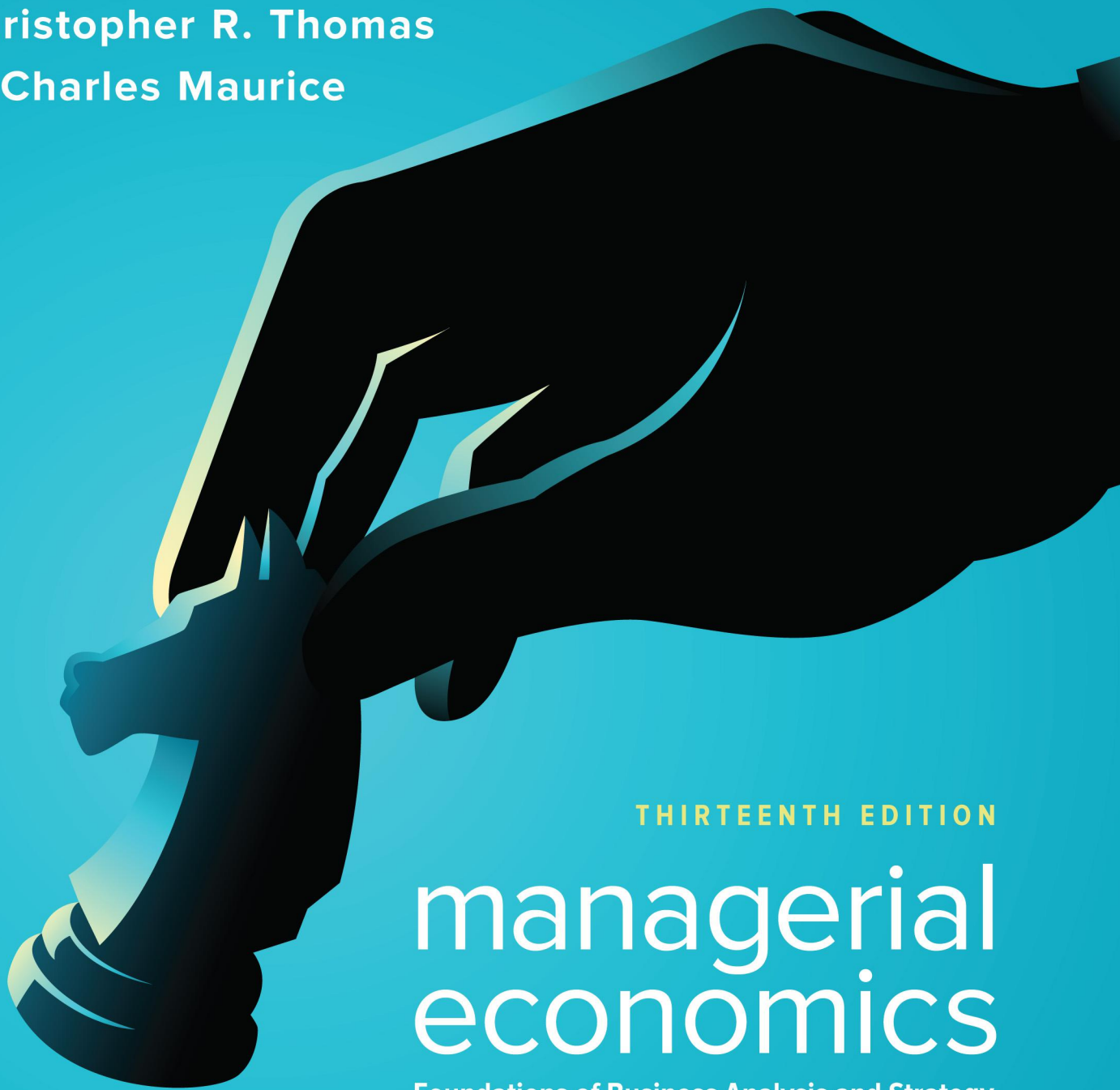
Christopher R. Thomas
S. Charles Maurice



THIRTEENTH EDITION

managerial economics

Foundations of Business Analysis and Strategy

Mc Graw Hill Education

MANAGERIAL ECONOMICS

Foundations of Business Analysis and Strategy

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

This book is printed on acid-free paper.

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

ISBN 978-1-260-00475-5 (bound edition)
MHID 1-260-00475-9 (bound edition)
ISBN 978-1-260-50633-4 (loose-leaf edition)
MHID 1-260-50633-9 (loose-leaf edition)

Portfolio Manager: *Andy Weekes*
Product Developer: *Kevin White*
Marketing Manager: *Bobby Pearson*
Content Project Managers: *Melissa M. Leick, Samantha Donisi-Hamm, Karen Jozefowicz*
Buyer: *Susan K. Culbertson*
Design: *Jessica Cuevas*
Content Licensing Specialist: *Missy Homer*
Cover Image: *©Shutterstock/rudall30*
Compositor: *SPi Global*

Library of Congress Cataloging-in-Publication Data
Names: Thomas, Christopher R., author.
Title: Managerial economics : foundations of business analysis and strategy / Christopher R. Thomas.
Description: Thirteenth edition. | New York, NY : McGraw-Hill Education, [2020]
Identifiers: LCCN 2019018228 | ISBN 9781260004755 (alk. paper)
Subjects: LCSH: Managerial economics.
Classification: LCC HD30.22 .M39 2020 | DDC 338.5024/658—dc23
LC record available at https://lccn.loc.gov/2019018228

mheducation.com/highered

MANAGERIAL ECONOMICS

Foundations of Business Analysis and Strategy

THIRTEENTH EDITION

Christopher R. Thomas

University of South Florida

S. Charles Maurice

Texas A&M University
Late Professor Emeritus

Mc Graw Hill

The McGraw-Hill Series Economics

Essentials of Economics

Brue, McConnell, and Flynn
Essentials of Economics
Fourth Edition

Mandel
Economics: The Basics
Fourth Edition

Schiller
Essentials of Economics
Eleventh Edition

Principles of Economics

Asarta and Butters
Principles of Economics
Second Edition

Colander
Economics, Microeconomics, and Macroeconomics
Eleventh Edition

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

Frank, Bernanke, Antonovics, and Heffetz
Streamlined Editions: Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics
Fourth Edition

Karlan and Morduch
Economics, Microeconomics, and Macroeconomics
Third Edition

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

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

Samuelson and Nordhaus
Economics, Microeconomics, and Macroeconomics
Nineteenth Edition

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

Slavin
Economics, Microeconomics, and Macroeconomics
Twelfth Edition

Economics of Social Issues

Guell
Issues in Economics Today
Ninth Edition

Register and Grimes
Economics of Social Issues
Twenty-First Edition

Econometrics and Data Analytics

Hilmer and Hilmer
Practical Econometrics
First Edition

Prince
Predictive Analytics for Business Strategy
First Edition

Managerial Economics

Baye and Prince
Managerial Economics and Business Strategy
Ninth Edition

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

Thomas and Maurice
Managerial Economics
Thirteenth Edition

Intermediate Economics

Bernheim and Whinston
Microeconomics
Second Edition

Dornbusch, Fischer, and Startz
Macroeconomics
Thirteenth Edition

Frank
Microeconomics and Behavior
Ninth Edition

Advanced Economics

Romer
Advanced Macroeconomics
Fifth Edition

Money and Banking

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

Urban Economics

O'Sullivan
Urban Economics
Ninth Edition

Labor Economics

Borjas
Labor Economics
Eighth Edition

McConnell, Brue, and Macpherson
Contemporary Labor Economics
Twelfth Edition

Public Finance

Rosen and Gayer
Public Finance
Tenth Edition

Environmental Economics

Field and Field
Environmental Economics: An Introduction
Eighth Edition

International Economics

Appleyard and Field
International Economics
Ninth Edition

Pugel
International Economics
Seventeenth Edition

To Shelly and Brooke

ABOUT THE AUTHORS

Christopher R. Thomas

Christopher R. Thomas is associate professor of economics at University of South Florida (USF), where he has spent the past 37 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. 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.*

PREFACE

WHY MANAGERIAL ECONOMICS?

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 Thirteenth 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) to one or more Technical Problems specifically designed to build

Now try Technical Problem 3.

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 Thirteenth 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:

- 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.

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 Thirteenth 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

An entire set of 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 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.

REVISIONS IN THE THIRTEENTH EDITION

I have updated and revised material in a number of places throughout the book to make improvements in clarity and content. Most of these changes are minor and do not need to be highlighted here. Several of the revisions for this edition, however, need to be identified here:

- Illustration 1.2 in Chapter 1 has been revised and updated using my own analysis of data from the top 100 Fortune 500 companies in 2016 to illustrate the sizable distortion between reported accounting profit and a firm's real economic profit of doing business caused by current accounting rules that treat the equity cost of capital as zero.
- The treatment of substitution and income effects of price changes on demand for goods and services has been moved from an online appendix back into the body of Chapter 5. Section 5.7 expands the presentation formerly located in the Online Appendix 1. I now explicitly describe substitution and income effects for both price increases and decreases for both normal and inferior goods. Two new graphs summarize these four situations. I have also added new Technical Problems to Chapter 5 that cover this topic.
- The discussion of sunk and avoidable costs in Chapter 8 has been slightly revised and an

additional Technical Problem added to help students better distinguish between the two types of costs. This extra effort in Chapter 8 is expected to aid students in understanding the reason for ignoring sunk costs when making the short-run decision to shut down in Chapters 11 and 12.

- The analytical development of the competitive long-run industry supply curve in Chapter 11 has been substantially revised. Better graphs and new Technical Problems are features in this Thirteenth Edition that should give students a more solid understanding of industry supply curves in constant- and increasing-cost industries.
- In Chapter 13, the presentation of limit pricing has been revised to improve clarity concerning the strategic requirements for limit pricing to successfully deter entry even as the incumbent firm continues to earn positive economic profit.

As always, I continue to rely on the valuable suggestions I regularly receive from both students and instructors for guidance in making changes and improvements to this book. I strongly encourage you to contact me directly (crthomas1@usf.edu) with any thoughts and ideas you might 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.

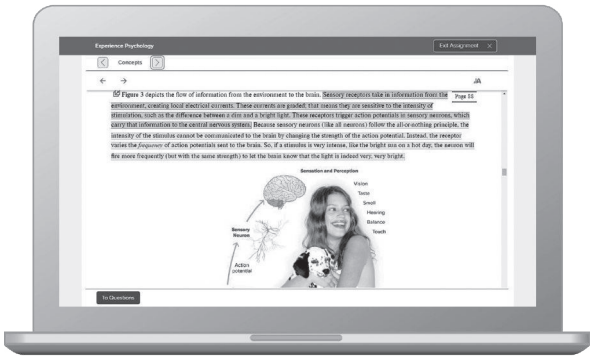
Active study techniques require you to think and reason for yourself. For example, when you close your book, put aside your lecture notes, and try to explain a concept to yourself—perhaps sketching a graph or developing your own numerical example. Only then are you forcing your brain to "burn" a logical 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.

FOR INSTRUCTORS

You're in the driver's seat.

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

65%
Less Time Grading



Laptop: McGraw-Hill Education

They'll thank you for it.

Adaptive study resources like SmartBook® 2.0 help your students be better prepared in less time. You can transform your class time from dull definitions to dynamic debates. Find out more about the powerful personalized learning experience available in SmartBook 2.0 at **www.mheducation.com/highered/connect/smartbook**

Make it simple, make it affordable.

Connect makes it easy with seamless integration using any of the major Learning Management Systems—Blackboard®, Canvas, and D2L, among others—to let you organize your course in one convenient location. Give your students access to digital materials at a discount with our inclusive access program. Ask your McGraw-Hill representative for more information.

Padlock: Jobalou/Getty Images

Solutions for your challenges.

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Our Customer Experience Group can also help you troubleshoot tech problems—although Connect's 99% uptime means you might not need to call them. See for yourself at **status.mheducation.com**

Checkmark: Jobalou/Getty Images

Effective, efficient studying.

Connect helps you be more productive with your study time and get better grades using tools like SmartBook 2.0, which highlights key concepts and creates a personalized study plan. Connect sets you up for success, so you walk into class with confidence and walk out with better grades.

Study anytime, anywhere.

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

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

Calendar: owattaphotos/Getty Images

No surprises.

The Connect Calendar and Reports tools keep you on track with the work you need to get done and your assignment scores. Life gets busy; Connect tools help you keep learning through it all.

Learning for everyone.

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

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

ACKNOWLEDGMENTS

As in past editions, a number of excellent ideas for improving this textbook have come from colleagues, adopters, and students. This revision was no exception, and I would like to identify several people who were especially helpful in this Thirteenth Edition. After making valuable suggestions for the last edition, Professor Yu Leng at Shanghai Jiao Tong University has once again contributed numerous corrections and insightful ideas, as well as overall encouragement to take on this new edition. I also benefited from conversations and extensive written comments from my former colleague, coauthor, and friend, John R. Swinton at Georgia College. While I was unable to incorporate all of John's ideas in this edition, I hope to return to his list in a future edition. A new colleague of mine at USF, Mikael Sandberg, made a convincing case for moving the presentation of substitution and income effects from an online appendix into the body of Chapter 5. Mike also offered advice on the presentation of quasi-fixed costs and the improved section on derivation of long-run industry supply curves in the chapter on perfect competition. Lastly, I am pleased to acknowledge one of my undergraduate economics majors, Justin Taylor, who identified a mistake in a graph for one of the Technical Problems on substitution and income effects, and Zain Nensey, one of my Executive MBA students, who found a mistake in the corporate tax rate in one of the Applied Probems in Chapter 1. As always, any remaining errors, are all mine.

I would also like to express my gratitude to my editorial and production team at McGraw-Hill for their considerable assistance in making this revision possible. Kevin White offered much valuable guidance and strategic assistance, while Sarah Wood efficiently managed the flow of manuscript preparation by keeping all the moving parts moving to the right places at the right times.

Melissa Leick did an outstanding job managing the flow of the entire project. And I am especially thankful to have had Mithun Kothandath and his team of digital compositors at SPi Global doing a masterful job making the final pages look perfect.

Finally, I want to thank my wife, Shelly, and my daughter, Brooke, for all their love and support during this Thirteenth Edition. Shelly and I both know just how much we all owe Chuck Maurice, my mentor and missing coauthor, for his lasting inspiration to write a textbook that students actually want to read. I hope this edition continues to live up to Chuck's standards.

Christopher R. Thomas
Tampa, Florida

BRIEF CONTENTS

Mc Graw Hill
501-1333

CONTENTS

ILLUSTRATIONS IN THE THIRTEENTH EDITION

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 that 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, 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.

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.

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.

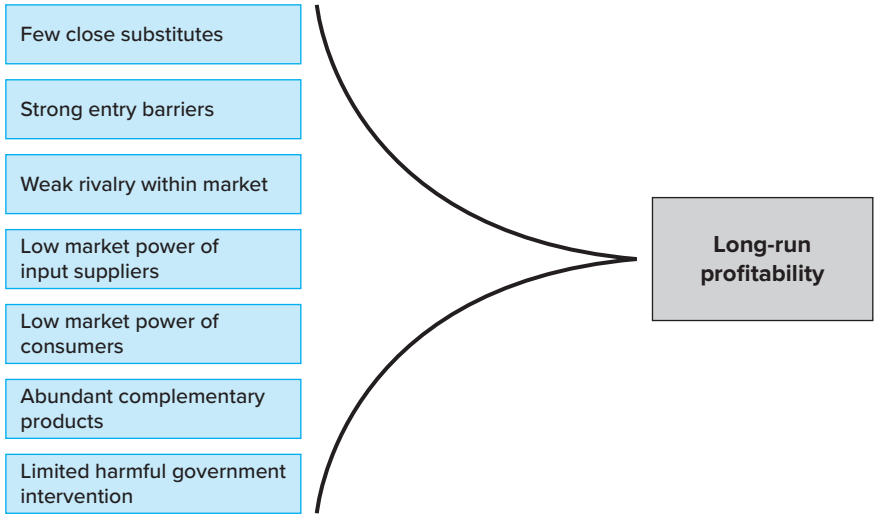
While microeconomics serves as our Swiss army knife for explaining most business practices, a specialized branch of microeconomics, known as *industrial organization,* gives us an additional, complementary tool for business analysis. **Industrial organization,** which focuses specifically on the behavior 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.

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

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.

FIGURE 1.1
Economic Forces That Promote Long-Run Profitability



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 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

[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.

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

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

market-supplied resources
Resources owned by others and hired, rented, or leased in resource markets.

owner-supplied resources
Resources owned and used by a firm.

total economic cost
Sum of opportunity costs of market-supplied resources plus opportunity costs of owner-supplied resources.

As you know, businesses use a variety of resources or productive inputs to produce the goods or services they sell. 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.

The method of measuring opportunity costs differs for various kinds of inputs used by businesses. Businesses utilize two kinds of inputs or resources. One of these categories is **market-supplied resources,** which are resources owned by others and hired, rented, or leased by the firm. Examples of resources purchased from others include labor services of skilled and unskilled workers, raw materials purchased in resource markets from commercial suppliers, and capital equipment rented or leased from equipment suppliers. The other category of resources is **owner-supplied resources.** The three most important types of owner-supplied resources are money provided to the business by its owners, time and labor services provided by the firm's owners, and any land, buildings, or capital equipment owned and used by the firm.

Businesses incur opportunity costs for *both* categories of resources used. Thus, the **total economic cost** of resources used in production is the sum of the opportunity

costs of market-supplied resources and the opportunity costs of owner-supplied resources. Total economic cost, then, represents the opportunity cost of all resources used by a firm to produce goods or services.

explicit costs
Monetary opportunity costs of using market-supplied resources.

The opportunity costs of using *market-supplied* resources are the out-of-pocket monetary payments made to the owners of resources. The monetary payments made for market-supplied inputs are also known as **explicit costs.** For example, one of the resources Apple Inc. needs to manufacture its iMac computer is an Intel Core i7 microprocessor chip. This chip is manufactured by Intel Corp., and Apple can purchase one for $310. Thus, Apple's opportunity cost to obtain the computer chip is $310, the monetary payment to the owner of the input. We want to emphasize here that explicit costs are indeed opportunity costs; specifically, it's the amount of money sacrificed by firm owners to get market-supplied resources.

In contrast to explicit costs of using market-supplied resources, there are no out-of-pocket monetary or cash payments made for using owner-supplied resources. The opportunity cost of using an *owner-supplied* resource is the best return the owners of the firm could have received had they taken their own resource to market instead of using it themselves. These nonmonetary opportunity costs of using a firm's own resources are called **implicit costs** because the firm makes no monetary payment to use its own resources. Even though firms do not make explicit monetary payments for using owner-supplied inputs, the opportunity costs of using such inputs are not zero. The opportunity cost is only equal to zero if the market value of the resource is zero, that is, if no other firm would be willing to pay anything for the use of the resource.

implicit costs
Nonmonetary opportunity costs of using owner-supplied resources.

Even though businesses incur numerous kinds of implicit costs, we will focus our attention here on the three most important types of implicit costs mentioned earlier: (1) the opportunity cost of cash provided to a firm by its owners, which accountants refer to as **equity capital;** (2) the opportunity cost of using land or capital owned by the firm; and (3) the opportunity cost of the owner's time spent managing the firm or working for the firm in some other capacity. For more than 70 years, these implicit costs have been the center of controversy over how accountants should measure the costs of using owner-supplied resources. We will have more to say about this issue in our later discussion of measuring business profit, as well as in Illustration 1.2. Let's first look at examples of each of these implicit costs.

equity capital
Money provided to businesses by the owners.

Initially, and then later as firms grow and mature, owners of businesses—single proprietorships, partnerships, and corporations alike—usually provide some amount of money or cash to get their businesses going and to keep them running. This equity capital is an owner-supplied resource and entails an opportunity cost equal to the best return this money could earn for its owner in some other investment of comparable risk. Suppose, for example, investors use $20 million of their own money to start a firm of their own. Further suppose this group could take the $20 million to the venture capital market and earn a return of 12 percent annually at approximately the same level of risk incurred by using the money in its own business. Thus, the owners sacrifice $2.4 million (= 0.12 × $20 million) annually by providing equity capital to the firm they own. If you don't think this is a real cost, then be sure to read Illustration 1.2.

Now let's illustrate the implicit cost of using land or capital owned by the firm. Consider Alpha Corporation and Beta Corporation, two manufacturing firms that produce a particular good. They are in every way identical, with one exception:

ILLUSTRATION 1.2

Closing the GAAP between Accounting and Economic Profit

As we have emphasized in this chapter, accountants follow reporting rules known as *generally accepted accounting principles*, or *GAAP*, which do not allow most kinds of implicit costs of owner-supplied resources to be deducted from revenues. Failure to deduct these implicit costs causes accounting measures of profit to overstate the actual economic profit earned because economic profit is measured by subtracting the costs of *all* resources used by businesses. Consequently, the accounting entries on financial statements, which are referred to variously as net earnings, earnings after tax, net income, net operating profit after tax, or simply net profit, will nearly always make companies appear to be more profitable and more valuable than if an accurate measure of economic profit were instead reported.

Robert Bartley, one of several experts who have contributed their opinions on the problems with GAAP accounting rules, observed that accounting measures of corporate profit are not even close to measuring economic profit. Bartley argues that economic profit is what matters to shareholders and investors because the value of the business depends directly and fundamentally on economic profit.[a] Another widely respected expert in the field of financial and accounting reporting methods, G. Bennett Stewart, agrees with Bartley's assessment and adds that "accountants simply are not counting what counts or measuring what matters."[b]

We have discussed in this chapter how to measure the implicit costs of several kinds of owner-supplied resources not presently treated as costs under GAAP: the owners' financial capital (i.e., equity capital), physical capital owned (not rented or leased) by a firm, land owned (not rented or leased) by a firm, and any of the owners' time spent managing their own firms. All of these types of implicit costs must be subtracted from revenues in order to bring reported accounting profit in line with economic profits. Bennett Stewart argues consistently in his many articles and books that failure to deduct the opportunity cost of equity capital in financial reporting of business profit generates "a stupendous earnings distortion."[c]

As an example of the magnitude of this "stupendous" distortion, Stewart notes that in 2002 the 500 firms that comprise the Standard and Poor's (S&P) stock index employed about $3 trillion of equity capital, which, at a 10 percent annual opportunity cost of equity capital, represents a resource cost to businesses of $300 billion (0.10 × $3 trillion). To put this cost into perspective (a cost that GAAP completely ignores), Stewart reports that the sum total of all accounting profit for the S&P 500 firms in 2002 was just $118 billion. After subtracting the opportunity cost of equity capital from aggregate accounting profit, the resulting measure of economic profit reveals that these 500 businesses experienced a total loss of $182 billion in 2002. Looking more recently at the profit performance of particular firms in 2017, we constructed the table below that shows 15 of the top 100 firms in the Fortune 500 reported positive accounting profits but actually earned negative economic profits after deducting the opportunity cost of equity capital (calculated at 7.5 percent for all firms). As you can now more fully appreciate, the GAAP between economic and accounting profit creates a sizable distortion that, if corrected, can turn a seemingly profitable business, along with its CEO, into a big loser!

[a]Robert L. Bartley, "Thinking Things Over: Economic vs. Accounting Profit," *The Wall Street Journal,* June 2, 2003, p. A23. Copyright © 2003 Dow Jones & Company, Inc.

[b]G. Bennett Stewart III, "Commentary: Why Smart Managers Do Dumb Things," *The Wall Street Journal,* June 2, 2003, p. A18. Copyright © 2003 Dow Jones & Company.

[c]Ibid.

(*Continued*)

2017 Fortune Top 100 Companies reporting positive accounting profits but earning economic losses

Fortune ranking	Company	Accounting profit	Total shareholder equity	Economic profit
4	Exxon Mobil	$ 7,840	$167,325	−$4,709
26	Bank of America Corp.	17,906	266,840	−2,107
30	Citigroup	14,912	225,120	−1,972
33	State Farm Insurance Cos.	350	87,592	−6,219
34	Phillips 66	1,555	22,390	−124
42	MetLife	800	67,309	−4,248
45	Archer Daniels Midland	1,279	17,173	−9
53	Humana	614	10,685	−187
65	New York Life Insurance	1,088	20,108	−420
68	Nationwide	334	15,537	−831
75	Liberty Mutual Insurance	1,006	20,366	−521
80	TIAA	1,492	35,583	−1,176
89	Exelon	1,134	25,837	−804
93	CHS	424	7,852	−165
97	Northwestern Mutual	818	20,226	−699

Profits and equity in millions of dollars and 7.5% opportunity cost of equity capital.
Source: 2017 Fortune 500 List of company names; accounting profit and total shareholder equity reported in company financial statements.

The owner of Alpha Corp. rents the building in which the good is produced; the owner of Beta Corp. inherited the building the firm uses and therefore pays no rent. Which firm has the higher costs of production? The costs are the same, even though Beta makes no explicit payment for rent. The reason the costs are the same is that using the building to produce goods costs the owner of Beta the amount of income that could have been earned had the building been leased at the prevailing rent. Because these two buildings are the same, presumably the market rentals would be the same. In other words, Alpha incurred an explicit cost for the use of its building, whereas Beta incurred an implicit cost for the use of its building.[2] Regardless of whether the payment is explicit or implicit, the opportunity cost of using the building resource is the same for both firms.

We should note that the opportunity cost of using owner-supplied inputs may not bear any relation to the amount the firm paid to acquire the input. The opportunity

[2]Alternatively, Beta's sacrificed return can be measured as the amount the owner could earn if the resource (the building) were sold and the payment invested at the market rate of interest. The sacrificed interest is the implicit cost when a resource is sold and the proceeds invested. This measure of implicit cost is frequently the same as the forgone rental or lease income, but if they are not equal, the true opportunity cost is the *best* alternative return.

cost reflects the current market value of the resource. If the firm paid $1 million for a plot of land two years ago but the market value of the land has since fallen to $500,000, the implicit cost now is the best return that could be earned if the land is sold for $500,000, not $1 million (which would be impossible under the circumstances), and the proceeds are invested. If the $500,000 could be invested at 6 percent annually, the implicit cost is $30,000 (= 0.06 × $500,000) per year. You should be careful to note that the implicit cost is *not* what the resource could be sold for ($500,000) but rather it is the best return sacrificed each year ($30,000).

Finally, consider the value of firm owners' time spent managing their own businesses. Presumably, if firm owners aren't managing their businesses or working for their firms in other capacities, they could obtain jobs with some other firms, possibly as managers. The salary that could be earned in an alternative occupation is an implicit cost that should be considered as part of the total cost of production because it is an opportunity cost to these owners. The implicit cost of an owner's time spent managing a firm or working for the firm in some other capacity is frequently, though not always, the same as the payment that would be necessary to hire an equivalent manager or worker if the owner does not work for the firm.

We wish to stress again that, even though no explicit monetary payment is made for the use of owner-supplied resources, $1 worth of implicit costs is no less (and no more) of an opportunity cost of using resources than $1 worth of explicit costs. Consequently, both kinds of opportunity costs, explicit and implicit opportunity costs, are added together to get the total economic cost of resource use. We now summarize this important discussion on measuring the economic costs of using resources in a principle:

Principle The opportunity cost of using resources is the amount the firm gives up by using these resources. Opportunity costs can be either explicit costs or implicit costs. Explicit costs are the costs of using market-supplied resources, which are the monetary payments to hire, rent, or lease resources owned by others. Implicit costs are the costs of using owner-supplied resources, which are the greatest earnings forgone from using resources owned by the firm in the firm's own production process. Total economic cost is the sum of explicit and implicit costs.

Now try Technical Problem 1.

Figure 1.2 illustrates the relations set forth in this principle. Now that we have shown you how to measure the cost of using resources, we can explain the difference between economic profit and accounting profit.

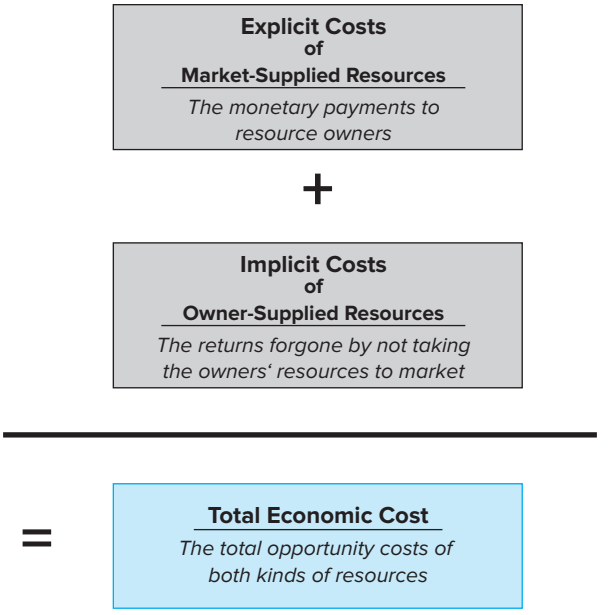
Notice to students: The notebooks in the left margin throughout this text are directing you to work the enumerated Technical Problems at the end of the chapter. Be sure to check the answers provided for you at the end of the book *before* proceeding to the next section of a chapter. We have carefully designed the Technical Problems to guide your learning in a step-by-step process.

economic profit
The difference between total revenue and total economic cost.

Economic Profit versus Accounting Profit

Economic profit is the difference between total revenue and total economic cost. Recall from our previous discussion that total economic cost measures the opportunity costs

FIGURE 1.2
Economic Cost of Using Resources



of *all* the resources used by the business, both market-supplied and owner-supplied resources, and thus

$$\text{Economic profit} = \text{Total revenue} - \text{Total economic cost}$$
$$= \text{Total revenue} - \text{Explicit costs} - \text{Implicit costs}$$

Economic profit, when it arises, belongs to the owners of the firm and will increase the wealth of the owners. When revenues fail to cover total economic cost, economic profit is negative, and the loss must be paid for out of the wealth of the owners.

When accountants calculate business profitability for financial reports, they follow a set of rules known as generally accepted accounting principles, or GAAP. If you have taken courses in accounting, you know that GAAP provides accountants with detailed measurement rules for developing accounting information presented in financial statements, such as balance sheets, cash flow statements, and income statements. The Securities and Exchange Commission (SEC) along with the Financial Accounting Standards Board (FASB), a professional accounting organization, work together to construct the detailed rules of GAAP. To understand the importance of GAAP for our present discussion, you only need to know that GAAP rules do not allow accountants to deduct most types of implicit costs for the purposes of calculating taxable accounting profit.

accounting profit
The difference between total revenue and explicit costs.

Accounting profit, then, differs from economic profit because accounting profit does not subtract from total revenue the implicit costs of using resources. **Accounting profit** is the difference between total revenue and explicit costs:

$$\text{Accounting profit} = \text{Total revenue} - \text{Explicit costs}$$

Depending on the type of financial statement and where it appears in a statement, accounting profit goes by a variety of names such as income, net income, operating income, net profit, earnings, or net earnings.

As you can see, when firms employ owner-supplied resources, the resulting implicit costs are not subtracted from total revenue and the accounting profits reported in financial statements overstate business profitability. All three types of implicit costs discussed earlier are ignored by accountants.[3] We want to stress, however, that when financial accountants omit these implicit costs from financial reports, they are following generally accepted rules set forth by the FASB and SEC. The practice of omitting most kinds of implicit costs, which can be quite large for many firms, is widely recognized by managers, shareholders, government officials, and financial analysts, who make lucrative careers converting the information in financial accounting statements into measures more closely resembling economic profit (see Illustration 1.2).

Business owners, of course, must bear all costs of using resources, both explicit and implicit, regardless of which costs may be deducted for accounting purposes. Because all costs matter to owners of a firm, you should now clearly understand why maximizing economic profit, rather than accounting profit, is the objective of the firm's owners. And, as we explain in the following section, the value of a firm is determined by the amount of economic profit, rather than accounting profit, the firm is expected to earn in the current period and all future periods. As you now see, it is economic profit that matters in business decision making, so in the rest of this chapter and in later chapters whenever we refer to "profit," we will mean *economic* profit. We will now summarize the relation between economic and accounting profits in a principle:

Principle Economic profit is the difference between total revenue and total economic cost:

$$\text{Economic profit} = \text{Total revenue} - \text{Total economic cost}$$
$$= \text{Total revenue} - \text{Explicit costs} - \text{Implicit costs}$$

Accounting profit differs from economic profit because accounting profit does not subtract from total revenue the implicit costs of using resources:

$$\text{Accounting profit} = \text{Total revenue} - \text{Explicit costs}$$

Since the owners of firms must cover the costs of all resources used by the firm, maximizing economic profit, rather than accounting profit, is the objective of the firm's owners.

Now try Technical Problem 2.

[3] One of the implicit costs that accountants do deduct when computing accounting profit is the cost of depreciation of capital assets, which is the reduction in the value of capital equipment from the ordinary wear and tear of usage. As you may know from taking accounting courses, businesses have several methods to choose from when computing depreciation costs, and some of these methods tend to overstate the actual value of depreciation in the early years of equipment ownership.

Maximizing the Value of the Firm

As we stressed in the preceding discussion and principle, owners of a firm, whether the shareholders of a corporation or the owner of a single proprietorship, are best served by management decisions that seek to maximize the profit of the firm. In general, when managers maximize economic profit, they are also maximizing the value of the firm, which is the price someone will pay for the firm. How much will someone pay for a firm? Suppose you are going to buy a business on January 1 and sell it on December 31. If the firm is going to make an economic profit of $50,000 during the year, you are willing to pay no more than $50,000 (in monthly payments matching the flow of profit) to own the firm for that year. Because other potential buyers are *also* willing to pay up to $50,000, the firm likely sells for very nearly or exactly the amount of the economic profit earned in a year.

value of a firm
The price for which the firm can be sold, which equals the present value of future profits.

When a firm earns a stream of economic profit for a number of years in the future, the **value of a firm**—the price for which it can be sold—is the present value of the future economic profits expected to be generated by the firm:

$$\text{Value of a firm} = \frac{\pi_1}{(1+r)} + \frac{\pi_2}{(1+r)^2} + \cdots + \frac{\pi_T}{(1+r)^T} = \sum_{t=1}^{T} \frac{\pi_t}{(1+r)^t}$$

risk premium
An increase in the discount rate to compensate investors for uncertainty about future profits.

where π_t is the economic profit expected in period t, r is the risk-adjusted discount rate, and T is the number of years in the life of a firm.[4] Inasmuch as future profit is not known with certainty, the value of a firm is calculated using the profit *expected* to be earned in future periods. The greater the variation in possible future profits, the less a buyer is willing to pay for those risky future profits. The risk associated with not knowing future profits of a firm is accounted for by adding a **risk premium** to the (riskless) discount rate. A risk premium increases the discount rate, thereby decreasing the present value of profit received in the future, in order to compensate investors for the risk of not knowing with certainty the future value of profits. The more uncertain the future profits, the higher the risk-adjusted discount rate used by investors in valuing a firm, and the more heavily future profits will be discounted.

Now try Technical Problem 3.

Principle The value of a firm is the price for which it can be sold, and that price is equal to the present value of the expected future profits of the firm. The larger (smaller) the risk associated with future profits, the higher (lower) the risk-adjusted discount rate used to compute the value of the firm, and the lower (higher) will be the value of the firm.

[4]Because a dollar of profit received in the future is worth less than a dollar received now, multiperiod decision making employs the concept of present value. Present value is the value at the present time of a payment or stream of payments to be received (or paid) some time in the future. The appendix at the end of this chapter reviews the mathematics of present value computations, a topic usually covered in an introductory course in finance or accounting.

ILLUSTRATION 1.3

How Do You Value a Golf Course?
Estimating the Market Price of a Business

Recently golf courses have been raising their membership and green fees, making golf courses more profitable. Not surprisingly, *Golf Digest* reports that prices investors are paying for golf courses are now rising. As we explain in this chapter, the value of any business firm is the price for which the firm can be sold, and this price will reflect the buyer's calculation of the present value of the future profits expected to be generated by the firm.

So, if you wanted to invest in a golf course, how much should you expect to pay to buy one? Because you would be competing with many other investors, you would not expect to pay less than the present value of the golf course's future stream of profits. To help answer this question, *Golf Digest* interviewed Keith Cubba, who is the national director of the golf course group at a large commercial real estate brokerage firm. Based on this interview, *Golf Digest* worked up a valuation of a golf course using a computational technique that is essentially equivalent to the "value of a firm" equation we present on page 14 of this textbook.

Golf Digest begins its computation with a specific annual profit figure, which we will say is $480,000 for this Illustration. *Golf Digest* simplifies its computation in two ways: (1) profit is assumed to be $480,000 in *every* year, and (2) the profit stream continues forever—that is, T in our textbook equation is infinity. Then, *Golf Digest* explains that in today's commercial real estate market, investors require a risk-adjusted rate of return equal to about 10 percent annually. The value of this golf course is then calculated by dividing the annual profit by the risk-adjusted rate of return:

$$\text{Value of a golf course} = \frac{\pi}{r} = \frac{\$480{,}000}{0.10} = \$4{,}800{,}000$$

As it turns out, $4.8 million is extremely close to the numerical value you would get if you applied the equation we present on page 14 using $480,000 in the numerator for the profit every year over a very long period of time and a risk-adjusted discount rate of 10 percent.[a] Thus, a commercial real estate investor who wishes to earn 10 percent annually by owning this golf course would be willing to pay about $4.8 million to buy it. A more "greedy" investor who requires a return of, say, 16 percent will only be willing to pay $3 million ($480,000/0.16) for the same golf course.

While the valuation analysis in *Golf Digest* is mathematically correct and economically sound, it can be misleading if the specific golf course has additional financial features that cause a buyer to offer a price either higher or lower than the value of the golf course "enterprise" itself. Suppose the golf course has accumulated a cash account of $100,000. Because the buyer of the golf course gets the $100,000 of cash along with the golf course, the buyer would be willing to pay a price for the course that is $100,000 *more* than the present value of the expected stream of profit. Alternatively, suppose the golf course has borrowed money in the past for whatever reason and has $100,000 of debt owed to a bank. At the time of purchase, the buyer of the golf course must pay off the debt to the bank, which *reduces* the price the buyer of the golf course is willing to pay by $100,000. As you can now see, the actual price paid for the golf course may not be equal to the present value of the expected stream of profit if the golf course comes with some amount of cash or debt. Financial economists sometimes refer to the value of the stream of expected profit as the "enterprise value" (EV) of the business. We just call it "the value of the firm" in this textbook.

[a]You might be wondering about *Golf Digest*'s assumption that a golf course generates a *perpetual* stream of profit (i.e., $T = \infty$). For the golf course in this example, if we let $T = 50$ years in our textbook equation, the value will be $4,759,111, which is just a small deviation from the $4.8 million present value of a perpetual stream of profit. In other words, even if the investor believes the golf course will only generate profit for 50 years, she can still use *Golf Digest*'s "perpetuity" formula for the sake of convenience without much worry that she will be overvaluing the present value stream of profit. The nature of this mathematical approximation is also discussed in the Mathematical Appendix at the end of this chapter, "Review of Present Value Calculations."

Source: Peter Finch, "Investors Are Taking a Fresh Look at Golf—and Liking What They See," *Golf Digest*, December 2014, p. 62.

The Equivalence of Value Maximization and Profit Maximization

Owners of a firm want the managers to make business decisions that will maximize the value of the firm, which, as we discussed in the previous subsection, is the sum of the discounted expected profits in current and future periods. As a general rule, then, a manager maximizes the value of the firm by making decisions that maximize expected profit in each period. That is, single-period profit maximization and maximizing the value of the firm are usually equivalent means to the same end: Maximizing profit in each period will result in the maximum value of the firm, and maximizing the value of the firm requires maximizing profit in each period.

Principle If cost and revenue conditions in any period are independent of decisions made in other time periods, a manager will maximize the value of a firm (the present value of the firm) by making decisions that maximize profit in every single time period.

The equivalence of single-period profit maximization and maximizing the value of the firm holds only when the revenue and cost conditions in one time period are independent of revenue and costs in future time periods. When today's decisions affect profits in future time periods, price or output decisions that maximize profit in each (single) time period will not maximize the value of the firm. Two examples of these kinds of situations occur when (1) a firm's employees become more productive in future periods by producing more output in earlier periods—a case of learning by doing—and (2) current production has the effect of increasing cost in the future—as in extractive industries such as mining and oil production. Thus, if increasing current output has a positive effect on future revenue and profit, a value-maximizing manager selects an output level that is *greater* than the level that maximizes profit in a single time period. Alternatively, if current production has the effect of increasing cost in the future, maximizing the value of the firm requires a *lower* current output than maximizing single-period profit.

Now try Technical Problem 4.

Despite these examples of inconsistencies between the two types of maximization, it is generally the case that there is little difference between the conclusions of single-period profit maximization (the topic of most of this text) and present value maximization. Thus, single-period profit maximization is generally the rule for managers to follow when trying to maximize the value of a firm.

Some Common Mistakes Managers Make

Taking a course in managerial economics is certainly not a requirement for making successful business decisions. Everyone can name some extraordinarily astute business managers who succeeded in creating and running very profitable firms with little or no formal education in business or economics. Taking this course will not guarantee your success either. Plenty of managers with MBA degrees took courses in managerial economics but nonetheless failed sensationally and ended up getting fired or replaced in hostile takeovers by more profitably managed firms. We firmly believe, however, that a course in managerial economics helps you avoid some of the more common mistakes that have led other managers to fail. As you progress through this

book, we will draw your attention at various points along the way to a number of common pitfalls, misconceptions, and even mistakes that real-world managers would do well to avoid.

Although it is too soon for us to demonstrate or prove that certain practices can reduce profit and possibly create losses in some cases—this is only Chapter 1!— we can nonetheless give you a preview of several of the more common mistakes that you will learn to avoid in later chapters. Some of the terms in this brief preview might be unclear to you now, but you can be sure that we will carefully explain things later in the text.

Never increase output simply to reduce average costs Sometimes managers get confused about the role of average or unit cost in decision making. For example, a firm incurs total costs of $100 to produce 20 units. The average or unit cost is $5 for each of the 20 units. Managers may believe, incorrectly, if they can increase output and cause average cost to fall, then profit *must* rise by expanding production. Profit might rise, fall, or stay the same, and the actual change in profit has nothing to do with falling average costs.

As you will learn in Chapter 8, producing and selling more units in the short run can indeed cause unit or average costs to fall as fixed costs of production are spread over a greater number of units. As you will learn in Chapter 9, increasing output in the long run causes average cost to fall when economies of scale are present. However, profit-maximizing firms should never increase production levels simply because average costs can be reduced. As we will show you, it is the *marginal* cost of production—the increment to total cost of producing an extra unit—that matters in decision making. Consequently, a manager who increases or decreases production to reduce unit costs will usually miss the profit-maximizing output level. Quite simply, output or sales expansion decisions should never be made on the basis of what happens to average costs.

Pursuit of market share usually reduces profit Many managers misunderstand the role market share plays in determining profitability. Simply gaining market share does *not* create higher profits. In many situations, if managers add market share by cutting price, the firm's profit actually falls. Illustration 1.4 examines some empirical studies of managers who pursued market share while ignoring profit. You will learn in Chapters 11 and 12 that the best general advice is to ignore market share in business decision making.

We should mention here an important, although rather rare, exception to this rule that will be examined more carefully in Chapter 12: the value of market share when "network effects" are present. Network effects arise when the value each consumer places on your product depends on the number of *other* consumers who also buy your product. Suppose consumers highly value your good because a large number of *other* consumers also buy your good. Under these circumstances, grabbing market share faster than your rivals could give you a dominant position in the market, as consumers switch to your product away from sellers with small market shares. Failing to capture substantial market share might even threaten your long-run survival in the market. As

ILLUSTRATION 1.4

Managerial Strategy
Maximize Profit or Maximize Market Share?

Although sports and war metaphors are common in business conversation and management seminars, managers may be reducing the value of their firms by placing too much emphasis on beating their competitors out of market share rather than focusing on making the most profit for their shareholders. In a provocative study of managerial strategy, Professors J. Scott Armstrong at the University of Pennsylvania's Wharton School and Fred Collopy at Case Western Reserve University advise CEOs to focus on profits instead of market share.[a] Armstrong and Collopy discovered that, instead of maximizing profit, many managers make decisions with an eye toward performing well relative to their competitors—a decision-making point of view they refer to as "competitor-oriented" decision making.

In their nine-year study of more than 1,000 experienced managers, Armstrong and Collopy found that managers are more likely to abandon the goal of profit maximization when they have greater amounts of information about the performance of their rivals. In the study, managers were asked to choose between two pricing plans for a new product—a low-price and a high-price strategy—and were told the five-year present value of expected profits associated with each strategy. The table in the next column presents two of the "treatments" that were administered to different groups of subjects.

Net Present Value of Expected Profit over Five Years

	Low-price strategy	High-price strategy
Base treatment:		
Your firm	$40 million	$ 80 million
Beat treatment:		
Your firm	40 million	80 million
Rival firm	20 million	160 million

The "base" treatment gives the manager no information about how a rival firm will fare under the two plans, while the "beat" treatment allows the manager to know how a decision will affect a rival. In the base treatment, almost all managers, as expected, chose the most profitable strategy (high price). When given information about the rival firm's profit, subjects could see the impact of their decision on their rival, and many managers abandoned profit maximization. In the beat treatment, 60 percent chose not to maximize profit (low price). To address the possibility that the subjects were considering longer-term profits, Armstrong and Collopy changed the payoffs to *20-year* present values. The results were the same.

Armstrong and Collopy believe the abandonment of profit as the firm's objective is a consequence of managers having information about a competitor's performance. They discovered that exposing managers to techniques that focus on gaining market share increased the proportion of subjects who abandoned profit maximization. For this reason, when executives take strategic management courses, they become more likely to make profit-reducing decisions. These results are impressive because they have been repeated in more than 40 experiments with more than 1,000 subjects.

To see if firms that seek to maximize market share (competitor-oriented firms) tend to be less profitable *over the long run* than firms that pursue profit without concern for market share, Armstrong and Collopy tracked the performance of two groups of firms over a 54-year period. The group of firms that made pricing decisions based on competitor-oriented goals, such as increasing market share, were consistently less profitable over the 54-year period than the group that made pricing decisions to increase profit without regard to market share. Furthermore, companies pursuing market share were found to be less likely to survive: Four out of six companies focusing strictly on market share (Gulf, American Can, Swift, and National Steel) failed to survive. The four profit-oriented companies (DuPont, General Electric, Union Carbide, and Alcoa) all survived.

Armstrong and Collopy conclude that the use of competitor-oriented objectives is detrimental to profitability. To encourage managers to keep their focus on profit and *not* on market share, they offer the following specific advice:

- Don't use market share as an objective.
- Avoid using sports and military analogies because they foster a competitor orientation.
- Do not use management science techniques that are oriented to maximizing market share, such

as portfolio planning matrices and experience curve analysis.

- Design information systems to focus attention on the firm's performance, as measured by profits.
- Beware that improvement in the ability to measure market share—specifically through scanner data collected at checkouts—may lead to a stronger focus on market share and less focus on profitability.

These ideas from Armstrong and Collopy are reinforced in a book about the business strategies of Southwest Airlines, where the authors examine the decisions made by the airline's CEO, Herb Kelleher. In a section of the book titled "Say Nuts to Market Share," Kelleher explains the role that market share played at Southwest Airlines when he was CEO.[b] Kelleher says quite explicitly that market share has "nothing to do with profitability." He goes on to argue that the pursuit of market share indicates the CEO just wants to be big and not necessarily make any profit while getting big. The book goes on to say that Kelleher believed getting confused over the two concepts (increasing profit and increasing market share) "derailed many firms" in meeting their fundamental goal of maximizing profit and the value of the firm. Perhaps it was only a coincidence, but we should mention that the value of Southwest Airlines tripled during the early to mid-1990s while Kelleher was CEO.

As we emphasize in this chapter, shareholders wish to see the value of their firms maximized. A manager bent on being the biggest airline or biggest auto rental agency may fail to be the most profitable airline or auto rental agency. As mentioned in our discussion of common management errors, the presence of network effects can make the pursuit of market share a profitable strategy, as we will explain more fully in Chapter 12. In an important book on the topic of maximizing market share, Richard Miniter offers a particular warning on the exceptional case of network effects.[c] Even though markets characterized by the existence of network effects creates a special situation in which the pursuit of higher market share is consistent with earning higher profits, he warns managers to be extremely careful of falling for the myth that their business is "special and unique" because of network effects and so decide that profits don't matter but market share does. He stresses what we have stressed in this chapter: For the majority of business firms profit alone is what matters.

We will show you in Chapter 12 how to identify these special few industries with network effects for which market share does indeed matter. As this illustration stresses, most managers should ignore market share. Between advances in shareholders' willingness and ability to fire CEOs and the active market for corporate control (mergers, acquisitions, and takeovers), a manager who fails to pursue primarily the maximization of profit may face a much shorter career.

Sources

[a]J. Scott Armstrong and Fred Collopy, "Competitor Orientation: Effects of Objectives and Information on Managerial Decisions and Profitability," *Journal of Marketing Research,* May 1996, pp. 188–99.

[b]Kevin Freiberg and Jackie Freiberg, *Nuts!: Southwest Airlines' Crazy Recipe/or Business and Personal Success* (New York: Broadway Books, 1995).

[c]Richard Miniter, *The Myth of Market Share* (New York: Crown Business, 2002).

we will explain fully in Chapter 12, your best move when network effects exist may be to charge a low initial price so that you can dominate the market and charge higher prices in later periods. Again, we must stress that pursuing market share is consistent with profit maximization only when network effects are present.

Focusing on profit margin won't maximize total profit Profit margin is the difference between the price you charge for each unit and the average cost of producing the units. Suppose you charge $15 per unit, and average or unit cost is $9 per unit. Your profit margin, or average profit per unit, is $6 ($15 − $9) per unit. As we will demonstrate later in Chapters 11 and 12, managers should not make decisions with the

primary objective of increasing profit margin because total profit is *not* maximized at the output and price level where profit margin or unit profit is greatest. In later chapters you will learn to ignore profit margin when making pricing and output decisions. As you will see, profit margin is handy for computing the amount of profit a business makes, but profit margin plays no role in making profit-maximizing decisions. This subtle distinction in the proper use of profit margin is not well understood in the business community.

Maximizing total revenue reduces profit You might think if managers have an opportunity to change price or quantity in a way that increases total revenue, they will always wish to do so. As it turns out, increasing revenue does not necessarily increase profit and may even lower profit. You will see that the demand curve facing a firm tells a manager the maximum price a firm can charge to sell various quantities of its product. At any chosen point on demand, total revenue is computed by multiplying price times the quantity demanded. Choosing different points on a firm's demand curve will alter the amount of revenue the firm generates, as well as production costs and the amount of profit left over for the owners. We will show you in Chapters 11 and 12 that the point on a firm's demand curve that maximizes profit will *not* be the price and quantity that maximizes total revenue.[5] General managers have learned that, when the salaries of sales managers are tied to the number of units sold or the dollar amount of revenue generated, sales managers may try to persuade general managers to produce and sell too much product. The result: Revenue goes up, but profit goes down!

Cost-plus pricing formulas don't produce profit-maximizing prices Pricing decisions are probably the most difficult and risky of all the business decisions managers must make. To make matters worse, prices for the same product must routinely be set over and over again as market conditions change month after month and year after year. Of course, some firms produce hundreds, even thousands, of products. So, it's hard to blame managers for trying to find a simple pricing formula requiring nothing more than readily available spreadsheet data. One such pricing formula, cost-plus pricing, is still widely used even though everyone trained in economics and marketing knows that setting prices higher than unit cost by some fixed, arbitrarily determined portion of unit cost almost never works. The unfortunate truth is that cost-plus pricing does not deliver profit-maximizing prices, except by sheer luck.[6] In Chapter 12, we will show you how to set the most profitable prices when everyone pays the same price for the same good—a method known as uniform pricing. In Chapter 14, we will show you

[5]In theory, one exception to this rule exists, but it arises very rarely in practice. When a price-setting firm faces marginal costs that are zero, it will maximize profit by maximizing total revenue. We will explain this exception in Chapter 12.

[6]Only when businesses face constant costs can a formula for choosing a profit-maximizing markup on unit cost be contrived. But, this pricing formula is so complicated to apply that it offers no practical advantage over the "marginal revenue equals marginal cost" approach to optimal pricing that you will learn in Chapter 12. We consider this contrived formula to be worthless and do not cover it anywhere in this text.

several advanced pricing techniques, which charge different buyers different prices and generate even more revenue than with uniform prices.

These are just a few of the many mistakes we will teach you how to avoid. Don't be concerned at this point if you're not sure you understand these mistakes—we guarantee you will by the end of the text!

1.3 SEPARATION OF OWNERSHIP AND CONTROL OF THE FIRM

Business owners frequently choose to delegate control of their businesses to a professional executive or senior manager who will typically be assisted by additional subordinate managers, which creates an executive management team that relieves the owners of management duties. Only in the smallest business organizations—typically sole proprietorships, smaller general partnerships, and family businesses—are you likely to see owners managing their own businesses. The decision to hire professional managers creates a separation between business *ownership* and its *management*. This separation forms a special relationship between business owners and managers known as a *principal–agent relationship*. In this particular type of **principle–agent relationship,** a business owner (the principal) enters an agreement with an executive manager (the agent) whose job is to formulate and implement tactical and strategic business decisions that will further the objectives of the business owner (the principal).[7] The agency "agreement" can, and usually does, take the form of a legal contract to confer some degree of legal enforceability, but it can also be something as simple as an informal agreement settled by a handshake between the owner and manager.

principal–agent relationship Relationship formed when a business owner (the principal) enters an agreement with an executive manager (the agent) whose job is to formulate and implement tactical and strategic business decisions that will further the objectives of the business owner (the principal).

Separating ownership and control of a firm holds the potential to significantly increase a firm's value, especially when it replaces "amateur" owner-managers with more experienced and talented professional business decision makers. In practice, however, some or all of the potential gain to the owners from hiring expert managers can be lost when owners cannot prevent managers from behaving opportunistically by taking self-interested actions that are harmful to the owners. We will now discuss this fundamental problem arising from the separation of ownership and management and examine some ways to solve or at least control the severity of these problems.

The Principal–Agent Problem

A fundamental problem that frequently, but not always, afflicts the principal–agent relationship between business owners and managers occurs when a manager takes an action or makes a decision that advances the interests of the manager but is

[7]We are employing here a rather specific definition of the principal–agent relationship to focus on the agency relationship between a firm's owners and the firm's executive managers. Business organizations typically form a variety of principal–agent relationships in addition to the one between owners and executive managers that we are discussing in this textbook. Several other examples of principal–agent relationships include CEOs and other executive officers (CFO, CIO, and COO), the boards of directors and CEOs, and CEOs and middle managers.

harmful to the owners because the manager's action reduces the value of the firm. This celebrated problem, which has generated considerable interest and concern among business consultants, economists, and management scholars, is known as the **principal–agent problem.** A principal–agent problem requires the presence of two conditions: (1) the manager's objectives must be different from those of the owner, and (2) the owner must find it too costly or even impossible to monitor the manager's decisions to block any decisions or behavior that would reduce the firm's value.

principal–agent problem
A manager takes an action or makes a decision that advances the interests of the manager but reduces the value of the firm.

Conflicting objectives between owners and managers In the natural state of affairs between owners and managers, the goals of owners are almost certainly different from the goals of managers, and thus we say that owner and manager goals are *not aligned* or that managers and owners *possess conflicting objectives*. A self-interested owner naturally wants her business run in a way that maximizes the value of her business. A self-interested executive manager—if the penalty is zero or small—will naturally wish to take advantage of opportunities to make decisions or take actions that will promote his well-being even when these decisions also harm the owner of the business.

For example, managers may choose to consume excessive, even lavish perquisites (or perks). It would be an unusual manager indeed who would not like to have the company (i.e., the owners) pay for a lavish office, memberships in exclusive country clubs, extraordinary levels of life and health insurance, a nanny to look after their children, a chauffeured limousine, and, if at all possible, a corporate jet. Although the decision to consume lavish perks is good for the manager, these perks reduce the profitability and value of the firm and thus harm the owners.

Another important example of conflicting goals involves managers who get sidetracked by goals that are inconsistent with value-maximization, such as the pursuit of larger firm *size* or the pursuit of higher market *share*. Studies show that there may be a couple of reasons for this behavior. First, executive managers are notorious for their enormous egos and intense desire to engage in empire building, which they find satisfying even if profit is sacrificed in the process. Second, some executives believe that their future salary and compensation, either at their present job or at their next job, will be richer if the firm they now manage experiences rapid growth in assets, number of employees, or level of sales and revenues relative to their rival firms. As you will learn later in this book, pricing and production decisions focused on creating the biggest, fastest-growing, or relatively largest companies do *not*, as a general rule, maximize profit or the value of the firm. You may recall that American Airlines was the *largest* airline in the United States for many years, but smaller Southwest Airlines was the most *profitable* airline during the same time period. Similarly, the largest car rental agency is usually not the most profitable rental car company, and Samsung's Galaxy S is the market share leader in smartphones but Apple's iPhone 6 has created far more profit for Apple shareholders. Illustration 1.4 examines some of the causes and consequences of managers focusing on maximizing market share instead of economic profit.

Problems with monitoring managers Business owners, recognizing that their interests may diverge from the interests of their managers, can try to bind managers through some form of incentive agreement—typically a legal contract for employment—that is carefully designed using incentives and penalties to force executives to make only decisions that will increase the value of the firm. Let's suppose that a **complete contract**—one that protects owners from every possible deviation by managers from value-maximizing decisions—could in fact be designed by the owners' lawyers. Once this complete contract is signed by the owners and excecutive manager, the owners then face the costly task of monitoring and enforcing the contract to make sure managers do not shirk, renege, or otherwise underperform when carrying out their contractual responsibilities to maximize the value of the firm.

complete contract
An employment contract that protects owners from every possible deviation by managers from value-maximizing decisions.

If monitoring the manager could be accomplished perfectly and at a low cost, then no principle–agent problem would arise because the (hypothetical) complete contract forms an exact alignment of the owners' and manager's objectives, and low-cost monitoring ensures that the contractual alignment of goals is enforced. As you probably guessed, this ideal plan for eliminating the principal–agent problem fails in practice—even if complete contracts could be written—because monitoring managers is usually a costly activity for owners, and thus owners of the firm will not find it in their best interest to perfectly monitor the executive manager. When monitoring costs are significant, as they usually are, managers will be able to undertake some opportunistic actions that further their interests at the expense of the owners.

hidden actions
Actions or decisions taken by managers that cannot be observed by owners for any feasible amount of monitoring effort.

In more extreme situations, monitoring becomes practically impossible because the manager is able to take **hidden actions** or make hidden decisions that cannot be observed by owners for any economically and legally feasible amount of monitoring effort. Hidden actions can be either good or bad actions from the owners' point of view; that is, a hidden action can either increase or decrease the value of the firm. Because owners do not know whether a hidden action has been taken—either a good one or a bad one—it is impossible for monitoring efforts by owners to block or prevent managers from taking "bad" hidden actions. In this situation, owners' efforts to monitor managers cannot protect owners from a principal–agent problem caused by hidden actions. This particular form of the principal–agent problem is called **moral hazard.** As you can see, moral hazard is both a problem of nonaligned objectives *and* a problem of harmful hidden actions. If either one of these two aspects is missing then there is no moral hazard problem. After all, in the absence of conflicting objectives, managers would make value-maximizing decisions and any hidden actions that might be undertaken would be "good" hidden actions that increase profit rather than "bad" hidden actions that reduce profit.

moral hazard
A situation in which managers take hidden actions that harm the owners of the firm but further the interests of the managers.

Principle A principal–agent problem arises between a firm's owner and manager when two conditions are met: (1) the objectives of the owner and manager are not aligned, and (2) the owner finds it either too costly or impossible in the case of moral hazard to perfectly monitor the manager to block all management decisions that might be harmful to the owner of the business.

Corporate Control Mechanisms

The discussion of the principle–agent problem is not meant to imply that the owners or shareholders of corporations are completely helpless in the face of managers who aren't doing what owners expect them to do. Rules of corporate governance give shareholders rights that allow them to control managers directly through specific corporate control measures and indirectly through the corporation's board of directors, whose responsibility it is to monitor management. Shareholders themselves, and in partnership with the board of directors, may choose from a variety of mechanisms for controlling agency problems. In addition to these internal governance methods, forces outside the firm can also motivate managers to pursue maximization of the firm's value. We will now review a few of the most important types of these mechanisms for intensifying a manager's desire to maximize profit.

Stockholders often try to resolve or at least reduce the intensity of conflicting objectives between owners and managers by tying managers' compensation to fulfilling the goals of the owner/shareholders. Managers have a greater incentive to make decisions that further the owners' goals when managers themselves are owners. Equity ownership has proven to be one of the most effective mechanisms for taming the principal–agent problem, so much so that a growing number of professional money managers and large institutional investors refuse to invest in firms whose managers hold little or no equity stake in the firms they manage.

The members of the board of directors are agents of the shareholders charged with monitoring the decisions of executive managers. Just as managers are agents for owners, so too are directors, and thus principal–agent problems can arise between directors and shareholders. Many experts in corporate governance believe that the value of the board's monitoring services is enhanced by appointing outsiders—directors not serving on the firm's management team—and by linking directors' compensation to the value of the firm. Although having outsiders on the board and linking board member compensation to firm value are both effective ways to mitigate principal–agent problems, other problems can remain troublesome. Specifically, the effectiveness of a board of directors is undermined when a particular business decision is so complex that the board cannot reliably judge whether the decision furthers shareholder interests or not. And yet another problem arises when CEOs play an important role in the selection of the individual board members. Just how objective will board members be who owe their jobs to the person they are supposed to be monitoring?

Another method of creating incentives for managers to make value-maximizing decisions involves corporate policy on debt financing. A policy that emphasizes financing corporate investments with debt rather than equity—selling shares of common stock to raise financial capital—can further the interests of shareholders in several ways. First, debt financing makes bankruptcy possible, in that firms cannot go bankrupt if they have no debt. Thus, managers who value their employment have an additional incentive to increase profitability to lower the probability

of bankruptcy. Second, managers face less pressure to generate revenues to cover the cost of investments if the payments are dividends to shareholders, which they can choose to defer or neglect altogether, rather than if the investment payments are installments on a loan. Finally, lending institutions themselves have an incentive to monitor managers of firms that borrow money from them. Banks and other lenders are likely to make it difficult for managers to consume excessive perks or make unprofitable investments.

Looking beyond the *internal* control mechanisms discussed, we should add to our discussion of corporate control mechanisms an important *external* force initiated by parties outside the firm itself—a corporate takeover—that can impose an effective solution to the principal–agent problem between shareholders and managers. When the value of a firm under its present management is less than what it would be with a different management team, a profit opportunity arises for outside investors to acquire stock and take control of the underperforming firm and then replace the existing management team with a new and presumably more profitable set of managers. If the new owners are indeed able to increase profit, the firm will become more valuable and the raiders will be rewarded by higher stock prices.

Even though Hollywood movies have portrayed corporate takeovers as greedy maneuvers aimed only at making corporate raiders rich, most economists believe that takeovers can serve as a check on the power of opportunistic managers who exploit principal–agent problems. Takeovers create a market for corporate control of publicly traded businesses that can help resolve the conflict between managers and shareholders caused by separation of ownership and management: Managers know they must maximize the value of their firms or else face a takeover and lose their jobs to new management.

1.4 MARKET STRUCTURE AND MANAGERIAL DECISION MAKING

As we have mentioned, managers cannot expect to succeed without understanding how market forces shape the firm's ability to earn profit. A particularly important aspect of managerial decision making is the pricing decision. The structure of the market in which the firm operates can limit the ability of a manager to raise the price of the firm's product without losing a substantial amount, possibly even all, of its sales.

Not all managers have the power to set the price of the firm's product. In some industries, each firm in the industry makes up a relatively small portion of total sales and produces a product that is identical to the output produced by all the rest of the firms in the industry. The price of the good in such a situation is not determined by any one firm or manager but, rather, by the impersonal forces of the marketplace—the intersection of market demand and supply, as you will see in the next chapter. If a manager attempts to raise the price above the market-determined price, the firm loses all its sales to the other firms in the industry. After all, buyers do not care from whom they buy this identical product, and they would be unwilling to pay more than the

price-taker
A firm that cannot set the price of the product it sells, since price is determined strictly by the market forces of demand and supply.

price-setting firm
A firm that can raise its price without losing all of its sales.

market power
A firm's ability to raise price without losing all sales.

going market price for the product. In such a situation, the firm is a **price-taker** and cannot set the price of the product it sells. We will discuss price-taking firms in detail in Chapter 11, and you will see that the demand curve facing a price-taking firm is horizontal at the price determined by market forces.

In contrast to managers of price-taking firms, the manager of a **price-setting firm** does set the price of the product. A price-setting firm has the ability to raise its price without losing all sales because the product is somehow differentiated from rivals' products or perhaps because the geographic market area in which the product is sold has only one, or just a few, sellers of the product. At higher prices the firm sells less of its product, and at lower prices the firm sells more of its product. The ability to raise price without losing all sales is called **market power,** a subject we will examine more thoroughly in Chapters 13 and 14. Before we discuss some of the differing market structures to be analyzed in later chapters of this text, we first want you to consider the fundamental nature and purpose of a market.

What Is a Market?

market
Any arrangement through which buyers and sellers exchange anything of value.

A **market** is any arrangement through which buyers and sellers exchange final goods or services, resources used for production, or, in general, anything of value. The arrangement may be a location and time, such as a commercial bank from 9 a.m. until 6 p.m. on weekdays only, an agricultural produce market every first Tuesday of the month, a trading "pit" at a commodity exchange during trading hours, or even the parking lot of a stadium an hour before game time when ticket scalpers sometimes show up to sell tickets to sporting events. An arrangement may also be something other than a physical location and time, such as a classified ad in a newspaper or a website on the Internet. You should view the concept of a market quite broadly, particularly because advances in technology create new ways of bringing buyers and sellers together.

Markets are arrangements that reduce the cost of making transactions. Buyers wishing to purchase something must spend valuable time and other resources finding sellers, gathering information about prices and qualities, and ultimately making the purchase itself. Sellers wishing to sell something must spend valuable resources locating buyers (or pay a fee to sales agents to do so), gathering information about potential buyers (e.g., verifying creditworthiness or legal entitlement to buy), and finally closing the deal. These costs of making a transaction happen, which are additional costs of doing business over and above the price paid, are known as **transaction costs.** Buyers and sellers use markets to facilitate exchange because markets lower the transaction costs for both parties. To understand the meaning of this seemingly abstract point, consider two alternative ways of selling a used car that you own. One way to find a buyer for your car is to canvass your neighborhood, knocking on doors until you find a person willing to pay a price you are willing to accept. This will likely require a lot of your time and perhaps even involve buying a new pair of shoes. Alternatively, you could run an advertisement

transaction costs
Costs of making a transaction happen, other than the price of the good or service itself.

in the local newspaper describing your car and stating the price you are willing to accept for it. This method of selling the car involves a market—the newspaper ad. Even though you must pay a fee to run the ad, you choose to use this market because the transaction costs will be lower by advertising in the newspaper than by searching door to door.

Different Market Structures

market structure
Market characteristics that determine the economic environment in which a firm operates.

Market structure is a set of market characteristics that determines the economic environment in which a firm operates. As we now explain, the structure of a market governs the degree of pricing power possessed by a manager, both in the short run and in the long run. The list of economic characteristics needed to describe a market is actually rather short:

- *The number and size of the firms operating in the market:* A manager's ability to raise the price of the firm's product without losing most, if not all, of its buyers depends in part on the number and size of sellers in a market. If there are a large number of sellers with each producing just a small fraction of the total sales in a market, no single firm can influence market price by changing its production level. Alternatively, when the total output of a market is produced by one or a few firms with relatively large market shares, a single firm can cause the price to rise by restricting its output and to fall by increasing its output, as long as no other firm in the market decides to prevent the price from changing by suitably adjusting its own output level.
- *The degree of product differentiation among competing producers:* If sellers all produce products that consumers perceive to be identical, then buyers will never need to pay even a penny more for a particular firm's product than the price charged by the rest of the firms. By differentiating a product either through real differences in product design or through advertised image, a firm may be able to raise its price above its rivals' prices if consumers find the product differences sufficiently desirable to pay the higher price.
- *The likelihood of new firms entering a market when incumbent firms are earning economic profits:* When firms in a market earn economic profits, other firms will learn of this return in excess of opportunity costs and will try to enter the market. Once enough firms enter a market, price will be bid down sufficiently to eliminate any economic profit. Even firms with some degree of market power cannot keep prices higher than opportunity costs for long periods when entry is relatively easy.

Microeconomists have analyzed firms operating in a number of different market structures. Not surprisingly, economists have names for these market structures: perfect competition, monopoly, monopolistic competition, and oligopoly. Although each of these market structures is examined in detail later in this text, we briefly discuss each one now to show you how market structure shapes a manager's pricing decisions.

In *perfect competition,* a large number of relatively small firms sell an undifferentiated product in a market with no barriers to the entry of new firms. Managers of firms operating in perfectly competitive markets are price-takers with no market power. At the price determined entirely by the market forces of demand and supply, they decide how much to produce in order to maximize profit. In the absence of entry barriers, any economic profit earned at the market-determined price will vanish as new firms enter and drive the price down to the average cost of production. Many of the markets for agricultural goods and other commodities traded on national and international exchanges closely match the characteristics of perfect competition.

In a *monopoly* market, a single firm, protected by some kind of barrier to entry, produces a product for which no close substitutes are available. A monopoly is a price-setting firm. The degree of market power enjoyed by the monopoly is determined by the ability of consumers to find imperfect substitutes for the monopolist's product. The higher the price charged by the monopolist, the more willing are consumers to buy other products. The existence of a barrier to entry allows a monopolist to raise its price without concern that economic profit will attract new firms. As you will see in Chapter 12, examples of true monopolies are rare.

In markets characterized by *monopolistic competition,* a large number of firms that are small relative to the total size of the market produce differentiated products without the protection of barriers to entry. The only difference between perfect competition and monopolistic competition is the product differentiation that gives monopolistic competitors some degree of market power; they are price-setters rather than price-takers. As in perfectly competitive markets, the absence of entry barriers ensures that any economic profit will eventually be bid away by new entrants. The toothpaste market provides one example of monopolistic competition. The many brands and kinds of toothpaste are close, but not perfect, substitutes. Toothpaste manufacturers differentiate their toothpastes by using different flavorings, abrasives, whiteners, fluoride levels, and other ingredients, along with a substantial amount of advertising designed to create brand loyalty.

In each of the three market structures discussed here, managers do not need to consider the reaction of rival firms to a price change. A monopolist has no rivals; a monopolistic competitor is small enough relative to the total market that its price changes will not usually cause rival firms to retaliate with price changes of their own; and, of course, a perfectly competitive firm is a price-taker and would not change its price from the market-determined price. In contrast, in the case of an *oligopoly* market, just a few firms produce most or all of the market output, so any one firm's pricing policy will have a significant effect on the sales of other firms in the market. This interdependence of oligopoly firms means that actions by any one firm in the market will have an effect on the sales and profits of the other firms. As you will see in Chapter 13, the strategic decision making in oligopoly markets is the most complex of all decision-making situations.

1.5 GLOBALIZATION OF MARKETS

globalization of markets
Economic integration of markets located in nations around the world.

For the past quarter century, businesses around the world have experienced a surge in the **globalization of markets,** a phrase that generally refers to increasing economic integration of markets located in nations throughout the world. Market integration takes place when goods, services, and resources (particularly people and money) flow freely across national borders. Despite excitement in the business press over the present wave of globalization, the process of integrating markets is not a new phenomenon, but rather it is an ongoing process that may advance for some period of time and then suffer setbacks. The last significant wave of globalization lasted from the late 1800s to the start of World War I. During that period, expansion of railroads and the emergence of steamships enabled both a great migration of labor resources from Europe to the United States as well as a surge in the flow of goods between regional and international markets. Even though some governments and some citizens oppose international economic integration, as evidenced by a number of antiglobalization protests, most economists believe the freer flow of resources and products can raise standards of living in rich and poor nations alike.

The movement toward global markets over the last 25 years can be traced to several developments. During this period North American, European, and Latin American nations successfully negotiated numerous bilateral and multilateral trade agreements, eliminating many restrictions to trade flows among those nations. And, during this time, 11 European nations agreed to adopt a single currency—the euro—to stimulate trade on the continent by eliminating the use of assorted currencies that tends to impede cross-border flows of resources, goods, and services. Adding to the momentum for globalization, the Information Age rapidly revolutionized electronic communication, making it possible to buy and sell goods and services over a worldwide Internet. As noted in Illustration 1.5, Microsoft Office software has become something of an international language for businesses, as companies around the world communicate using *Excel* spreadsheets and documents created in Word and PowerPoint. All of these developments contributed to reducing the transaction costs of bringing buyers and sellers in different nations together for the purpose of doing business.

As you can see from this discussion, globalization of markets provides managers with an opportunity to sell more goods and services to foreign buyers and to find new and cheaper sources of labor, capital, and raw material inputs in other countries, but along with these benefits comes the threat of intensified competition by foreign businesses. This trend toward economic integration of markets changes the way managers must view the structure of the markets in which they sell their products or services, as well as the ways they choose to organize production. Throughout the text, we will point out some of the opportunities and challenges of globalization of markets.

ILLUSTRATION 1.5

Internet Spurs Globalization of Services

Antiglobalization protestors in Seattle, Washington, D.C., Quebec, and Genoa have criticized multinational corporations—as well as their governments, the World Trade Organization, the International Monetary Fund, and the World Bank—for moving manufacturing operations to countries with low wages. While the protestors express deep concern that workers in poorer countries will be "exploited" by multinational corporations and be forced to work in sweatshops for "unfair" wages, the more basic fear among protestors seems to be an understandable concern that they will lose their jobs as manufacturing moves to other countries.

Douglas Lavin, in *The Wall Street Journal*, explains that antiglobalization protestors have overlooked a more significant shift in services: "Thanks largely to the fact that a decent education, Microsoft Office, and the Internet are all as useful in Manila as in Minneapolis, the service sector has gone (global)." The worldwide Internet now makes possible for services what railroads and steamships made possible for manufactured goods: Services can be produced anywhere in the world and "delivered" digitally via terrestrial, broadband, fiber-optic cables, or high-capacity satellites in geosynchronous orbits to end users most anywhere in the world. Every imaginable kind of service is now experiencing globalization: from accounting services, claims processing, credit evaluation, and answering customer service questions on 1-800 telephone numbers to data entry, software coding, and even gambling. Businesses in the United States, Britain, Spain, Hong Kong, and France currently lead the way in outsourcing services to workers in other countries, such as India, the Philippines, Jamaica, Ghana, Hungary, and the Czech Republic.

As Lavin emphasizes in his article, the Internet "explosion" coupled with vast improvements in telecommunications technology enabled the service sector to join the process of globalization. Because many Third World nations can afford the infrastructure investments required to access the Internet—even when better roads and bridges may be too costly—Lavin predicts globalization of the service sector could create a significant improvement in living standards in poorer nations. Furthermore, by providing multinational corporations with the ability to buy inexpensive services, globalization tends to increase productivity, which tends to push wages up in the home countries of these corporations. Although protestors may argue globalization harms the poor, Lavin reminds us that the thousands of people now working as accountants for Andersen Tax and as engineers for Cisco in India are thrilled to trade their education and skills on the Internet, and they are no longer poor.

Economists have long recognized that when two parties voluntarily engage in trade, both parties gain. Globalization of services made possible by the Internet provides an opportunity for such trades: Businesses can reduce their costs, and hundreds of thousands of workers in low-income nations can earn higher wages.

Source: Douglas Lavin, "Globalization Goes Upscale," in *The Wall Street Journal*, February 1, 2002, p. A 21.

1.6 SUMMARY

- Managerial economics applies the most useful concepts and theories from microeconomics and industrial organization to create a systematic, logical way of analyzing business practices and tactics designed to maximize profit, as well as formulating strategies for sustaining or protecting these profits in the long run. Marginal analysis provides the foundation for understanding the everyday business decisions managers routinely make in running a business. Such decisions are frequently referred to as business practices or tactics. Strategic decisions differ from routine business practices or tactics because

strategic decisions seek to alter the conditions under which a firm competes with its rivals in ways that will increase and/or protect the firm's long-run profit. Industrial organization identifies seven economic forces that promote long-run profitability: few close substitutes, strong entry barriers, weak rivalry within markets, low market power of input suppliers, low market power of consumers, abundant complementary products, and limited harmful government intervention. (*LO1*)

- 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 the firm must give up to use the resource. Total economic cost is the sum of the opportunity costs of market-supplied resources (explicit costs) plus the opportunity costs of owner-supplied resources (implicit costs). Economic profit is the difference between total revenue and total economic cost. Accounting profit differs from economic profit because accounting profit does not subtract the implicit costs of using resources from total revenue. The value of a firm is the price for which it can be sold, and that price is equal to the present value of the expected future profit of the firm. The risk associated with not knowing future profits of a firm requires adding a risk premium to the discount rate used for calculating the present value of the firm's future profits. The larger (smaller) the risk associated with future profits, the higher (lower) the risk premium used to compute the value of the firm, and the lower (higher) the value of the firm will be. (*LO2*)
- The decision to hire professional managers to run a business creates a separation between business ownership and its management, forming a principal–agent relationship: A business owner (the principal) contracts with a manager (the agent) to perform tasks designed to further the objectives or goals of the owner. With the separation of ownership and management, a principal–agent *problem* can arise because owners cannot be certain that managers are making decisions to maximize the value of the firm. A principal–agent problem requires the presence of two conditions: (1) manager and owner objectives are not aligned, and (2) the owner finds it either too costly or impossible to monitor the actions and decisions of the manager to ensure these decisions will maximize the firm's value. Monitoring managers becomes an impossible task when managers are able to take hidden actions that cannot be observed by owners. A moral hazard is present if the hidden actions harm owners while benefiting the managers—perhaps by reducing their work effort, by taking excessive perks, or by pursuing goals other than profit maximization. Moral hazard is both a problem of nonaligned objectives and a problem of harmful hidden actions; if either one of these two aspects is missing there is no moral hazard problem. The shareholder owners of a public corporation can control or mitigate agency problems by (1) requiring managers to hold an equity stake in the firm, (2) increasing the number of outsiders serving on the company's board of directors, and (3) financing corporate investments with debt instead of equity. In addition to these internal corporate control measures, corporate takeovers, which originate outside the firm, can also effectively motivate managers to make value-maximizing decisions. (*LO3*)
- A price-taking firm cannot set the price of the product it sells because price is determined strictly by the market forces of demand and supply. A price-setting firm sets the price of its product because it possesses some degree of market power, which is the ability to raise price without losing all sales. A market is any arrangement that enables buyers and sellers to exchange goods and services, usually for money payments. Markets exist to reduce transaction costs, which are the costs of making a transaction. Market structure is a set of characteristics that determines the economic environment in which a firm operates: (1) the number and size of firms operating in the market, (2) the degree of product differentiation, and (3) the likelihood of new firms entering. Markets may be structured as one of four types: perfect competition, monopoly, monopolistic competition, and oligopoly. (*LO4*)
- Globalization of markets, which is the process of integrating markets located in nations around the world, is not a new phenomenon but rather an ongoing historical process that brings opportunities and challenges to business managers. Globalization provides managers with an opportunity to sell more goods and services to foreign buyers and to find new and cheaper sources of labor, capital, and raw material inputs in other countries, but along with these benefits comes the threat of intensified competition by foreign businesses. (*LO5*)

KEY TERMS

accounting profit
business practices or tactics
complete contract
economic profit
equity capital
explicit costs
globalization of markets
hidden actions
implicit costs
industrial organization
market
market power
market structure
market-supplied resources
microeconomics
moral hazard
opportunity cost
owner-supplied resources
price-setting firm
price-taker
principal–agent problem
principal–agent relationship
risk premium
strategic decisions
total economic cost
transaction costs
value of a firm

TECHNICAL PROBLEMS*

1. For each one of the costs below, explain whether the resource cost is explicit or implicit, and give the annual opportunity cost for each one. Assume the owner of the business can invest money and earn 10 percent annually.
   a. A computer server to run the firm's network is leased for $6,000 per year.
   b. The owner starts the business using $50,000 of cash from a personal savings account.
   c. A building for the business was purchased for $18 million three years ago but is now worth $30 million.
   d. Computer programmers cost $50 per hour. The firm will hire 100,000 hours of programmer services this year.
   e. The firm owns a 1975 model Clarke-Owens garbage incinerator, which it uses to dispose of paper and cardboard waste. Even though this type of incinerator is now illegal to use for environmental reasons, the firm can continue to use it because it's exempt under a "grandfather" clause in the law. However, the exemption only applies to the current owner for use until it wears out or is replaced. (*Note:* The owner offered to give the incinerator to the Smithsonian Institute as a charitable gift, but managers at the Smithsonian turned it down.)
2. During a year of operation, a firm collects $175,000 in revenue and spends $80,000 on raw materials, labor expense, utilities, and rent. The owners of the firm have provided $500,000 of their own money to the firm instead of investing the money and earning a 14 percent annual rate of return. Treat income tax as an explicit cost of doing business.
   a. The explicit costs of the firm are $_____. The implicit costs are $_____. Total economic cost is $_____.
   b. The firm earns economic profit of $_____.
   c. The firm's accounting profit is $_____.
   d. If the owners could earn 20 percent annually on the money they have invested in the firm, the economic profit of the firm would be _____.

*__Notice to students:__ The Technical Problems throughout this book have been carefully designed to guide your learning in a step-by-step process. You should work the Technical Problems as indicated by the icons in the left margin, which direct you to the specific problems for that particular section of a chapter, before proceeding to the remaining sections of the chapter.