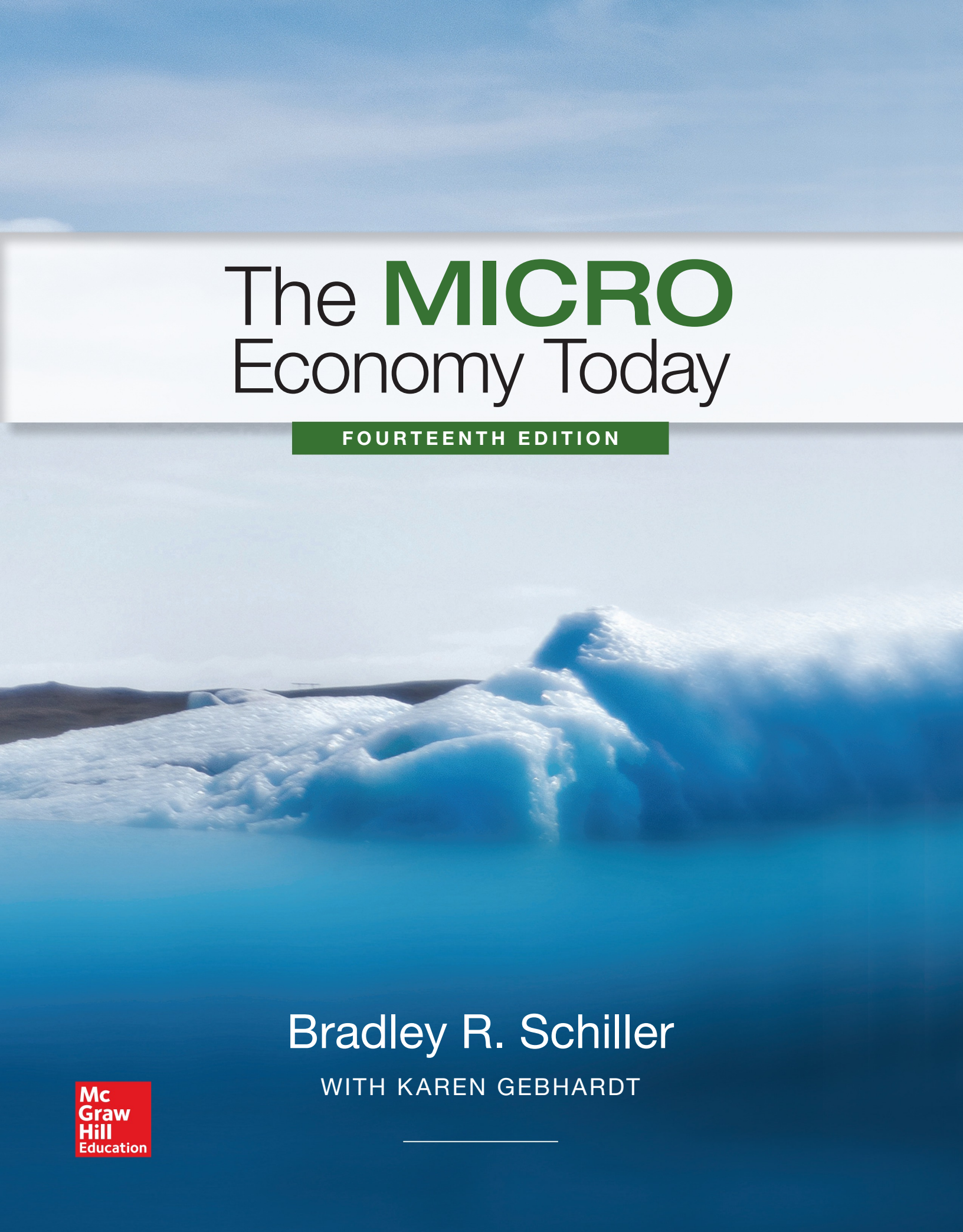

The MICRO Economy Today

FOURTEENTH EDITION

Bradley R. Schiller

WITH KAREN GEBHARDT

Mc Graw Hill Education

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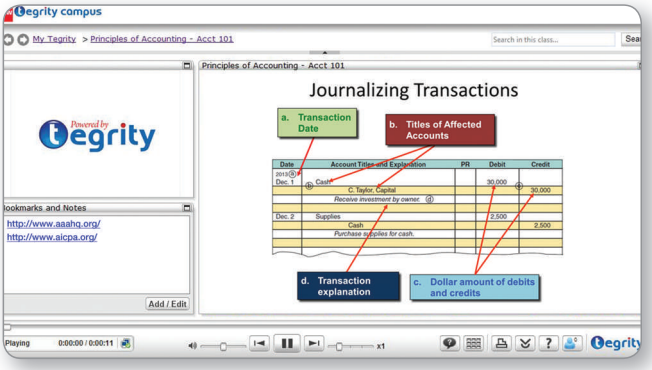

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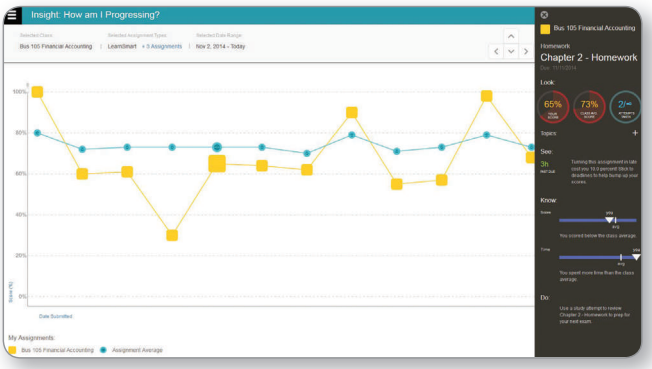

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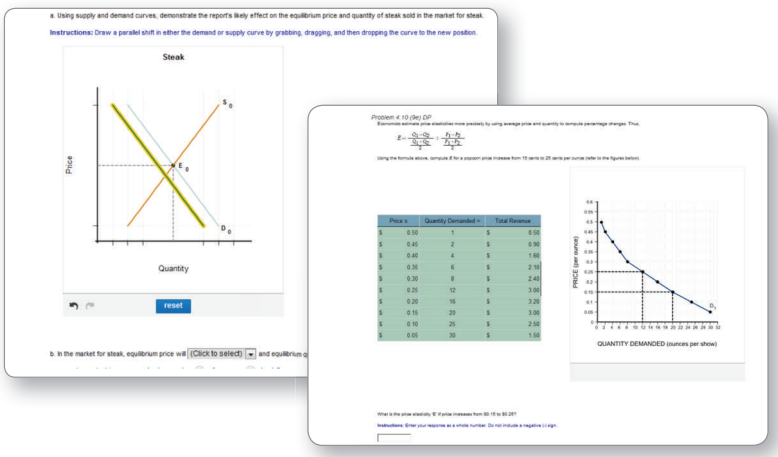

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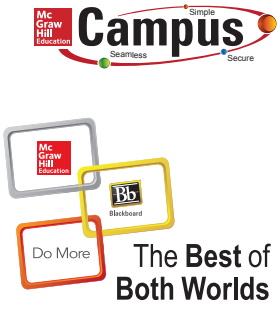

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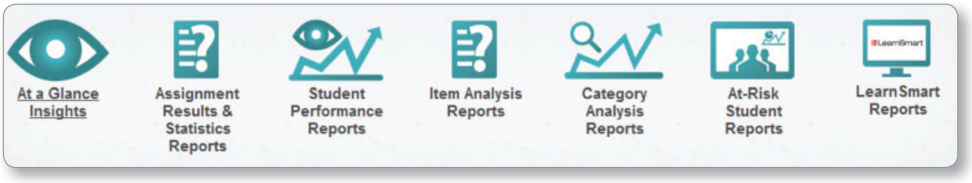

The MICRO Economy Today

FOURTEENTH EDITION

The McGraw-Hill Series Economics

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Karlan and Morduch
Economics, Microeconomics, and Macroeconomics
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McConnell, Brue, and Flynn
Economics, Microeconomics, and Macroeconomics
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Brief Editions: Microeconomics and Macroeconomics
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Schiller
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Contemporary Labor Economics
Tenth Edition

Public Finance

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Public Finance
Tenth Edition

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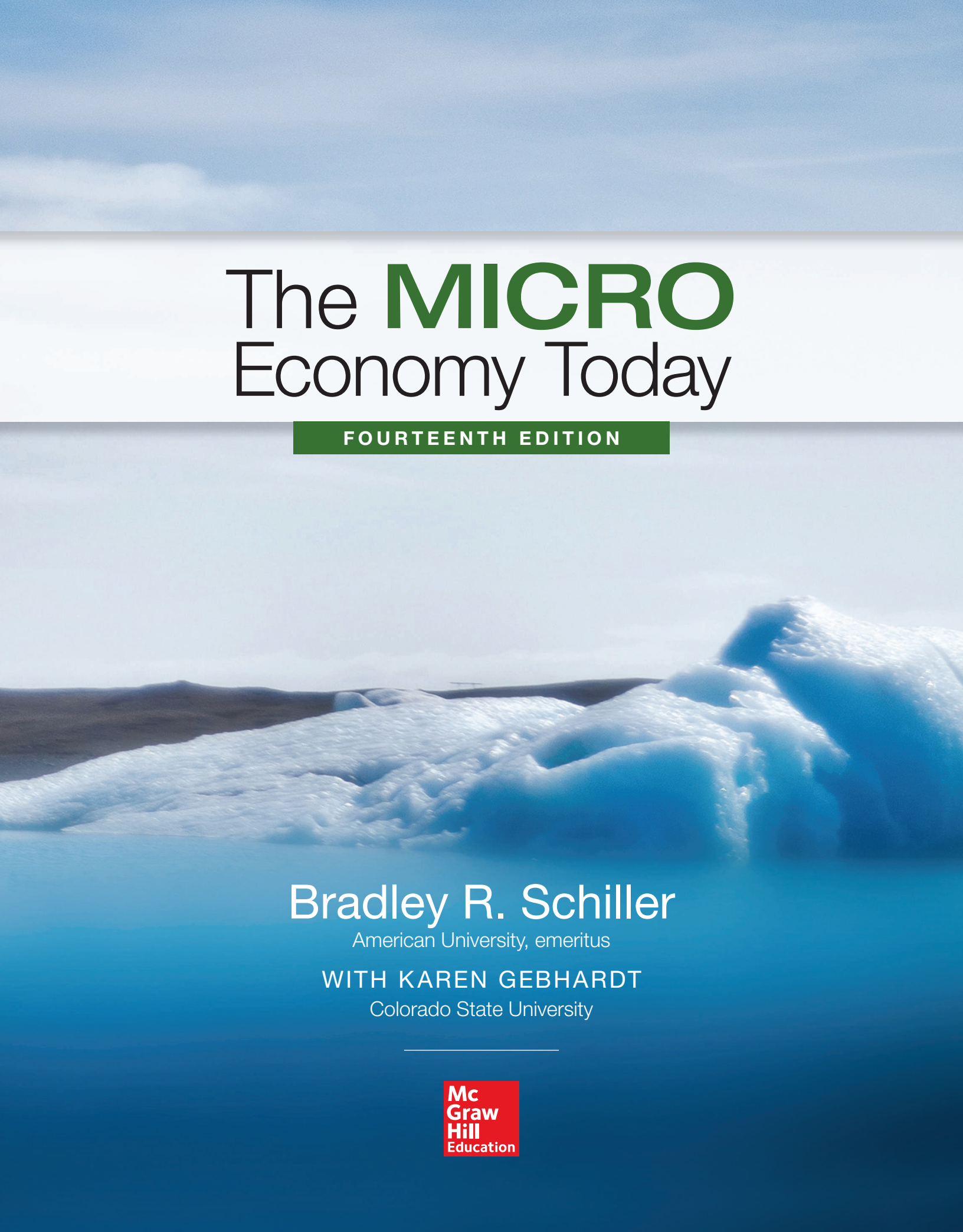

The MICRO Economy Today

FOURTEENTH EDITION

Bradley R. Schiller
American University, emeritus

WITH KAREN GEBHARDT
Colorado State University

Mc Graw Hill Education

THE MICRO ECONOMY TODAY, FOURTEENTH EDITION

This book is printed on acid-free paper.

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ABOUT THE AUTHORS

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, Brad is on the tennis courts, the ski slopes, or the crystal-blue waters of Lake Tahoe.

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. She also supervises and mentors the department's graduate teaching assistants and adjunct instructors.

Dr. Gebhardt was the recipient of the Water Pik Excellence in Education Award in 2006 and was nominated for Colorado State University Teacher of the Year in 2006, 2008, and 2013.

Her research interests, publications, and presentations involve the economics of human–wildlife interaction, economics education, and the economics of gender in the U.S. economy. 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 Great Recession of 2008–2009 lingered for far too long. But that devastating experience had at least one positive effect: it revitalized interest in economics. People wanted to know how a modern economy could stumble so badly—and why it took so long to recover. Public debates about economic theory became increasingly intense and partisan. Everything from Keynesian theory to environmental regulation became the subject of renewed scrutiny. These debates increased the demand for economic analysis and for principles instruction as well. Indeed, one could argue that the Great Recession proved that economics instruction is an inferior good: as the economy contracts, the demand for economics instruction increases.

While we might take offense at the thought of producing an inferior good, we should certainly rise to the occasion. This means bringing the real world into the classroom as never before: relating basic micro principles to the policy debates over taxes, regulation, energy, climate change, poverty, and trade; getting students to appreciate why and how economic issues are again the central focus of election campaigns.

The Micro Economy Today has always been a policy-driven introduction to economic principles. Indeed, that is one of its most distinctive features. This 14th edition continues that tradition with even more fervor. It challenges students to think more critically about the dominant policy issues of the day. Consider solar energy, for example. Students overwhelmingly embrace the potential of "clean" solar energy to replace "dirty" fossil fuels, thereby saving the environment, breaking the power of "Big Oil," and achieving energy independence. But what about opportunity costs? Economists preach that there is neither a "free lunch" nor a "free" solar panel. The first chapter of this text tries to get students thinking more like economists—that is, about resource constraints and implied trade-offs. The same critical thinking is applied in Chapter 1 to the "guns versus butter" debate that soaring budget deficits have brought to the fore once again (that is, which to cut). Then there is the renewed debate over "taxes on the rich," which relates both to equality (what is a "fair" distribution of the deficit-cutting burden) and to efficiency (production and investment disincentives).

A section titled "The Economy Tomorrow" at the end of every chapter focuses on these kinds of front-page policy issues. But the real-world emphasis of this text is not confined to that feature. Every chapter has an array of In the News and World View boxes that offer real-world illustrations of basic economic principles. And the body of the text itself is permeated with actual companies, products, people, and policy issues that students will recognize. Israel's success with its "Iron Dome" antimissile defense in the latest Hamas–Israel flare-up is used as an example of what we economists call a "public good" (Chapter 4). The post-ISIS defense build-up here and in Europe highlights the age-old "guns vs. butter" dilemma (Chapter 1). In the international sequence, I talk about new tariffs on Chinese solar panels, the Greek and Portuguese bailouts, and the impact of Russian aggression on the value of the Ukrainian hryvnia. 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

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. Should the government assume *more* responsibility for managing the economy—or will *less* intervention generate better micro outcomes? Public opinion is clear: as the accompanying News reveals, three out of four 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.

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

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

IN THE NEWS

Government Failure?

An August 2011 *Washington Post* poll asked a cross-section of Americans the following question:

Answers:

Source: Data from *The Washington Post,* © August 9, 2011.

ANALYSIS: "Government failure" occurs when government intervention fails to improve economic outcomes—that is, solve economic problems. Three out of four Americans expect such failures to occur.

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 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 emphasis on contemporary policy issues is evident throughout micro. 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 analysis of President Obama's 2010 tax return (p. 413) 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 on p. 194) all the way to the iPhone 6 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 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 dimension of micro issues (e.g., effective competition, oil prices).

WHAT'S NEW AND UNIQUE IN THIS 14TH 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 14th edition offers the following.

23 New In the News Boxes

Price determination is illustrated in Chapter 3 with NCAA ticket scalping, price cuts on Galaxy phones, and the surge in shrimp prices following the Gulf BP oil spill. The record-breaking Alibaba IPO highlights the role of financial markets in reallocating resources. Tesla's new "gigafactory" illustrates the advantages of economies of scale. Those "bikini barristers" in Everett, Washington, emphasize the importance of product differentiation in monopolistic competition. And the 2014 U.N. Climate Summit addresses the realities of global externalities.

10 New World View Boxes

Israel's deployment of its "Iron Dome" missile defense system offers a new illustration of public goods. The oil-market response to the downing of the Malaysian Airlines flight in the Ukraine puts a spotlight on the determinants of demand in Chapter 3. The pricing of the iPhone 6 and iWatch highlight the central role of price elasticities. And the latest OPEC deal illustrates the use of price-fixing to attain monopoly profits. All In the News and World View boxes are annotated and referred to explicitly in the body of the text.

129 New Problems

As in earlier editions, the 14th 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.

27 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.

New Digital Coauthor and Enhanced Digital Content

We are pleased to welcome Karen Gebhardt (Colorado State University) to the author team. Karen has made important contributions to the 14th edition of *The Micro Economy Today* as a digital coauthor, including helping create quality digital materials to accompany the textbook and ensuring that the Test Bank and end-of-chapter questions are not only accurate but contain effective and probing questions for students.

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. The 2011–2013 defense cutbacks and the post-ISIS call for a defense build-up highlight the guns vs. butter dilemma (opportunity cost), as does North Korea's continuing food shortages.

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.

Chapter 3: Supply and Demand introduces the core elements of the market mechanism. Walmart's 2014 price cuts on the Galaxy S4 illustrate the law of demand. Ticket scalping at the NCAA finals illustrates disequilibrium pricing. Supply/demand shifts are illustrated with shrimp prices in the wake of the BP Gulf oil spill and oil prices in the wake of the Malaysian Airlines downing.

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 new 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 6 launch, 2015 tax hikes on cigarettes, and consumer responses to higher gasoline prices. 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. Ford's closure of its Australian 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. New 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 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. The 2014 merger of Reynolds and Lorillard illustrates key challenges.

Chapter 12: Monopolistic Competition stresses the differences in structure, behavior, and outcomes of this common industry category. The introduction of powermats 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 recent American Airlines/U.S. Airways merger offers a new case study.

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 2014 created new price floors and subsidies 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. President Obama's proposed $10.10 minimum wage is 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 GM/UAW outcomes and the 2012–2013 National Hockey League lockout. 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 Alibaba's record-breaking IPO in September 2014. Ten new problems give students practice in computing key financial measures.

Chapter 19: Taxes: Equity vs. Efficiency continues to be a staple of political debate. Should the "rich" pay more taxes, as President Obama has urged? Or should tax rates be reduced to encourage more investment and innovation? The nature and terms of the equity/efficiency trade-off are examined, as is President Obama's own tax return. 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 2014 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 solar panels helps illustrate the winners and losers from trade barriers.

Chapter 22: International Finance explains how international exchange rates are determined and why they fluctuate. The depreciation of the Ukrainian hryvnia in the wake of Russia's invasion provides a new perspective on currency fluctuations. There is also a new World View depicting who gains and who loses from a strong (appreciating) dollar.

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 (2014) 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

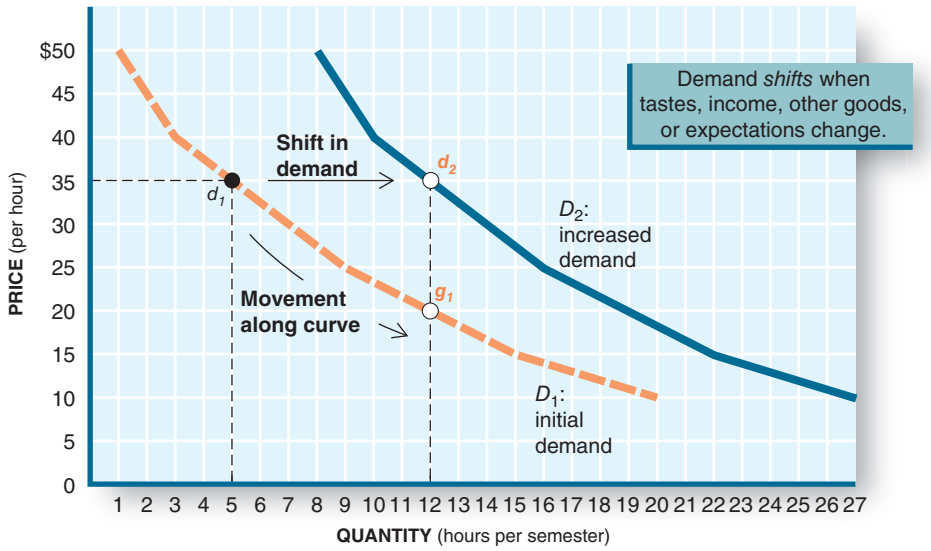
Despite the abundance of real-world applications, this is at heart a *principles* text, not a compendium of issues. Good theory and interesting applications are not mutually exclusive. This is a text that wants to *teach economics,* not just increase awareness of policy issues. To that end, *The Micro Economy Today* provides a logically organized and uncluttered theoretical structure for micro and international theory. 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.

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 textbook without an annotation is akin to writing a cluster of numbers on the board, then leaving the classroom without any explanation.



	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.

Reinforced Key Concepts. Key terms are defined in the margin when they first appear and, unlike in other texts, redefined in the margin as necessary in subsequent chapters. Website references are directly tied to the book's content, not hung on like ornaments. 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.

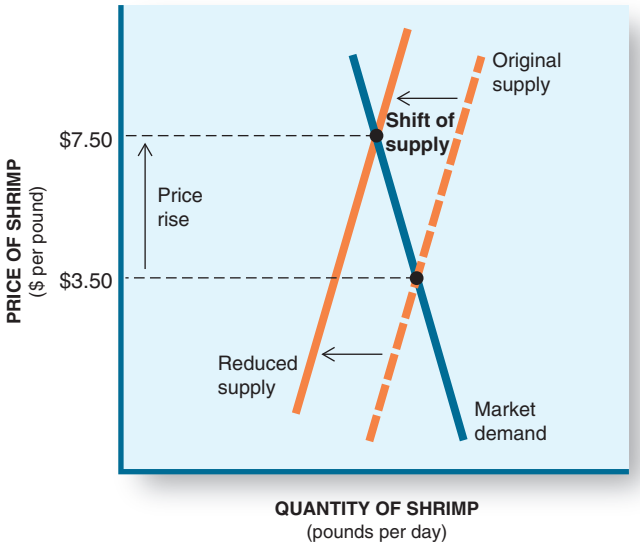
Boxed and Annotated Applications. In addition to the real-world applications that run through the body of the text, *The Micro Economy Today* intersperses boxed domestic (In the News) and global (World View) case studies intertextually for further understanding and reference. Although nearly every text on the market now offers boxed applications, *The Micro Economy Today*'s presentation is distinctive. First, the sheer number of In the News (68) and World View (47) boxes is unique. Second, and more important, *every* boxed application is referenced in the body of the text. Third, *every* 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.

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 worsens, the supply curve *shifts* to the left. Such leftward supply-curve shifts push prices up the market demand curve.

Photos and Cartoons. The text presentation is also enlivened with occasional photos and cartoons that reflect basic concepts. The photos on page 40 are much more vivid testimony to the extremes of inequality than the data in Figure 2.3 (p. 39). The contrasting photos of the original Apple I (p. 194), the iPhone 6, and the iWatch (p. 203) underscore how the "animal spirits" of competitive markets spur innovation. Every photo and cartoon is

Analysis: An abundance of capital equipment and advanced technology make American farmers and workers far more productive than workers in poor nations.

annotated and referenced in the body of the text. These visual features are an integral part of the presentation, not diversions.

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 book. (Well, not as much as a Stephen King novel, but a whole lot better than most textbooks they've had to plow through.) The writing style is lively and issue-focused. Unlike any other textbook 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

I firmly believe that students must *work* with key concepts in order to really learn them. Weekly homework assignments are *de rigueur* in my own classes. To facilitate homework assignments, I have prepared the student problem set, which includes 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 (*Connect*® *Economics,* discussed in the following pages). This really helps students transition between the written material and online supplements. It also means that the online assignments are totally book-specific.

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*®.

Instructor Aids

Test Bank. The Test Bank has been rigorously revised for this 14th 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. Tests created in EZ Test can be exported for use with course management systems such as WebCT, BlackBoard, or PageOut. The program is available for Windows, Macintosh, and Linux environments. Additionally, you can access the test bank through McGraw-Hill *Connect*.

PowerPoint Presentations. Mike Cohick of Collin College, with the help of Karen Gebhardt, revised presentation slides for the 14th edition. Developed using Microsoft PowerPoint software, these slides are a step-by-step review of the key points in each of the book's 23 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.

Digital Image Library. All of the text's tables and graphs have been reproduced as full-color images on the website for instructor access.

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

News Flashes. As up-to-date as *The Micro Economy Today* is, it can't foretell the future. As the future becomes the present, however, I write two-page News Flashes describing major economic events and relating them to specific text references. These News Flashes provide good lecture material and can be copied for student use. Adopters of *The Micro Economy Today* have the option of receiving News Flashes via fax or mail. They are also available via the Instructor Resource Material in *Connect*. Four to six News Flashes are sent to adopters each year. (Contact your local McGraw-Hill Education sales representative to get on the mailing list.)

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. Graphing grids are provided. The answer blanks are formatted to facilitate grading.

Web Click Boxes

A mini website directory is provided in each chapter's marginal Web Click boxes, created and updated by Mark Wilson of West Virginia University Institute of Technology. These URLs aren't random picks; they were selected because they let students extend and update adjacent in-text discussions.

Study Econ Mobile App

McGraw-Hill is proud to offer a new mobile study app for students learning economics from Schiller's *The Micro Economy Today*, 14th edition. The features of the Study Econ app include flashcards for all key terms, a basic math review, customizable self-quizzes, common mistakes, and games. For additional information, please refer to the back inside cover of this book. Visit your mobile app store and download a trial version of the Schiller Study Econ app today!

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- Increase intent listening and class participation by easing students' concerns about note taking. Lecture Capture will make it more likely you will see students' faces, not the tops of their heads.

For more information about *Connect*, go to **connect.mheducation.com**, or contact your local McGraw-Hill sales representative.

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LEARNSMART® Students want to make the best use of their study time. The LearnSmart adaptive self-study technology within *Connect Economics* provides students with a seamless combination of practice, assessment, and remediation for every concept in the textbook. LearnSmart's intelligent software adapts to every student response and automatically delivers concepts that advance students' understanding while reducing time devoted to the concepts already mastered. The result for every student is the fastest path to mastery of the chapter concepts. LearnSmart

- Applies an intelligent concept engine to identify the relationships between concepts and to serve new concepts to each student only when he or she is ready.
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Smartbook

SMARTBOOK® Smartbook is an extension of LearnSmart—an adaptive eBook that helps students focus their study time more effectively. As students read, Smartbook assesses comprehension and dynamically highlights where they need to study more.

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We understand that getting the most from your new technology can be challenging. That's why our services don't stop after you purchase our products. You can e-mail our Product Specialists 24 hours a day to get product-training online. Or you can search our knowledge bank of Frequently Asked Questions on our support website. For Customer Support, call **800-331-5094**, or visit **www.mhhe.com/support**.

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Tegrity Tegrity Campus is a fully automated lecture capture solution used in traditional, hybrid, "flipped classes," and online courses to record lessons, lectures, and skills. Its personalized learning features make study time incredibly efficient and its ability to affordably scale brings this benefit to every student on campus. Patented search technology and real-time LMS integrations make Tegrity the market-leading solution and service.

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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, or *Connect® Economics* 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,* 14th 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,* 14th edition, are provided only as a guide for the users of this textbook. 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,* 14th edition, and the teaching package make no claim of any specific AACSB qualification or evaluation, we have labeled within *The Micro Economy Today,* 14th edition, selected questions according to the six general knowledge and skills areas.

ACKNOWLEDGMENTS

This 14th edition is unquestionably the finest edition of *The Micro Economy Today,* and I am deeply grateful to all those people who helped develop it. Sarah Otterness was my faithful, fastidious, and cheerful product developer, who checked every word and feature in the text, prompting scores of corrections. Kathryn Wright, the project manager, did an exceptional job in assuring that every page of the text was visually pleasing, properly formatted, error-free, and timely produced. Scott Smith and Katie Hoenicke served as brand managers, offering sage advice and savvy leadership. The design team, led by Debra Kubiak, created a vibrant palette of colors and features that enhanced *The Micro Economy Today*'s readability. My thanks to all of them and their supporting staff.

I also want to express my heartfelt thanks to the professors who have shared their reactions (both good and bad) with me. Direct feedback from users and reviewers has always been a great source of continuing improvements in *The Micro Economy Today:*

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Finally, I'd like to thank all the professors and students who are going to use *The Micro Economy Today* as an introduction to economics principles. I welcome any responses (even the bad ones) you'd like to pass on for future editions.

—Bradley R. Schiller

CONTENTS IN BRIEF

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PART 7: INTERNATIONAL ECONOMICS

The MICRO Economy Today

FOURTEENTH EDITION

PART

1

The Economic Challenge

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.

CHAPTER 1

Economics:
The Core Issues

LEARNING OBJECTIVES

After reading this chapter, you should know

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

"The Economist in Chief"

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 and the array of forces that shape economic outcomes. But no matter. Voters will hold the Economist in Chief responsible for economic misfortunes, whether or not he is able to single-handedly prevent them.

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, pursue the education they desire, and enjoy the creature comforts of a prosperous economy. And we want to enjoy all these material comforts while protecting the environment, caring for the poor, and pursuing world peace.

We may know what we want, but how do we get it? 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? Or are private markets simply unresponsive to government policies? These questions are being debated again in the run-up to the 2016 presidential elections.

Just raising these questions begs the fundamental issue 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 textbook 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. The Economist in Chief has to decide how *best* to use the nation's limited 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 $18 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" (see the cartoon on the next page) 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.

"Meaningless statistics were up one-point-five per cent this month over last month."

Analysis: Many people think of economics as dull statistics. But economics is really about human behavior—how people decide to use scarce resources and how those decisions affect market outcomes.

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 320 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, such as land, labor, capital, and 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 textbook, 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 textbook 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. 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.

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

Entrepreneurship. The more land, labor, and capital available, the greater the amount of 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 320 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 125,000). 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.

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

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

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 available, and we have to choose one use over another.

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 something else.*** Even a so-called free lunch has an opportunity cost (see the below cartoon). 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 highway construction and energy development).

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

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 book 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 book, 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 book. 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.

"There's no such thing as a free lunch."

Analysis: All goods and services have an opportunity cost. Even the resources used to produce a "free lunch" could have been used to produce something else.

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. Let us assume further that we have a total of only 10 workers available per day to produce either trucks or tanks. Our initial problem is to determine the *limits* of output. How many trucks or tanks *can* be produced in a day with available resources?

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.

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"

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

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.

	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

(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.

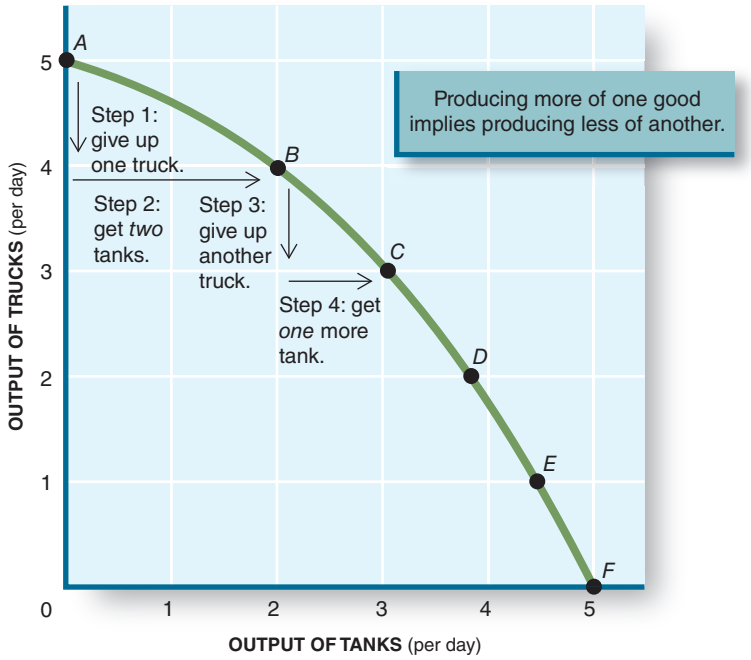

FIGURE 1.1
A Production Possibilities Curve

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. By producing one less truck, we could assemble a third tank and thus move 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. 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 North Korea maintains the fifth-largest army in the world and continues to develop a nuclear weapons capability. To do so, it must allocate 16 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, Korea's farmers can't produce enough food to feed the population (see the World View on the next page). As Figure 1.2 illustrates, the opportunity cost of "guns" in Korea is a lot of needed "butter."

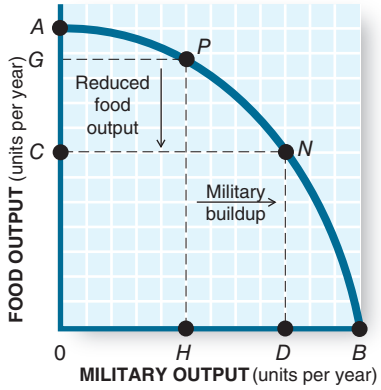

FIGURE 1.2
The Cost of War

North Korea devotes 16 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.*