Managerial Economics AND Business Strategy

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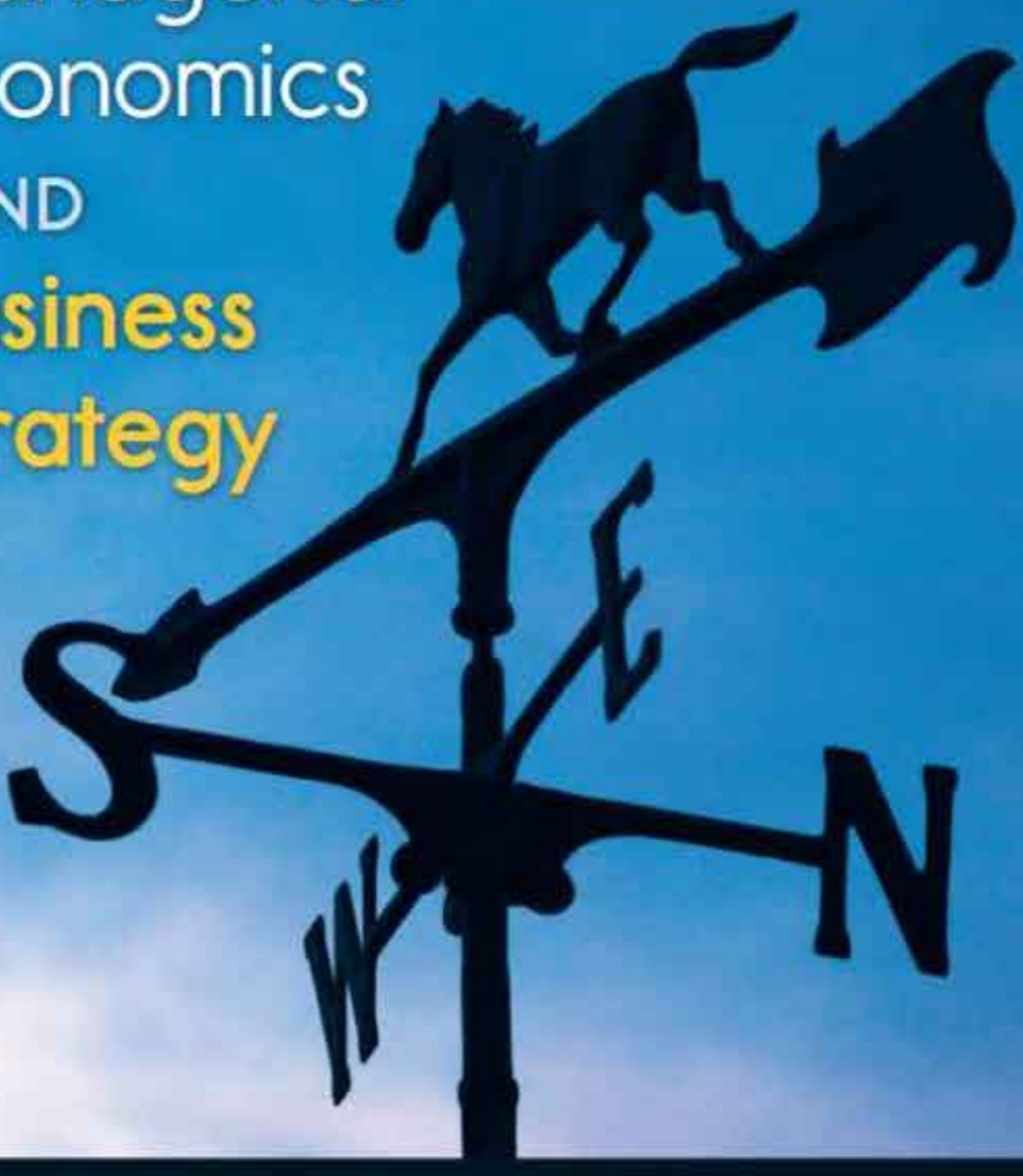

MICHAEL R. BAYE • JEFFREY T. PRINCE

connect® plus+ ECONOMICS

McGraw-Hill Connect® Plus Economics, a proven digital solution that will help you achieve your course goals of improving student readiness, enhancing student engagement, and increasing their comprehension of content, is now available with **Baye and Prince's *Managerial Economics and Business Strategy,* Eighth Edition!**

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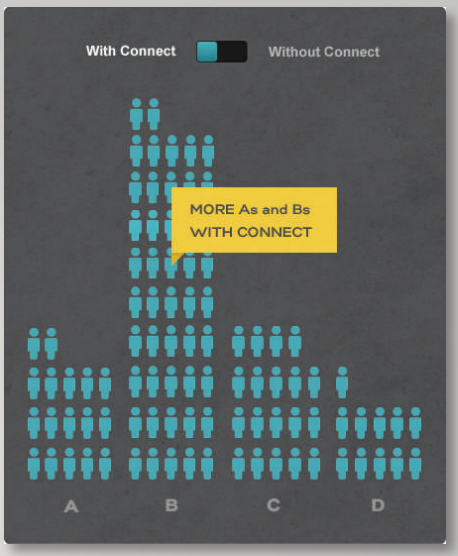

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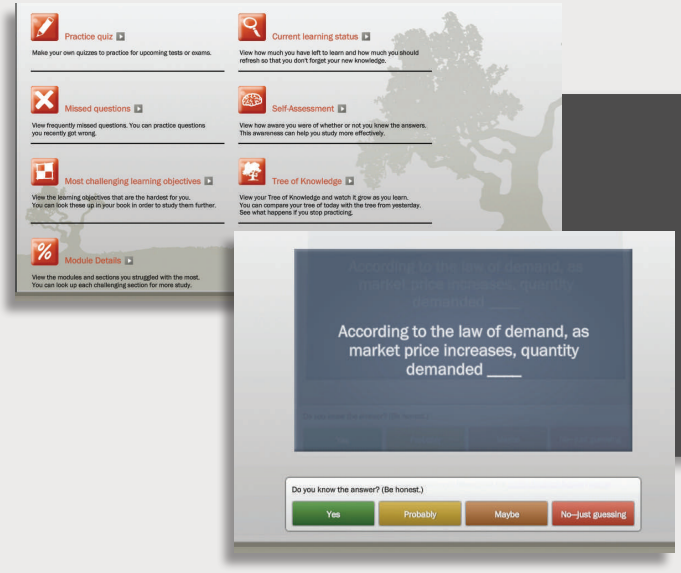
See the next two pages for more details on LearnSmart, the graphing tool, eBooks, and Tegrity lecture capture – all available with Connect Plus Economics!

Get Connected.

FEATURES



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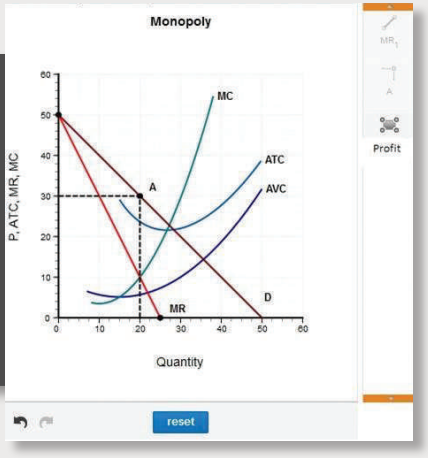

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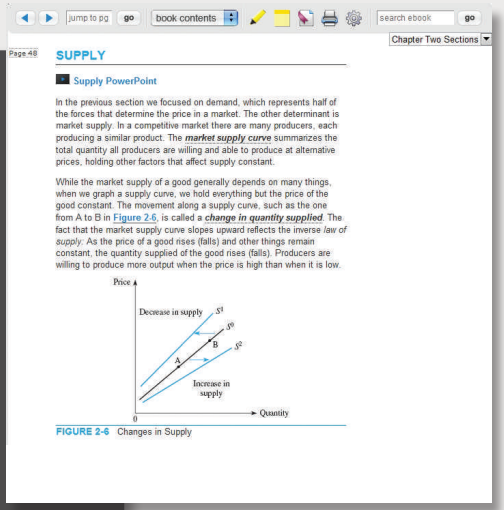
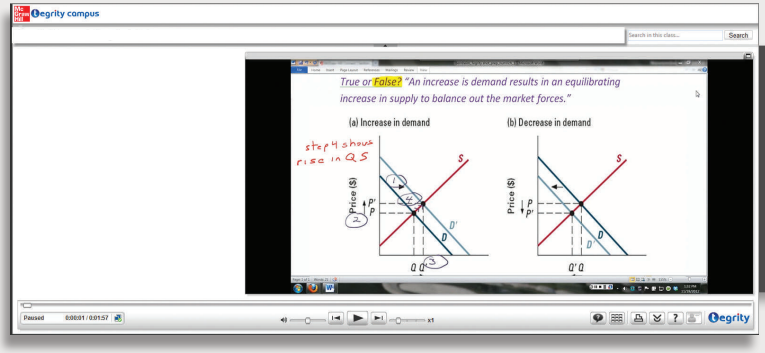
eBooks

Connect Plus includes a media-rich eBook that allows you to share your notes with your students. Your students can insert and review their own notes, highlight the text, search for specific information, and interact with media resources. Using an eBook with Connect Plus gives your students a complete digital solution that allows them to access their materials from any computer. Videos of key Demonstration Problems are linked next to the applicable Demonstration Problems within each of the chapters.



Lecture Capture



Make your classes available anytime, anywhere. With simple, one-click recording, students can search for a word or phrase and be taken to the exact place in your lecture that they need to review.

Managerial Economics and Business Strategy

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International Economics
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EIGHTH EDITION

Managerial Economics and Business Strategy

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DEDICATION

To my former students.

—Michael R. Baye

To Annie and Kate.

—Jeffrey T. Prince

ABOUT THE AUTHORS

Michael R. Baye is the Bert Elwert Professor of Business Economics & Public Policy at Indiana University's Kelley School of Business, and served as the Director of the Bureau of Economics at the Federal Trade Commission from July 2007 to December 2008. He received his B.S. in economics from Texas A&M University in 1980 and earned a Ph.D. 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, M.B.A., and Ph.D. levels. His research has been published in the *American Economic Review, Journal of Political Economy, Econometrica*, the *Review of Economic Studies,* the *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.

Jeffrey T. Prince is Associate Professor of Business Economics & Public Policy at Indiana University's Kelley School of Business. He received his B.A. in economics and B.S. in mathematics and statistics from Miami University in 1998 and earned a Ph.D. 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 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 TO THE EIGHTH EDITION

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 eighth 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 is the examples used to make managerial economics come to life for this generation of students and—thanks to the addition of Jeff Prince to this edition—the 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 eighth 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 unchanged to ensure a smooth transition to this edition.

KEY PEDAGOGICAL FEATURES

The eighth 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. But this edition includes a number of new features available to those using McGraw-Hill's wonderful interactive learning products, *Connect* and *LearnSmart*. *Connect* offers hundreds of variations of end-of-chapter problems that may be electronically graded and provide students with immediate, detailed, feedback. Students and instructors can access these and other powerful resources directly from their laptops, tablets and phones. For more information, please refer to pp. xiv–xvii of the preface.

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. A listing is provided at the end of the chapter that identifies select end of chapter problems to the learning objective(s) to which they relate.

Demonstration Problems

The best way to learn economics is to practice solving economic problems. So, in addition to the *Headlines*, each chapter contains many *Demonstration Problems* sprinkled throughout the text, along with detailed answers. This provides students with a mechanism to verify that they have mastered the material, and reduces the cost to students and instructors of having to meet during office hours to discuss answers to problems. One key demonstration problem in each chapter has an accompanying video tutorial, which walks through the solution step-by-step. These videos are available via the eBook included in Connect® Plus and the Online Learning Center, www.mhhe.com/baye8e. For more information please refer to p. xiv of the Preface.

Inside Business Applications

Most chapters contain boxed material (called *Inside Business* applications) to illustrate how theories explained in the text relate to a host of different business situations. As in previous editions, we have tried 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 and non-calculus based formula. 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.

Key Terms and Marginal Definitions

Each chapter ends with a list of key terms and concepts. These provide an easy way for professors to glean material covered in each chapter, and for students to check their mastery of terminology. In addition, marginal definitions are provided throughout the text.

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 Time Warner case that follows Chapter 14 includes 14 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. Solutions to all of the memos are contained online at www.mhhe.com/baye8e.

Detailed answers to all problems—including *Problems and Applications* and the Time Warner case *Memos*, are available to instructors on the password-protected website (www.mhhe.com/baye8e).

Case Study

A case study in business strategy—*Challenges at Time Warner*—follows Chapter 14 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 on the book's website.

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 13. Each may choose to include additional chapters (for example, Chapter 14 or the Time Warner 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 EIGHTH EDITION

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

- McGraw-Hill's homework management platform system, Connect®, is now offered for the eighth edition. This allows students to access video tutorials for selected demonstration problems through an electronic version of the book available in Connect® Plus, and gives instructors the ability to assign (and automatically grade) literally hundreds of end-of-chapter problems (including algorithmic variants), and options to provide students with immediate, detailed feedback and answers. In our experience, this allows both students and instructors to economize on the time required to set up one-on-one appointments.
- Also new to the eighth edition, LearnSmart is an adaptive learning tool that allows students to continually test their mastery of basic and more complex concepts.
- Over 100 new variations of the class-tested problems from the previous edition plus several new end-of-chapter problems. Where appropriate, problems from the previous edition have been updated to reflect the current economic climate.
- Suggested end-of-chapter problems for each learning objective, to help foster targeted learning.
- The updated *Test Bank* has been rigorously quality tested, and now contains over 100 new, challenging problems.
- New and updated *Headlines*.
- New and updated *Inside Business* applications.

Chapter-by-Chapter Changes

- **Chapter 1** contains new and updated examples, and an updated *Inside Business* application. It also contains twenty refreshed end-of-chapter problems.
- **Chapter 2** contains new and updated examples and *Inside Business* applications. This chapter has fourteen refreshed end-of-chapter problems.
- **Chapter 3** contains new and updated examples as well as an updated *Inside Business* application. It also has improved discussion of regression analysis. This chapter has twenty refreshed end-of-chapter problems.
- **Chapter 4** contains updated examples, and two new *Inside Business* applications; the first examines the relationship between the budget constraint and credit card usage, and the second examines output-oriented incentives. It also has two new and sixteen refreshed end-of-chapter problems.

- **Chapter 5** contains updated *Inside Business* applications, as well as a new demonstration problem. It also has sixteen refreshed end-of-chapter problems.
- **Chapter 6** offers a new *Headline*, and new examples. It also has four new and three refreshed end-of-chapter problems.
- **Chapter 7** contains thoroughly updated examples and industry data, as well as updated *Inside Business* applications. It also includes updates that account for the new 2010 *Horizontal Merger Guidelines*, and nine refreshed end-of-chapter problems.
- **Chapter 8** contains an updated *Headline* and several new examples. It also has fifteen refreshed end-of-chapter problems.
- **Chapter 9** provides improved exposition of contestable markets, and a new *Inside Business* application examining OPEC and the temptation to cheat on collusive arrangements. It also includes thirteen refreshed end-of-chapter problems.
- **Chapter 10** contains a new *Inside Business* application examining cola wars in India, as well as improved exposition of equilibrium strategies. It also has sixteen refreshed end-of-chapter problems.
- **Chapter 11** contains an updated *Headline*, updated *Inside Business* applications, and a new *Inside Business* application examining whether price discrimination is necessarily bad for consumers. There are fifteen refreshed end-of-chapter problems.
- **Chapter 12** includes an improved explanation of the merits of standard deviation as a measure of risk, and a new *Inside Business* application that examines adverse selection in the context of a famous quote by Groucho Marx. It also has eleven refreshed end-of-chapter problems.
- **Chapter 13** contains a new *Headline* and new examples for commitment mechanisms and network effects. It also has eight refreshed end-of-chapter problems.
- **Chapter 14** contains updated discussion of the 2010 *Horizontal Merger Guidelines*, the *Dodd-Frank Wall Street Reform and Consumer Protection Act*, and updated *Inside Business* applications. It also has seven refreshed end-of-chapter problems.

ORGANIZED LEARNING IN THE EIGHTH EDITION

Chapter Learning Objectives

Students and instructors can be confident that the organization of each chapter reflects common themes outlined by four to seven learning objectives listed on the first page of each chapter. These objectives, along with AACSB and Bloom's taxonomy learning categories, are connected to all end-of-chapter material and test bank questions to offer a comprehensive and thorough teaching and learning experience.

Assurance of Learning Ready

Many educational institutions today are focused on the notion of *assurance of learning*, an important element of some accreditation standards. *Managerial Economics and Business Strategy* is designed specifically to support your assurance of learning initiatives with a simple, yet powerful solution.

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

AACSB Statement

The McGraw-Hill Companies is a proud corporate member of AACSB International. Understanding the importance and value of AACSB accreditation, *Managerial Economics and Business Strategy*, Eighth edition, recognizes the curricula guidelines detailed in the AACSB standards for business accreditation by connecting questions in the test bank and end-of-chapter material to the general knowledge and skill guidelines found in the AACSB standards.

The statements contained in *Managerial Economics and Business Strategy,* Eighth edition, are provided only as a guide for the users of this textbook. The AACSB leaves content coverage and assessment within the purview of individual schools, the mission of the school, and the faculty.

SUPPLEMENTS FOR THE INSTRUCTOR

We are pleased to report that the eighth edition of *Managerial Economics and Business Strategy* truly offers adopters the most comprehensive and easily accessible supplements in the market. 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 book website at www.mhhe.com/baye8e and are password protected for security.

Cases

In addition to the Time Warner case, nearly a dozen full-length cases were 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, Sprint, and Kodak. Expanded teaching notes and solutions for all of the cases—including the Time Warner case—are also provided.

PowerPoint Slides

Thoroughly updated and fully editable PowerPoint presentations with animated figures and graphs, prepared by Patrick Scholten of Bentley University, 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, prepared by the authors, 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

McGraw-Hill's EZ Test is a flexible and easy-to-use electronic testing program that allows you to create tests from book-specific items, customized to your needs. It accommodates a wide range of question types, and you can add your own questions. Multiple versions of the test can be created, and any test can be exported for use with course management systems such as BlackBoard. EZ Test Online gives you a place to administer your EZ-Test created exams and quizzes online. The program is available for Windows and Macintosh environments.

Digital Image Library

All the figures and tables presented in the book have been made available in electronic format, providing flexibility to integrate art from the textbook into PowerPoint presentations, or to directly print the figures on overhead transparencies.

SUPPLEMENTS FOR THE STUDENT

Study Guide

We have prepared a study guide that offers a wealth of additional resources to master the course. The study guide includes a study outline, a review of key concepts, a variety of questions for additional practice, and the solutions to the questions so you can check your answers.

Online Learning Center www.mhhe.com/baye8e

The book website is a central resource for students and instructors alike. Students can access a glossary, Time Warner Case Study materials, data for key chapters, Inside Business assets, chapter overviews, and PowerPoint presentations. Students can also test their knowledge of chapter concepts with auto-gradable practice quizzes.

MCGRAW-HILL CONNECT® ECONOMICS

Less Managing. More Teaching. Greater Learning.

McGraw-Hill *Connect® Economics* is an online assignment and assessment solution that connects students with the tools and resources they'll need to achieve success.

McGraw-Hill *Connect Economics* helps prepare students for their future by enabling faster learning, more efficient studying, and higher retention of knowledge.

McGraw-Hill *Connect® Economics* features

Connect Economics offers a number of powerful tools and features to make managing assignments easier, so faculty can spend more time teaching. With *Connect Economics*, students can engage with their coursework anytime and anywhere, making the learning process more accessible and efficient. *Connect Economics* offers the features described here.

Simple assignment management

With *Connect Economics*, creating assignments is easier than ever, so you can spend more time teaching and less time managing. The assignment management function enables you to:

- Create and deliver assignments easily with selectable end-of-chapter questions and test bank items.
- Streamline lesson planning, student progress reporting, and assignment grading to make classroom management more efficient than ever.
- Go paperless with the eBook and online submission and grading of student assignments.

Smart grading

When it comes to studying, time is precious. *Connect Economics* helps students learn more efficiently by providing feedback and practice material when they need it, where they need it. When it comes to teaching, your time also is precious. The grading function enables you to:

- Have assignments scored automatically, giving students immediate feedback on their work and side-by-side comparisons with correct answers.

- Access and review each response; manually change grades or leave comments for students to review.
- Reinforce classroom concepts with practice tests and instant quizzes.

Instructor library

The *Connect Economics* Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture.

Student study center

The *Connect Economics* Student Study Center is the place for students to access additional resources. The Student Study Center:

- Offers students quick access to lectures, practice materials, eBooks, and more.
- Provides instant practice material and study questions, easily accessible on the go.

Diagnostic and adaptive learning of concepts: LearnSmart

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

- Applies an intelligent concept engine to identify the relationships between concepts and to serve new concepts to each student only when he or she is ready.
- Adapts automatically to each student, so students spend less time on the topics they understand and practice more those they have yet to master.
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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

BRIEF CONTENTS

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CASE STUDY

CHAPTER ONE

The Fundamentals of Managerial Economics

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.

With short-term interest rates at 7 percent, 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]

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 six principles of effective managerial decision making.

[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 *BusinessWeek* or *The Wall Street Journal,* or read a trade publication like *Restaurant News* or *Supermarket Business News,* you will find a host of stories that involve managerial economics. A recent search generated the following headlines:

"The Dodge Dart marks Chrysler's renaissance"

"ConocoPhillips completes spinoff of refining business"

"Charles Schwab cuts some of its ETF fees. Will rivals match?

"Apple accused of price-fixing"

"Competition heats up for Northwest wine shipping"

"U.S. Government steps up challenges to hospital mergers"

"Brands rethink social media strategy"

"Google buys QuickOffice"

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 smart phones 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

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

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.

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

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.

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 com-

ponents 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 six 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; and (6) use marginal analysis.

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 profit* is 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.

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.

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 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 hairstyling 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 book, 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, 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.

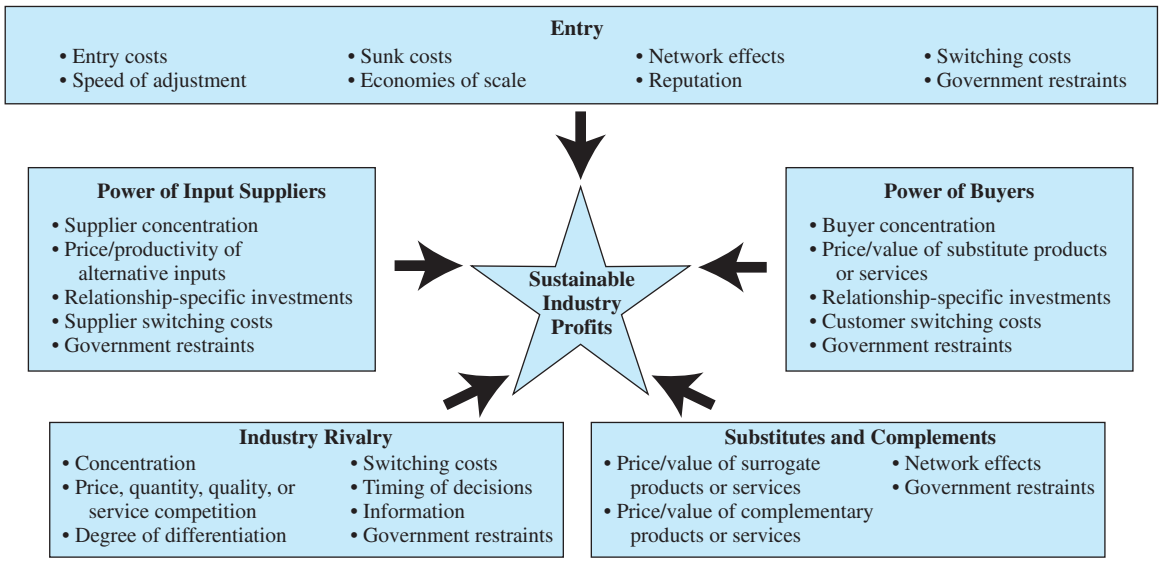
Source: "Mitsui & Co., Ltd. UK Regulatory Announcement: Final Results," *Business Wire,* May 13, 2004.

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.

FIGURE 1–1 The Five Forces Framework



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 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 discussion below 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

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

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 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 sizeable sunk costs (Chapters 5, 9), significant economies of scale (Chapters 5, 8), or significant network effects (Chapter 13), or where existing firms have invested in strong reputations for providing value to a sizeable base of loyal consumers (Chapter 11) or to aggressively fight entrants (Chapters 10, and 13). 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 (Chapters 5 and 14), and environmental legislation (Chapter 14). 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 (Chapters 2 and 14), 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 (Chapters 2 and 14), 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