MANAGERIAL ECONOMICS

FOUNDATIONS OF BUSINESS ANALYSIS AND STRATEGY

Christopher R. Thomas | S. Charles Maurice

Mc Graw Hill Education

MANAGERIAL ECONOMICS

Foundations of Business Analysis and Strategy

MANAGERIAL ECONOMICS: FOUNDATIONS OF BUSINESS ANALYSIS AND STRATEGY, TWELFTH EDITION
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MANAGERIAL ECONOMICS

Foundations of Business Analysis and Strategy

TWELFTH EDITION

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Mc Graw Hill Education

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To Shelly and Brooke

ABOUT THE AUTHORS

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Christopher R. Thomas is associate professor of economics at University of South Florida (USF), where he has spent the past 33 years and held the Exide Professorship of Sustainable Enterprise from 2004 through 2010. He worked for two years as an energy economist at Oak Ridge National Laboratory before joining the faculty at USF in 1982. He now teaches managerial economics to undergraduates and to MBA students in both traditional and executive formats. Professor Thomas has published numerous articles on government regulation of industry and antitrust issues and is coeditor of the *Oxford Handbook in Managerial Economics.* Professor Thomas lives with his wife in Brooksville, Florida, where he enjoys photography and playing golf and tennis.

S. Charles Maurice

Chuck Maurice was professor emeritus of economics at Texas A&M University. He spent 30 years in the Department of Economics at Texas A&M, where he served as department head from 1977 through 1981 and held the Rex B. Grey University Professorship of Free Enterprise from 1981 through 1985. Professor Maurice published numerous articles on microeconomic theory in the top economic journals. He co-wrote two scholarly books on natural resource depletion: *The Doomsday Myth* and *The Economics of Mineral Extraction.* He also wrote with Charles Ferguson, and later, Owen Phillips, the widely used intermediate-level microeconomics textbook *Economic Analysis,* which was published from 1971 to 1996. Professor Maurice retired to Gainesville, Florida, where he lived until his death in the spring of 1999.

PREFACE

WHY MANAGERIAL ECONOMICS?

Over the past 40 years, the growing influence of microeconomics and industrial organization economics in every field of business analysis has transformed the role of managerial economics in business school curricula. Economists have understood for some time that every modern course in business strategy and organizational architecture must draw from key areas of advancement in microeconomics and industrial organization. While many business schools have been quick to adopt "strategy" as a fundamental theme in their curricula, this new emphasis on strategy too often falls on the shoulders of a single, one-semester course in business strategy. In a single course, it is extremely difficult, if not impossible, to teach business students managerial economics *and* cover all of the valuable topics in business strategy and organization. In any case, a thorough foundation in managerial economics is required in order to *understand* how to use the many new and important developments in microeconomics and industrial organization.

The objective of *Managerial Economics,* then, is to teach and apply the foundation topics in microeconomics and industrial organization essential for making both the day-to-day business decisions that maximize profit as well as the strategic decisions designed to create and protect profit in the long run. In so doing, we believe *Managerial Economics* helps business students become architects of business tactics and strategy instead of middle managers who plod along the beaten path of others.

PEDAGOGICAL HIGHLIGHTS

The Twelfth Edition of *Managerial Economics* maintains all the pedagogical features that have made previous editions successful. These features follow.

Emphasis on the Economic Way of Thinking

The primary goal of this book has always been, and continues to be, to teach students the economic way of thinking about business decisions and strategy. *Managerial Economics* develops critical thinking skills and provides students with a logical way of analyzing both the routine decisions of managing the daily operations of a business as well as the longer-run strategic plans that seek to manipulate the actions and reactions of rival firms.

Easy to Learn and Teach From

Managerial Economics is a self-contained textbook that requires no previous training in economics. While maintaining a rigorous style, this book is designed to be one of the easiest books in managerial economics from which to teach *and* learn. Rather than parading students quickly through every interesting or new topic in microeconomics and industrial organization, *Managerial Economics* instead carefully develops and applies the most *useful* concepts for business decision making and strategic planning.

Dual Sets of End-of-Chapter Questions

To promote the development of analytical and critical thinking skills, which most students probably do not know how to accomplish on their own, two different kinds of problem sets are provided for each chapter. Much like the pedagogy in mathematics textbooks, which employ both "exercises" and "word problems," *Managerial Economics* provides both Technical Problems and Applied Problems.

- **Technical Problems**—Each section of a chapter is linked (by an icon in the margin)

Now try Technical Problem 3.

to one or more Technical Problems specifically designed to build and reinforce a particular skill. The Technical Problems provide a step-by-step guide for students to follow in developing the analytical skills set forth in each chapter. The answers to all of the Technical Problems are provided to instructors via Create or McGraw-Hill Connect®. The narrow focus of each Technical Problem accomplishes two things: (1) It encourages students to master concepts by taking small "bites" instead of trying to "gulp" the whole chapter at once, and (2) It allows students to pinpoint any areas of confusion so that interaction with the instructor—in the classroom or in the office—will be more productive. When students finish working the Technical Problems, they will have practiced all of the technical skills required to tackle the Applied Problems.

- **Applied Problems**—Following the Technical Problems, each chapter has a set of Applied Problems that serve to build critical thinking skills as well as business decision-making skills. These problems, much like the "word problems" in a math textbook, are a mix of stylized business situations and real-world problems taken from *Bloomberg Businessweek, The Economist, Forbes, The Wall Street Journal,* and other business news publications. Business students frequently find classroom discussion of the Applied Problems among the most valuable lessons of their entire business training. Answers to Applied Problems are available in the *Instructor's Manual.*

The clarity of exposition, coupled with the integrated, step-by-step process of the Technical Problems, allows students to learn most of the technical skills before coming to class. To the extent that technical skills are indeed mastered before class, instructors can spend more time in class showing students how to *apply* the economic way of thinking to business decision making.

Flexible Mathematical Rigor

Starting with only basic algebra and graph-reading skills, all other analytical tools employed in the book are developed within the text itself.

While calculus is not a part of any chapter, instructors wishing to teach a calculus-based course can do so by using the Mathematical Appendices at the end of most chapters. The Mathematical Appendices employ calculus to analyze the key topics covered in the chapter. Most appendices have a set of Mathematical Exercises that requires calculus to solve, and the answers to the Mathematical Exercises are available in the *Instructor's Manual.* A short tutorial, titled "Brief Review of Derivatives and Optimization" is provided via the instructor resource material available through McGraw-Hill Connect®. This six-page review covers the concept of a derivative, the rules for taking derivatives, unconstrained optimization, and constrained optimization.

Self-Contained Empirical Analysis

The Twelfth Edition continues to offer a self-contained treatment of statistical estimation of demand, production, and cost functions. While this text avoids advanced topics in econometrics and strives to teach students only the fundamental statistical concepts needed to estimate demand, production, and cost, the explanations of statistical procedures nonetheless maintain the rigor found in the rest of the book. For those instructors who do not wish to include empirical analysis in their courses, the empirical content can be skipped with no loss of continuity.

Wide Audience

Managerial Economics is appropriate for undergraduate courses in managerial economics and introductory business strategy courses. At the MBA and Executive MBA level, this book works well for

"boot camp" or "toolkit" courses in managerial economics, and can also be used as a supplemental text for business strategy and organizational architecture courses. The self-contained nature of the book is especially valuable in night classes, online courses, and Executive MBA courses where students typically have a somewhat limited opportunity to meet with instructors for help outside class.

SUPPLEMENTS

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

Online Appendices and Web Chapter

The *Online Appendices* cover topics that may interest a somewhat narrower group of students and instructors. The following Online Appendices are available:

- Substitution and Income Effects of a Price Change
- Estimating and Forecasting Industry Demand for Price-Taking Firms
- Linear Programming
- Pricing Multiple Products Related in Production

A *Web Chapter* is also available, which, like the appendices, covers a special interest topic. Unlike the appendices, the *Web Chapter* is more robust in length and contains all the elements of a chapter, including, a summary, Technical Problems, and Applied Problems. The following Web Chapter is available:

- The Investment Decision

Test Bank

The *Test Bank* offers well over 1,500 multiple-choice and fill-in-the-blank questions categorized by level of difficulty, AACSB learning categories, Bloom's taxonomy, and topic.

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. 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. *EZ Test Online* gives you a place to administer your EZ Test-created exams and quizzes online. Additionally, you can access the test bank through McGraw-Hill Connect®.

Instructor's Manual

Written by the author, the *Instructor's Manual* contains Answers to the end-of-chapter Applied Problems and the Mathematical Exercises. Beginning with this Twelfth Edition, the Homework Exercises section moves from the *Student Workbook* to the *Instructor's Manual*. Instructors can assign any or all of these Homework Exercises to students for extra practice. Since the students do not have access to the answers, the Homework Exercises provide an additional set of problems for grading beyond those already available in the Test Bank. In contrast to the Test Bank questions, Homework Exercises are not multiple-choice questions and are designed to look very similar to Technical and Applied Problems found in the textbook.

Duplicate Technical Problems with Answers

For this Twelfth Edition, an entire set of new, duplicate Technical Problems with answers is available to instructors. This additional set of Technical Problems is designed to offer matching problems that instructors can choose to use as additional exercises, as homework assignments, or as exam questions. Students do not have access to either the questions or the answers, and the decision to make answers available to students is the instructor's decision to make. These additional Technical Problems can be accessed by instructors through McGraw-Hill Connect®.

PowerPoint Presentations

PowerPoint Presentations created by Victoria Perk contain animated figures and tables presented in each chapter to make presentations flow in a step-by-step fashion. You can edit, print, or rearrange the slides to fit the needs of your course.

DIGITAL SOLUTIONS

McGraw-Hill Connect®

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

Mcgraw-Hill's Connect Features

Connect allows faculty to create and deliver exams easily with selectable test bank items. Instructors can also build their own questions into the system for homework or practice. Other features include:

- **Instructor Library**—The Connect 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. The Connect Instructor Library includes all of the instructor supplements for this text.
- **Student Resources**—The Web Chapter and Online Appendices are available to students via the Student Resource Library.
- **Student Progress Tracking**—Connect keeps instructors informed about how each student, section, and class is performing, allowing for more productive use of lecture and office hours. The progress-tracking function enables you to:
  - View scored work immediately and track individual or group performance with assignment and grade reports.
  - Access an instant view of student or class performance relative to learning objectives.
  - Collect data and generate reports required by many accreditation organizations, such as AACSB.
- **Diagnostic and Adaptive Learning of Concepts**—LearnSmart and SmartBook offer the first and only adaptive reading experience designed to change the way students read and learn.

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

- Applies an intelligent concept engine to identify the relationships between concepts and to serve new concepts to each student only when he or she is ready.
- Adapts automatically to each student, so students spend less time on the topics they understand and practice more those they have yet to master.
- Provides continual reinforcement and remediation, but gives only as much guidance as students need.
- Integrates diagnostics as part of the learning experience.
- Enables you to assess which concepts students have efficiently learned on their own, thus freeing class time for more applications and discussion.

SMARTBOOK®

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

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NEW FEATURES IN THE TWELFTH EDITION

As with every new edition, I have made a number of revisions to the text by adding new Illustrations, updating and improving topic coverage as needed, and developing a few more Technical and Applied Problems. In this Twelfth Edition, I retired two Illustrations: Illustration 1.3, "Is Baseball Going Broke? Accounting Profits vs. Market Values" and Illustration 2.2, "Do Buyers Really Bid Up Prices?" These retired Illustrations, along with all the other retired Illustrations from past editions, can still be accessed through the Student Library via McGraw-Hill Connect. Five Illustrations are new for this edition:

- Illustration 1.3, "How Do You Value a Golf Course? Estimating the Market Price of a Business"
- Illustration 2.2, "Effects of Changes in Determinants of Supply"
- Illustration 6.1, "$P \times Q$ Measures More Than Just Business's Total Revenue"
- Illustration 12.2, "Diamonds Are Forever—Entry Barriers Are Not"
- Illustration 14.1, "Greyhound Ditches Uniform Pricing for Dynamic Pricing"

In addition to these new Illustrations, Illustration 7.3, "Forecasting New-Home Sales: A Time-Series Forecast" is completely revised using the most recent data for new-home sales. The following recaps the major chapter-by-chapter changes:

- In Chapter 1, the discussion of problems arising from the separation of ownership and control of businesses is revised and updated to more carefully address the concepts of conflicting goals and monitoring problems associated with hidden actions and moral hazard. The presentation of this topic is now more consistent with the modern treatment of incomplete contracts and incomplete information. I chose to not draw the distinction between adverse selection and moral hazard because the outcome of adverse selection in the context of owners and managers is ultimately just the moral hazard: the manager with unknowable and hidden "bad" traits will make non-value-maximizing decisions. While principal–agent problems and corporate control mechanisms are fascinating and complex,

coverage in the Twelfth Edition is brief and fundamental, yet still complete enough to stir the interest of better students who may wish to pursue advanced elective courses in business strategy and organization.

- Also new in Chapter 1, Illustration 1.3 examines a "real-world" rule-of-thumb approach to valuing a business's future stream of expected profit, one that is reportedly used by real estate brokers who specialize in selling golf courses. They simplify the valuation process by treating the purchase of a golf course as buying this year's profit in perpetuity. Although this rule of thumb is no doubt too simplistic, students find the simple technique of dividing the single-period profit by the risk-adjusted discount rate to be "useful." Illustration 1.3 discusses the circumstances under which we can reasonably expect to find an equivalence between this simple rule of thumb and the textbook computation of the present value of the stream of future expected profits. To accommodate the students' interest in this topic, I have extended the Mathematical Appendix in Chapter 1 to cover computing present value of a perpetuity along with a quantitative problem that applies this technique.
- Also included in new Illustration 1.3 is a brief explanation of the concept of "enterprise value" (EV), a term now widely used in business publications and investment blogs. EV is promoted as a convenient way to relate the present value of expected profits to the market price paid for a firm. To compute the firm's EV, the transacted market price of a firm is adjusted for the firm's capital structure by subtracting from market price the value of any cash balances the firm may possess and adding the value of any debt obligations that would need to be settled by the firm's buyer at the time of purchase: enterprise value = market price of firm − cash + debt.
- In Chapter 2, a new Illustration 2.2 does for supply what Illustration 2.1 does for demand—it gives students some more examples of variables that shift the supply curve. Illustration 2.2 reinforces the idea that supply curve shifts should be viewed as horizontal shifts in supply, rather than "up" or "down" shifts. Chapter 2 also adopts a rather minor change in notation that should be mentioned here to head off any confusion that might arise. The notation for the expected price of a good in the future is modified slightly to clear up any possible confusion that buyers' expectations of future prices are somehow equivalent to sellers' expectations of future prices. This edition no longer uses P_e to denote *both* demand-and supply-side effects of expected price. Following the convention already adopted in past editions, the subscript for the demand-side variable is henceforth denoted with uppercase E (P_E) and the supply-side variable continues to be denoted with lowercase e (P_e). As a consequence of this change, P_E no longer denotes equilibrium price. $\overline{P}$ now denotes equilibrium price and $\overline{Q}$ denotes equilibrium quantity.
- In Chapter 6, new Illustration 6.1, "$P \times Q$ Measures More Than Just Business's Total Revenue," reminds students that total revenue also measures the total expenditure by consumers on a good or service. The Illustration then shows how to employ demand elasticity to predict the effect of price changes on *consumer expenditures*, which, of course, is the same as predicting the effect of price changes on *total revenue*. Illustration 6.1 can seem obvious or even trivial to instructors, but students often see it clarifying the simple idea.
- In Chapter 7, as previously mentioned, I have updated Illustration 7.3, "Forecasting New-Home Sales: A Time-Series Forecast," by collecting the new-home sales data covering the 36-month period January 2012–December 2014.

Using the latest data, the seasonal dummy variable regression and forecasting model works quite well again to illustrate the power of this rather simple method of capturing seasonal buying patterns on monthly sales of new homes.

- One new Technical Problem is added to both Chapters 11 and 12, and two new Applied Problems have been added to Chapter 12, along with new Illustration 12.2, "Diamonds Are Forever—Entry Barriers Are Not." The new Illustration examines the nature of entry barriers in the New York City taxi cab market and explains how these barriers are now disappearing as a result of new smartphone app-based car services supplied by Uber, Lyft, and Gett.
- Finally, in Chapter 14, new Illustration 14.1, "Greyhound Ditches Uniform Pricing for Dynamic Pricing," discusses the value to Greyhound Bus Company of moving away from uniform pricing to a form of price discrimination called *dynamic pricing*. Although neither the illustration nor the text attempts to model dynamic pricing, students can nonetheless see how Greyhound can profit from charging different prices at different times for the same bus trip.

In addition to the changes in the textbook, the Twelfth Edition also improves the Supplements, which are available to students and instructors via McGraw-Hill Connect. Possibly the most useful of these improvements is the significant expansion in the number of problems available in the Homework Exercises supplement, which as previously noted is now located in the *Instructors' Manual*.

As always, I continue to rely heavily on suggestions for improvement from both students and instructors. I encourage you to contact me directly (crthomas1@usf.edu) with any thoughts you may have for improving the textbook or the accompanying supplements.

A WORD TO STUDENTS

One of the primary objectives in writing this book is to provide you, the student, with a book that enhances your learning experience in managerial economics. However, the degree of success you achieve in your managerial economics course will depend, in large measure, on the effectiveness of your study techniques. I would like to offer you this one tip on studying: Emphasize *active* study techniques rather than *passive* study techniques. Passive study techniques are the kinds of study routines that do not require you to "dig out" the logic for yourself. Some examples of *passive* study activities include reading the text, reviewing class notes, and listening to lectures. These are "passive" in nature because the authors of your textbook or your instructor are providing the analytical guidance and logic for you. You are simply following someone else's reasoning process, working your mind only hard enough to follow along with the authors or instructor. Passive techniques do not cause your brain to "burn" new neural pathways or networks. Generally speaking, students gravitate toward passive study methods, because they are easier and less exhausting than active study methods.

Active study techniques require you to think and reason for yourself. For example, when you close your book, put aside your lecture notes, and try to explain a concept to yourself—perhaps sketching a graph or developing your own numerical example. Only then are you forcing your brain to "burn" a logical path of neurons that will make sense to you later. The better you can explain the "how" and "why" of key concepts and principles in this book, the more thorough will be your understanding and the better you will perform on exams. Of course, some passive study is necessary to become familiar with the material, but genuine understanding and the ability to use the decision-making skills of managerial economics require emphasis on active, rather than passive, study techniques.

ACKNOWLEDGMENTS

Many of the best ideas for improving a textbook come from colleagues, adopters, reviewers, and students. This revision was no exception.

As always, I am grateful to the entire editorial and production team at McGraw-Hill for their considerable help making this revision possible. I would like especially to thank Christina Kouvelis and Sarah Otterness for their thoroughness and good cheer with the substantial editorial work required to complete successfully this Twelfth Edition. Dheeraj Chahal deserves appreciation for his wonderful job managing the process of compositing this book.

I also received numerous comments from my colleagues and adopters that helped improve the topic coverage and as well as some details of exposition. Comments from Professor Yu Leng at Shanghai Jiaotong University were especially helpful. And I would like to thank Ilya Malkov, one of my best economics students, for his willingness to proof read and check the solutions to the many new Technical Problems introduced in this edition.

Finally, I wish to thank my wife and daughter, Shelly and Brooke, for all their love and support during this project. They too are very much part of the team that makes this book possible.

Christopher R. Thomas
Tampa, Florida

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Chapter 1

Managers, Profits, and Markets

After reading this chapter, you will be able to:

1.1 Understand why managerial economics relies on microeconomics and industrial organization to analyze business practices and design business strategies.

1.2 Explain the difference between economic and accounting profit and relate economic profit to the value of the firm.

1.3 Describe how separation of ownership and management can lead to a principal–agent problem when goals of owners and managers are not aligned and monitoring managers is costly or impossible for owners.

1.4 Explain the difference between price-taking and price-setting firms and discuss the characteristics of the four market structures.

1.5 Discuss the primary opportunities and threats presented by the globalization of markets in business.

> *Student of managerial economics: Will I ever use this?*
> *Professor: Only if your career is successful.*

Success in the business world, no matter how you slice it, means winning in the marketplace. From CEOs of large corporations to managers of small, privately held companies—and even nonprofit institutions such as hospitals and universities—managers of any of these kinds of organizations cannot expect to make successful business decisions without a clear understanding of how market forces create both opportunities and constraints for business enterprises. Business publications such as *The Wall Street Journal,*

Bloomberg Businessweek, The Economist, Harvard Business Review, Forbes, and *Fortune* regularly cover the many stories of brilliant and disastrous business decisions and strategies made by executive managers. Although luck often plays a role in the outcome of these stories, the manager's understanding—or lack of understanding—of fundamental economic relations usually accounts for the difference between success and failure in business decisions. While economic analysis is not the only tool used by successful managers, it is a powerful and essential tool. Our primary goal in this text is to show you how business managers can use economic concepts and analysis to make decisions and design strategies that will achieve the firm's primary goal, which is usually the maximization of profit.

Publishers roll out dozens of new books and articles each year touting the latest strategy *du jour* from one of the year's most "insightful" business gurus. The never-ending parade of new business "strategies," buzzwords, and anecdotes might lead you to believe that successful managers must constantly replace outdated analytical methods with the latest fad in business decision making. While it is certainly true that managers must constantly be aware of new developments in the marketplace, a clear understanding of the economic way of thinking about business decision making is a valuable and timeless tool for analyzing business practices and strategies. Managerial economics addresses the larger economic and market forces that shape both day-to-day business practices, as well as strategies for sustaining the long-run profitability of firms. Instead of presenting cookbook formulas, the economic way of thinking develops a systematic, logical approach to understanding business decisions and strategies—both today's and tomorrow's.

While this text focuses on making the most profitable business decisions, the principles and techniques set forth also offer valuable advice for managers of nonprofit organizations such as charitable foundations, universities, hospitals, and government agencies. The manager of a hospital's indigent-care facility, for example, may wish to minimize the cost of treating a community's indigent patients while maintaining a satisfactory level of care. A university president, facing a strict budget set by the state board of regents, may want to enroll and teach as many students as possible subject to meeting the state-imposed budget constraint. Although profit maximization is the primary objective addressed in this text, the economic way of thinking about business decisions and strategies provides *all* managers with a powerful and indispensible set of tools and insights for furthering the goals of their firms or organizations.

1.1 THE ECONOMIC WAY OF THINKING ABOUT BUSINESS PRACTICES AND STRATEGY

Because this text relies primarily on economic theory to explain how to make more profitable business decisions, we want to explain briefly how and why economic theory is valuable in learning how to run a business. Managerial economics applies the most useful concepts and theories from two closely related areas of economics—microeconomics and industrial organization—to create a systematic, logical way of analyzing business practices and tactics designed to get the most profit, as well as formulating strategies for sustaining or protecting these profits in the long run.

Economic Theory Simplifies Complexity

No doubt you have heard statements such as "That's OK in theory, but what about the real world?" or "I don't want ivory-tower theorizing; I want a practical solution." Practical solutions to challenging real-world problems are seldom found in cookbook formulas, superficial rules of thumb, or simple guidelines and anecdotes. Profitable solutions generally require that people understand how the real world functions, which is often far too complex to comprehend without making the simplifying assumptions used in theories. Theory allows people to gain insights into complicated problems using simplifying assumptions to make sense out of confusion, to turn complexity into relative simplicity. By abstracting away from the irrelevant, managers can use the economic way of thinking about business problems to make predictions and explanations that are valid in the real world, even though the theory may ignore many of the actual characteristics of the real world. And, as we like to remind students, if it doesn't work in theory or concept, it is highly unlikely to work in practice.

Using economic theory is in many ways like using a road map. A road map abstracts away from nonessential items and concentrates on what is relevant for the task at hand. Suppose you want to drive from Dallas to Memphis. Having never made this trip, you need to have a map. So, you log on to the Internet and go to Google maps, where you get to choose either a satellite view of the region between Dallas and Memphis or a simple street view. The satellite view is an exact representation of the real world; it shows every road, tree, building, cow, and river between Dallas and Memphis. While the satellite view is certainly fascinating to look at, its inclusion of every geographic detail makes it inferior to the much simpler street view in its ability to guide you to Memphis. The simpler street view is better suited to guide you because it abstracts from reality by eliminating irrelevant information and showing only the important roads between Dallas and Memphis. As such, the (abstract) street view gives a much clearer picture of how to get to Memphis than the (real-world) satellite view. Likewise, the economic approach to understanding business reduces business problems to their most essential components.

The Roles of Microeconomics and Industrial Organization

microeconomics
The study of individual behavior of consumers, business firms, and markets, and it contributes to our understanding of business practices and tactics.

As we mentioned previously, managerial economics draws on two closely related areas of economic theory: microeconomics and industrial organization. If you have taken a basic course in economics, you will recall that **microeconomics** is the study and analysis of the behavior of individual segments of the economy: individual consumers, workers and owners of resources, individual firms, industries, and markets for goods and services. As a necessary means for addressing the behavior of rational individuals (both consumers and producers), microeconomics develops a number of foundation concepts and optimization techniques that explain the everyday business decisions managers must routinely make in running a business. These decisions involve such things as choosing the profit-maximizing production level, deciding how much of the various productive inputs to purchase in order to produce the chosen output level at lowest total cost,

ILLUSTRATION 1.1

Managerial Economics
The Right ℞ for Doctors

A number of universities offer MBA programs designed specifically for medical doctors. The majority of the doctors enrolled in these specialized programs are seeking to develop the business-decision-making skills they need to manage private and public medical clinics and hospitals.

Doctors are understandably most interested in courses that will quickly teach them practical business skills. In managerial economics, they have found many valuable tools for business decision making and have been quick to apply the principles and tools of managerial economics to a variety of business problems in medicine. Some of the more interesting of these applications, all of which are topics you will learn about in this text, are discussed here:

- *Irrelevance of fixed costs in decision making:* Nearly all the physicians admitted to making some decisions based on fixed costs. A director of a radiation oncology department complained that many of her hospital's administrative costs are included as part of the incremental costs of treating additional patients. While the hospital prided itself in moving toward a marginal cost pricing structure for services, the accounting department's calculation of marginal cost was inflated by fixed administrative costs.
- *Price discrimination:* A doctor specializing in vasectomies wanted to increase revenue by engaging in price discrimination. After a lengthy discussion about the legality of charging different prices for medical services, he decided to promote his vasectomy clinic by placing a $40-off coupon in the local newspaper's TV guide. He believes that only lower income patients will clip the coupon and pay the lower price.
- *Advertising dilemma:* After a class discussion on the advertising dilemma in oligopoly markets, a doctor who specializes in LASIK eye surgery expressed her relief that none of the other three LASIK surgeons in her small town had shown any interest in advertising their services. She decided it would not be wise for her to begin running radio ads.
- *Linear trend forecasting:* Several physicians used linear trend analysis to forecast patient load. An administrator of a hospital's emergency room services found that using "day-of-week" dummy variables, he could offer hospital administrators statistical evidence—instead of his casual observation—that certain days of the week tend to be (statistically) significantly busier than others.
- *Strategic entry deterrence:* A doctor in New Orleans decided to open new clinics in Baton Rouge and Morgan City. No other clinics like his are currently operating in these two cities. In order to discourage other doctors from opening similar clinics, he plans to price his services just slightly above average total cost but significantly below the price that would maximize profit under monopoly.
- *Profit maximization vs. revenue maximization:* A doctor with a 25 percent ownership interest in a pharmaceutical supply firm realized during class that his sales manager is probably selling too many units because the manager's compensation is based substantially on commissions. The doctor plans to recommend raising drug prices to sell fewer units and to begin paying the sales manager a percentage of profit.
- *Economies of scale and scope:* Hospital managers perceive the current trend toward "managed care" to be forcing hospitals to reduce costs without reducing quality. Economies of scale and scope, to the extent that such economies exist, offer an attractive solution to the need for cost reduction. Hospital administrators in the class were especially interested in empirical methods of measuring economies of scale in order to plan for future expansion or contraction.
- *Cost-minimizing input combination:* One doctor who owns and manages a chain of walk-in clinics decided to reduce the employment of MDs and increase the employment of RNs on the basis of

classroom discussion of cost minimization. Apparently, for many of the procedures performed at the clinic, experienced nurses can perform the medical tasks approximately as well as the physicians, as long as the nurses are supervised by MDs. The doctor-manager reasoned that even though MDs have higher marginal products than RNs, the marginal product per dollar spent on RNs exceeded the marginal product per dollar spent on MDs.

Business publications report that doctors with MBA degrees are becoming increasingly powerful in the medical profession as hospitals, health maintenance organizations, and other types of health care clinics hire them to manage the business aspect of health care. Some doctors, as well as the American Medical Association, are opposed to blending business and medical values. Given the nature of the applications of managerial economics cited here, it appears that a course in managerial economics offers doctors insights into the business of medicine that they would not usually get in medical school. Many doctors think this knowledge is good medicine.

choosing how much to spend on advertising, allocating production between two or more manufacturing plants located in different places, and setting the profit-maximizing price(s) for the good(s) the firm sells.

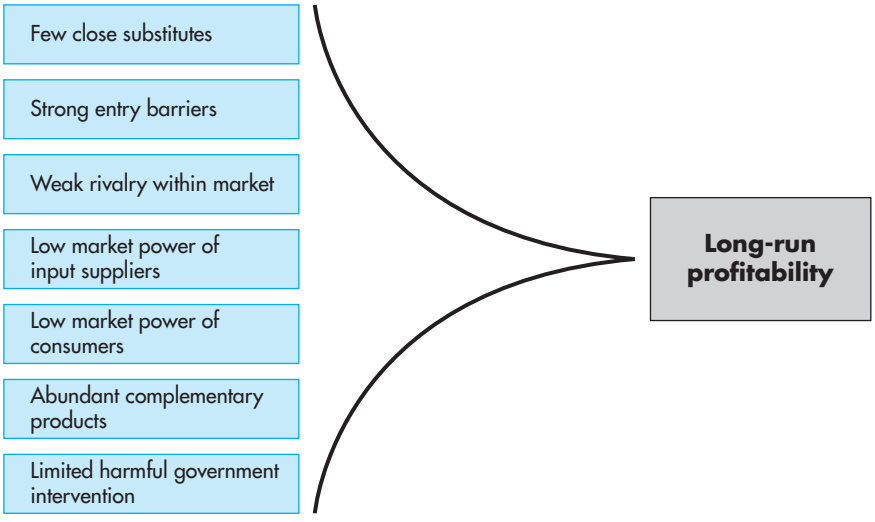
These routine business decisions, made under the prevailing market conditions, are sometimes referred to as *business practices or tactics* to distinguish them from *strategic decisions,* which involve business moves designed intentionally to influence the behavior of rival firms. In other words, the firm's management team makes many decisions about **business practices** or **tactics** to create the greatest possible profit for the specific business environment faced by the firm. Because business practices typically involve maximizing or minimizing something, the field of microeconomics can be extremely helpful in understanding how to make these operating decisions. As we will stress throughout this book, microeconomics, with its emphasis on maximizing and minimizing processes, provides a kind of all-purpose, Swiss army knife for explaining how to make the most profitable business decisions. Once you get the hang of this approach, you will see that managerial economics is really just a series of repeated applications of a general method of reasoning known as "marginal analysis." In Chapter 3, we will explain and illustrate the powerful logic of marginal analysis. Economists like to say that marginal analysis provides "the key to the kingdom of microeconomics." Given the central role of microeconomics in managerial economics, we can safely tell you that marginal analysis also provides "the key to the kingdom of *managerial* economics."

business practices or **tactics**
Routine business decisions managers must make to earn the greatest profit under the prevailing market conditions facing the firm.

While microeconomics serves as our "Swiss army knife" for explaining most business practices, a specialized branch of microeconomics, known as *industrial organization,* gives us an additional, complementary tool for business analysis. **Industrial organization,** which focuses specifically on the behavior and structure of firms and industries, supplies considerable insight into the nature, motivation, and consequences of strategic actions firms may wish to undertake. Many of the most important developments in business analysis and strategic thinking over the past 30 years flow directly from advances in the theory of industrial organization. Most of the discussion in this text about strategic decision making can be attributed to these advances in the field of industrial organization.

industrial organization
Branch of microeconomics focusing on the behavior and structure of firms and industries.

FIGURE 1.1
Economic Forces That Promote Long-Run Profitability



strategic decisions
Business actions taken to alter market conditions and behavior of rivals in ways that increase and/or protect the strategic firm's profit.

Strategic decisions differ from routine business practices and tactics because strategic decisions do not accept the existing conditions of competition as fixed, but rather attempt to shape or alter the circumstances under which a firm competes with its rivals. In so doing, strategic decisions can create greater profits and, in some cases, protect and sustain the profits into the future. While common business practices and tactical decisions are necessary for keeping organizations moving toward their goals—usually profit-maximization—strategic decisions are, in a sense, "optional" actions managers might be able to undertake should circumstances arise making a strategy suitable and likely to succeed. In Chapter 13, we will show you how to apply a variety of concepts from game theory and industrial organization to design strategic moves to make more profit.

With its emphasis on noncooperative game theory and the behavior of firms when rivals are few in number, industrial organization concepts now play a central role in every modern course in business strategy. Business strategists rely heavily on the field of industrial organization to identify and examine the economic forces that influence the long-run profitability of businesses. Figure 1.1 shows a list of economic forces that determine the *level* of profit a firm can expect to earn in the long run and the *durability* of long-run profits.[1] As a business or economics major, you may wish to take an entire course in industrial organization to learn about these forces. In this book, we will cover most of these factors in varying degrees of detail. We are confident that when you finish this course, you will agree that

[1]Michael Porter, in his book *Competitive Strategy*, New York: Free Press, 1980, examines the first five forces in Figure 1.1. His pioneering work, called "Five Forces Analysis," remains a widely studied framework in business strategy courses. More recently, Adam Brandenburger and Barry Nalebuff have added complementarity of products and inputs to the list of economic forces affecting long-run profitability. See their book, *Co-Opetition*, New York: Doubleday, 1996.

managerial economics covers a wide range of important business decisions and offers a powerful, indispensable view of the business world.

1.2 MEASURING AND MAXIMIZING ECONOMIC PROFIT

As mentioned previously, the primary purpose of this text is to show managers how to make decisions that will generate the most profit for their businesses. Profit serves as the score in the "game" of business. It's the amount by which revenues exceed costs. And when costs exceed revenues, the resulting negative profits, or losses, signal owners in no uncertain terms that they are reducing their wealth by owning and running unprofitable businesses. The success of managers' decisions is judged according to a single overriding concern: Are managers' decisions creating higher or lower profits? Managers who can make the largest possible profits not only enrich the owners of firms—and managers are often part or full owners of firms they manage—but they also create for themselves a reputation for profitable decision making that can be worth millions of dollars in executive compensation. Thus, it is crucial for managers to understand how the "score" is calculated and how to achieve the highest possible score without getting sidetracked by issues that don't affect the score. It is essential that managers never forget that the goal of the firm is to maximize economic profits. Nothing else matters in the world of business as much as profit does because the value of a business and the wealth of its owners are determined solely by the amount of profits the firm can earn.

After hearing so much news about scandals over financial reporting errors, as well as several spectacular cases of management and accounting fraud—think Enron, WorldCom, and MF Global—you probably won't be surprised when we explain in this section why "profits" reported in corporate financial statements generally overstate the profitability of firms. The tendency for overstating profits examined in this section, however, has nothing to do with accounting mistakes or fraud. Indeed, the reason accounting reports of profit (which accountants may call net income, net earnings, or net profit, depending on the circumstances) poorly reflect the actual profitability of firms can be explained by examining the generally accepted accounting practices set forth by professional accounting associations subject to approval from government agencies. Before we can explain why financial accounting procedures overstate business profitability, we must first show you how to measure the economic costs businesses incur when using resources to produce goods or services.

Economic Cost of Using Resources

As you know, businesses produce the goods or services they sell using a variety of resources or productive inputs. Many kinds of labor services and capital equipment inputs may be employed along with land, buildings, raw materials, energy, financial resources, and managerial talent. The economic cost of using resources to produce a good or service is the *opportunity cost* to the owners of the firm using those resources. The **opportunity cost** of using any kind of resource is what the owners of a business must give up to use the resource.

opportunity cost
What a firm's owners give up to use resources to produce goods or services.