*Twenty-First Edition*

McConnell, Brue, and Flynn
**Brief Editions: Microeconomics and Macroeconomics**
*Second Edition*

Miller
**Principles of Microeconomics**
*First Edition*

Samuelson and Nordhaus
**Economics, Microeconomics, and Macroeconomics**
*Nineteenth Edition*

Schiller
**The Economy Today, The Micro Economy Today, and The Macro Economy Today**
*Fifteenth Edition*

Slavin
**Economics, Microeconomics, and Macroeconomics**
*Eleventh Edition*

### Economics of Social Issues

Guell
**Issues in Economics Today**
*Eighth Edition*

Sharp, Register, and Grimes
**Economics of Social Issues**
*Twenty-First Edition*

### Econometrics

Gujarati and Porter
**Basic Econometrics**
*Fifth Edition*

Gujarati and Porter
**Essentials of Econometrics**
*Fourth Edition*

Hilmer and Hilmer
**Practical Econometrics**
*First Edition*

### Managerial Economics

Baye and Prince
**Managerial Economics and Business Strategy**
*Ninth Edition*

Brickley, Smith, and Zimmerman
**Managerial Economics and Organizational Architecture**
*Sixth Edition*

Thomas and Maurice
**Managerial Economics**
*Twelfth Edition*

### Intermediate Economics

Bernheim and Whinston
**Microeconomics**
*Second Edition*

Dornbusch, Fischer, and Startz
**Macroeconomics**
*Twelfth Edition*

Frank
**Microeconomics and Behavior**
*Ninth Edition*

### Advanced Economics

Romer
**Advanced Macroeconomics**
*Fourth Edition*

### Money and Banking

Cecchetti and Schoenholtz
**Money, Banking, and Financial Markets**
*Fifth Edition*

### Urban Economics

O'Sullivan
**Urban Economics**
*Eighth Edition*

### Labor Economics

Borjas
**Labor Economics**
*Seventh Edition*

McConnell, Brue, and Macpherson
**Contemporary Labor Economics**
*Eleventh Edition*

### Public Finance

Rosen and Gayer
**Public Finance**
*Tenth Edition*

Seidman
**Public Finance**
*First Edition*

### Environmental Economics

Field and Field
**Environmental Economics: An Introduction**
*Seventh Edition*

### International Economics

Appleyard and Field
**International Economics**
*Eighth Edition*

King and King
**International Economics, Globalization, and Policy: A Reader**
*Fifth Edition*

Pugel
**International Economics**
*Sixteenth Edition*

# THE MICROECONOMY TODAY

FIFTEENTH EDITION

Bradley R. Schiller

WITH KAREN GEBHARDT

Mc Graw Hill Education

THE MICRO ECONOMY TODAY, FIFTEENTH EDITION



This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LWI 21 20 19 18

ISBN 978-1-260-10532-2
MHID 1-260-10532-6

Senior Portfolio Manager: *Katie Hoenicke*
Lead Product Developer: *Kelly Delso*
Product Developer: *Adam Huenecke*
Core Content Project Manager: *Kathryn D. Wright*
Senior Assessment Content Project Manager: *Kristin Bradley*
Media Content Project Manager: *Karen Jozefowicz*
Senior Buyer: *Laura Fuller*
Senior Designer: *Matt Diamond*
Content Licensing Specialist: *Lorraine Buczek*
Cover Image: *©The-Lightwrighter/Getty Images RF*
Compositor: *Aptara®, Inc.*

All credits appearing on page or at the end of the book are considered to be an extension of the copyright page.

**Library of Congress Cataloging-in-Publication Data**

Names: Schiller, Bradley R., 1943- author. | Gebhardt, Karen, author.
Title: The micro economy today / Bradley R. Schiller, American University, emeritus, with Karen Gebhardt, Colorado State University.
Description: Fifteenth Edition. | Dubuque : McGraw-Hill Education, [2019] | Revised edition of the authors' The micro economy today, [2016]
Identifiers: LCCN 2017048456 | ISBN 9781260105322 (alk. paper) | ISBN 1260105326 (alk. paper)
Subjects: LCSH: Microeconomics.
Classification: LCC HB172 .S3625 2019 | DDC 338.5—dc23 LC record available at https://lccn.loc.gov/2017048456



mheducation.com/highered

# ABOUT THE AUTHORS

Courtesy of Bradley R. Schiller

**Bradley R. Schiller** has more than four decades of experience teaching introductory economics at American University, the University of Nevada, the University of California (Berkeley and Santa Cruz), and the University of Maryland. He has given guest lectures at more than 300 colleges ranging from Fresno, California, to Istanbul, Turkey. Dr. Schiller's unique contribution to teaching is his ability to relate basic principles to current socioeconomic problems, institutions, and public policy decisions. This perspective is evident throughout *The Micro Economy Today.*

Dr. Schiller derives this policy focus from his extensive experience as a Washington consultant. He has been a consultant to most major federal agencies, many congressional committees, and political candidates. In addition, he has evaluated scores of government programs and helped design others. His studies of poverty, discrimination, training programs, tax reform, pensions, welfare, Social Security, and lifetime wage patterns have appeared in both professional journals and popular media. Dr. Schiller is also a frequent commentator on economic policy for television and radio, and his commentary has appeared in *The Wall Street Journal, The Washington Post, The New York Times,* and *Los Angeles Times,* among other major newspapers.

Dr. Schiller received his Ph.D. from Harvard and his B.A. degree, with great distinction, from the University of California (Berkeley). His current research focus is on Cuba—its post-revolution collapse and its post-Castro prospects. On his days off, Dr. Schiller is on the tennis courts, the ski slopes, or the crystal-blue waters of Lake Tahoe.

Courtesy of Karen Gebhardt

**Dr. Karen Gebhardt** is a faculty member in the Department of Economics at Colorado State University (CSU). Dr. Gebhardt has a passion for teaching economics. She regularly instructs large, introductory courses in macro- and microeconomics; small honors sections of these core principles courses; and upper-division courses in pubic finance, microeconomics, and international trade, as well as a graduate course in teaching methods.

She is an early adopter of technology in the classroom and advocates strongly for it because she sees the difference it makes in student engagement and learning. Dr. Gebhardt has taught online consistently since 2005 and coordinates the online program within the Department of Economics at CSU.

Dr. Gebhardt was the recipient of the Water Pik Excellence in Education Award in 2006 and was awarded the CSU Best Teacher Award in 2015.

Dr. Gebhardt's research interests, publications, and presentations involve the economics of human–wildlife interaction and economics and online education. Before joining CSU, she worked as an economist at the U.S. Department of Agriculture/Animal and Plant Health Inspection Service/Wildlife Services/National Wildlife Research Center, conducting research on the interactions of humans and wildlife, such as the economic effects of vampire bat–transmitted rabies in Mexico, the potential economic damage from introduction of invasive species to the Islands of Hawaii, bioeconomic modeling of the impacts of wildlife-transmitted disease, and others. In her free time, Dr. Gebhardt enjoys learning about new teaching methods that integrate technology and going rock climbing and camping in the Colorado Rockies and beyond.

# PREFACE

The election of Donald Trump not only transformed the political landscape, but also radically altered the economic policy agenda. Trade policy became a front-page story. So did tax cuts, deregulation, and immigration policy. Sure, these issues were always on the political agenda, but they took on a greater priority with the ascension of the Trump administration. These shifting priorities require us econ professors to adapt. Students are always more interested in economics when we relate our theories to the news of the day. That means that we've got to make room in our syllabi for these rejuvenated issues.

Fortunately, *The Micro Economy Today* is exceptionally well suited for this task. From its inception, this text has been motivated by policy issues. The primary goal has been to help students understand the challenges of economic policy and the consequences of specific actions like tariffs, regulation, and tax reform. It has always provided a *balanced* discussion of these issues, allowing students to assess different perspectives on critical issues. For this edition, instructors will particularly appreciate the unique chapters that provide a solid foundation for explaining, illustrating, and assessing major Trump initiatives. Chapter 21 on international trade goes beyond the theory of comparative advantage to explain why and how some market participants seek to erect trade barriers. The unique chapter devoted to deregulation (Chapter 13) examines the rationale for government regulation of industry, the inherent trade-offs, and the consequences of (de)regulation. The same kind of insistence on critical thinking about policy issues is apparent in Chapter 14 on environmental protection.

We have two companion chapters on taxes (Chapter 19) and transfer payments (Chapter 20). The intent of these parallel chapters is to illustrate the equity vs. efficiency trade-offs that are common to both sides of the public budget. It provides a solid foundation for discussing the distributional effects of the Trump tax cuts and proposed reductions in income transfers.

No other text offers comparable, chapter-length coverage of the policy issues that have taken on a new urgency with the Trump administration. This is not a text full of fables and other abstractions; it's a text loaded with real-world applications, including the policy agenda of the Trump administration (which is explained, illustrated, and assessed—but not championed). This text makes it a lot easier for students to see the relevancy of economic principles to the front-page issues that dominate the news and political debates. It also requires critical thinking about these same economic issues and the economic concepts that underlie them. No other text comes close to this policy-driven, real-world approach. Students respond with greater interest, motivation—and even retention. If our goal is to have students understand both core economic concepts and their relevancy to the world around them, this is the text to use.

A feature titled "The Economy Tomorrow" at the end of every chapter illustrates one of the ways core economic concepts are linked to policy issues. This feature challenges students to relate the concepts they have just learned to a real-world policy problem. In the very first chapter, for example, students are forced to consider how the newly introduced concept of opportunity costs alters perspectives on "harnessing the sun," such as building more solar-power infrastructure. In Chapter 3 students are challenged to consider the deadly consequences of prohibiting the use of the market mechanism to allocate human organs.

The emphasis on real-world policy challenges is not confined to The Economy Tomorrow feature. Every chapter has an array of In the News and World View boxes that offer real-world illustrations of basic economic principles. Israel's success with its "Iron Dome" antimissile defense is a great illustration of what economists call a "public good" (Chapter 4 World View "Israel's 'Iron Dome' Frustrates Hamas"). North Korea's latest missile tests are a timely illustration of the "guns vs. butter" trade-off (Chapter 1 World View "World's

Largest Armies"). In the News "Californians Vote to Triple Cigarette Tax" in Chapter 6 on California's 2017 cigarette tax hike provides an opportunity to put the concept of price elasticity to work. You get the picture: this *is* the premier policy-driven, real-world focused introduction to economic principles.

## DIFFERENTIATING FEATURES

The policy-driven focus of *The Micro Economy Today* clearly differentiates it from other principles texts. Other texts may claim real-world content, but none comes close to the empirical perspectives of this text. Beyond this unique approach, *The Micro Economy Today* offers a combination of features that no other text matches, including the following.

### Markets versus Government Theme

**market failure:** An imperfection in the market mechanism that prevents optimal outcomes.

**government failure:** Government intervention that fails to improve economic outcomes.

We all know there is no such thing as a pure market-driven economy and that markets operate on the fringe even in the most centralized economics. So "markets versus government" is not an all-or-nothing proposition. It is still a central theme, however, in the real world as President Trump insisted. Should the government assume *more* responsibility for managing the economy—or will *less* intervention generate better outcomes? Public opinion is clear: As the accompanying News reveals, the majority of Americans have a negative view of federal intervention. The challenge for economics instructors is to enunciate principles that help define the boundaries of public and private sector activity. When do we expect **market failure** to occur? How and why do we anticipate that government intervention might result in **government failure**? Can we get students to think critically about these central issues? *The Micro Economy Today* certainly tries, aided by scores of real-world illustrations.

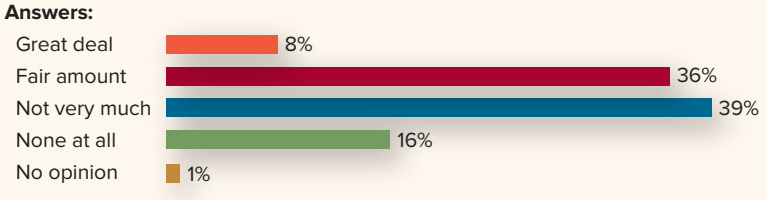
### Unique Topic Coverage

The staples of introductory economics are fully covered in *The Micro Economy Today*. Beyond the core chapters, however, there is always room for additional coverage. In fact, authors reveal their uniqueness in their choice of such chapters. Those choices tend to be more abstract in competing texts, offering "extra" chapters on public choice, behavioral economics, economics of information, uncertainty, and asymmetric information. All of these are interesting and important, but they entail opportunity costs that are particularly high at the principles level. The menu in *The Micro Economy Today* is more tailored to the dimensions and issues of the world around us. Chapter 2, for example, depicts the dimensions of the U.S. economy in a comparative global framework. Where else are students

**IN THE NEWS**

### PERCEPTIONS OF GOVERNMENT FAILURE

**Question:** How much trust and confidence do you have in our federal government in Washington when it comes to handling domestic problems?




Source: Gallup poll of September 7-11, 2016.

**ANALYSIS:** When people say they don't think the government can improve market outcomes, they are expecting "government failure."

going to learn that China is *not* the world's largest economy, that U.S. workers are the most productive, or that income inequality is more severe in poor nations than rich ones?

The same emphasis on contemporary policy issues is evident throughout this edition. The parallel chapters on taxes (19) and transfers (20) underscore the central conflict between equity and efficiency concerns that impedes easy solutions to important policy questions. The comparison of the Clinton and Pence tax returns in Chapter 19 enlivens the discussion of tax "loopholes."

The extensive coverage of market structure includes *two* chapters on competition. The first (8) presents the standard, static profit maximization model for the perfectly competitive firm. The second chapter (9) adds real-world excitement. Chapter 9 focuses on market dynamics, emphasizing how competitive *forces* alter both market structures and market outcomes. The core case study takes students from the original Apple I (see the photo in Chapter 9) all the way to the iPhone 7 and iWatch. Along the way, the effects of continuous entry, exit, and innovation are highlighted. Students come away with an enhanced appreciation of how competitive markets generate superior outcomes—one of the most important insights of the micro sequence.

Also noteworthy in the micro sequence is the chapter (13) on natural monopoly. We know that natural monopoly presents unique challenges for antitrust and regulatory policy. This chapter first assesses the goal conflicts that complicate government intervention, and then reviews regulatory history and outcomes in the rail, telephone, airline, and cable industries.

**Global Perspective**

"Global perspective," along with "real-world" content, is promised by just about every principles author. *The Micro Economy Today* actually delivers on that promise. This is manifestly evident in the titles of Chapter 2 (global comparisons) and Chapter 23 (global poverty). The global perspective is also easy to discern in the boxed World View features embedded in every chapter. More subtle, but at least as important, is the portrayal of an open economy from the get-go. While some texts start with a closed economy—or worse still, a closed, private economy—and then add international dimensions as an afterthought, *The Micro Economy Today* depicts an open economy from start to finish. These global linkages are a vital part of any coherent explanation of micro issues (e.g., effective competition, oil prices).

## WHAT'S NEW AND UNIQUE IN THIS 15TH EDITION

Every edition of *The Micro Economy Today* introduces a wealth of new content and pedagogy. This is critical for a text that prides itself on currency of policy issues, institutions, and empirical perspectives. Every page, every example, and all the data have been reviewed for currency and updated where needed. Beyond this general upgrade, this 15th edition offers the following.

**28 New In the News Boxes**

Price determination is illustrated in Chapter 3 with NCAA ticket scalping, price cuts on Galaxy 7 phones, and the surge in gasoline prices in the wake of Hurricane Matthew. In micro, the record-breaking Snapchat IPO highlights the role of financial markets in reallocating resources (Chapter 18). Tesla's new "gigafactory" illustrates the advantages of economies of scale (Chapter 13). Those "bikini barristers" in Everett, Washington, emphasize the importance of product differentiation in monopolistic competition (Chapter 12). And the new tariff on Canadian lumber addresses the realities of trade protection (Chapter 21).

**11 New World View Boxes**

Israel's deployment of its "Iron Dome" missile defense system offers a great illustration of public goods. Among the new World Views are Venezuela's increasing socialism (Chapter 23), the U.S. 2017 imposition of tariffs on Canadian lumber (Chapter 21), Heritage Foundation's 2017 global rankings on its Index of Economic Freedom (Chapter 1), and California's 2017 tax hike on cigarettes highlights the importance of price elasticity calculations.

The pricing of the iPhone 7 and iWatch highlight the central role of price elasticities (Chapter 6). And the latest OPEC deal illustrates the use of price-fixing to attain monopoly profits (Chapter 11). All In the News and World View boxes are annotated and referred to explicitly in the body of the text.

**93 New Problems**

As in earlier editions, the 15th edition forges explicit links between the end-of-chapter problems and the content of the chapter. Problems require students to go back into the body of the text and use data from the In the News and World View boxes, as well as from standard tables and texts. This strategy greatly improves the odds of students actually reading the boxed material and comprehending the graphs and tables.

**44 New Discussion Questions**

The discussion questions also require students to make use of material within the In the News boxes and the body of the text. Virtually all of the new Discussion Questions build on such in-chapter content.

**5 New "Economy Tomorrow" Features**

We gaze into the future of climate change and explore the methods of prospect for wider adaptation of electrical vehicles (Chapter 6) and the "War on Coal" (Chapter 14).

## CHAPTER-BY-CHAPTER CHANGES: PURPOSE, SCOPE, AND UPDATES

Every page of this text has been subjected to review, revision, and updating. The following list gives a thumbnail sketch of the purpose, scope, and revisions of each chapter.

**Chapter 1: Economics: The Core Issues** introduces the core issues of What, How, and For Whom and the debate over market reliance or government regulation to resolve them. New global rankings on the extent of market reliance are highlighted. President Trump's call for cuts in space exploration and increases in defense spending highlight the guns vs. butter dilemma (opportunity cost), as does North Korea's continuing food shortage in the midst of an expensive missile program.

**Chapter 2: The U.S. Economy: A Global View** is intended to give students a sense of how the American economy stacks up to other nations in the world. The completely updated comparisons are organized around the core issues of What, How, and For Whom. The end-of-chapter The Economy Tomorrow feature considers the challenges of the United Nations goal for sustainable global development.

**Chapter 3: Supply and Demand** introduces the core elements of the market mechanism. Samsung's pricing of the Galaxy S7 illustrate the law of demand. Ticket scalping at the NCAA finals illustrates disequilibrium pricing. Supply/demand shifts are illustrated with gasoline prices in the wake of Hurricane Matthew and oil prices in the wake of Nigerian supply disruptions.

**Chapter 4: The Role of Government** focuses on the justifications for government intervention (market failures) and the growth of the public sector. Data on tax rates, public opinion about the role of government, state/local bond referenda, and government growth have all been updated. Israel's "Iron Dome" missile defense system is offered as a classic example of a "public good."

**Chapter 5: Consumer Choice** introduces the notion of consumer choice by first contrasting sociopsychiatric and economic explanations of consumer behavior. Utility theory, consumer surplus, price discrimination, and consumer choice are all discussed and illustrated. The update on LeBron James's endorsements underscores the role of advertising on consumer behavior.

**Chapter 6: Elasticity** explores price, income, and cross-price elasticities with the iPhone 7 launch, 2017 California tax hike on cigarettes, and consumer responses to higher gasoline prices. The role of prices in charting the future adoption of electric vehicles (EVs) is assessed in The Economy Tomorrow feature. Ten new problems provide practice in computing elasticities.

**Chapter 7: The Costs of Production** introduces the production function and emphasizes the relationship between productivity and cost measures. Tesla's new "gigafactory" illustrates the nature and sources of economies of scale. There are also new statistics on global competitiveness.

**Chapter 8: The Competitive Firm** depicts the static equilibrium behavior of the perfectly competitive firm, using the catfish industry as the core example. General Motor's temporary closure of its Detroit factories helps illustrate the differences between shutdown and exit decisions.

**Chapter 9: Competitive Markets** is a unique assessment of the dynamics of competitive markets—the heart and soul of market economies. The core story focuses on the evolution of the computer market, emphasizing the importance of entry, innovation, and exit to competitive outcomes. Illustrations include the tablet market, India's telecom market, and even long-run equilibrium in the catfish market.

**Chapter 10: Monopoly** not only examines the unique structural features of monopoly but also offers a unique, step-by-step contrast between competitive and monopoly behavior and outcomes. The American and European antitrust complaints against Google and Microsoft illustrate the nature of entry barriers and monopoly exploitation in the tech world.

**Chapter 11: Oligopoly** emphasizes how common oligopoly is in familiar product markets and the unique profit opportunities and coordination problems that result. OPEC's explicit price and output agreements illustrate outright price-fixing, while other industries use various entry barriers (e.g., input lockups, shelf-space rentals, distribution control, legal challenges) to thwart competition and increase profits.

**Chapter 12: Monopolistic Competition** stresses the differences in structure, behavior, and outcomes of this common industry category. The introduction of "Roasteries" at Starbucks and "bikini barristers" in Everett, Washington, illustrate the need for continuous product differentiation. New estimates of the dollar value of specific brands underscores the importance of brand recognition and loyalty.

**Chapter 13: Natural Monopolies: (De)Regulation?** goes beyond the depiction of this unique industry structure to explore the regulatory dilemmas that result. Quite simply, how can regulators compel natural monopolies to deliver the advantages of economies of scale without stifling innovation and decreasing efficiency? And how much will regulation cost? These questions are illustrated in the trucking, airline, cable, and electricity industries. The willingless of Nevada casinos to pay to escape that state's power monopoly illustrates how oppressive monopoly pricing can be.

**Chapter 14: Environmental Protection** is one of the world's great challenges, as the 2014 UN Climate Summit emphasized. This chapter explores the role of market incentives in environmental degradation and assesses the various policy options for inducing more eco-friendly behavior. The EPA's "war on coal," the battle over the Indian Point nuclear facility, and proposed "carbon taxes" offer timely illustrations of the theoretical and policy issues in the environmental debates.

**Chapter 15: The Farm Problem** just won't go away. Low price and income elasticities combine with the vagaries of weather to keep food prices volatile. The Farm Act of 2018 revisits the new price floors and subsidies designed to shelter farmers from market volatility.

**Chapter 16: The Labor Market** has been roiled in recent years by structural and cyclical forces. This chapter examines the underpinnings of labor demand and supply and then assesses the sources of wage inequalities. Proposals to raise the federal minimum wage are analyzed, as are the sky-high salaries of corporate CEOs.

**Chapter 17: Labor Unions** have lost ground in the private sector but have gained significant power in the public sector (especially in colleges and secondary schools). The parameters of collective bargaining are spelled out and then illustrated with the 2017–2021 contract for the National Basketball Association players. The 2005–2009 Silicon Valley conspiracy to hold down tech wages offers a vivid example of oligopsony power at work.

**Chapter 18: Financial Markets** have been front-page news since the onset of the Great Recession. This chapter emphasizes the *economic* role that stock and bond markets play in reallocating resources to new products and processes. Examples range from the financing of Columbus's New World expedition to Snapchat's $3 billion IPO in March 2017. The use of crowdfunding as a source of start-up financing is discussed.

**Chapter 19: Taxes: Equity vs. Efficiency** continues to be a staple of political debate. Should the "rich" pay more taxes, as President Obama urged? Or should tax rates be reduced to encourage more investment and innovation as President Trump proposed? The nature and terms of the equity/efficiency trade-off are examined, and illustrated with a comparison of the Clinton and Pence tax returns for 2015 (Trump's tax return was not available). New data on global tax rates and tax migrations are provided.

**Chapter 20: Transfer Payments: Welfare and Social Security** continues the discussion of equity/efficiency trade-offs, emphasizing the work disincentives inherent in all income transfer programs. New data on the redistributive impact of transfers underscores their importance for equity, and the 2017 formula for Social Security benefits highlights the efficiency concern.

**Chapter 21: International Trade** not only examines the theory of comparative advantage, but also investigates the opposition to free trade and the impact of trade barriers that result. The latest data on trade flows and trade balances (both aggregate and bilateral) are injected. The new U.S. tariff on Chinese steel and Canadian lumber help illustrate the winners and losers from trade barriers.

**Chapter 22: International Finance** explains how international exchange rates are determined and why they and the 2016–2017 collapse of the Venezuelan bolivar fluctuate. The depreciation of the Ukrainian hryvnia in the wake of Russia's invasion and the 2016–2017 collapse of the Venezuelan bolivar provide new perspectives on currency fluctuations. The loss Serena Williams incurred on her Wimbledon prize money when English voters elected to exit the EU and the pound tumbled is a nice illustration of the distributional effects of currency fluctuations.

**Chapter 23: Global Poverty** is receding, but billions of people remain desperately poor around the world. This chapter describes the current dimensions of global poverty and the World Bank's new (2017) antipoverty goal. Emphasis is on the importance of productivity advance and the policies that accelerate or restrain that advance. A new World View on Venezuela's economic contraction provides a relevant illustration.

## EFFECTIVE PEDAGOGY

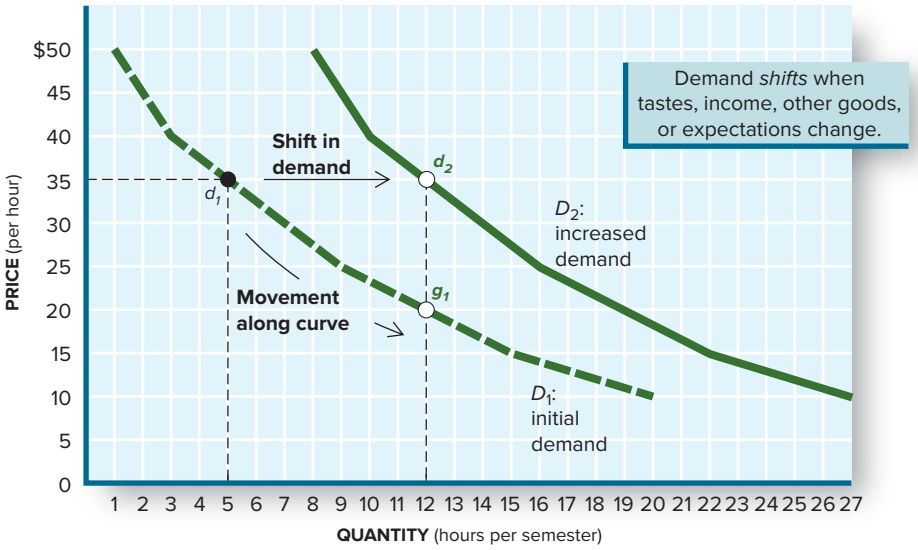
### Clean, Clear Theory

Despite the abundance of real-world applications, this is at heart a *principles* text, not a compendium of issues. Good theory and interesting applications are not mutually exclusive. This is a text that wants to *teach economics,* not just increase awareness of policy issues. To that end, *The Micro Economy Today* provides a logically organized and uncluttered theoretical structure. What distinguishes this text from others on the market is that it conveys theory in a lively, student-friendly manner.

### Concept Reinforcement

Student comprehension of core theory is facilitated with careful, consistent, and effective pedagogy. This distinctive pedagogy includes the following features:

**Chapter Learning Objectives.** Each chapter contains a set of chapter-level learning objectives. Students and professors can be confident that the organization of each chapter surrounds common themes outlined by three to five learning objectives listed on the first page of each chapter. End-of-chapter material, including the chapter summary, discussion questions, and student problem sets, is tagged to these learning objectives, as is the supplementary material, which includes the Test Bank and Instructor's Resource Manual.




| | Quantity Demanded (Hours per Semester) | | |
|---|---|---|---|
| | Price (per Hour) | Initial Demand | After Increase in Income |
| *A* | $50 | 1 | 8 |
| *B* | 45 | 2 | 9 |
| *C* | 40 | 3 | 10 |
| *D* | 35 | 5 | 12 |
| *E* | 30 | 7 | 14 |
| *F* | 25 | 9 | 16 |
| *G* | 20 | 12 | 19 |
| *H* | 15 | 15 | 22 |
| *I* | 10 | 20 | 27 |

**FIGURE 3.3**
**Shifts vs. Movements**

A demand curve shows how a consumer responds to price changes. If the determinants of demand stay constant, the response is a *movement* along the curve to a new quantity demanded. In this case, the quantity demanded increases from 5 (point $d_1$), to 12 (point $g_1$), when price falls from $35 to $20 per hour.

If the determinants of demand *change,* the entire demand curve *shifts.* In this case, a rise in income increases demand. With more income, Tom is willing to buy 12 hours at the initial price of $35 (point $d_2$), not just the 5 hours he demanded before the lottery win.

**Self-Explanatory Graphs and Tables.** Graphs are *completely* labeled, colorful, and positioned on background grids. Because students often enter the principles course as graphphobics, graphs are frequently accompanied by synchronized tabular data. Every table is also annotated. This shouldn't be a product-differentiating feature, but sadly, it is. Putting a table in a text without an annotation is akin to writing a cluster of numbers on the board, then leaving the classroom without any explanation.

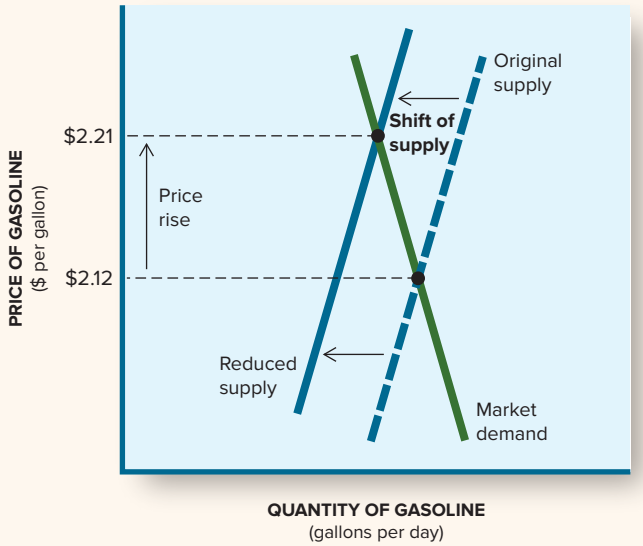
**Reinforced Key Concepts.** Key terms are defined when they first appear and, unlike in other texts, redefined as necessary in subsequent chapters. End-of-chapter discussion questions use tables, graphs, and boxed news stories from the text, reinforcing key concepts, and are linked to the chapter's learning objectives.

**Boxed and Annotated Applications.** In addition to the real-world applications that run through the body of the text, *The Micro Economy Today* intersperses boxed domestic (In the News) and global (World View) case studies intertextually for further understanding and reference. Although nearly every text on the market now offers boxed applications, *The Micro Economy Today*'s presentation is distinctive. First, the sheer number of In the News (60) and World View (37) boxes is unique. Second, and more important, *every* boxed application is referenced in the body of the text. Third, *every*

**IN THE NEWS**

## SEAFOOD PRICES RISE AFTER BP OIL SPILL

**Oily shrimp? No thank you! The National Oceanic and Atmospheric Administration (NOAA) has closed a third of the Gulf of Mexico in response to the BP oil spill. The explosion of BP's Deepwater Horizon oil rig has spilled nearly 5 million barrels of oil into the Gulf. Whatever their taste, oily fish and shrimp may be a health hazard.**




**Closure of the Gulf has caused seafood prices to soar. The price of top-quality white shrimp has jumped from $3.50 a pound to $7.50 a pound. Restaurants are jacking up their prices or taking shrimp off the menu.**

Source: News reports, June 2010.

**ANALYSIS:** When factor costs or availability worsen, the supply curve *shifts* to the left. Such leftward supply-curve shifts push prices up the market demand curve.

News and World View comes with a brief, self-contained explanation, as the accompanying example illustrates. Fourth, the News and World View boxes are the explicit subject of the end-of-chapter discussion questions and student problem set exercises. In combination, these distinctive features assure that students will actually *read* the boxed applications and discern their economic content. The Test Bank provides subsets of questions tied to the News and World View boxes so that instructors can confirm student use of this feature.

### Readability

The one adjective invariably used to describe *The Micro Economy Today* is "readable." Professors often express a bit of shock when they realize that students actually enjoy reading the text. (Well, not as much as a Stephen King novel, but a whole lot better than most texts they've had to plow through.) The writing style is lively and issue-focused. Unlike any other text on the market, every boxed feature, every graph, every table, and every cartoon is explained and analyzed. Every feature is also referenced in the text, so students actually learn the material rather than skipping over it. Because readability is ultimately in the eye of the beholder, you might ask a couple of students to read and compare a parallel chapter in *The Micro Economy Today* and in another text. This is a test *The Micro Economy Today* usually wins.

## Student Problem Set

We firmly believe that students must *work* with key concepts in order to really learn them. Weekly homework assignments are *de rigueur* in our own classes. To facilitate homework assignments, we have prepared the student problem set at the end of each chapter. These sets include built-in numerical and graphing problems that build on the tables, graphs, and boxed material that align with each chapter's learning objectives. Grids for drawing graphs are also provided. Students cannot complete all the problems without referring to material in the chapter. This increases the odds of students actually *reading* the chapter, the tables, and the boxed applications.

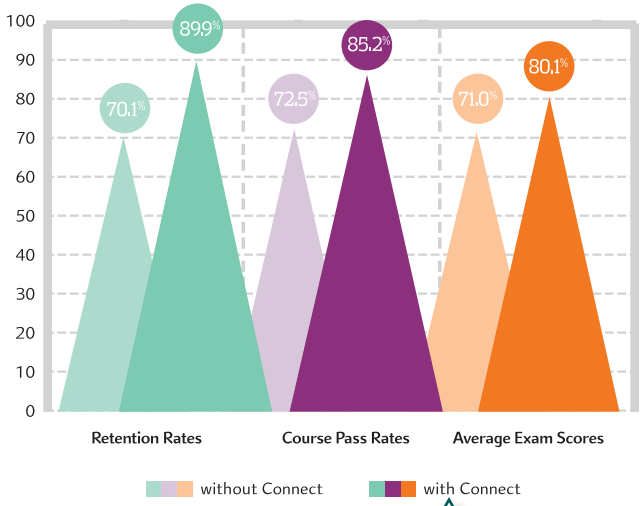
The student problem set at the end of each chapter is reproduced in the online student tutorial software. This really helps students transition between the written material and online supplements. It also means that the online assignments are totally book-specific.

McGraw-Hill Connect® is a highly reliable, easy-to-use homework and learning management solution that utilizes learning science and award-winning adaptive tools to improve student results.

## Homework and Adaptive Learning

- Connect's assignments help students contextualize what they've learned through application, so they can better understand the material and think critically.
- Connect will create a personalized study path customized to individual student needs through SmartBook®.
- SmartBook helps students study more efficiently by delivering an interactive reading experience through adaptive highlighting and review.

### Connect's Impact on Retention Rates, Pass Rates, and Average Exam Scores




Using **Connect** improves retention rates by **19.8%,** passing rates by **12.7%, and** exam scores by **9.1%.**

Over **7 billion questions** have been answered, making McGraw-Hill Education products more intelligent, reliable, and precise.

## Quality Content and Learning Resources

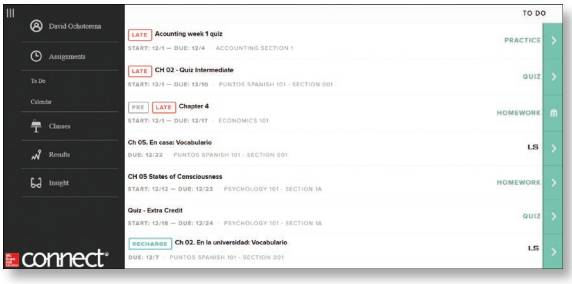
- Connect content is authored by the world's best subject matter experts, and is available to your class through a simple and intuitive interface.
- The Connect eBook makes it easy for students to access their reading material on smartphones and tablets. They can study on the go and don't need internet access to use the eBook as a reference, with full functionality.
- Multimedia content such as videos, simulations, and games drive student engagement and critical thinking skills.

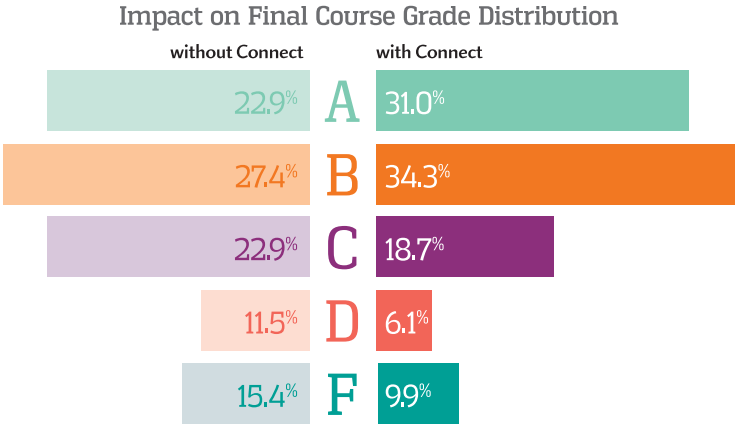
73% of instructors who use **Connect** require it; instructor satisfaction **increases** by 28% when **Connect** is required.

# Robust Analytics and Reporting

©Hero Images/Getty Images RF

- Connect Insight® generates easy-to-read reports on individual students, the class as a whole, and on specific assignments.
- The Connect Insight dashboard delivers data on performance, study behavior, and effort. Instructors can quickly identify students who struggle and focus on material that the class has yet to master.
- Connect automatically grades assignments and quizzes, providing easy-to-read reports on individual and class performance.




More students earn **As** and **Bs** when they use **Connect**.

# Trusted Service and Support

- Connect integrates with your LMS to provide single sign-on and automatic syncing of grades. Integration with Blackboard®, D2L®, and Canvas also provides automatic syncing of the course calendar and assignment-level linking.
- Connect offers comprehensive service, support, and training throughout every phase of your implementation.
- If you're looking for some guidance on how to use Connect, or want to learn tips and tricks from super users, you can find tutorials as you work. Our Digital Faculty Consultants and Student Ambassadors offer insight into how to achieve the results you want with Connect.

## NEW AND IMPROVED SUPPLEMENTS

The following ancillaries are available for quick download and convenient access via the Instructor Resource material available through McGraw-Hill Connect.

## DIGITAL SOLUTIONS

**Extensive Algorithmic and Graphing Assessment.** Robust, auto-gradable question banks for each chapter now include even more questions that make use of the Connect graphing tool. More questions featuring algorithmic variations have also been added.

**Interactive Graphs.** This new assignable resource within Connect helps students see the relevance of subject matter by providing visual displays of real data for students to manipulate. All graphs are accompanied by assignable assessment questions and feedback to guide students through the experience of learning to read and interpret graphs and data.

**Videos.** New to this edition are videos that provide support for key economic topics. These short, engaging explanations are presented at the moment students may be struggling to help them connect the dots and grasp challenging concepts.

**Math Preparedness Tutorials.** Our math preparedness assignments have been reworked to help students refresh on important prerequisite topics necessary to be successful in economics.

**Test Bank.** The Test Bank has been rigorously revised for this 15th edition of *The Micro Economy Today*. Digital co-author Karen Gebhardt enlisted the help of her grad students to carefully assess *every* problem in the Test Bank, assigning each problem a letter grade and identifying errors and opportunities for improvement. This in-depth and critical assessment and revision has ensured a high level of quality and consistency of the test questions and the greatest possible correlation with the content of the text. All questions are coded according to chapter learning objectives, AACSB Assurance of Learning, and Bloom's Taxonomy guidelines. The computerized Test Bank is available in EZ Test, a flexible and easy-to-use electronic testing program that accommodates a wide range of question types, including user-created questions. You can access the test bank through McGraw-Hill Connect.

**Computerized Test Bank Online.** TestGen is a complete, state-of-the-art test generator and editing application software that allows instructors to quickly and easily select test items from McGraw Hill's test bank content. The instructors can then organize, edit, and customize questions and answers to rapidly generate tests for paper or online administration. Questions can include stylized text, symbols, graphics, and equations that are inserted directly into questions using built-in mathematical templates. TestGen's random generator provides the option to display different text or calculated number values each time questions are used with both quick-and-simple test creation and flexible and robust editing tools, TestGen is a complete test generator system for today's educators.

You can use our test bank software, TestGen, or Connect to easily query for learning outcomes and objectives that directly relate to the learning objectives for your course. You can then use the reporting features to aggregate student results in a similar fashion, making the collection and presentation of assurance-of-learning data simple and easy.

**Assurance-of- Learning Ready**

Many educational institutions today are focused on the notion of *assurance of learning,* an important element of some accreditation standards. *The Micro Economy Today* is designed specifically to support your assurance-of-learning initiatives with a simple yet powerful solution.

Each test bank question for *The Micro Economy Today* maps to a specific chapter learning outcome/objective listed in the text. You can use our test bank software, EZ Test and EZ Test Online, to easily query for learning outcomes/objectives that directly relate to the learning objectives for your course. You can then use the reporting features of EZ Test to aggregate student results in similar fashion, making the collection and presentation of assurance-of-learning data simple and easy.

## AACSB Statement

McGraw-Hill Education is a proud corporate member of AACSB International. Understanding the importance and value of AACSB accreditation, *The Micro Economy Today,* 15th edition, recognizes the curricula guidelines detailed in the AACSB standards for business accreditation by connecting selected questions in the text and the test bank to the six general knowledge and skill guidelines in the AACSB standards.

The statements contained in *The Micro Economy Today,* 15th edition, are provided only as a guide for the users of this text. The AACSB leaves content coverage and assessment within the purview of individual schools, the mission of the school, and the faculty. While *The Micro Economy Today,* 15th edition, and the teaching package make no claim of any specific AACSB qualification or evaluation, we have labeled within *The Micro Economy Today,* 15th edition, labeled selected questions according to the eight general knowledge and skills areas emphasized by AACSB.

## Instructor Aids

**PowerPoint Presentations.** Developed using Microsoft PowerPoint software, these slides are a step-by-step review of the key points in each of the book's 37 chapters. They are equally useful to the student in the classroom as lecture aids or for personal review at home or the computer lab. The slides use animation to show students how graphs build and shift.

**Solutions Manual.** Prepared by Karen Gebhardt, this manual provides detailed answers to the end-of-chapter questions.

## Student Aids

**Built-in Student Problem Set.** The built-in student problem set is found at the end of every chapter of *The Micro Economy Today.* Each chapter has 8 to 10 numerical and graphing problems tied to the content of the text.

## ACKNOWLEDGMENTS

This 15th edition of *The Micro Economy Today* represents a continuing commitment to disseminate the core principles of economics to a broad swath of college students. Like earlier editions, it has benefited greatly from the continuing stream of ideas and suggestions from both instructors and students. For all that feedback, I am most grateful. Among those who have contributed feedback to this and earlier editions are the following instructors:

**Reviewers**

**Cynthia E. Abadie**
Southwest Tennessee Community College

**Mark Abajian**
San Diego Mesa College

**Steve Abid**
Grand Rapids Community College

**Ercument G. Aksoy**
Los Angeles Valley College

**Mauro Cristian Amor**
Northwood University

**Catalina Amuedo-Dorantes**
San Diego State University

**Gerald Baumgardner**
Penn College

**Mack A. Bean**
Franklin Pierce University

**Adolfo Benavides**
Texas A&M University–Corpus Christi

**Anoop Bhargava**
Finger Lakes Community College

**Joerg Bibow**
Skidmore College

**Eugenie Bietry**
Pace University

**John Bockino**
Suffolk County Community College

**Peter Boelman**
Norco College

**Walter Francis Boyle**
Fayetteville Technical Community College

**Amber Brown**
Grand Valley State University

**Don Bumpass**
Sam Houston State University

**Suparna Chakraborty**
Baruch College, CUNY

**Stephen J. Conroy**
University of San Diego

**Sherry L. Creswell**
Kent State University

**Manabendra Dasgupta**
University of Alabama–Birmingham

**Antony Davies**
Duquesne University

**Diane de Freitas**
Fresno City College

**Diana Denison**
Red Rocks Community College

**Alexander Deshkovski**
North Carolina Central University

**John A. Doces**
Bucknell University

**Ishita Edwards**
Oxnard College

**Eric R. Eide**
Brigham Young University

**Yalcin Ertekin**
Trine University

**Kelley L. Fallon**
Owensboro Community & Technical College

**Frank Garland**
Tri-County Technical College

**Leroy Gill**
The Ohio State University

**Paul Graf**
Indiana University

**Barnali Gupta**
Miami University

**Sheila Amin Gutierrez de Pineres**
University of Texas–Dallas

**Jonatan Jelen**
City College of New York

**Hyojin Jeong**
Lakeland Community College

**Barbara Heroy John**
University of Dayton

**Tim Kochanski**
Portland State University

**David E. Laurel**
South Texas College

**Raymond Lawless**
Quinsigamond Community College

**Richard B. Le**
Cosumnes River College

**Jim Lee**
Texas A&M University–Corpus Christi

**Sang H. Lee**
Southeastern Louisiana University

**Minghua Li**
Franklin Pierce University

**Yan Li**
University of Wisconsin–Eau Claire

**Paul Lockard**
Black Hawk College

**Rotua Lumbantobing**
North Carolina State University

**Paula Manns**
Atlantic Cape Community College

**Jeanette Milius**
Iowa Western Community College

**Norman C. Miller**
Miami University

**Stanley Robert Mitchell**
McLennan Community College

**Stephen K. Nodine**
Tri-County Technical College

**Phacharaphot Nuntramas**
San Diego State University

**Seth Ari Roberts**
Frederick Community College

**Michael J. Ryan**
Western Michigan University

**Craig F. Santicola**
Westmoreland County Community College

**Rolando A. Santos**
Lakeland Community College

**Theodore P. Scheinman**
Mt. Hood Community College

**Marilyn K. Spencer**
Texas A&M University–Corpus Christi

**Irina Nikolayevna Strelnikova**
Red Rocks Community College

**Michael Swope**
Wayne County Community College

**Gary Lee Taylor**
South Dakota State University

**Deborah L. Thorsen**
Palm Beach State College

**Ngoc-Bich Tran**
San Jacinto College

**Markland Tuttle**
Sam Houston State University

**Kenneth Lewis Weimer**
Kellogg Community College

**Selin Yalcindag**
Mercyhurst College

**Erik Zemljic**
Kent State University

The text itself and all the accompanying supplements could not make it to the marketplace without the prodigious efforts of the production team at McGraw-Hill. In this regard, I want to extend special thanks to Adam Huenecke, who has not only managed the production process, but even tutored me in the use of the digital tools needed to produce a text today. Katie Hoenicke served once again as a valued editor of the entire project. Last but not least, I want to call out Karen Gebhardt, who is the digital co-author for this text. Karen has not only upgraded and synchronized all of the digital dimensions of our text package, but has also motivated me to check and recheck every detail of the text. She is an invaluable partner.

Let me conclude by thanking all the instructors and students who are going to use *The Micro Economy Today* as an introduction to economic principles. I will welcome any reactions (even bad ones) and suggestions you'd like to pass on for future editions.

**—Bradley R. Schiller**

# CONTENTS IN BRIEF

## PART 2: PRODUCT MARKETS: THE BASICS

### CHAPTER 5: CONSUMER CHOICE 92



### CHAPTER 6: ELASTICITY 116



### CHAPTER 7: THE COSTS OF PRODUCTION 136



## PART 3: MARKET STRUCTURE

### CHAPTER 8: THE COMPETITIVE FIRM 164

## PART 4: REGULATORY ISSUES



## PART 5: FACTOR MARKETS: BASIC THEORY

## PART 7: INTERNATIONAL ECONOMICS

# THE MICROECONOMY TODAY

FIFTEENTH EDITION

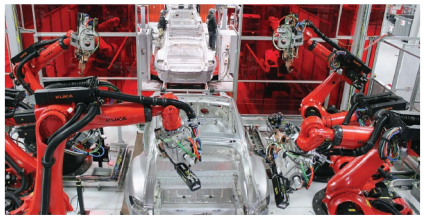
Mc Graw Hill Education

©MOF/Getty Images RF

PART 1

# THE ECONOMIC CHALLENGE

©REUTERS/Alamy Stock Photo



©Kyodo via AP Images

©Blend Images/Getty Images RF

©Hisham F. Ibrahim/Getty Images RF

People around the world want a better life. Whether rich or poor, everyone strives for a higher standard of living. Ultimately, the performance of the economy determines who attains that goal.

These first few chapters examine how the *limits* to output are determined and how the interplay of market forces and government intervention utilize and even expand those limits.

"The Economist in Chief"



CHAPTER 1

# Economics: The Core Issues

**LEARNING OBJECTIVES**

*After reading this chapter, you should know*

- **LO1-1** What scarcity is.
- **LO1-2** How scarcity creates opportunity costs.
- **LO1-3** What the production possibilities curve represents.
- **LO1-4** The three core economic questions that every society must answer.
- **LO1-5** How market and government approaches to economic problems differ.

People understand that the president of the United States is the Commander in Chief of the armed forces. The president has the ultimate responsibility to decide when and how America's military forces will be deployed. He issues the orders that military officers must carry out. He is given credit for military successes and blame for military failures. He can't "pass the buck" down the line of command.

Less recognized is the president's role as "Economist in Chief." The president is held responsible not just for the *military* security of the United States, but for its *economic* security as well. Although he doesn't have the command powers in the economic arena that he has in the military arena, people expect him to take charge of the economy. They expect the Economist in Chief to keep the economy growing, to create jobs for everyone who wants one, and to prevent prices from rising too fast. Along the way, they expect the Economist in Chief to protect the environment, assure economic justice for all, and protect America's position in the global economy.

That is a tall order, especially in view of the president's limited constitutional powers to make economic policy decisions. The economy is also buffeted by international and natural forces that no president can control. But no matter. Voters hold the Economist in Chief responsible for economic misfortunes, whether or not he is able to single-handedly prevent them, and give him credit for economic success.

What everyone ultimately wants is a prosperous and growing economy: an economy in which people can find good jobs, enjoy rising living standards and wealth, get the education they desire, and enjoy an array of creature comforts. And we want to enjoy this good life while protecting the environment, caring for the poor, and pursuing world peace.

How are we going to get all this? Is "the economy" some sort of perpetual motion machine that will keep churning out more goods and services every year? Clearly not. During the Great Recession of 2008–2009 the economy churned out less output, eliminated jobs, and reduced living standards and wealth. A lot of college graduates had to move back home when they couldn't find jobs. What went wrong?

Even after the Great Recession ended in June 2009, economic pain persisted. The growth of the economy was agonizingly slow, and unemployment remained high for another 6 years. Was that much distress really necessary? Couldn't the Economist in Chief have fixed these problems? These questions are were debated intensely in the 2016 presidential election. Donald Trump promised "to make America

great again" by creating more jobs, building more bridges and roads, strengthening the armed forces, and limiting both illegal immigration and unfair foreign competition. Voters decided to give him the opportunity to serve as Economist in Chief. Like his predecessors, President Trump's challenge has been to convert campaign promises into tangible economic results. To convert campaign promises into desirable economic outcomes requires a knowledge of what makes an economy tick. How are prices, wages, employment, and other economic outcomes actually determined? Does Wall Street run the system? How about selfish, greedy capitalists? The banks? Or maybe foreign nations? Are incompetent bureaucrats and self-serving politicians the root of our occasional woes? Who, in fact, calls the shots?

The goal of this course is to understand how the economy works. To that end, we want to determine how *markets*—the free-wheeling exchange of goods and services—shape economic outcomes—everything from the price of this text to the national unemployment rate. Then we want to examine the role that government can and does play in (re)shaping economic performance. Once we've established this foundation, we'll be in a better position to evaluate what the Economist in Chief *can* do—and what he *should* do. We'll also better understand how we can make better economic decisions for ourselves.

We'll start our inquiry with some harsh realities. In a world of unlimited resources, we could have all the goods we desired. We'd have time to do everything we wanted and enough money to buy everything we desired. We could produce enough to make everyone rich while protecting the environment and exploring the universe. The Economist in Chief could deliver everything voters asked for. Unfortunately, we don't live in that utopia: **we live in a world of limited resources.** Those limits are the root of our economic problems. They force us to make difficult decisions about how *best* to use our time, our money, and our resources. These are *economic* decisions.

In this first chapter we'll examine how the problem of limited resources arises and the kinds of choices it forces us to make. As we'll see, **three core choices confront every nation:**

- **WHAT to produce with our limited resources.**
- **HOW to produce the goods and services we select.**
- **FOR WHOM goods and services are produced—that is, who should get them.**

We also have to decide who should answer these questions. Should people take care of their own health and retirement, or should the government provide a safety net of health care and pensions? Should the government regulate airfares or let the airlines set prices? Should Microsoft decide what features get included in a computer's operating system, or should the government make that decision? Should Facebook decide what personal information is protected, or should the government make that decision? Should interest rates be set by private banks alone, or should the government try to control interest rates? The battle over *who* should answer the core questions is often as contentious as the questions themselves.

## THE ECONOMY IS US

To learn how the economy works, let's start with a simple truth: *the economy is us.* "The economy" is simply an abstraction referring to the grand sum of all our production and consumption activities. What we collectively produce is what the economy produces; what we collectively consume is what the economy consumes. In this sense, the concept of "the economy" is no more difficult than the concept of "the family." If someone tells you that the Jones family has an annual income of $42,000, you know that the reference is to the collective earnings of all the Joneses. Likewise, when someone reports that the nation's income is $20 trillion per year—as it now is—we should recognize that the reference is to the grand total of everyone's income. If we work fewer hours or get paid less, both family income *and* national income decline. The "meaningless statistics" often cited in the news are just a summary of our collective market behavior.

The same relationship between individual behavior and aggregate behavior applies to specific outputs. If we as individuals insist on driving cars rather than taking public transportation, the economy will produce millions of cars each year and consume vast quantities of oil. In a slightly different way, the economy produces billions of dollars of military hardware to satisfy our desire for national defense. In each case, the output of the economy reflects the collective behavior of the 340 million individuals who participate in the U.S. economy.

We may not always be happy with the output of the economy. But we can't ignore the link between individual action and collective outcomes. If the highways are clogged and the air is polluted, we can't blame someone else for the transportation choices we made. If we're disturbed by the size of our military arsenal, we must still accept responsibility for our choices (or nonchoices, if we failed to vote). In either case, we continue to have the option of reallocating our resources. We can create a different outcome tomorrow, next month, or next year.

## SCARCITY: THE CORE PROBLEM

Although we can change economic outcomes, we can't have everything we want. If you go to the mall with $20 in your pocket, you can buy only so much. The money in your pocket sets a *limit* to your spending.

The output of the entire economy is also limited. The limits in this case are set not by the amount of money in people's pockets, but by the resources available for producing goods and services. Everyone wants more housing, new schools, better transit systems, and a new car. We also want to explore space and bring safe water to the world's poor. But even a country as rich as the United States can't produce everything people want. So, like every other nation, we have to grapple with the core problem of **scarcity**—the fact that **there aren't enough resources available to satisfy all our desires.**

**scarcity:** Lack of enough resources to satisfy all desired uses of those resources.

### Factors of Production

**factors of production:** Resource inputs used to produce goods and services, e.g., land, labor, capital, entrepreneurship.

The resources used to produce goods and services are called **factors of production.** ***The four basic factors of production are***

- ***Land.***
- ***Labor.***
- ***Capital.***
- ***Entrepreneurship.***

These are the *inputs* needed to produce desired *outputs.* To produce this text, for example, we needed paper, printing presses, a building, and lots of labor. We also needed people with good ideas who could put it together. To produce the education you're getting in this class, we need not only a text but a classroom, a teacher, a blackboard, and maybe a computer as well. **Without factors of production, we simply can't produce anything.**

**Land.** The first factor of production, land, refers not just to the ground but to all natural resources. Crude oil, water, air, and minerals are all included in our concept of "land."

**Labor.** Labor too has several dimensions. It's not simply a question of how many bodies there are. When we speak of labor as a factor of production, we refer to the skills and abilities to produce goods and services. Hence both the quantity and the quality of human resources are included in the "labor" factor.

**capital:** Final goods produced for use in the production of other goods, such as equipment and structures.

**Capital.** The third factor of production is capital. In economics the term **capital** refers to final goods produced for use in further production. The residents of fishing villages in southern Thailand, for example, braid huge fishing nets. The sole purpose of these nets is to catch more fish. The nets themselves become a factor of production in obtaining the

final goods (fish) that people desire. Thus they're regarded as *capital.* Blast furnaces used to make steel and desks used to equip offices are also capital inputs.

**Entrepreneurship.** The more land, labor, and capital we have, the more we can produce potential output. A farmer with 10,000 acres, 12 employees, and six tractors can grow more crops than a farmer with half those resources. But there's no guarantee that he will. The farmer with fewer resources may have better ideas about what to plant, when to irrigate, or how to harvest the crops. ***It's not just a matter of what resources you have but also of how well you use them.*** This is where the fourth factor of production—**entrepreneurship**—comes in. The entrepreneur is the person who sees the opportunity for new or better products and brings together the resources needed for producing them. If it weren't for entrepreneurs, Thai fishers would still be using sticks to catch fish. Without entrepreneurship, farmers would still be milking their cows by hand. If someone hadn't thought of a way to miniaturize electronic circuits, you wouldn't be able to text your friends.

**entrepreneurship:** The assembling of resources to produce new or improved products and technologies.

The role of entrepreneurs in economic progress is a key issue in the market versus government debate. The British economist John Maynard Keynes argued that free markets unleash the "animal spirits" of entrepreneurs, propelling innovation, technology, and growth. Critics of government regulation argue that government interference in the marketplace, however well intentioned, tends to stifle those very same animal spirits.

### Limits to Output

No matter how an economy is organized, there's a limit to how much it can produce. The most evident limit is the amount of resources available for producing goods and services. One reason the United States can produce so much is that it has nearly 4 million square miles of land. Tonga, with less than 300 square miles of land, will never produce as much. The United States also has a population of more than 340 million people. That's a lot less than China (1.4 billion) but far larger than 200 other nations (Tonga has a population of less than 120,000). So an abundance of raw resources gives us the potential to produce a lot of output. But that greater production capacity isn't enough to satisfy all our desires. We're constantly scrambling for additional resources to build more houses, make better movies, and provide more health care. That imbalance between available resources and our wish list is one of the things that makes the job of Economist in Chief so difficult: He can't deliver everything people want.

The science of **economics** helps us frame these choices. In a nutshell, economics is the study of how people use scarce resources. How do you decide how much time to spend studying? How does Google decide how many workers to hire? How does Ford decide whether to use its factories to produce sport utility vehicles or sedans? What share of a nation's resources should be devoted to space exploration, the delivery of health care services, or pollution control? In every instance, **alternative ways of using scarce labor, land, and capital resources are always available, and we have to choose one use over another.**

**economics:** The study of how best to allocate scarce resources among competing uses.

## OPPORTUNITY COSTS

Scientists have long sought to explore every dimension of space. President Kennedy initiated a lunar exploration program that successfully landed men on the moon on July 20, 1969. That only whetted the appetite for further space exploration. President George W. Bush initiated a program to land people on Mars, using the moon as a way station. Scientists believe that the biological, geophysical, and technical knowledge gained from the exploration of Mars will improve life here on Earth. But should we do it? In a world of unlimited resources the answer would be an easy "yes." But we don't live in that world.

***Every time we use scarce resources in one way, we give up the opportunity to use them in other ways.*** If we use more resources to explore space, we have fewer resources available for producing earthly goods. The forgone earthly goods represent the **opportunity costs** of a Mars expedition. ***Opportunity cost is what is given up to get***

**opportunity cost:** The most desired goods or services that are forgone in order to obtain something else.

***something else.*** Even a so-called free lunch has an opportunity cost. The resources used to produce the lunch could have been used to produce something else. A trip to Mars has a much higher opportunity cost. President Obama decided those opportunity costs were too high: he scaled back the Mars programs to make more resources available for Earthly uses (like education, highway construction, and energy development). President Trump agreed. While calling space exploration "wonderful," he observed "Right now, we have bigger problems—we've got to fix our potholes." He reallocated scarce resources from space exploration to domestic infrastructure (roads, bridges, airports).

Your economics class also has an opportunity cost. The building space used for your economics class can't be used to show movies at the same time. Your professor can't lecture (produce education) and repair motorcycles simultaneously. The decision to use these scarce resources (capital, labor) for an economics class implies producing less of other goods.

Even reading this text is costly. That cost is not measured in dollars and cents. The true (economic) cost is, instead, measured in terms of some alternative activity. What would you like to be doing right now? The more time you spend reading this text, the less time you have available for other uses of your time. The opportunity cost of reading this text is the best alternative use of your scarce time. If you are missing your favorite TV show, we'd say that show is the opportunity cost of reading this text. It is what you gave up to do this assignment. Hopefully, the benefits you get from studying will outweigh that cost. Otherwise this wouldn't be the best way to use your scarce time.

### Guns vs. Butter

One of the most difficult choices nations must make about resource use entails defense spending. After the September 11, 2001, terrorist attacks on the World Trade Center and Pentagon, American citizens overwhelmingly favored an increase in military spending. Even the unpopularity of the wars in Iraq and Afghanistan didn't quell the desire for more national defense. But national defense, like Mars exploration, requires the use of scarce resources; Americans wanted to feel *safe*. But there is a *cost* to assuring safety: the 1.4 million men and women who serve in the armed forces aren't available to build schools, program computers, or teach economics. Similarly, the land, labor, capital, and entrepreneurship devoted to producing military hardware aren't available for producing civilian goods. An *increase* in national defense implies more sacrifices of civilian goods and services. How many schools, hospitals, or cars are we willing to sacrifice in order to "produce" more national security? This is the "guns versus butter" dilemma that all nations confront.

## PRODUCTION POSSIBILITIES

The opportunity costs implied by our every choice can be illustrated easily. Suppose a nation can produce only two goods, trucks and tanks. To keep things simple, assume that labor (workers) is the only factor of production needed to produce either good. Although other factors of production (land, machinery) are also needed in actual production, ignoring them for the moment does no harm. Assume further that we have a total of only 10 workers available per day to produce either trucks or tanks. That's a tiny work force, but it makes the math a lot easier.

Our initial problem is to determine the *limits* of output. How many trucks or tanks *can* be produced in a day with available resources (our 10 workers)?

Before going any further, notice how opportunity costs will affect the answer. If we use all 10 workers to produce trucks, no labor will be available to assemble tanks. In this case, forgone tanks would become the *opportunity cost* of a decision to employ all our resources in truck production.

We still don't know how many trucks could be produced with 10 workers or exactly how many tanks would be forgone by such a decision. To get these answers, we need more details about the production processes involved—specifically, how many workers are required to manufacture either good.

| | Production Options | |
|---|---|---|
| | Output of Trucks per Day | Output of Tanks per Day |
| *A* | 5 | 0 |
| *B* | 4 | 2.0 |
| *C* | 3 | 3.0 |
| *D* | 2 | 3.8 |
| *E* | 1 | 4.5 |
| *F* | 0 | 5.0 |

**TABLE 1.1**

**A Production Possibilities Schedule**

As long as resources are limited, their use entails an opportunity cost. In this case, resources (labor) used to produce trucks can't be used for tank assembly at the same time. Hence the forgone tanks are the opportunity cost of additional trucks. If all our resources were used to produce trucks (row *A*), no tanks could be assembled. To produce tanks, we have to reduce truck production.

## The Production Possibilities Curve

Table 1.1 summarizes the hypothetical choices, or **production possibilities,** that we confront in this case. Suppose we wanted to produce only trucks (i.e., no tanks). Row *A* of the table shows the *maximum* number of trucks we could produce. With 10 workers available and a labor requirement of 2 workers per truck, we can manufacture a maximum of five trucks per day.

Producing five trucks per day leaves no workers available to produce tanks. Our 10 available workers are all being used to produce trucks. On row *A* of Table 1.1 we've got "butter" (trucks) but no "guns" (tanks). If we want tanks, we have to cut back on truck production. The remainder of Table 1.1 illustrates the trade-offs we confront in this simple case. By cutting truck production from five to four trucks per day (row *B*), we reduce labor use in truck production from 10 workers to 8. That leaves 2 workers available for other uses, including the production of tanks.

If we employ these remaining 2 workers to assemble tanks, we can build two tanks a day. We would then end up on row *B* of the table with four trucks and two tanks per day. What's the opportunity cost of these two tanks? It's the one additional truck (the fifth truck) that we could have produced but didn't.

As we proceed down the rows of Table 1.1, the nature of opportunity costs becomes apparent. Each additional tank built implies the loss (opportunity cost) of truck output. Likewise, every truck produced implies the loss of some tank output.

These trade-offs between truck and tank production are illustrated in the production possibilities curve of Figure 1.1. ***Each point on the production possibilities curve depicts an alternative mix of output*** **that could be produced.** In this case, each point represents a different combination of trucks and tanks that we could produce in a single day using all available resources (10 workers in this case).

Notice in particular how points *A* through *F* in Figure 1.1 represent the choices described in each row of Table 1.1. At point *A*, we're producing five trucks per day and no tanks. As we move down the curve from point *A* we're producing fewer trucks and more tanks. At point *B*, truck production has dropped from five to four vehicles per day while tank assembly has increased from zero to two. In other words, we've given up one truck to get two tanks assembled. The opportunity cost of those tanks is the one truck that is given up. A production possibilities curve, then, is simply a graphic summary of production possibilities, as described in Table 1.1. As such, ***the production possibilities curve illustrates two essential principles:***

- ***Scarce resources.*** There's a limit to the amount of output we can produce in a given time period with available resources and technology.
- ***Opportunity costs.*** We can obtain additional quantities of any particular good only by reducing the potential production of another good.

These principles help explain why both presidents Obama and Trump chose to devote fewer resources to space exploration. They felt the opportunity costs (reduced education, less infrastructure) were simply too high.

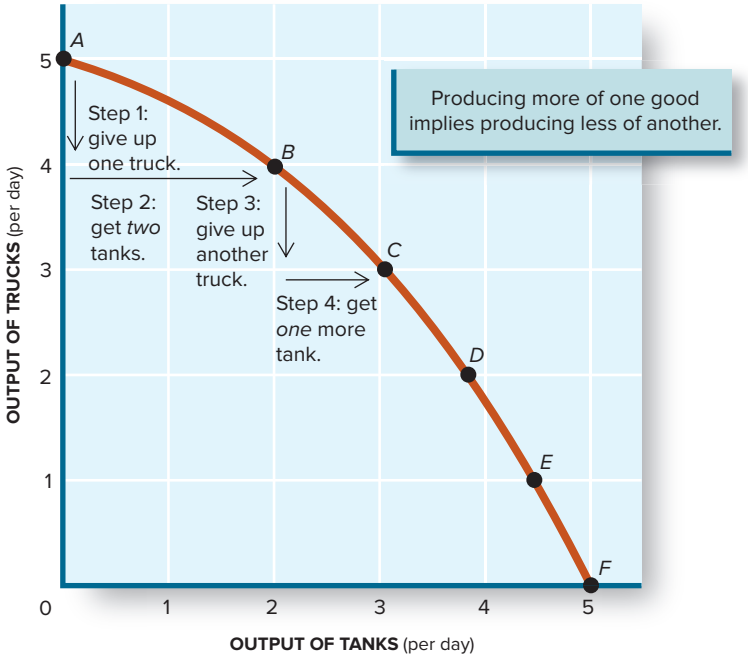
**production possibilities:** **The alternative combinations of final goods and services that could be produced in a given period with all available resources and technology.**

**FIGURE 1.1**
**A Production Possibilities Curve**

A production possibilities curve (PPC) describes the various output combinations that could be produced in a given time period with available resources and technology. It represents a menu of output choices an economy confronts.

Point *B* indicates that we could produce a *combination* of four trucks and two tanks per day. Alternatively, we could produce one less truck and a third tank by moving to point *C*.

Points *A, D, E,* and *F* illustrate still other output combinations that *could* be produced. This curve is a graphic illustration of the production possibilities schedule in Table 1.1.




## Increasing Opportunity Costs

The shape of the production possibilities curve reflects another limitation on our choices. Notice how opportunity costs increase as we move along the production possibilities curve. When we cut truck output from five to four (step 1, Figure 1.1), we get two tanks (step 2). When we cut truck production further, however (step 3), we get only one tank per truck given up (step 4). The opportunity cost of tank production is increasing. This process of increasing opportunity cost continues. By the time we give up the last truck (row *F*), tank output increases by only 0.5: we get only half a tank for the last truck given up. These increases in opportunity cost are reflected in the outward bend of the production possibilities curve.

Why do opportunity costs increase? Mostly because it's difficult to move resources from one industry to another. It's easy to transform trucks to tanks on a blackboard. In the real world, however, resources don't adapt so easily. Workers who assemble trucks may not have the right skills for tank assembly. As we continue to transfer labor from one industry to the other, we start getting fewer tanks for every truck we give up.

The difficulties entailed in transferring labor skills, capital, and entrepreneurship from one industry to another are so universal that we often speak of the *law* of *increasing opportunity cost.* This law says that we must give up ever-increasing quantities of other goods and services in order to get more of a particular good. The law isn't based solely on the limited versatility of individual workers. The *mix* of factor inputs makes a difference as well. Truck assembly requires less capital than tank assembly. In a pinch, wheels can be mounted on a truck almost completely by hand, whereas tank treads require more sophisticated machinery. As we move labor from truck assembly to tank assembly, available capital may restrict our output capabilities.

## The Cost of North Korea's Military

The production possibilities curve illustrates why the core economic decision about WHAT to produce is so difficult: We can't have everything we want and, worse yet, getting more of one thing implies getting less of something else. We are forced to make difficult choices.

Consider, for example, North Korea's decision to maintain a large military. North Korea is a relatively small country: its population of 25 million ranks fiftieth in the world. Yet

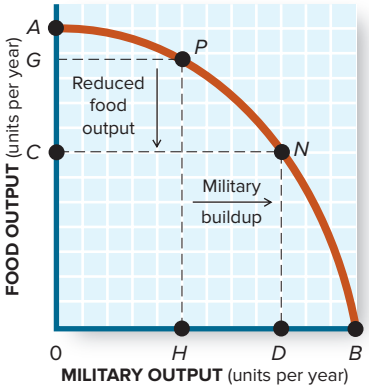



**FIGURE 1.2**

**The Cost of War**

North Korea devotes as much as 20 percent of its output to the military. The opportunity cost of this decision is reduced output of food. As the military expands from 0*H* to 0*D*, food output drops from 0*G* to 0*C*.

North Korea maintains the fourth-largest army in the world and continues to develop a nuclear weapons capability. To do so, it allocates as much as 20 percent of all its resources to feeding, clothing, and equipping its military forces. As a consequence, there aren't enough resources available to produce food. Without adequate machinery, seeds, fertilizer, or irrigation, North Korea's farmers can't produce enough food to feed the population (see World View "North Korea's Food Shortage Grows"). As Figure 1.2 illustrates, the opportunity cost of "guns" in Korea is a lot of needed "butter."

## WORLD VIEW

### WORLD'S LARGEST ARMIES

| Rank | Country | Active Military |
|---|---|---|
| 1 | China | 2,333,000 |
| 2 | United States | 1,492,200 |
| 3 | India | 1,325,000 |
| 4 | North Korea | 1,190,000 |
| 5 | Russia | 845,000 |
| 6 | Pakistan | 643,800 |
| 7 | South Korea | 630,000 |
| 8 | Iran | 523,000 |
| 9 | Turkey | 510,600 |
| 10 | Vietnam | 482,000 |

Source: U.S. Central Intelligence Agency 2017.

**ANALYSIS:** Nations "produce" national defense by employing land, labor, and capital in their armed forces. The opportunity cost of those "guns" are less "butter."

During World War II, the United States confronted a similar trade-off. In 1944 nearly 40 percent of all U.S. output was devoted to the military. Civilian goods were so scarce that they had to be rationed. Staples like butter, sugar, and gasoline were doled out in small quantities. Even golf balls were rationed. In North Korea, golf balls would be a luxury even without a military buildup. As the share of North Korea's output devoted to the military increased, even basic food production became more difficult. (See World View "North Korea's Food Shortage Grows.")

What is the opportunity cost of North Korea's army?