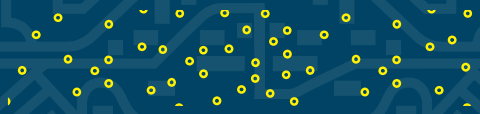
This International Student Edition is for use outside of the U.S.

TENTH EDITION

MANAGERIAL ECONOMICS and BUSINESS STRATEGY

MICHAEL R. BAYE / JEFFREY T. PRINCE

Mc Graw Hill



TENTH EDITION

Managerial Economics and Business Strategy

The McGraw-Hill Series Economics

Survey of Economics

Brue, McConnell, and Flynn
Essentials of Economics
Fourth Edition

Guell
Issues in Economics Today
Ninth Edition

Mandel
M: Economics: The Basics
Fourth Edition

Schiller and Gebhardt
Essentials of Economics
Eleventh Edition

Principles of Economics

Asarta and Butters
Connect Master 2.0: Principles of Economics
Third Edition

Colander
Economics, Microeconomics, and Macroeconomics
Eleventh Edition

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

Frank, Bernanke, Antonovics, and Heffetz
A Streamlined Approach for: Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics
Fourth Edition

Karlan and Morduch
Economics, Microeconomics, and Macroeconomics
Third Edition

McConnell, Brue, and Flynn
Economics, Microeconomics, and Macroeconomics
Twenty-Second Edition

McConnell, Brue, and Flynn
Brief Editions: Microeconomics and Macroeconomics
Third Edition

Samuelson and Nordhaus
Economics, Microeconomics, and Macroeconomics
Nineteenth Edition

Schiller and Gebhardt
The Economy Today, The Micro Economy Today, and The Macro Economy Today
Sixteenth Edition

Slavin
Economics, Microeconomics, and Macroeconomics
Twelfth Edition

Economics of Social Issues

Guell
Issues in Economics Today
N Edition

Register and Grimes
Economics of Social Issues
Twenty-First Edition

Data Analytics for Economics

Prince
Predictive Analytics for Business Strategy
First Edition

Managerial Economics

Baye and Prince
Managerial Economics and Business Strategy
Tenth Edition

Brickley, Smith, and Zimmerman
Managerial Economics and Organizational Architecture
Seventh Edition

Thomas and Maurice
Managerial Economics
Thirteenth Edition

Intermediate Economics

Bernheim and Whinston
Microeconomics
Second Edition

Dornbusch, Fischer, and Startz
Macroeconomics
Thirteenth Edition

Frank
Microeconomics and Behavior
Tenth Edition

Advanced Economics

Romer
Advanced Macroeconomics
Fifth Edition

Money and Banking

Cecchetti and Schoenholtz
Money, Banking, and Financial Markets
Sixth Edition

Urban Economics

O'Sullivan
Urban Economics
Ninth Edition

Labor Economics

Borjas
Labor Economics
Eighth Edition

McConnell, Brue, and Macpherson
Contemporary Labor Economics
Twelfth Edition

Public Finance

Rosen and Gayer
Public Finance
Tenth Edition

Environmental Economics

Field and Field
Environmental Economics: An Introduction
Eighth Edition

International Economics

Appleyard and Field
International Economics
Ninth Edition

Pugel
International Economics
Seventeenth Edition

TENTH EDITION

Managerial Economics and Business Strategy

Michael R. Baye
Bert Elwert Professor of Business Economics & Public Policy
Kelley School of Business
Indiana University

Jeffrey T. Prince
Professor of Business Economics & Public Policy
Harold A. Poling Chair in Strategic Management
Kelley School of Business
Indiana University

Mc Graw Hill

MANAGERIAL ECONOMICS AND BUSINESS STRATEGY

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LWI 24 23 22 21

ISBN 978-1-266-07101-0
MHID 1-266-07101-6

Cover Image: *akindo/Digital Vision Vectors/Getty Images*

mheducation.com/highered

DEDICATION

To Mom.

—Michael R. Baye

To Annie, Kate, Elise, and Henry.

—Jeffrey T. Prince

About the Authors

SOURCE: Federal Trade Commission

Michael R. Baye is the Bert Elwert Professor of Business Economics & Public Policy at Indiana University's Kelley School of Business, and currently serves as the Chairman of the U.S. Consumer Financial Protection Bureau's *Academic Research Council*. He also served as the Director of the Bureau of Economics at the Federal Trade Commission from July 2007 to December 2008. He received his BS in economics from Texas A&M University in 1980 and earned a PhD in economics from Purdue University in 1983. Prior to joining Indiana University, he taught graduate and undergraduate courses at the Pennsylvania State University, Texas A&M University, and the University of Kentucky. He has held a variety of editorial posts in economics, marketing, and business, and currently serves as a co-editor for the *Journal of Economics and Management Strategy.*

Professor Baye has won numerous awards for his outstanding teaching and research and teaches courses in managerial economics and industrial organization at the undergraduate, MBA, and PhD levels. His research has been published in the *American Economic Review*, *Journal of Political Economy*, *Econometrica*, *Review of Economic Studies*, *Economic Journal*, and *Management Science*. It has also been featured in *The Wall Street Journal*, *Forbes*, the *New York Times*, and numerous other outlets. When he is not teaching or engaged in research, Mike enjoys activities ranging from camping to shopping for electronic gadgets.

SOURCE: The Trustees of Indiana University

Jeffrey T. Prince is Professor of Business Economics & Public Policy at Indiana University's Kelley School of Business. He is also the Harold A. Poling Chair in Strategic Management and Co-Director of the Institute for Business Analytics at Kelley. From September 2019 to September 2020, he served as Chief Economist at the Federal Communications Commission. He received his BA in economics and BS in mathematics and statistics from Miami University in 1998 and earned a PhD in economics from Northwestern University in 2004. Prior to joining Indiana University, he taught graduate and undergraduate courses at Cornell University.

Professor Prince has won top teaching honors as a faculty member at both Indiana University and Cornell and as a graduate student at Northwestern. He has a broad research agenda within applied economics, having written and published on topics that include demand in technology markets, Internet diffusion, regulation in health care, risk aversion in insurance markets, and quality competition among airlines. He is one of a small number of economists to have published in both the top journal in economics (*American Economic Review*) and the top journal in management *(Academy of Management Journal*). He currently serves as a co-editor for the *Journal of Economics and Management Strategy* and is on the editorial board for *Information Economics and Policy*. In his free time, Jeff enjoys activities ranging from poker and bridge to running and racquetball.

Preface

Thanks to feedback from users around the world, *Managerial Economics and Business Strategy* remains the best-selling managerial text in the market. We are grateful to all of you for allowing us to provide this updated and improved edition. Before highlighting some of the new features of the tenth edition, we would like to stress that the fundamental goal of the book—providing students with the tools from intermediate microeconomics, game theory, and industrial organization that they need to make sound managerial decisions—has not changed. What *has* changed are the examples used to make managerial economics come to life for this generation of students, a stronger integration with data-based decision-making, and an enriched utilization of new technologies (such as *Connect*) for enhancing the teaching and learning experiences of instructors and their students.

This book begins by teaching managers the practical utility of basic economic tools such as present value analysis, supply and demand, regression, indifference curves, isoquants, production, costs, and the basic models of perfect competition, monopoly, and monopolistic competition. Adopters and reviewers also praise the book for its real-world examples and because it includes modern topics not contained in any other single managerial economics textbook: oligopoly, penetration pricing, multistage and repeated games, foreclosure, contracting, vertical and horizontal integration, networks, bargaining, predatory pricing, principal–agent problems, raising rivals' costs, adverse selection, auctions, screening and signaling, search, limit pricing, and a host of other pricing strategies for firms enjoying market power. This balanced coverage of traditional and modern microeconomic tools makes it appropriate for a wide variety of managerial economics classrooms. An increasing number of business schools are adopting this book to replace (or use alongside) managerial strategy texts laden with anecdotes but lacking the microeconomic tools needed to identify and implement the business strategies that are optimal in a given situation.

This tenth edition of *Managerial Economics and Business Strategy* has been revised to include updated examples and problems, but it retains all of the basic content that made previous editions a success. The basic structure of the textbook is largely unchanged to ensure a smooth transition to this edition.

KEY PEDAGOGICAL FEATURES

The tenth edition retains all of the class-tested features of previous editions that enhance students' learning experiences and make it easy to teach from this book.

Headlines

As in previous editions, each chapter begins with a *Headline* that is based on a real-world economic problem—a problem that students should be able to address after completing the chapter. These *Headlines* are essentially hand-picked "mini-cases" designed to motivate

students to learn the material in the chapter. Each *Headline* is answered at the end of the relevant chapter—when the student is better prepared to deal with the complications of real-world problems. Reviewers, as well as users, of previous editions praise the *Headline*s not only because they motivate students to learn the material in the chapter, but also because the answers at the end of each chapter help students learn how to use economics to make business decisions.

Learning Objectives

Each chapter includes learning objectives designed to enhance the learning experience. End-of-chapter problems are denoted with the learning objective(s) to which they relate.

Demonstration Problems

The best way to learn economics is to practice solving economic problems. Every chapter contains *Demonstration Problems* that provide students with detailed answers to help them verify that they have mastered the material. Select *Demonstration Problems* also offer a video walk-through of the problem, explaining the steps along the way. Students can click the link in their ebook or key in the URL provided to access the videos and solutions. Videos and solutions are also provided in the Connect Library, under Instructor Resource for instructors. The goal is in providing this additional guidance is to minimize time spent with students and instructors discussing answers to problems, allowing instructors more time to focus on other concepts.

Inside Business Applications

Most chapters offer *Inside Business* applications boxes to illustrate how theories explained in the text relate to a host of different business situations. As in previous editions, this feature is authored to strike a balance between applications drawn from the current economic literature and the popular press.

Calculus and Non-Calculus Alternatives

Users can easily include or exclude calculus-based material without losing content or continuity. That's because the basic principles and formulae needed to solve a particular class of economic problems (e.g., $MR = MC$) are first stated without appealing to the notation of calculus. Immediately following each stated principle or formula is a clearly marked *Calculus Alternative.* Each of these calculus alternatives states the preceding principle or formula in calculus notation and explains the relation between the calculus-based and non-calculus-based formulas. More detailed calculus derivations are relegated to chapter *Appendices*. Thus, the book is designed for use by instructors who want to integrate calculus into managerial economics and by those who do not require students to use calculus.

Variety of End-of-Chapter Problems

Three types of problems are offered. Highly structured but nonetheless challenging *Conceptual and Computational Questions* stress fundamentals. These are followed by *Problems and Applications,* which are far less structured and, like real-world decision environments, may contain more information than is actually needed to solve the problem. Many of these applied problems are based on actual business events.

Additionally, the new *Spectrum* case that follows Module Group B includes 13 problems called Memos that have a "real-world feel" and complement the text. All of these case-based problems may be assigned on a chapter-by-chapter basis as specific skills are introduced, or as part of a capstone experience.

Detailed answers to all problems can be found among the instructor resource material available via *Connect*.

Case Study

A case study in business strategy, *Spectrum—the Spawn of Time Warner Cable and Charter Communications—Navigates Challenges from Cord Cutting and Mobile Competition* follows Module Group B and was prepared especially for this text. It can be used either as a capstone case for the course or to supplement individual chapters. The case allows students to apply core elements from managerial economics to a remarkably rich business environment. Instructors can use the case as the basis for an "open-ended" discussion of business strategy, or they can assign specific "memos" (contained at the end of the case) that require students to apply specific tools from managerial economics to the case. Teaching notes, as well as solutions to all of the memos, are provided among the instructor resource material available via *Connect*.

Flexibility

Instructors of managerial economics have genuinely heterogeneous textbook needs. Reviewers and users continue to praise the book for its flexibility, and they assure us that sections or even entire chapters can be excluded without losing continuity. For instance, an instructor wishing to stress microeconomic fundamentals might choose to cover Chapters 2, 3, 4, 5, 8, 9, 10, 11, and 12. An instructor teaching a more applied course that stresses business strategy might choose to cover Chapters 1, 2, 3, 5, 6, 7, 8, 10, 11, and some or all of Module Group A. Each may choose to include additional content (for example, some or all of Module Group B or the *Time Warner Cable* case) as time permits. More generally, instructors can easily omit topics such as present value analysis, regression, indifference curves, isoquants, or reaction functions without losing continuity.

CHANGES IN THE TENTH EDITION

We have made every effort to update and improve *Managerial Economics and Business Strategy* while assuring a smooth transition to the tenth edition. Following is a summary of the pedagogical improvements, enhanced supplements, and content changes that make the tenth edition an even more powerful tool for teaching and learning managerial economics and business strategy.

- New and updated mini-cases on topics such as: Google Search, Netflix Pricing, and a range of mergers.
- New and updated end-of-chapter problems.
- New and updated *Headlines.*
- New and updated *Inside Business* applications.
- New Excel Exercises in Connect. As denoted in the text with an Excel icon, this edition offers students the ability to get more hands-on practice using Excel.
- Content from Chapters 13 and 14 in the previous edition are now placed in stand-alone modules that permit instructors to easily pick-and-choose topics to include along with their conventional materials.
- *Spectrum—the Spawn of Time Warner Cable and Charter Communications—Navigates Challenges from Cord Cutting and Mobile Competition* replaces the old *Time Warner Cable* Case.

Chapter-by-Chapter Changes

- **Chapter 1** contains a new section discussing how managers make data-driven decisions, setting the stage to incorporate the use of data to solve managerial problems throughout the remainder of the text. It also contains new and updated examples and two new end-of-chapter problems centered on the use of data analysis for managerial decision-making.
- **Chapter 2** contains two updated and one new *Inside Business* applications. The new application discusses globalization and the supply of automobiles from China.
- **Chapter 3** contains updated examples and several new elasticity tables. It also contains a new *Inside Business* about strategy in digital markets. In addition, it has a new section about data-driven demand curves and another new *Inside Business* application about the use of data to estimate demand for gamers.
- **Chapter 4** contains an updated *Inside Business* application and updated end-of-chapter problems.
- **Chapter 5** contains a new *Inside Business* application on artificial intelligence and cost minimization. It also includes new sections on data-driven production and cost functions, and there are two new end-of-chapter problems based on these new sections.
- **Chapter 6** offers a new *Headline* on vertical integration, two updated *Inside Business* applications, and a new *Inside Business* application on outsourcing.
- **Chapter 7** contains a new *Headline* on the Sprint/T-Mobile merger along with updated examples and industry data. It also provides a new *Inside Business* application on demand elasticities and a new end-of-chapter problem.
- **Chapter 8** contains an updated *Headline* and two new end-of-chapter problems.
- **Chapter 9** contains an updated *Inside Business* applications and two new end-of-chapter problems focused on data-driven decision-making.
- **Chapter 10** contains a new *Inside Business* application examining Canadian gasoline markets, as well as an updated *Inside Business* application and *Demonstration Problem*. It also contains a new end-of-chapter problem on competition between Google and Amazon in the smart home market.
- **Chapter 11** contains a new *Inside Business* application on bundling telecommunications services to reduce churn. It also includes an updated *Headline* and *Inside Business* application, as well as two new end-of-chapter problems on data-driven decision-making.
- **Chapter 12** contains an updated *Inside Business* application.
- **Module Group A (formerly Chapter 13)** has been transformed into four self-contained, concise and easy-to-navigate modules on entry prevention, lessening competition, restructuring game timing, and overcoming network effects.
- **Module Group B (formerly Chapter 14)** has been transformed into three self-contained, concise and easy-to-navigate modules on regulatory constraint on market power; regulation of markets with externalities, public goods, or incomplete information; and government policy and international markets.

Remote Proctoring & Browser-Locking Capabilities

New remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control students' assessment experience by restricting browser activity, recording students' activity, and verifying students are doing their own work.

Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

ACKNOWLEDGMENTS

We thank the many users of *Managerial Economics and Business Strategy* who provided both direct and indirect feedback that has helped improve *your* book. This includes thousands of students at Indiana University's Kelley School of Business and instructors worldwide who have used this book in their own classrooms, colleagues who unselfishly gave up their own time to provide comments and suggestions, and reviewers who provided detailed suggestions to improve this and previous editions of the book. We especially thank the following professors, past and present, for enlightening us on the market's diverse needs and for providing suggestions and constructive criticisms to improve this book.

Contributing reviewers for this edition:

Anthony Paul Andrews, *Governors State University*
Kelly Blanchard, *Purdue University—West Lafayette*
Larry Chavis, *University of North Carolina—Chapel Hill*
Kristen Collett-Schmitt, *University of Notre Dame*
James Dana, *Northeastern University*
Tina Das, *Elon University*
Brooks Depro, *Elon University*
David Hudgins, *Texas A&M University—Corpus Christi*
Jim Lee, *Texas A&M University—Corpus Christi*
Abiodun Ojemakinde, *Albany State University*
Mark Pingle, *University of Nevada—Reno*
Barbara W. K. Son, *Anaheim University*
Denise Stanley, *California State University—Fullerton*

Contributing reviewers for previous editions:

Fatma Abdel-Raouf, *Goldey-Beacom College*
Burton Abrams, *University of Delaware*
Rashid Al-Hmoud, *Texas Tech University*
Anthony Paul Andrews, *Governors State University*
Sisay Asefa, *Western Michigan University*
Simon Avenell, *Murdoch University*
Narine Badasyan, *Murray State University*
Joseph P. Bailey, *University of Maryland*
Dale G. Bails *Christian Brothers University*
Dean Baim, *Pepperdine University*
Sheryl Ball, *Virginia Polytechnic University*
Klaus Becker, *Texas Tech University*
Richard Beil, *Auburn University*
Barbara C. Belivieu, *University of Connecticut*
Dan Black, *University of Chicago*
Louis Cain, *Northwestern University*
Kerem Cakirer, *Indiana University*
Leo Chan, *University of Kansas*
Robert L. Chapman, *Florida Metropolitan University*
Joni Charles, *Texas State University—San Marcos*
Basanta Chaudhuri, *Rutgers University—New Brunswick*

Shuo Chen, *State University of New York at Geneseo*
Xiujian Chen, *State University of New York—Binghamton University*
Kwang Soo Cheong, *Johns Hopkins University*
Christopher B. Colburn, *Old Dominion University*
Daniel Patrick Condon, *Dominican University*
Michael Conlin, *Syracuse University*
Cristanna Cook, *Husson University*
Keith Crocker, *Penn State University*
Ian Cromb, *University of Western Ontario*
Dean Croushore, *Federal Reserve*
Wilffrid W. Csaplar Jr., *Bethany College*
Shah Dabirian, *California State University, Long Beach*
Joseph DaBoll-Lavioe, *Nazareth College of Rochester*
Robert Daffenbach, *University of Oklahoma*
George Darko, *Tusculum College*
Tina Das, *Elon University*
Ron Deiter, *Iowa State University*
Jonathan C. Deming, *Seattle Pacific University*
Casey Dirienzo, *Appalachian State University*
Eric Drabkin, *Hawaii Pacific University*
Martine Duchatelet, *Barry University*
Keven C. Duncan, *University of Southern Colorado*
Yvonne Durham, *Western Washington University*
Jeffrey Edwards, *North Carolina A&T University*
Eugene F. Elander, *Brenau University*
Ibrahim Elsaify, *Goldey-Beacom College*
David Ely, *San Diego State University*
Mark J. Eschenfelder, *Robert Morris University*
Li Feng, *Texas State University–San Marcos*
David Figlio, *University of Florida*
Ray Fisman, *Graduate School of Business, Columbia University*
Silke Forbes, *Case Western Reserve University*
David Gerard, *Carnegie Mellon University*
Sharon Gifford, *Rutgers University*
Lynn G. Gillette, *Northeast Missouri State University*
Otis Gilley, *Louisiana Tech University*
Roy Gobin, *Loyola University*
Stephan Gohmann, *University of Louisville*
Steven Gold, *Rochester Institute of Technology*
Julie Hupton Gonzalez, *University of California—Santa Cruz*
Thomas A. Gresik, *Mendoza College of Business (University of Notre Dame)*
Andrea Mays Griffith, *California State University*
Madhurima Gupta, *University of Notre Dame*
Carl Gwin, *Pepperdine University*
Gail Heyne Hafer, *Lindenwood College*
Karen Hallows, *George Mason University*
William Hamlen Jr., *SUNY Buffalo*
Shawkat Hammoudeh, *Drexel University*
Mehdi Harian, *Bloomsburg University*
Nile W. Hatch, *Marriott School (Brigham Young University)*
Clifford Hawley, *West Virginia University*
Ove Hedegaard, *Copenhagen Business School*
Martin Heintzelman, *Clarkson University*
Steven Hinson, *Webster University*
Hart Hodges, *Western Washington University*
Robert L. Holland, *Purdue University*
Jack Hou, *California State University—Long Beach*
Craig Hovey, *Brenau University, Gainesville*
Lowel R. Jacobsen, *William Jewell College*
Thomas D. Jeitschko, *Michigan State University*
Anand Jha, *Texas A&M International University*

Jaswant R. Jindia, *Southern University*
Russell Kashian, *University of Wisconsin—Whitewater*
Paul Kattuman, *Judge Business School (Cambridge University)*
Brian Kench, *University of Tampa*
Kimberley L. Kinsley, *University of Mary Washington*
Peter Klein, *University of Georgia, University of Missouri—Columbia*
Audrey D. Kline, *University of Louisville*
Robert A. Krell, *George Mason University*
Paul R. Kutasovic, *New York Institute of Technology*
W. J. Lane, *University of New Orleans*
Daniel Lee, *Shippensburg University*
Dick Leiter, *American Public University*
Canlin Li, *University of California—Riverside*
Chung-Ping Loh, *University of North Florida*
Vahe Lskavyan, *Ohio University—Athens*
Heather Luea, *Newman University*
Nancy L. Lumpkin, *Georgetown College*
Thomas Lyon, *University of Michigan*
Richard Marcus, *University of Wisconsin—Milwaukee*
Vincent Marra, *University of Delaware*
Wade Martin, *California State University, Long Beach*
Catherine Matraves, *Michigan State University—East Lansing*
John Maxwell, *Indiana University*
David May, *Oklahoma City University*
Alan McInnes, *California State University, Fullerton*
Christopher McIntosh, *University of Minnesota Duluth*
Kimberly L. Merritt, *Oklahoma Christian University*
Edward Millner, *Virginia Commonwealth University*
John Moran, *Syracuse University*
Shahriar Mostashari, *Campbell University*
John Morgan, *Haas Business School (University of California—Berkeley)*
Ram Mudambi, *Temple University*
Francis Mummery, *California State University—Fullerton*
Inder Nijhawan, *Fayetteville State University*
Albert A. Okunade, *University of Memphis*
Walton M. Padelford, *Union University*
Darrell Parker, *Georgia Southern University*
Harlan Platt, *Northeastern University*
Stephen Pollard, *California State University, Los Angeles*
Dwight A. Porter, *College of St. Thomas*
Stanko Racic, *University of Pittsburgh*
Eric Rasmusen, *Indiana University*
Matthew Roelofs, *Western Washington University*
Christian Roessler, *National University of Singapore*
Stefan Ruediger, *Arizona State University*
Bansi Sawhney, *University of Baltimore*
George L. Schatz, *Maine Maritime Academy*
Craig Schulman, *University of Arkansas*
Karen Schultes, *University of Michigan—Dearborn*
Peter M. Schwartz, *University of North Carolina*
Richard Alan Seals Jr., *Oklahoma City University*
Charles Sebuhara, *Virginia Technical University*
Edward Shinnick, *University College Ireland*
Dean Showalter, *Southwest Texas State University*
Chandra Shrestha, *Virginia Commonwealth University*
Karen Smith, *Columbia Southern University*
John Stapleford, *Eastern University*
Mark Stegeman, *University of Arizona*
Ed Steinberg, *New York University*
Barbara M. Suleski, *Cardinal Stritch College*
Caroline Swartz, *University of North Carolina Charlotte*

Joseph K. Tanimura, *San Diego State University*
Bill Taylor, *New Mexico Highlands University*
Roger Tutterow, *Kennesaw State College*
Nora Underwood, *University of Central Florida*
Lskavyan Vahe, *Ohio University*
Lawrence White, *Stern School of Business (New York University)*
Leonard White, *University of Arkansas*
Thomas White, *Fontbonne University*
Keith Willett, *Oklahoma State University—Stillwater*
Mike Williams, *Bethune Cookman College*
Richard Winkelman, *Arizona State University*
Laura Youderian, *Xavier University*
Eduardo Zambrano, *University of Notre Dame*
Rick Zuber, *University of North Carolina, Charlotte*

We thank Adam Huenecke, Kelly Delso, Tim Vertovec, and Kevin Moran at McGraw Hill for all they have done to make this project a success. We also thank those whose who contributed to the development of this edition: Mark Wilson of West Virginia State University and Susan Bell of Seminole State College for their careful review of Connect content, Patricia Turco of Milwaukee Area Technical College for her PowerPoint development, and our team of testbank authors who worked to ensure the content is error free: Archana Dube and Denise Stanley of California State Fullerton, Casey Dirienzo of Elon University, and Abiodun Ojemakinde of Albany State University, as well as those who contributions informed the prior edition: Mitchell Baye, Patrick Scholten, Eric Schmidbauer, Susan Kayser, Kyle Anderson, and Vikram Ahuja for suggestions and assistance during various stages of the revision, and Ellie Mafi-Kreft, Haizhen Lin, and Steven Kreft, who graciously agreed to class test the *Connect* features in their classrooms. Finally, we thank our families for their continued love and support.

As always, we welcome your comments and suggestions for the next edition. Please feel free to write to us directly at *mbaye@indiana.edu* or *jeffprin@indiana.edu.*

Michael R. Baye
Jeffrey T. Prince

SUPPLEMENTS

We know the content and reliability of new editions and book supplements are of utmost importance to users of our book. Because of this, and unlike most other managerial economics books, we personally are involved in crafting and accuracy checking virtually every content update and supplement for our book. Below we discuss popular features of some of the supplements that have been greatly expanded for this edition. The following ancillaries are available for quick download and convenient access via the instructor resource material available through *Connect*.

Cases

In addition to the *Spectrum* case, nearly a dozen full-length cases were updated and prepared to accompany *Managerial Economics and Business Strategy.* These cases complement the textbook by showing how real-world businesses use tools like demand elasticities, markup pricing, third-degree price discrimination, bundling, Herfindahl indices, game theory, and

predatory pricing to enhance profits or shape business strategies. The cases are based on actual decisions by companies that include Microsoft, Heinz, Visa, Staples, American Airlines, and Nasdaq. Expanded teaching notes and solutions for all of the cases—including the *Spectrum* case—are also provided.

PowerPoint Slides

Thoroughly updated and fully editable PowerPoint presentations with animated figures and graphs, make teaching and learning a snap. For instance, a simple mouse click reveals the firm's demand curve. Another click reveals the associated marginal revenue curve. Another click shows the firm's marginal cost. A few more clicks, and students see how to determine the profit-maximizing output, price, and maximum profits. Animated graphs and tables are also provided for all other relevant concepts (like Cournot and Stackelberg equilibrium, normal form and extensive form games, and the like).

Solutions Manual

We have prepared a solutions manual that provides detailed answers to all end-of-chapter problems, all of which have been class-tested for accuracy.

Test Bank

An updated test bank, offers well over 1,000 multiple-choice questions categorized by learning objectives, AACSB learning categories, Bloom's taxonomy objectives, and level of difficulty.

Computerized Test Bank

Test Builder within Connect allows you to create tests that can be printed or administered within your LMS. This cloud-based application includes a modern, streamlined interface for easy assessment creation. Content can easily be configured to match your course needs, including the ability to:

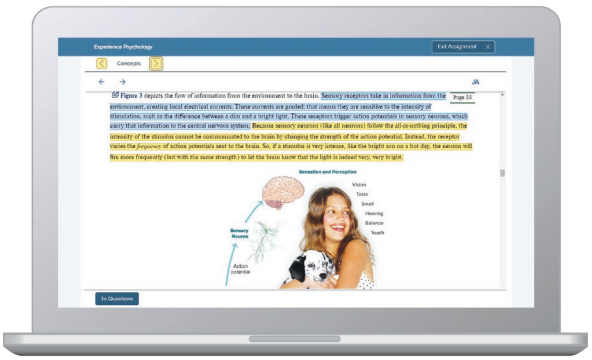
- Easily pinpoint the most relevant content through robust filtering options.
- Manipulate the order of questions.
- Adjust point values.
- Scramble questions and/or answers.
- Pin questions to a specific location within a test.
- Determine your preferred treatment of algorithmic questions.
- Add instructions.
- Configure default settings.

Instructors: Student Success Starts with You

Tools to enhance your unique voice

Want to build your own course? No problem. Prefer to use our turnkey, prebuilt course? Easy. Want to make changes throughout the semester? Sure. And you'll save time with Connect's auto-grading too.

65%
Less Time Grading



Laptop: McGraw Hill; Woman/dog: George Doyle/Getty Images

Study made personal

Incorporate adaptive study resources like SmartBook® 2.0 into your course and help your students be better prepared in less time. Learn more about the powerful personalized learning experience available in SmartBook 2.0 at **www.mheducation.com/highered/connect/smartbook**

Affordable solutions, added value

Make technology work for you with LMS integration for single sign-on access, mobile access to the digital textbook, and reports to quickly show you how each of your students is doing. And with our Inclusive Access program you can provide all these tools at a discount to your students. Ask your McGraw Hill representative for more information.

Padlock: Jobalou/Getty Images

Solutions for your challenges

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Visit **www.supportateverystep.com** for videos and resources both you and your students can use throughout the semester.

Checkmark: Jobalou/Getty Images

SUPPORT AT every step

Students: Get Learning that Fits You

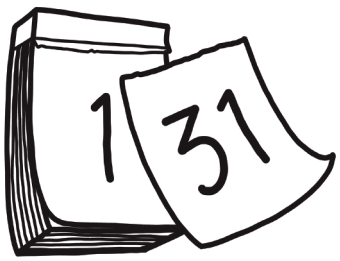
Effective tools for efficient studying

Connect is designed to make you more productive with simple, flexible, intuitive tools that maximize your study time and meet your individual learning needs. Get learning that works for you with Connect.

Study anytime, anywhere

Download the free ReadAnywhere app and access your online eBook or SmartBook 2.0 assignments when it's convenient, even if you're offline. And since the app automatically syncs with your eBook and SmartBook 2.0 assignments in Connect, all of your work is available every time you open it. Find out more at **www.mheducation.com/readanywhere**

> ***"I really liked this app—it made it easy to study when you don't have your textbook in front of you."***
>
> - Jordan Cunningham, Eastern Washington University



Calendar: owattaphotos/Getty Images

Everything you need in one place

Your Connect course has everything you need—whether reading on your digital eBook or completing assignments for class, Connect makes it easy to get your work done.

Learning for everyone

McGraw Hill works directly with Accessibility Services Departments and faculty to meet the learning needs of all students. Please contact your Accessibility Services Office and ask them to email accessibility@mheducation.com, or visit **www.mheducation.com/about/accessibility** for more information.

Top: Jenner Images/Getty Images, Left: Hero Images/Getty Images, Right: Hero Images/Getty Images

Because learning changes everything.®

Connect Economics Asset Alignment with Bloom's Taxonomy

We Take Students Higher

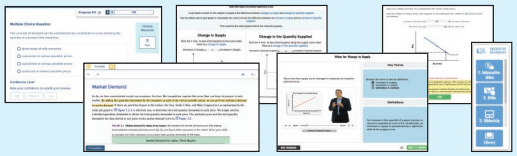
As a learning science company we create content that supports higher order thinking skills. Within Connect®, we tag assessments accordingly so you can filter your search, assign it, and receive reporting on it. These content asset types can be associated with one or more levels of Bloom's Taxonomy.

The chart below shows a few of the key assignable economics assets with *McGraw Hill Connect* aligned with Bloom's Taxonomy. Take your students higher by assigning a variety of applications, moving them from simple memorization to concept application.

* Outside of Connect.

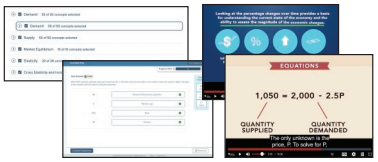
SmartBook 2.0

Adaptively aids students to study more efficiently by highlighting where in the chapter to focus, asking review questions and pointing them to passages in the text until they understand. Assignable and assessable.



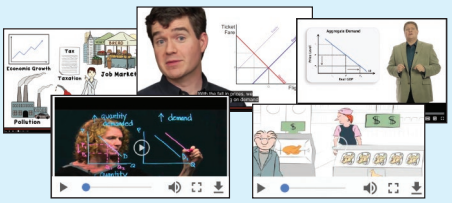
Math Preparedness

Math Preparedness assignments help students refresh important prerequisite topics necessary to be successful in economics. Tutorial videos are included to help illustrate math concepts to students visually.



Videos

Select Economic Naturalist examples have been developed into videos that show how to employ basic economic principles to understand and explain what you observe in the world around you. All videos are closed captioned and are assignable with assessment questions for improved retention.



Exercises

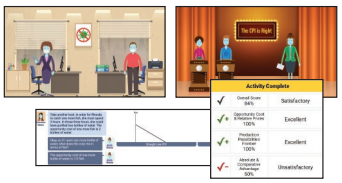
Exercises with algorithmic variations provide ample opportunities for students to practice and hone quantitative skills. Graphing Exercises provide opportunities for students to draw, interact with, manipulate, and analyze graphs.

Interactive Graphs

Interactive Graphs provide visual displays of real data and economic concepts 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.

Application-Based Activities

Immersive real-life scenarios engage students and put them in the role of everyday economists. Students practice their economic thinking and problem-solving skills as they apply course concepts and see the implications of their decisions as they go. Each activity is designed as a 15-minute experience, unless students eagerly replay for a better outcome.

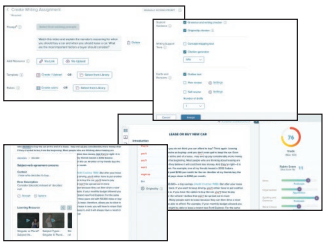


ECON Everyday Current Events Blog

Our Econ Everyday blog saves instructors time brining current, student-centered content into their course all semester long. Short articles, written for principles-level students, is tagged by topic to bring currency into your course. We also provide discussion questions to help you drive the conversation forward. Visit www.econeveryday.com and subscribe for updates.

Writing Assignment Plus

Writing Assignment Plus delivers a learning experience that helps students improve their written communication skills and conceptual understanding. Faculty can assign, monitor, grade, and provide feedback on writing projects efficiently. Built-in grammar and writing review helps students improve writing quality while an originality check helps students correct central plagiarism before submission. End result? Improved workplace skills of writing in critical thinking.



For more information, please visit: **www.mheducation.com/highered/economics**

Brief Contents

1 The Fundamentals of Managerial Economics *1*

2 Market Forces: Demand and Supply *40*

3 Quantitative Demand Analysis *74*

4 The Theory of Individual Behavior *103*

5 The Production Process and Costs *137*

6 The Organization of the Firm *179*

7 The Nature of Industry *206*

8 Managing in Competitive, Monopolistic, and Monopolistically Competitive Markets *231*

9 Basic Oligopoly Models *274*

10 Game Theory: Inside Oligopoly *306*

11 Pricing Strategies for Firms with Market Power *345*

12 The Economics of Information *378*

Module Group A: Strategies to Change the Business Environment *412*

Module Group B: Government in the Marketplace *441*

CASE STUDY Spectrum—the Spawn of Time Warner Cable and Charter Communications—Navigates Challenges from Cord Cutting and Mobile Competition *473*

Glossary *503*

Additional Readings and References *511*

Name Index *530*

General Index *536*

Contents

CHAPTER 1

The Fundamentals of Managerial Economics *1*

- **HEADLINE**: Amcott Loses $3.5 Million; Manager Fired *1*

INTRODUCTION 2
- The Manager *2*
- Economics *3*
- Managerial Economics Defined *3*

THE ECONOMICS OF EFFECTIVE MANAGEMENT 4
- Identify Goals and Constraints *4*
- Recognize the Nature and Importance of Profits *4*
  - *Economic versus Accounting Profits 4*
  - *The Role of Profits 5*
  - *The Five Forces Framework and Industry Profitability 6*
- Understand Incentives *10*
- Understand Markets *11*
  - *Consumer–Producer Rivalry 11*
  - *Consumer–Consumer Rivalry 11*
  - *Producer–Producer Rivalry 11*
  - *Government and the Market 11*
- Recognize the Time Value of Money *12*
  - *Present Value Analysis 12*
  - *Present Value of Indefinitely Lived Assets 14*
- Use Marginal Analysis *16*
  - *Discrete Decisions 17*
  - *Continuous Decisions 19*
  - *Incremental Decisions 20*
- Make Data-Driven Decisions *21*
  - *Obtaining Estimates Using Regression 22*
  - *Evaluating the Statistical Significance of Estimated Coefficients 24*
  - *Regression for Nonlinear Functions and Multiple Regression 26*
  - *A Caveat 29*

LEARNING MANAGERIAL ECONOMICS 29

- **ANSWERING THE HEADLINE 30**

KEY TERMS AND CONCEPTS *30* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *30* / PROBLEMS AND APPLICATIONS *32* / SELECTED READINGS *37* / APPENDIX A: THE CALCULUS OF MAXIMIZING NET BENEFITS *37* / APPENDIX B: EVALUATING THE OVERALL FIT OF THE REGRESSION LINE *38*

INSIDE BUSINESS 1–1: The Goals of Firms in Our Global Economy *6*

INSIDE BUSINESS 1–2: Profits and the Evolution of the Computer Industry *9*

INSIDE BUSINESS 1–3: Joining the Jet Set *16*

CHAPTER 2

Market Forces: Demand and Supply *40*

- **HEADLINE**: Samsung and Hynix Semiconductor to Cut Chip Production *40*

INTRODUCTION 41

DEMAND 41
- Demand Shifters *42*
  - *Income 43*
  - *Prices of Related Goods 44*
  - *Advertising and Consumer Tastes 45*
  - *Population 45*
  - *Consumer Expectations 46*
  - *Other Factors 46*
- The Demand Function *46*
- Consumer Surplus *48*

SUPPLY 49
- Supply Shifters *50*
  - *Input Prices 50*
  - *Technology or Government Regulations 50*
  - *Number of Firms 50*

Substitutes in Production 51
Taxes 51
Producer Expectations 53
The Supply Function 53
Producer Surplus 54
MARKET EQUILIBRIUM 55
PRICE RESTRICTIONS AND MARKET EQUILIBRIUM 57
Price Ceilings 57
Price Floors 61
COMPARATIVE STATICS 62
Changes in Demand 63
Changes in Supply 64
Simultaneous Shifts in Supply and Demand 65
● **ANSWERING THE HEADLINE 67**
SUMMARY 68 / KEY TERMS AND CONCEPTS 68 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 68 / PROBLEMS AND APPLICATIONS 70 / SELECTED READINGS 73
INSIDE BUSINESS 2–1: Asahi Breweries Ltd. and the Asian Recession 44
INSIDE BUSINESS 2–2: International Trade Agreements and the Supply Curve 52
INSIDE BUSINESS 2–3: Unpopular Equilibrium Prices 56
INSIDE BUSINESS 2–4: Price Ceilings and Price Floors around the Globe 60
INSIDE BUSINESS 2–5: Globalization and the Supply of Automobiles 64
INSIDE BUSINESS 2–6: Using a Spreadsheet to Calculate Equilibrium in the Supply and Demand Model 65

CHAPTER 3

Quantitative Demand Analysis 74

● **HEADLINE**: Walmart Hoping for Another Big Holiday Showing 74
INTRODUCTION 75
THE ELASTICITY CONCEPT 75
OWN PRICE ELASTICITY OF DEMAND 76
Elasticity and Total Revenue 77
Factors Affecting the Own Price Elasticity 80
Available Substitutes 81
Time 81
Expenditure Share 82
Marginal Revenue and the Own Price Elasticity of Demand 82
CROSS-PRICE ELASTICITY 84
INCOME ELASTICITY 87
OTHER ELASTICITIES 88
OBTAINING ELASTICITIES FROM DEMAND FUNCTIONS 89
Elasticities for Linear Demand Functions 89
Elasticities for Nonlinear Demand Functions 90
DATA-DRIVEN DEMAND CURVES 93
● **ANSWERING THE HEADLINE 96**
SUMMARY 96 / KEY TERMS AND CONCEPTS 96 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 97 / PROBLEMS AND APPLICATIONS 99 / SELECTED READINGS 102
INSIDE BUSINESS 3–1: Calculating and Using the Arc Elasticity: An Application to the Housing Market 80
INSIDE BUSINESS 3–2: Inelastic Demand for Prescription Drugs 83
INSIDE BUSINESS 3–3: Using Cross-Price Elasticities to Guide Strategies in Digital Markets 86
INSIDE BUSINESS 3–4: Using Big Data to Estimate Demand Elasticities for Millions of Gamers 95

CHAPTER 4

The Theory of Individual Behavior 103

● **HEADLINE**: Packaging Firm Uses Overtime Pay to Overcome Labor Shortage 103
INTRODUCTION 104
CONSUMER BEHAVIOR 104
CONSTRAINTS 108
The Budget Constraint 108
Changes in Income 110
Changes in Prices 112
CONSUMER EQUILIBRIUM 113
COMPARATIVE STATICS 114
Price Changes and Consumer Behavior 114
Income Changes and Consumer Behavior 116
Substitution and Income Effects 118
APPLICATIONS OF INDIFFERENCE CURVE ANALYSIS 119
Choices by Consumers 119
Buy One, Get One Free 119
Cash Gifts, In-Kind Gifts, and Gift Cards 120
Choices by Workers and Managers 123
A Simplified Model of Income–Leisure Choice 123
The Decisions of Managers 124

THE RELATIONSHIP BETWEEN INDIFFERENCE CURVE ANALYSIS AND DEMAND CURVES 126
Individual Demand *126*
Market Demand *127*
ANSWERING THE HEADLINE 128
SUMMARY *129* / KEY TERMS AND CONCEPTS *129* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *130* / PROBLEMS AND APPLICATIONS *132* / SELECTED READINGS *135* / APPENDIX: A CALCULUS APPROACH TO INDIVIDUAL BEHAVIOR *135*
INSIDE BUSINESS 4–1: Indifference Curves and Risk Preferences *107*
INSIDE BUSINESS 4–2: The Budget Constraint and Credit Cards *111*
INSIDE BUSINESS 4–3: Price Changes and Inventory Management for Multiproduct Firms *115*
INSIDE BUSINESS 4–4: Income Effects and the Business Cycle *117*
INSIDE BUSINESS 4–5: The "Deadweight Loss" of In-Kind Gifts *124*
INSIDE BUSINESS 4–6: Public Health Centers and Output-Oriented Incentives *128*

CHAPTER 5
The Production Process and Costs *137*
HEADLINE: Boeing Loses the Battle but Wins the War *137*
INTRODUCTION 138
THE PRODUCTION FUNCTION 138
Short-Run versus Long-Run Decisions *139*
Measures of Productivity *140*
Total Product 140
Average Product 140
Marginal Product 140
The Role of the Manager in the Production Process *142*
Produce on the Production Function 142
Use the Right Level of Inputs 142
Algebraic Forms of Production Functions *145*
Algebraic Measures of Productivity *146*
Isoquants *148*
Isocosts *150*
Cost Minimization *151*
Optimal Input Substitution *153*
Data-Driven Production Functions *155*
THE COST FUNCTION 156
Short-Run Costs *157*
Average and Marginal Costs *158*
Relations among Costs *160*
Fixed and Sunk Costs *162*
Algebraic Forms of Cost Functions *163*
Long-Run Costs *164*
Economies of Scale *165*
Data-Driven Cost Functions *165*
A Reminder: Economic Costs versus Accounting Costs *166*
MULTIPLE-OUTPUT COST FUNCTIONS 167
Economies of Scope *167*
Cost Complementarity *167*
ANSWERING THE HEADLINE 169
SUMMARY *170* / KEY TERMS AND CONCEPTS *170* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *171* / PROBLEMS AND APPLICATIONS *173* / SELECTED READINGS *177* / APPENDIX: THE CALCULUS OF PRODUCTION AND COSTS *177*
INSIDE BUSINESS 5–1: Where Does Technology Come From? *144*
INSIDE BUSINESS 5–2: Artificial Intelligence and Cost-Minimizing Inputs *154*
INSIDE BUSINESS 5–3: The Affordable Care Act, Employer Mandate, and Input Substitution *157*
INSIDE BUSINESS 5–4: International Companies Exploit Economies of Scale *166*

CHAPTER 6
The Organization of the Firm *179*
HEADLINE: AT&T Finalizes Acquisition of Time Warner Inc. *179*
INTRODUCTION 180
METHODS OF PROCURING INPUTS 181
Purchase the Inputs Using Spot Exchange *181*
Acquire Inputs under a Contract *181*
Produce the Inputs Internally *182*
TRANSACTION COSTS 182
Types of Specialized Investments *183*
Site Specificity 183
Physical-Asset Specificity 183
Dedicated Assets 184
Human Capital 184

Implications of Specialized Investments 184
Costly Bargaining 184
Underinvestment 184
Opportunism and the "Hold-Up Problem" 185

OPTIMAL INPUT PROCUREMENT 186
Spot Exchange 186
Contracts 187
Vertical Integration 190
The Economic Trade-Off 191

MANAGERIAL COMPENSATION AND THE PRINCIPAL–AGENT PROBLEM 193

FORCES THAT DISCIPLINE MANAGERS 195
Incentive Contracts 195
External Incentives 196
Reputation 196
Takeovers 196

THE MANAGER–WORKER PRINCIPAL–AGENT PROBLEM 196
Solutions to the Manager–Worker Principal–Agent Problem 196
Profit Sharing 196
Revenue Sharing 196
Piece Rates 197
Time Clocks and Spot Checks 198

● **ANSWERING THE HEADLINE 199**

SUMMARY 199 / KEY TERMS AND CONCEPTS 199 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 200 / PROBLEMS AND APPLICATIONS 201 / SELECTED READINGS 204 / APPENDIX: AN INDIFFERENCE CURVE APPROACH TO MANAGERIAL INCENTIVES 204

INSIDE BUSINESS 6–1: The Cost of Using an Inefficient Method of Procuring Inputs 186

INSIDE BUSINESS 6–2: What Determines Contract Length in Franchising? 190

INSIDE BUSINESS 6–3: The Role and Growth of Outsourcing 191

INSIDE BUSINESS 6–4: Incentives Matter for Performance 198

CHAPTER 7

The Nature of Industry 206

● **HEADLINE**: T-Mobile and Sprint Finalize Merger 206

INTRODUCTION 207

MARKET STRUCTURE 207
Firm Size 207
Industry Concentration 208
Measures of Industry Concentration 209
The Concentration of U.S. Industry 210
Limitations of Concentration Measures 211
Technology 212
Demand and Market Conditions 213
Potential for Entry 215

CONDUCT 216
Pricing Behavior 216
Integration and Merger Activity 217
Vertical Integration 218
Horizontal Integration 218
Conglomerate Mergers 219
Research and Development 219
Advertising 220

PERFORMANCE 220
Profits 220
Social Welfare 220

THE STRUCTURE–CONDUCT–PERFORMANCE PARADIGM 221
The Causal View 221
The Feedback Critique 221
Relation to the Five Forces Framework 222

OVERVIEW OF THE REMAINDER OF THE BOOK 223
Perfect Competition 223
Monopoly 223
Monopolistic Competition 223
Oligopoly 224

● **ANSWERING THE HEADLINE 225**

SUMMARY 225 / KEY TERMS AND CONCEPTS 226 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 226 / PROBLEMS AND APPLICATIONS 227 / SELECTED READINGS 230

INSIDE BUSINESS 7–1: The 2017 North American Industry Classification System (NAICS) 213

INSIDE BUSINESS 7–2: The Elasticity of Demand at the Firm and Market Levels 215

INSIDE BUSINESS 7–3: The Evolution of Market Structure in the Computer Industry 224

CHAPTER 8

Managing in Competitive, Monopolistic, and Monopolistically Competitive Markets 231

● **HEADLINE**: McDonald's New Buzz: Specialty Coffee 231

INTRODUCTION 232
PERFECT COMPETITION 232
Demand at the Market and Firm Levels *233*
Short-Run Output Decisions *234*
Maximizing Profits 234
Minimizing Losses 237
The Short-Run Firm and Industry Supply Curves 240
Long-Run Decisions *242*
MONOPOLY 243
Monopoly Power *243*
Sources of Monopoly Power *245*
Economies of Scale 245
Economies of Scope 246
Cost Complementarity 246
Patents and Other Legal Barriers 246
Maximizing Profits *247*
Marginal Revenue 247
The Output Decision 251
The Absence of a Supply Curve 253
Multiplant Decisions 254
Implications of Entry Barriers *255*
MONOPOLISTIC COMPETITION 257
Conditions for Monopolistic Competition *257*
Profit Maximization *258*
Long-Run Equilibrium *260*
Implications of Product Differentiation *262*
OPTIMAL ADVERTISING DECISIONS 263
ANSWERING THE HEADLINE 265
SUMMARY *265* / KEY TERMS AND CONCEPTS *266* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *266* / PROBLEMS AND APPLICATIONS *268* / SELECTED READINGS *272* / APPENDIX: THE CALCULUS OF PROFIT MAXIMIZATION *272* / APPENDIX: THE ALGEBRA OF PERFECTLY COMPETITIVE SUPPLY FUNCTIONS *273*
INSIDE BUSINESS 8–1: Peugeot-Citroën of France: A Price-Taker in China's Auto Market *238*
INSIDE BUSINESS 8–2: Patent, Trademark, and Copyright Protection *248*
INSIDE BUSINESS 8–3: Product Differentiation, Cannibalization, and Colgate's Smile *258*

CHAPTER 9
Basic Oligopoly Models *274*
HEADLINE: Crude Oil Prices Fall, but Consumers in Some Areas See No Relief at the Pump *274*
INTRODUCTION 275
CONDITIONS FOR OLIGOPOLY 275
THE ROLE OF BELIEFS AND STRATEGIC INTERACTION 275
PROFIT MAXIMIZATION IN FOUR OLIGOPOLY SETTINGS 277
Sweezy Oligopoly *277*
Cournot Oligopoly *278*
Reaction Functions and Equilibrium 279
Isoprofit Curves 283
Changes in Marginal Costs 285
Collusion 287
Stackelberg Oligopoly *289*
Bertrand Oligopoly *292*
COMPARING OLIGOPOLY MODELS 294
Cournot *294*
Stackelberg *295*
Bertrand *295*
Collusion *295*
CONTESTABLE MARKETS 296
ANSWERING THE HEADLINE 297
SUMMARY *298* / KEY TERMS AND CONCEPTS *299* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *299* / PROBLEMS AND APPLICATIONS *301* / SELECTED READINGS *304* / APPENDIX: DIFFERENTIATED-PRODUCT BERTRAND OLIGOPOLY *305*
INSIDE BUSINESS 9–1: OPEC Members Can't Help but Cheat *288*
INSIDE BUSINESS 9–2: Commitment in Stackelberg Oligopoly *290*
INSIDE BUSINESS 9–3: Price Competition and the Number of Sellers: Evidence from Online and Laboratory Markets *293*
INSIDE BUSINESS 9–4: Using a Spreadsheet to Calculate Cournot, Stackelberg, and Collusive Outcomes *296*

CHAPTER 10
Game Theory: Inside Oligopoly *306*
HEADLINE: Bring Back Complimentary Drinks! *306*
INTRODUCTION 307
OVERVIEW OF GAMES AND STRATEGIC THINKING 307
SIMULTANEOUS-MOVE, ONE-SHOT GAMES 308
Theory *308*
Applications of One-Shot Games *312*
Pricing Decisions 312
Advertising and Quality Decisions 313
Coordination Decisions 314

Monitoring Employees 315
Nash Bargaining 316
INFINITELY REPEATED GAMES 318
Theory 318
Review of Present Value 318
Supporting Collusion with Trigger Strategies 318
Factors Affecting Collusion in Pricing Games 321
Number of Firms 321
Firm Size 321
History of the Market 321
Punishment Mechanisms 322
An Application of Infinitely Repeated Games to Product Quality 323
FINITELY REPEATED GAMES 324
Games with an Uncertain Final Period 324
Repeated Games with a Known Final Period: The End-of-Period Problem 327
Applications of the End-of-Period Problem 328
Resignations and Quits 328
The "Snake-Oil" Salesman 329
MULTISTAGE GAMES 329
Theory 329
Applications of Multistage Games 332
The Entry Game 332
Innovation 333
Sequential Bargaining 334
● **ANSWERING THE HEADLINE 336**
SUMMARY 336 / KEY TERMS AND CONCEPTS 337 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 337 / PROBLEMS AND APPLICATIONS 340 / SELECTED READINGS 344
INSIDE BUSINESS 10–1: Hollywood's (not so) Beautiful Mind: Nash or "Opie" Equilibrium? 311
INSIDE BUSINESS 10–2: Cola Wars in India 313
INSIDE BUSINESS 10–3: Collusion in Canadian Gasoline Markets 322
INSIDE BUSINESS 10–4: Multimarket Contact and Price Competition 324
INSIDE BUSINESS 10–5: Entry Strategies in International Markets: Sprinkler or Waterfall? 331

CHAPTER 11

Pricing Strategies for Firms with Market Power 345

● **HEADLINE**: Mickey Mouse Lets You Ride "for Free" at Disney World 345
INTRODUCTION 346
BASIC PRICING STRATEGIES 346
Review of the Basic Rule of Profit Maximization 346
A Simple Pricing Rule for Monopoly and Monopolistic Competition 347
A Simple Pricing Rule for Cournot Oligopoly 350
STRATEGIES THAT YIELD EVEN GREATER PROFITS 352
Extracting Surplus from Consumers 352
Price Discrimination 352
Two-Part Pricing 356
Block Pricing 359
Commodity Bundling 361
Pricing Strategies for Special Cost and Demand Structures 363
Peak-Load Pricing 363
Cross-Subsidies 364
Transfer Pricing 365
Pricing Strategies in Markets with Intense Price Competition 367
Price Matching 367
Inducing Brand Loyalty 368
Randomized Pricing 369
● **ANSWERING THE HEADLINE 370**
SUMMARY 371 / KEY TERMS AND CONCEPTS 371 / CONCEPTUAL AND COMPUTATIONAL QUESTIONS 372 / PROBLEMS AND APPLICATIONS 374 / SELECTED READINGS 377
INSIDE BUSINESS 11–1: Pricing Markups as Rules of Thumb 348
INSIDE BUSINESS 11–2: Is Price Discrimination Bad for Consumers? 357
INSIDE BUSINESS 11–3: Bundling to Reduce Churn in Telecommunications 362
INSIDE BUSINESS 11–4: The Prevalence of Price-Matching Policies and Other Low-Price Guarantees 368
INSIDE BUSINESS 11–5: Kroger Combines Pricing Strategies 369
INSIDE BUSINESS 11–6: Randomized Pricing in the Airline Industry 370

CHAPTER 12

The Economics of Information 378

● **HEADLINE**: Firm Chickens Out in the FCC Spectrum Auction 378

INTRODUCTION 379

THE MEAN AND THE VARIANCE 379

UNCERTAINTY AND CONSUMER BEHAVIOR 381
- Risk Aversion *381*
  - *Managerial Decisions with Risk-Averse Consumers 382*
- Consumer Search *384*

UNCERTAINTY AND THE FIRM 386
- Risk Aversion *387*
- Producer Search *389*
- Profit Maximization *389*

UNCERTAINTY AND THE MARKET 390
- Asymmetric Information *390*
  - *Adverse Selection 392*
  - *Moral Hazard 393*
- Signaling and Screening *394*

AUCTIONS 396
- Types of Auctions *397*
  - *English Auction 397*
  - *First-Price, Sealed-Bid Auction 397*
  - *Second-Price, Sealed-Bid Auction 398*
  - *Dutch Auction 398*
- Information Structures *399*
  - *Independent Private Values 399*
  - *Correlated Value Estimates 400*
- Optimal Bidding Strategies for Risk-Neutral Bidders *400*
  - *Strategies for Independent Private Values Auctions 400*
  - *Strategies for Correlated Values Auctions 402*
- Expected Revenues in Alternative Types of Auctions *403*

ANSWERING THE HEADLINE 405

SUMMARY *406* / KEY TERMS AND CONCEPTS *406* / CONCEPTUAL AND COMPUTATIONAL QUESTIONS *406* / PROBLEMS AND APPLICATIONS *408* / SELECTED READINGS *411*

INSIDE BUSINESS 12–1: Risk Aversion and the Value of Selling the Firm: The St. Petersburg Paradox *382*

INSIDE BUSINESS 12–2: Obfuscation to Counter Low Internet Search Costs *385*

INSIDE BUSINESS 12–3: Groucho Marx the Economist? *392*

INSIDE BUSINESS 12–4: Second-Price Auctions on eBay *398*

INSIDE BUSINESS 12–5: Auctions with Risk-Averse Bidders *405*

MODULE GROUP A

Strategies to Change the Business Environment *412*

INTRODUCTION 412

MODULE 1: ENTRY PREVENTION 412
- Limit Pricing to Prevent Entry *413*
- Theoretical Basis for Limit Pricing *413*
- Limit Pricing May Fail to Deter Entry *414*
- Linking the Preentry Price to Postentry Profits *415*
  - *Commitment Mechanisms 415*
  - *Learning Curve Effects 416*
  - *Incomplete Information 417*
  - *Reputation Effects 417*
- Dynamic Considerations *418*

KEY TERMS AND CONCEPTS *420* / PRACTICE PROBLEMS *420*

INSIDE BUSINESS M1–1: Limit Pricing and the "Southwest Effect" *419*

MODULE 2: LESSENING COMPETITION 421
- Predatory Pricing *422*
- Raising Rivals' Costs *424*
  - *Strategies Involving Marginal Cost 425*
  - *Strategies Involving Fixed Costs 426*
  - *Strategies for Vertically Integrated Firms 426*

KEY TERMS AND CONCEPTS *427* / PRACTICE PROBLEMS *427*

INSIDE BUSINESS M2–1: Business Strategy at Microsoft *424*

MODULE 3: RESTRUCTURING GAME TIMING 429
- First-Mover Advantages *429*
- Second-Mover Advantages *432*

KEY TERMS AND CONCEPTS *432* / PRACTICE PROBLEMS *432*

INSIDE BUSINESS M3–1: First to Market, First to Succeed? Or First to Fail? *431*

MODULE 4: OVERCOMING NETWORK EFFECTS 434
- What Is a Network? *434*
- Network Externalities *435*
- First-Mover Advantages Due to Consumer Lock-In *436*
- Using Penetration Pricing to "Change the Game" *437*

KEY TERMS AND CONCEPTS *438* / PRACTICE PROBLEMS *439* / SELECTED READINGS *439*

INSIDE BUSINESS M4–1: Network Externalities and Penetration Pricing by Yahoo! Auctions *437*

MODULE GROUP B

Government in the Marketplace *441*

INTRODUCTION 441

MODULE 5: REGULATORY CONSTRAINT ON MARKET POWER 441
- Market Power *441*
- Government Tools to Constrain Market Power *442*
  - *Antitrust Policy 443*
  - *Price Regulation 446*
- Rent Seeking *449*

KEY TERMS AND CONCEPTS *451* / PRACTICE PROBLEMS *451*

INSIDE BUSINESS M5–1: European Commission Moves to Protect Small Businesses *444*

INSIDE BUSINESS M5–2: Electricity Deregulation *448*

MODULE 6: REGULATION OF MARKETS WITH EXTERNALITIES, PUBLIC GOODS, OR INCOMPLETE INFORMATION 454
- Externalities *454*
  - *The Clean Air Act 456*
- Public Goods *458*
- Incomplete Information *461*
  - *Rules against Insider Trading 462*
  - *Certification 462*
  - *Truth in Lending 463*
  - *Truth in Advertising 463*
  - *Enforcing Contracts 465*

KEY TERMS AND CONCEPTS *465* / PRACTICE PROBLEMS *465*

INSIDE BUSINESS M6–1: Canada's Competition Bureau *464*

MODULE 7: GOVERNMENT POLICY AND INTERNATIONAL MARKETS 467
- Quotas *467*
- Tariffs *469*
  - *Lump-Sum Tariffs 469*
  - *Excise Tariffs 470*

KEY TERMS AND CONCEPTS *471* / PRACTICE PROBLEMS *471* / SELECTED READINGS *472*

CASE STUDY

Spectrum—the Spawn of Time Warner Cable and Charter Communications—Navigates Challenges from Cord Cutting and Mobile Competition *473*

HEADLINE 474

BACKGROUND 475
- Time Warner Cable History *475*
- Cable Television History *475*
- Broadband Internet *476*

BUSINESS AND MARKETS 477
- Video Programming *477*
- Internet Services *479*
- Telephone *479*

COMPETITION 480
- Cable Companies *480*
  - *Comcast 480*
  - *Comcast/Time Warner Cable Proposed Acquisition 481*
  - *Charter Communications 481*
  - *Other Cable Players 482*
- Satellite *482*
  - *AT&T DirecTV 482*
  - *Dish Network 483*
- Telephone Providers *483*
  - *Verizon 483*
  - *AT&T 483*
  - *Other Companies 484*
- Online Video Distributors *484*
  - *Netflix 484*
  - *Amazon Prime Video 485*
  - *Hulu 485*
  - *Google/YouTube 485*

SUPPLIERS 486
- Cable Networks *486*
- Broadcast Networks *486*
- Sports Programming *487*
- Carriage Disputes *487*
- Over-the-Top Content *488*

MARKET TRENDS AND CONSUMER BEHAVIOR 488
- Digital Video Recorders (DVRs) *488*
- Cutting the Cord *489*
- Going Mobile *489*

REGULATION IN THE CABLE INDUSTRY 489
- Carriage of Broadcast Television *490*
- Cable Pricing Regulation *490*
- Net Neutrality *490*
- Connect America Fund *490*

CHALLENGES 490

CASE-BASED EXERCISES 491

MEMOS 491

SELECTED READINGS AND REFERENCES *498*/ APPENDIX: EXHIBITS *499*

Glossary *503*

Additional Readings and References *511*

Name Index *530*

General Index *536*

1 The Fundamentals of Managerial Economics

LEARNING OBJECTIVES

After completing this chapter, you will be able to:

- **LO1** Summarize how goals, constraints, incentives, and market rivalry affect economic decisions.
- **LO2** Distinguish economic versus accounting profits and costs.
- **LO3** Explain the role of profits in a market economy.
- **LO4** Apply the five forces framework to analyze the sustainability of an industry's profits.
- **LO5** Apply present value analysis to make decisions and value assets.
- **LO6** Apply marginal analysis to determine the optimal level of a managerial control variable.
- **LO7** Identify and apply seven principles of effective managerial decision making.

headLINE

Amcott Loses $3.5 Million; Manager Fired

On Tuesday software giant Amcott posted a year-end operating loss of $3.5 million. Reportedly, $1.7 million of the loss stemmed from its foreign language division.

At a time when Amcott was paying First National a hefty 7 percent rate to borrow short-term funds, Amcott decided to use $20 million of its retained earnings to purchase three-year rights to Magicword, a software package that converts generic word processor files saved as French text into English. First-year sales revenue from the software was $7 million, but thereafter sales were halted pending a copyright infringement suit filed by Foreign, Inc. Amcott lost the suit and paid damages of $1.7 million. Industry insiders say that the copyright violation pertained to "a very small component of Magicword."

Ralph, the Amcott manager who was fired over the incident, was quoted as saying, "I'm a scapegoat for the attorneys [at Amcott] who didn't do their homework before buying the rights to Magicword. I projected annual sales of $7 million per year for three years. My sales forecasts were right on target."

Do you know why Ralph was fired?[1]

[1]Each chapter concludes with an answer to the question posed in that chapter's opening headline. After you read each chapter, you should attempt to solve the opening headline on your own and then compare your solution to that presented at the end of the chapter.

INTRODUCTION

Many students taking managerial economics ask, "Why should I study economics? Will it tell me what the stock market will do tomorrow? Will it tell me where to invest my money or how to get rich?" Unfortunately, managerial economics by itself is unlikely to provide definitive answers to such questions. Obtaining the answers would require an accurate crystal ball. Nevertheless, managerial economics is a valuable tool for analyzing business situations such as the ones raised in the headlines that open each chapter of this book.

In fact, if you surf the Internet, browse a business publication such as *Bloomberg Businessweek* or *The Wall Street Journal*, or read a trade publication like *National Restaurant News* or *Supermarket News*, you will find a host of stories that involve managerial economics. A recent search generated the following headlines:

"Disney to Assume Full Operational Control of Hulu in Comcast Deal"

"Walmart Ups the Delivery Game with Next Day Shipping"

"Generic Drug Companies, Executives Slapped with Price-Fixing Lawsuit"

"Is 'Never Knowingly Undersold' Killing John Lewis?"

"Brands Rethink Social Media Strategy"

"Uber and Lyft Are in 'an Arms Race in Marketing Spend Right Now'"

"U.S. Government Steps Up Challenges to Hospital Mergers"

"Amazon Is Paying Employees $10,000 and 3 Months' Salary to Quit and Start Their Own Business"

Sadly, billions of dollars are lost each year because many existing managers fail to use basic tools from managerial economics to shape pricing and output decisions, optimize the production process and input mix, choose product quality, guide horizontal and vertical merger decisions, or optimally design internal and external incentives. Happily, if you learn a few basic principles from managerial economics, you will be poised to drive the inept managers out of their jobs! You will also understand why the latest recession was great news to some firms and why some software firms spend millions on the development of applications for smartphones but permit consumers to download them for free.

Managerial economics is not only valuable to managers of *Fortune* 500 companies; it is also valuable to managers of not-for-profit organizations. It is useful to the manager of a food bank who must decide the best means for distributing food to the needy. It is valuable to the coordinator of a shelter for the homeless whose goal is to help the largest possible number of homeless, given a very tight budget. In fact, managerial economics provides useful insights into every facet of the business and nonbusiness world in which we live—including household decision making.

Why is managerial economics so valuable to such a diverse group of decision makers? The answer to this question lies in the meaning of the term *managerial economics*.

The Manager

manager
A person who directs resources to achieve a stated goal.

A **manager** is a person who directs resources to achieve a stated goal. This definition includes all individuals who (1) direct the efforts of others, including those who delegate tasks within an organization such as a firm, a family, or a club; (2) purchase inputs to be used in the production of goods and services such as the output of a firm, food for the needy, or shelter for the homeless; or (3) are in charge of making other decisions, such as product price or quality.

A manager generally has responsibility for his or her own actions as well as for the actions of individuals, machines, and other inputs under the manager's control. This control may involve responsibilities for the resources of a multinational corporation or for those of a single household. In each instance, however, a manager must direct resources and the behavior of individuals for the purpose of accomplishing some task. While much of this book assumes the manager's task is to maximize the profits of the firm that employs the manager, the underlying principles are valid for virtually any decision process.

Economics

The primary focus of this book is on the second word in *managerial economics*. **Economics** is the science of making decisions in the presence of scarce resources. *Resources* are simply anything used to produce a good or service or, more generally, to achieve a goal. Decisions are important because scarcity implies that by making one choice, you give up another. A computer firm that spends more resources on advertising has fewer resources to invest in research and development. A food bank that spends more on soup has less to spend on fruit. Economic decisions thus involve the allocation of scarce resources, and a manager's task is to allocate resources so as to best meet the manager's goals.

economics
The science of making decisions in the presence of scarce resources.

One of the best ways to comprehend the pervasive nature of scarcity is to imagine that a genie has appeared and offered to grant you three wishes. If resources were not scarce, you would tell the genie you have absolutely nothing to wish for; you already have everything you want. Surely, as you begin this course, you recognize that time is one of the scarcest resources of all. Your primary decision problem is to allocate a scarce resource—time—to achieve a goal—such as mastering the subject matter or earning an A in the course.

Managerial Economics Defined

Managerial economics, therefore, is the study of how to direct scarce resources in the way that most efficiently achieves a managerial goal. It is a very broad discipline in that it describes methods useful for directing everything from the resources of a household to maximize household welfare to the resources of a firm to maximize profits.

managerial economics
The study of how to direct scarce resources in the way that most efficiently achieves a managerial goal.

To understand the nature of decisions that confront managers of firms, imagine that you are the manager of a *Fortune* 500 company that makes computers. You must make a host of decisions to succeed as a manager: Should you purchase components such as disk drives and chips from other manufacturers or produce them within your own firm? Should you specialize in making one type of computer or produce several different types? How many computers should you produce, and at what price should you sell them? How many employees should you hire, and how should you compensate them? How can you ensure that employees work hard and produce quality products? How will the actions of rival computer firms affect your decisions?

The key to making sound decisions is to know what information is needed to make an informed decision and then to collect and process the data. If you work for a large firm, your legal department can provide data about the legal ramifications of alternative decisions; your accounting department can provide tax advice and basic cost data; your marketing department can provide you with data on the characteristics of the market for your product; and your firm's financial analysts can provide summary data for alternative methods of obtaining financial capital. Ultimately, however, the manager must integrate all of this information, process it, and arrive at a decision. The remainder of this book will show you how to perform this important managerial function by using seven principles that comprise effective management.

THE ECONOMICS OF EFFECTIVE MANAGEMENT

The nature of sound managerial decisions varies depending on the underlying goals of the manager. Since this course is designed primarily for managers of firms, this book focuses on managerial decisions as they relate to maximizing profits or, more generally, the value of the firm. Before embarking on this special use of managerial economics, we provide an overview of the basic principles that comprise effective management. In particular, an effective manager must (1) identify goals and constraints, (2) recognize the nature and importance of profits, (3) understand incentives, (4) understand markets, (5) recognize the time value of money, (6) use marginal analysis, and (7) make data-driven decisions.

Identify Goals and Constraints

The first step in making sound decisions is to have well-defined *goals* because achieving different goals entails making different decisions. If your goal is to maximize your grade in this course rather than maximize your overall grade point average, your study habits will differ accordingly. Similarly, if the goal of a food bank is to distribute food to needy people in rural areas, its decisions and optimal distribution network will differ from those it would use to distribute food to needy inner-city residents. Notice that, in both instances, the decision maker faces *constraints* that affect the ability to achieve a goal. The 24-hour day affects your ability to earn an A in this course; a budget affects the ability of the food bank to distribute food to the needy. Constraints are an artifact of scarcity.

Different units within a firm may be given different goals; those in a firm's marketing department might be instructed to use their resources to maximize sales or market share, while those in the firm's financial group might focus on earnings growth or risk-reduction strategies. Later in this book we will see how the firm's overall goal—maximizing profits—can be achieved by giving each unit within the firm an incentive to achieve potentially different goals.

Unfortunately, constraints make it difficult for managers to achieve goals such as maximizing profits or increasing market share. These constraints include such things as the available technology and the prices of inputs used in production. The goal of maximizing profits requires the manager to decide the optimal price to charge for a product, how much to produce, which technology to use, how much of each input to use, how to react to decisions made by competitors, and so on. This book provides tools for answering these types of questions.

Recognize the Nature and Importance of Profits

The overall goal of most firms is to maximize profits or the firm's value, and the remainder of this book will detail strategies managers can use to achieve this goal. Before we provide these details, let us examine the nature and importance of profits in a free-market economy.

Economic versus Accounting Profits

When most people hear the word *profit*, they think of accounting profits. **Accounting profits** are the total amount of money taken in from sales (total revenue, or price times quantity sold) minus the dollar cost of producing goods or services. Accounting profits are what show up on the firm's income statement and are typically reported to the manager by the firm's accounting department.

A more general way to define profits is in terms of what economists refer to as economic profits. **Economic profits** are the difference between the total revenue and the total opportunity cost of producing the firm's goods or services. The **opportunity cost** of using a resource includes both the *explicit* (or *accounting*) *cost* of the resource and the *implicit cost* of giving

accounting profits
The total amount of money taken in from sales (total revenue, or price times quantity sold) minus the dollar cost of producing goods or services.

economic profits
The difference between total revenue and total opportunity cost.

opportunity cost
The explicit cost of a resource plus the implicit cost of giving up its best alternative use.

up the best alternative use of the resource. The opportunity cost of producing a good or service generally is higher than accounting costs because it includes both the dollar value of costs (explicit, or accounting, costs) and any implicit costs.

Implicit costs are very hard to measure and therefore managers often overlook them. Effective managers, however, continually seek out data from other sources to identify and quantify implicit costs. Managers of large firms can use sources within the company, including the firm's finance, marketing, and/or legal departments, to obtain data about the implicit costs of decisions. In other instances, managers must collect data on their own. For example, what does it cost you to read this book? The price you paid the bookseller for this book is an explicit (or accounting) cost, while the implicit cost is the value of what you are giving up by reading the book. You could be studying some other subject or watching TV, and each of these alternatives has some value to you. The "best" of these alternatives is your implicit cost of reading this book; you are giving up this alternative to read the book. Similarly, the opportunity cost of going to school is much higher than the cost of tuition and books; it also includes the amount of money you would earn had you decided to work rather than go to school.

In the business world, the opportunity cost of opening a restaurant is the best alternative use of the resources used to establish the restaurant—say, opening a hair salon. Again, these resources include not only the explicit financial resources needed to open the business, but any implicit costs as well. Suppose you own a building in New York that you use to run a small pizzeria. Food supplies are your only accounting costs. At the end of the year, your accountant informs you that these costs were $20,000 and that your revenues were $100,000. Thus, your accounting profits are $80,000.

However, these accounting profits overstate your economic profits because the costs include only accounting costs. First, the costs do not include the time you spent running the business. Had you not run the business, you could have worked for someone else, and this fact reflects an economic cost not accounted for in accounting profits. To be concrete, suppose you could have worked for someone else for $30,000. Your opportunity cost of time would have been $30,000 for the year. Thus, $30,000 of your accounting profits are not profits at all but one of the implicit costs of running the pizzeria.

Second, accounting costs do not account for the fact that, had you not run the pizzeria, you could have rented the building to someone else. If the rental value of the building is $100,000 per year, you gave up this amount to run your own business. Thus, the costs of running the pizzeria include not only the costs of supplies ($20,000) but the $30,000 you could have earned in some other business *and* the $100,000 you could have earned in renting the building to someone else. The economic cost of running the pizzeria is $150,000—the amount you gave up to run your business. Considering the revenue of $100,000, you actually lost $50,000 by running the pizzeria; your *economic profits* were –$50,000.

Throughout this text, when we speak of costs, we mean economic costs. Economic costs are opportunity costs and include not only the explicit (accounting) costs but also the implicit costs of the resources used in production.

The Role of Profits

A common misconception is that the firm's goal of maximizing profits is necessarily bad for society. Individuals who want to maximize profits often are considered self-interested, a quality that many people view as undesirable. However, consider Adam Smith's classic line from *The Wealth of Nations*: "It is not out of the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest."[2]

[2]Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations,* 1776.

INSIDE BUSINESS 1–1

The Goals of Firms in Our Global Economy

Recent trends in globalization have forced businesses around the world to more keenly focus on profitability. This trend is also present in Japan, where historical links between banks and businesses have traditionally blurred the goals of firms. For example, at the turn of the twenty-first century, the Japanese business engineering firm Mitsui & Co. Ltd. launched "Challenge 21," a plan directed at helping the company emerge as Japan's leading business engineering group. According to a spokesperson for the company, "[This plan permits us to] create new value and maximize profitability by taking steps such as renewing our management framework and prioritizing the allocation of our resources into strategic areas. We are committed to maximizing shareholder value through business conduct that balances the pursuit of earnings with socially responsible behavior."

Ultimately, the goal of any continuing company must be to maximize the value of the firm. This goal is often achieved by trying to hit intermediate targets, such as minimizing costs or increasing market share. If you—as a manager—do not maximize your firm's value over time, you will be in danger of either going out of business, being taken over by other owners (as in a leveraged buyout), or having stockholders elect to replace you and other managers.

SOURCE: "Mitsui & Co., Ltd. UK Regulatory Announcement: Final Results," *Business Wire*, May 13, 2004.

Smith is saying that by pursuing its self-interest—the goal of maximizing profits—a firm ultimately meets the needs of society. If you cannot make a living as a rock singer, it is probably because society does not appreciate your singing; society would more highly value your talents in some other employment. If you break five dishes each time you clean up after dinner, your talents are perhaps better suited for filing paperwork or mowing the lawn. Similarly, the profits of businesses signal where society's scarce resources are best allocated. When firms in a given industry earn economic profits, the opportunity cost to resource holders outside the industry increases. Owners of other resources soon recognize that, by continuing to operate their existing businesses, they are giving up profits. This induces new firms to enter the markets in which economic profits are available. As more firms enter the industry, the market price falls, and economic profits decline.

Thus, profits signal the owners of resources where the resources are most highly valued by society. By moving scarce resources toward the production of goods most valued by society, the total welfare of society is improved. As Adam Smith first noted, this phenomenon is due not to benevolence on the part of the firms' managers but to the self-interested goal of maximizing the firms' profits.

PRINCIPLE

Profits Are a Signal

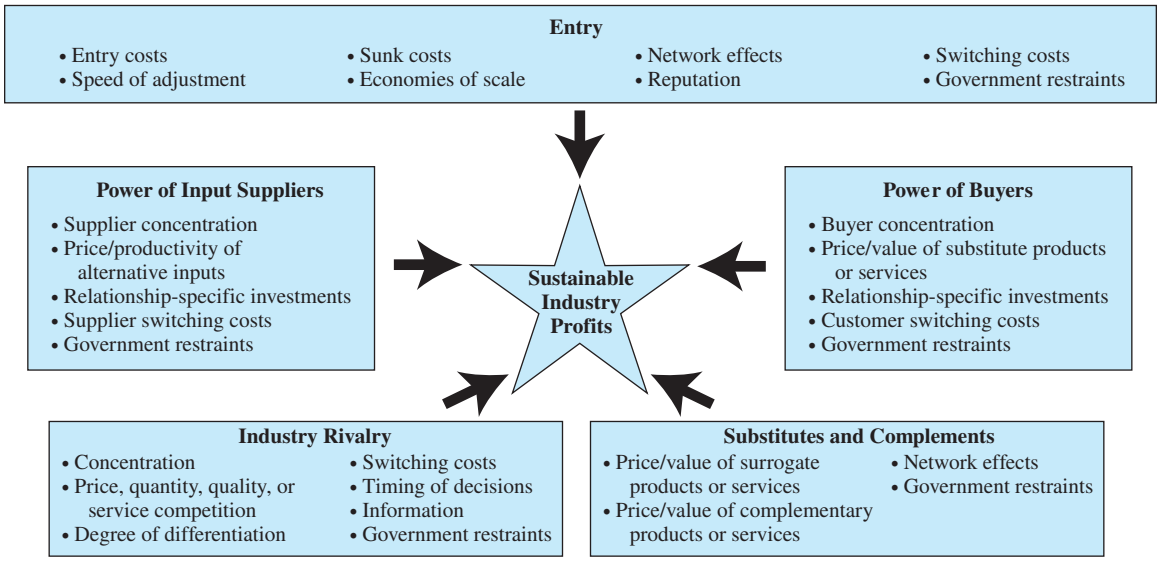
Profits signal to resource holders where resources are most highly valued by society.

The Five Forces Framework and Industry Profitability

A key theme of this textbook is that many interrelated forces and decisions influence the level, growth, and sustainability of profits. If you or other managers in the industry are clever enough to identify strategies that yield a windfall to shareholders this quarter, there is no guarantee that these profits will be sustained in the long run. You must recognize that profits are a signal—if your business earns superior profits, existing and potential competitors will do their

Figure 1–1

The Five Forces Framework



best to get a piece of the action. In the remaining chapters, we will examine a variety of business strategies designed to enhance your prospects of earning and sustaining profits. Before we do so, however, it is constructive to provide a conceptual framework for thinking about some of the factors that impact industry profitability.

Figure 1–1 illustrates the *"five forces" framework* pioneered by Michael Porter.[3] This framework organizes many complex managerial economics issues into five categories or "forces" that impact the sustainability of industry profits: (1) entry, (2) power of input suppliers, (3) power of buyers, (4) industry rivalry, and (5) substitutes and complements. The following discussion explains how these forces influence industry profitability and highlights the connections among these forces and material covered in the remaining chapters of the text.

Entry. As we will see in Chapters 2, 7, and 8, entry heightens competition and reduces the margins of existing firms in a wide variety of industry settings. For this reason, the ability of existing firms to sustain profits depends on how barriers to entry affect the ease with which other firms can enter the industry. Entry can come from a number of directions, including the formation of new companies (Wendy's entered the fast-food industry in the 1970s after its founder, Dave Thomas, left KFC), globalization strategies by foreign companies (Toyota has sold vehicles in Japan since the 1930s but waited until the middle of the last century to enter the U.S. automobile market), and the introduction of new product lines by existing firms (computer manufacturer Apple now also sells the popular iPhone).

As shown in Figure 1–1, a number of economic factors affect the ability of entrants to erode existing industry profits. In subsequent chapters, you will learn why entrants are less likely to capture market share quickly enough to justify the costs of entry in environments where there are sizable sunk costs (Chapters 5 and 9), significant economies of scale (Chapters 5 and 8), or significant network effects (Module Group A), or where existing

[3]Michael Porter, *Competitive Strategy* (New York: Free Press, 1980).

firms have invested in strong reputations for providing value to a sizable base of loyal consumers (Chapter 11) or to aggressively fight entrants (Chapter 10 and Module Group A). In addition, you will gain a better appreciation for the role that governments play in shaping entry through patents and licenses (Chapter 8), trade policies (Chapter 5 and Module Group B), and environmental legislation (Module Group B). We will also identify a variety of strategies to raise the costs to consumers of "switching" to would-be entrants, thereby lowering the threat that entrants will erode your profits.

Power of Input Suppliers. Industry profits tend to be lower when suppliers have the power to negotiate favorable terms for their inputs. Supplier power tends to be low when inputs are relatively standardized and relationship-specific investments are minimal (Chapter 6), input markets are not highly concentrated (Chapter 7), or alternative inputs are available with similar marginal productivities per dollar spent (Chapter 5). In many countries, the government constrains the prices of inputs through price ceilings and other controls (Chapter 2 and Module Group B), which limits to some extent the ability of suppliers to expropriate profits from firms in the industry.

Power of Buyers. Similar to the case of suppliers, industry profits tend to be lower when customers or buyers have the power to negotiate favorable terms for the products or services produced in the industry. In most consumer markets, buyers are fragmented and thus buyer concentration is low. Buyer concentration and hence customer power tend to be higher in industries that serve relatively few "high-volume" customers. Buyer power tends to be lower in industries where the cost to customers of switching to other products is high—as is often the case when there are relationship-specific investments and hold-up problems (Chapter 6), imperfect information that leads to costly consumer search (Chapter 12), or few close substitutes for the product (Chapters 2, 3, 4, and 11). Government regulations, such as price floors or price ceilings (Chapter 2 and Module Group B), can also impact the ability of buyers to obtain more favorable terms.

Industry Rivalry. The sustainability of industry profits also depends on the nature and intensity of rivalry among firms competing in the industry. Rivalry tends to be less intense (and hence the likelihood of sustaining profits is higher) in concentrated industries—that is, those with relatively few firms. In Chapter 7 we will take a closer look at various measures that can be used to gauge industry concentration.

The level of product differentiation and the nature of the game being played—whether firms' strategies involve prices, quantities, capacity, or quality/service attributes, for example—also impact profitability. In later chapters you will learn why rivalry tends to be more intense in industry settings where there is little product differentiation and firms compete in price (Chapters 8, 9, 10, and 11) and where consumer switching costs are low (Chapters 11 and 12). You will also learn how imperfect information and the timing of decisions affect rivalry among firms (Chapters 10 and 12 and Module Group A).

Substitutes and Complements. The level and sustainability of industry profits also depend on the price and value of interrelated products and services. Porter's original five forces framework emphasized that the presence of close substitutes erodes industry profitability. In Chapters 2, 3, 4, and 11 you will learn how to quantify the degree to which surrogate products are close substitutes by using elasticity analysis and models of consumer behavior. We will also see that government policies (such as restrictions limiting the importation of prescription

INSIDE BUSINESS 1–2

Profits and the Evolution of the Computer Industry

When profits in a given industry are higher than those in other industries, new firms will attempt to enter that industry. When losses are recorded, some firms will likely leave the industry. This sort of "evolution" has changed the global landscape of personal computer markets.

At the start of the PC era, personal computer makers enjoyed positive economic profits. These higher profits led to new entry and heightened competition. Over the past two decades, entry has led to declines in PC prices and industry profitability despite significant increases in the speed and storage capacities of PCs. Less efficient firms have been forced to exit the market.

In the early 2000s, IBM—the company that launched the PC era when it introduced the IBM PC in the early 1980s—sold its PC business to China-based Lenovo. Compaq—an early leader in the market for PCs—was acquired by Hewlett-Packard. A handful of small PC makers have enjoyed some success competing against the remaining traditional players, which include Dell and Hewlett-Packard. By the late 2000s, Dell's strategy switched from selling computers directly to consumers to entering into relationships with retailers such as Best Buy and Staples, as well as focusing on corporate customers. While only time will tell how these strategies will impact the long-run viability of traditional players, competitive pressures continue to push PC prices and industry profits downward as consumers increasingly shift toward tablets and smartphones.

drugs from Canada into the United States) can directly impact the availability of substitutes and thus industry profits.

More recent work by economists and business strategists emphasizes that complementarities also affect industry profitability.[4] For example, Microsoft's profitability in the market for operating systems is enhanced by the presence of complementary products ranging from relatively inexpensive computer hardware to a plethora of Windows-compatible application software. Analogously, Apple's profitability in the cell phone market is enhanced by the tens of thousands of complementary applications ("apps") that are compatible with its iPhone. In Chapters 3, 5, and 10, as well as Module Group A, you will learn how to quantify these complementarities or "synergies" and identify strategies to create and exploit complementarities and network effects.

Many forces that affect the level and sustainability of industry profits are interrelated. For instance, the U.S. automobile industry suffered a sharp decline in industry profitability during the 1970s as a result of sharp increases in the price of gasoline (a complement to automobiles). This change in the price of a complementary product enabled Japanese automakers to *enter* the U.S. market through a differentiation strategy of marketing their fuel-efficient cars, which sold like hotcakes compared to the gas-guzzlers American automakers produced at that time. These events, in turn, have had a profound impact on industry rivalry in the automotive industry—not just in the United States, but worldwide.

It is also important to stress that the five forces framework is primarily a tool for helping managers see the "big picture"; it is a schematic you can use to organize various industry conditions that affect industry profitability and assess the efficacy of alternative business strategies. However, it would be a mistake to view it as a comprehensive list of all factors that affect industry profitability. The five forces framework is not a substitute for understanding the economic principles that underlie sound business decisions.

[4]See, for example, Barry J. Nalebuff and Adam M. Brandenburger, *Co-Opetition* (New York: Doubleday, 1996), as well as R. Preston McAfee, *Competitive Solutions* (Princeton, NJ: Princeton University Press, 2002).