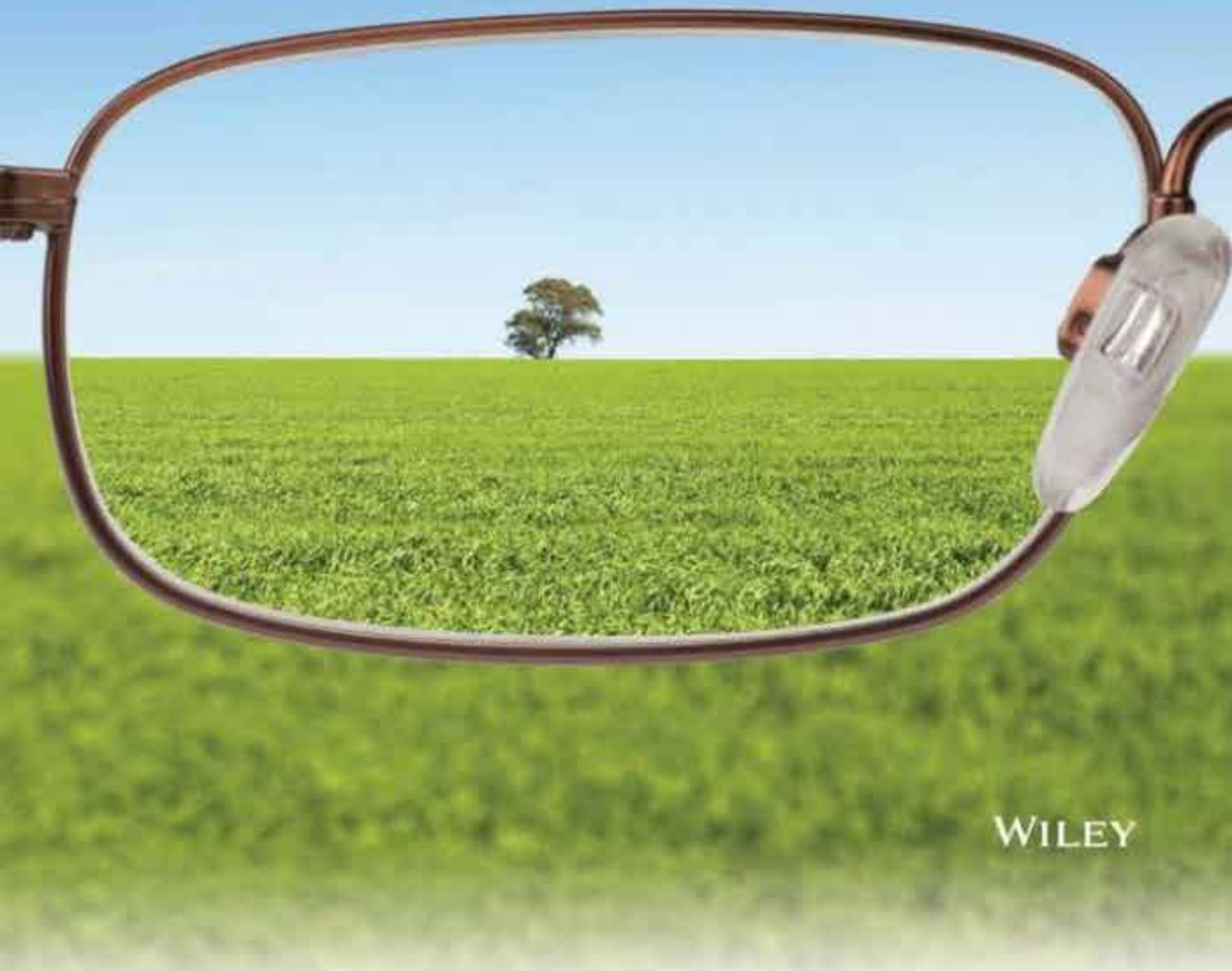
Edgar K. Browning • Mark A. Zupan

MICROECONOMICS

Theory and Applications | 12E



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Microeconomics: Theory & Applications

Twelfth Edition

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WILEY

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Preface

According to certain labor unions, traditional retailers, and community groups, Walmart imposes significant costs on society. Among the asserted costs are the destruction of jobs in competing stores, driving of employees toward public welfare systems by paying lower wages and providing limited health care coverage, and the fostering of urban sprawl. Arrayed against these claimed costs are the benefits generated by Walmart through the employment of a large number of workers (Walmart now is the largest private-sector employer in the United States) and the promotion of lower retail prices for consumers.

How can one assess the validity of the claims made by Walmart's critics? Moreover, is the combined magnitude of costs associated with Walmart sizable enough to outweigh the benefits generated by the retailing giant? A thorough knowledge of microeconomics can help answer topical questions such as these and, more broadly, gives students an understanding of how markets operate and allows them to see the world through the eyes of an economist.

Our intention with this edition of the text is to give students the fundamental tools of analysis and to show how the tools can be used to explain and predict market phenomena. To this end, we present basic microeconomic principles in a clear, thorough way, using numerous applications to illustrate the use of theory and to reinforce students' understanding of it.

We believe that microeconomics is the most important course in the undergraduate economics curriculum. We also believe that understanding microeconomics provides an essential foundation to any bachelor's or master's degree business student. As a result, our text is written so that both economics and business students will learn microeconomic theory and how to use it correctly.

Organization and Content

The twelfth edition of *Microeconomics: Theory and Applications* continues to reflect our belief that it is better for students to be exposed to thorough coverage of fundamental microeconomic concepts and techniques than to skim through a superficial treatment of a great number of topics, many of which they will never encounter again. The enthusiastic reception given the first 11 editions suggests that a large number of instructors also share this view. Apart from the emphasis on the core principles of microeconomics and how to use them, the text is by and large conventional in structure and organization except for one feature: Four chapters are devoted exclusively to applications. These are Chapter 5, "Using Consumer Choice Theory"; Chapter 10, "Using the Competitive Model"; Chapter 15, "Using Noncompetitive Market Models"; and Chapter 18, "Using Input Market Analysis."

A distinguishing feature of the text is the attention we give to input market analysis. Traditionally, this has been a weak area in most microeconomics texts, with seldom more than two chapters, and frequently only one, on the subject. Yet in a fundamental quantitative sense, input markets and product markets are of equal importance, because the sum of incomes generated in input markets (national income) equals total outlays on goods and services (national product). Moreover, public policy issues relating to input markets have become increasingly

important, as suggested by the recent attention given to managerial compensation, income distribution, welfare programs, discrimination, comparable worth, interest rates and investment, Social Security, and minimum wage legislation. Consequently, we devote three chapters to the subject of input market analysis (Chapters 16 through 18).

Because not all microeconomics courses are taught the same way, the text is designed to give instructors great flexibility in adapting the book to their requirements. For example, in a short course emphasizing the theoretical underpinnings of partial equilibrium analysis, the instructor might cover only Chapters 1 through 4, 7 through 11, 16, and 17. A longer, more theoretically oriented course could include all chapters except that most instructors will steer a middle course and select three or four applications from each of these chapters (the way we normally use the material). In addition, instructors can either assign the applications as they appear in the text—following the development of the theory—or integrate them into their presentations of the theory chapters.

Applications

We believe that a large dose of applications is an essential ingredient in any microeconomics course. Although economists know that microeconomics is important and often exciting, students occasionally need to be convinced that this is so. Applications serve this purpose. In addition, they enliven the subject for students and help them better appreciate the theory. Time permitting, the more applications covered, the better prepared students will be to use the theory on their own.

Each of the four applications chapters (Chapters 5, 10, 15, and 18) contains four to six longer applications that use and reinforce the graphical and logical techniques developed in the theory chapters. In Chapter 10, for example, the competitive model is employed to analyze taxicab licensing, airline regulation, and international trade. In Chapter 18, "Using Input Market Analysis," the theory is applied to discrimination, the incidence of the Social Security payroll tax, the effects of the National Collegiate Athletic Association on college athletes, and the benefits and costs of immigration.

Applications are not relegated exclusively to the four applications chapters; all other chapters contain several shorter applications. We feel, however, that it is appropriate to use more applications in some areas than in others. For example, it seems a misallocation of limited textbook space to include as many applications for general equilibrium theory as for the competitive and monopoly models. Not only are the applications in the latter two areas likely to be more interesting to students, they are also likely to provide more useful background for students' later work.

Changes in the Twelfth Edition

Based on comments from users and reviewers of the eleventh edition, as well as our own desire to further improve the text, we have revised it in three important ways. The principal aim of our revisions is to enhance the hallmarks of the text, namely: the wealth of real-world illustrations of microeconomic theory at work; clear and engaging exposition; and a commitment to coverage of cutting-edge concepts.

Only the Best Applications

When asked to identify the strengths of this text, reviewers and users overwhelmingly cite the applications—the four chapters devoted to longer illustrations of microeconomic theory

at work as well as the 100-plus shorter applications sprinkled throughout the other chapters. To continue building on this hallmark, we rely on a systematic rating system whereby we ask reviewers to evaluate each application. On the basis of their responses, we have added 20 new applications in this edition. The topical issues these address include the rise and fall of cigarette consumption in the United States; the growth of premium fast food options such as Chipotle; promoting efficiency in gift card giving; moral hazard when it comes to the operation of taxi cabs in New York City; the differing fortunes of college athletes and coaches; why Canadians are flying south of the border; why holiday home prices in Switzerland are soaring; privatization and productivity in China; and monopolistic competition in the refractive eye surgery marketplace.

We have retained (and whenever possible, enhanced) the top 80 percent of the applications from the previous edition. These applications cover topics such as monopsony in Major League Baseball; whether cell phone use while driving should be banned; trash pricing and recycling; the demand for and supply of school choice; the economic and accounting costs of the Sarbanes–Oxley (SOX) Act intended to enhance corporate governance; the hidden cost of our Social Security system; why price ceilings are proving deadly to individuals seeking an organ transplant; the returns to investing in a BA and an MBA; and compensating wage differentials for "glowboys"—individuals who fix steel pipes in aging nuclear power plants.

By culling the cream of the applications from the preceding edition and adding numerous interesting demonstrations of the way microeconomic theory can be used to explain and predict real-world phenomena, we've made the book's best-regarded feature—its applications—stronger than ever in this revision.

Clear and Engaging Exposition

A second key feature of the text consistently noted by adopters and reviewers is its clarity of exposition. To strengthen this feature even further, we have looked carefully at each chapter—applying Occam's razor to make our explanations as straightforward as possible. We have also sought to relegate all optional materials (e.g., mathematical appendices) to the accompanying book companion site. One telling manifestation of the care that has been applied to focusing on the essentials is that the actual text is approximately a full pound lighter than competing texts, notwithstanding our thoroughness in the coverage of key topics. The expositional clarity translates into an important benefit for students of microeconomics—superior comprehension.

To make the text as clear as possible and more engaging, we have paid particular attention to the illustrations and how they teach economic concepts. Effective graphs can truly be worth thousands of words. From the layout of graphs and tables to the number of subsections a chapter is broken down into, we have sought to respond to comments from reviewers and adopters as to the best way to showcase the content and thereby promote positive learning outcomes.

A Commitment to the Cutting Edge

Some key themes in business and economics education today are globalization, ethics/integrity, sustainability, and the appropriate role of government in society. Wherever possible, we have sought to show how economics can contribute to students' understanding of these topics, often in unexpected ways. For example, Chapter 14 provides a framework for understanding when ethical leadership is more likely to emerge through the context of a prisoner's dilemma game. The extent to which such a game is one-shot versus repeated and indefinitely lived allows us to predict the settings in which prospective leaders may be more likely to behave unethically. The perspective also allows us to grasp why market settings and capitalism, through the promotion of repeated and indefinitely lived settings, may encourage greater integrity.

The text and accompanying applications of Chapters 5, 7, and 20 explore a variety of aspects related to pollution and sustainability. Perhaps surprisingly to many students (but not to their economics instructors), this coverage illustrates how incentives and markets can actually be used to promote environmentally beneficial activities. Chapter 20, for instance, shows how the absence of liability caps would have encouraged British Petroleum to exercise greater care in its drilling operations and thereby perhaps averted the disaster that occurred in the Gulf of Mexico during the spring of 2010.

With regard to the appropriate role of government in society, Chapter 20 explores the extent to which government prolonged the Great Depression. This is a timely topic, given the recent debate over the appropriate government response to the major economic downturn of 2007–2010. Application 2.1 delves into extending unemployment insurance benefits and the impact on the unemployment level. Application 5.2 discusses school choice. A longer application in Chapter 5 provides a detailed analysis of certain important effects of the recent overhaul of health care policy in the United States (i.e., ObamaCare).

On the topic of globalization, Application 3.2 explains how Kraft successfully revised the Oreo in order to account for different consumer preferences in China. A full section in Chapter 10 deals with the net benefits of trade while Application 7.3 analyzes how returns to scale explain cross-country trade flows.

Students also have access to Excel-based tutorials relating to 16 of the key microeconomic concepts covered by our text through the companion Web site *www.wiley.com/college/browning*. These concepts are typically covered in an intermediate microeconomics one-semester course, and they enable students to manipulate the graphical presentations so that they can actually see the concepts in action as they change the input values associated with each tutorial.

Pedagogical Aids

Several other in-text pedagogical aids help students to structure and retain information.

Learning Objectives

Each chapter begins with a list of key learning objectives. These offer a preview of the chapter content and help structure study and review.

Glossary

A running glossary has been added in the margins of the text as a way to cement students' understanding of key concepts and terms. A complete glossary is also included at the end of the book.

Graphs

We have paid careful attention to the graphs used in the text. Unusually thorough explanations of graphs are given. Furthermore, the explanatory captions and liberal use of color will help students follow the text discussion and understand graphical analysis.

End-of-Chapter Aids

A summary at the end of each chapter highlights the important points of the chapter to help students review their knowledge of the basic material. More than 450 review questions and problems test students on chapter material and require them to solve analytical exercises. Answers to questions and problems with asterisks are provided on the Book Companion Site.

Chapter Appendices

Starred appendices for chapters 2,3,4,6,7,8,9,11,12 and 16 are available on the book companion site.

Teaching and Learning Resources

An *Instructor's Manual*, written by Brian is the only author for the IM and he is still at the univ. of tampa Brian Kench, of University of Tampa, accompanies the text. Each chapter in the manual features a chapter outline, general comments on the chapter, specific section-by-section comments, and suggestions that may help in developing lectures and class discussion topics. The appendix in the Instructor's Manual contains the answers to those questions and problems in the text that are not already answered at the end of the text.

Lecture Slides in PowerPoint, prepared by Della Lee Sue of Marist College, provides notes for all chapters with enlarged versions of all the figures contained in the text. This set can be used to create overhead transparencies for viewing in the classroom, or they can be copied and used as handouts for students.

The *Test Bank* prepared by Kenneth Slaysman of York College of Pennsylvania, contains 1,500 multiple-choice and short answer questions with answers. This material is also available electronically through Respondus, enabling instructors to create and manage exams that can be printed or published directly to their LMS.

A study guide prepared by Lori B. Anderson is also available. Each chapter features an in-depth section-by-section analysis, a key concepts review list, and a variety of practice and discussion questions.

A dedicated Web site with extensive resources for both students and professors *(www.wiley.com/college/browning)* is also available as are videos providing additional helpful learning materials from a microeconomics course taught in 2013–2014 at the University of Rochester, Simon Business School by Mark Zupan through Coursera, top Massively Open Online Course provider.

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The **Wiley E-Text: Powered by VitalSource** gives students anytime, anywhere, access to the best economics content when and where they study: on their desktop, laptop, tablet, or smartphone. Students can search across content, highlight, and take notes that they can share with teachers and classmates.

Wiley's E-Text for *Microeconomics: Theory and Applications, 12th edition* takes learning from traditional to cutting edge by integrating inline interactive multimedia with market–leading content. This exciting new learning model brings textbook pages to life-no longer just a static e-book, the E-Text enriches the study experience with dynamic features:

- **Interactive Tables and Graphs** allow students to access additional rich layers and "hot areas" of explanation by manipulating slider controls or clicking on embedded "hotspots" incorporated into select tables and graphs
- **Embedded Practice Quizzes** allow students to practice as they read and thereby receive instant feedback on their progress
- **Audio-Enhanced Graphics** provide further explanations for key graphs in the form of short audio clips.

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We have been fortunate to have had the assistance of many able economists in the preparation of this book. Those who have worked at various stages in the development of this edition and the 11 editions that preceded it include:

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Edgar K. Browning
Mark A. Zupan

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Applications

CHAPTER 1

An Introduction to Microeconomics

Learning Objectives

- Convey the scope of microeconomic theory.
- Explain why theory, is essential to understanding and predicting real-world outcomes.
- Distinguish between positive and normative analyses.
- Differentiate between real and nominal prices.
- Describe the basic assumptions economists make about market participants.
- Introduce the concept of opportunity cost and explain how economic costs differ from accounting costs.
- Show how a production possibility frontier graphically depicts the basic assumptions economists make about market actors as well as the concept of opportunity cost.

Memorable Quote

"Don't measure yourself by what you have accomplished, but rather by what you should have accomplished with your ability."

—John Wooden, UCLA basketball coaching legend with an opportunity-cost-based perspective

Why have health-care costs been rising? Will policies intended to provide universal health care coverage brake such cost increases in the future? If the government requires employers to provide Social Security/pension support and health care for employees, who bears the cost of such a mandate? How did mortgage-backed securities and incentive systems contribute to the recent financial market meltdown? Will financial market regulations passed by the U.S. government mitigate the likelihood of such downturns in the future? Why are Americans getting fatter? Will issuing firms tradable permits to pollute be an effective way to deal with global warming? Should apparent monopolies such as Microsoft, Google, and Apple be praised for their efficiency and profitability, or should they be subject to antitrust prosecution and broken up? What can be done to prevent future oil spill disasters such as the one involving British Petroleum in the Gulf of Mexico in 2010? Does government-provided unemployment insurance increase or decrease unemployment? Does the Internet promote competition or cartelization? Why do dry cleaners charge more to launder women's blouses than men's shirts? Should the minimum wage in the United States be raised from its present $7.25 per hour level? Are bans on cell phone calls by drivers warranted?

As these questions suggest, there are many interesting issues that microeconomic theory can help us understand. This text presents the analytical techniques of microeconomics and shows how to apply them to explain and predict real-world phenomena.

This chapter introduces microeconomic theory by first discussing its nature and the role of theory in general. The remainder of the chapter covers the basic assumptions economists make about market participants and the key concept of opportunity cost.

1.1 The Scope of Microeconomic Theory

macroeconomics
the study of aggregate economic factors

microeconomics
the study of the behavior of small economic units such as consumers and firms

price theory
another term for microeconomics

The prefix *micro-* in microeconomics comes from the Greek word *mikros*, meaning small. It contrasts with macroeconomics, the other branch of economic theory. **Macroeconomics** deals primarily with aggregates, such as the total amount of goods and services produced by society and the absolute level of prices, while **microeconomics** analyzes the behavior of "small" units: consumers, workers, savers, business managers, firms, individual industries and markets, and so on. Microeconomics, however, is not limited to "small" issues. Instead, it reflects the fact that many "big" issues can best be understood by recognizing that they are composed of numerous smaller parts. Just as much of our knowledge of chemistry and physics is built on the study of molecules, atoms, and subatomic particles, much of our knowledge of economics is based on the study of individual behavior.

Individuals are the fundamental decision makers in any society. Their decisions, in aggregate, define a society's economic environment. Consumers decide how much of various goods to purchase, workers decide what jobs to take, and business owners decide how many workers to hire and how much output to produce. Microeconomics encompasses the factors that influence these choices and the way these innumerable small decisions merge to determine the workings of the entire economy. Because prices have important effects on these individual decisions, microeconomics is frequently called **price theory**.

1.2 The Nature and Role of Theory

In disciplines from physics to political science, using a theory to make sense of a complex reality is essential. Facts do not always "speak for themselves." In economics, facts may describe a historical episode, but facts can never explain why the episode occurred or how things would have been different had, for example, the government pursued another policy. Moreover, facts can never demonstrate how, for instance, a change in agricultural price supports will affect agricultural production next year. For purposes of explanation or prediction, we must employ a theory that shows how facts are related to one another.

Theory in economics, as in other sciences, is based on certain assumptions. For example, economists assume that firms strive to maximize profit. Based on this assumption, the economic theory of the firm explains what mix of steel and plastic firms such as Toyota and General Motors (GM) employ in production as well as how many cars and trucks they produce. Theory also explains how Toyota's and GM's desired input mixes and final output levels are affected by changes in, say, the price of steel or the price received per car sold.

Economic theory can be used to predict as well as to explain real-world outcomes. For instance, the basic supply–demand model (discussed in Chapter 2) can explain the effects observed in cities that have enacted rent control laws. It can also predict the effects should the federal government impose similar price ceilings on health-care services.

What Is a Good Theory?

How do we know if a theory, whether it be in economics, physics, or political science, is a "good" theory? Basically, *a theory is considered to be valid and useful if it successfully explains and predicts the phenomena that it is intended to explain and predict.* In keeping

with this litmus test, theories are continually stacked up against real-world data. Depending on how well a theory matches the data, the theory is maintained, refined, or sometimes even discarded (perhaps in favor of a competing explanation). The continual process of testing theories against real-world data is critical to the advancement of any science, not just economics.

In testing a theory, it is important to note that imperfection tends to be the norm. That is, "good" theories typically do not explain the observed data perfectly, nor are the assumptions on which they are based entirely realistic. For example, consider the *calorie theory*, one accepted by millions of people. The calorie theory holds that a person's weight depends on the number of calories consumed per day: the more calories ingested, the heavier the person will be.

The calorie theory predicts that to lose weight, a person should cut his or her calorie intake. Is this a valid and useful theory? Consider two criticisms: first, the calorie theory is based on assumptions that are not completely realistic. That is, no one has ever seen a calorie, much less observed the human body convert it into weight. Second, the theory is not perfect. Reducing your calorie intake will not necessarily make you thin. Other factors, besides calories, influence a person's weight: heredity, exercise, metabolism, ratio of fat to protein consumption, and so on.

Does this mean that people who count calories are wrong? Not at all. In fact, the calorie theory is quite useful for millions of weight watchers around the world. For them, the general relationship between calories and weight tends to hold and becomes even stronger once the calorie theory is refined to account for other factors such as heredity, exercise, metabolism, and so forth.

Such is the case with economics. While firms may not appear to maximize profit (think about Amazon.com or Biogen), and refinements accounting for special features of particular markets may be necessary (long-run versus short-run profitability in industries where firms must make substantial up-front research and development investments), the economic theory of the firm based on the assumption of profit maximization successfully explains and predicts a wide range of real-world phenomena. Thus the theory is useful to both business managers and public policymakers.

1.3 Positive versus Normative Analysis

Economic theory is a tool for understanding relationships in the economy. While it can explain the behavior of market actors, it cannot determine which public policies are desirable and which are not. Economics can help us evaluate the results of public policies, but it never, by itself, demonstrates whether the results are good or bad.

Consider the federal minimum wage—first set in 1938 at $0.25 per hour and periodically increased over the years (to $7.25 per hour by July 2009). Evaluating the desirability of this policy requires three steps. First, one must determine the qualitative effects of the policy. For example, how does it affect the employment of workers by firms? Does it increase or decrease employment? Second, one must determine the magnitude of the effects. If the minimum wage leads to less employment, how much less? How many workers lose their jobs and how many retain their jobs at the higher wage rate? Finally, a judgment needs to be made as to whether the policy's effects are desirable. Does the benefit to workers who remain employed outweigh the costs to those workers whose jobs are cut?

positive analysis
assessment of expected, objective outcomes

The first step involves identifying the qualitative nature of a policy's consequences. This step is in the realm of **positive analysis**, assessing the expected, objective outcomes. The distinguishing feature of positive analysis is that it deals with propositions that can be tested with respect to both their underlying logic and the empirical evidence. It deals with what is, or what might be, without deciding whether something is right or wrong, good or bad. Positive analysis is scientific because it draws on accepted rules of logic and evidence, of both a

qualitative and quantitative nature, that can be used to determine the truth or falsity of statements. Microeconomic theory is a form of positive analysis; it can be used, for example, to make the qualitative prediction that a minimum wage law will reduce employment.

If we want to resolve the question of desirability, however, identifying the qualitative nature of the effects is not sufficient. We also need some idea of the size of the effects. It may matter a great deal whether the minimum wage causes 1 percent or 25 percent of unskilled workers to lose their jobs. Note that this step still involves positive analysis, but in quantitative rather than qualitative terms.

Knowing the consequences, both qualitative and quantitative, is still not sufficient to determine whether a policy is desirable. A final step is necessary: we must decide whether the consequences themselves are, on balance, desirable. To make this evaluation, each person must make a **normative analysis**, or value judgment. By nature, such a judgment is nonscientific. It cannot be proved right or wrong by facts, evidence, or logic. It stems from the value system of the person making the judgment. For example, a belief that it is desirable to raise the wages of the lowest-paid workers, even at the expense of others, falls into this category. People may agree that a particular policy has this effect, but some may hold that the outcome is desirable and others that it is not. Their value judgments differ.

normative analysis
a nonscientific value judgment

Microeconomic theory cannot demonstrate that a particular set of economic institutions or policies is desirable—and neither, for that matter, can any other scientific branch of knowledge. A belief that something is desirable requires a nonscientific judgment of what constitutes *desirability*, and that value judgment is the domain of normative analysis. Nonetheless, microeconomic theory can assist each of us in reaching such normative judgments by helping us determine the likely outcomes. In other words, microeconomics helps us take the first two of the three steps necessary to evaluate real-world phenomena.

1.4 Market Analysis and Real versus Nominal Prices

Most of microeconomics involves the study of how individual markets function. **Markets** involve the interplay of all potential buyers and sellers of a particular commodity or service. Most economic issues concern the way particular markets function. For example, an economist's wages are likely to be higher than those of a gas station attendant but lower than those of a doctor. This situation reflects the workings of the three labor markets.

markets
the interplay of all potential buyers and sellers of a particular commodity or service

To analyze markets, we concentrate on factors having the greatest influence on the decisions of buyers and sellers. Prices receive special attention. Prices result from market transactions, but they also strongly influence the behavior of buyers and sellers in every market.

In microeconomics, the term *price* always refers to the relative or real price of an item. The **nominal price**, or *absolute price*, by itself does not tell us how costly an item really is. Is a 10-cent cup of coffee expensive? In 1900 it would have been outrageously expensive; today it would be a bargain. The problem with nominal prices is that a dollar is an elastic yardstick. *The* **real price** *of a good reflects its nominal price adjusted for the changing value of money.* Table 1.1 clarifies the distinction between real and nominal prices. Between 1983 and 2013, the price level, or average price of goods and services, rose by 135 percent according to the consumer price index (CPI). This can be determined by the facts that the CPI for all items was 235 in 2013 and 100 in the base year, 1983, so it rose by:

nominal price
the absolute price, not adjusted for the changing value of money

real price
the nominal price adjusted for the changing value of money

$$(235 - 100) / 100 = 135 \text{ percent.}$$

The CPI measures the change in nominal prices. Table 1.1 indicates that the nominal prices of some goods, such as college tuition, rose by much more than the average 135 percent, and the prices of others, like telephone services, rose less.

Table 1.1

Nominal and Real Price Changes, 1983–2013

	Index of Nominal Prices in 2013 (1983 = 100)	Change in Real Prices, 1983 to 2013
All items	235	—
Tobacco and smoking products	869	+270%
College tuition	636	+171%
Medical care	423	+80%
Gasoline	310	+32%
Residential rent	267	+14%
Women's and girls' apparel	113	–52%
Telephone services	89	–62%
Personal computers and peripheral services	28	–75%

Source: U.S. Department of Labor, *CPI Detailed Report*, May 2013.

The last column in Table 1.1 lists the change in each item's price compared with the change in the average of all prices. Although the *nominal price* of gasoline rose by 210 percent, the overall price level rose by 135 percent over the same period, so the *real price* of gasoline rose by only 32 percent:

$$(310 - 235) / 235 = 32 \text{ percent.}$$

No matter how the nominal price changed between 1983 and 2013, an economist would say that the prices of the first five individual items rose while the prices of the last three fell. The term *price* always refers to a real price. The prices we use in discussion and in various diagrams refer to real prices, unless otherwise noted. But these prices are generally measured in dollar units. This practice is legitimate as long as we are using dollars of *constant purchasing power*—which is the same as measuring each price in comparison with the general price level.

APPLICATION 1.1

Real Versus Nominal Presidential Salaries

President Barack Obama was paid a government salary of $400,000 in 2013, or 16 times what President Abraham Lincoln earned 150 years prior. Yet, expressed in constant dollars, Lincoln's salary of $25,000 in 1863 equates to $652,778 in constant 2013 dollars (the CPI was 9 for 1863 versus 235 in 2013). While the salary paid to U.S. presidents has grown markedly in nominal terms over the last century and a half, it has declined in real terms.

1.5 Basic Assumptions about Market Participants

goal-oriented behavior the behavior of market participants interested in fulfilling their own personal goals

Economists make three basic assumptions about buyers and sellers. Let us address these in turn: goal orientation, rationality, and scarcity. First, market participants are presumed to be **goal oriented**—that is, interested in fulfilling their own personal goals. For example, the Sultan of Brunei may desire an opulent personal jet and advanced medical care for his country's people. Maverick entrepreneur Richard Branson has longed to circumnavigate the globe in a hot air balloon while launching and growing successful ventures such as Virgin Records and Virgin Atlantic Airways. The late film star Marilyn Monroe hoped for ever greater success on the screen and stage, an Academy Award, and children of her own.

rational behavior
the behavior of market participants based on a careful, deliberative process that weighs expected benefits and costs

The assumption of goal-oriented behavior often is taken to indicate that individuals are self-interested. This assumption, however, does not imply that market participants care solely about their own pocketbooks. As economists use this term, the behavior of Nobel Peace Prize winner Mother Teresa could accurately be described as goal oriented. Although Mother Teresa's actions clearly indicated that she had little interest in worldly possessions, they did reflect her own personal desire to help the poor of Calcutta. The assumption of goal-oriented behavior does not rule out altruistic goals.

The second assumption economists make about market participants is that they engage in **rational behavior**. For example, we presume that Toyota's decision to build a factory in the United States is the outcome of a careful, deliberative process that weighs the expected benefits and costs. We presume an individual buys a new home based on knowledge of its market value and an honest appraisal of what he or she can afford.

scarce resources
insufficient time, money, or other resources for individuals to satisfy all their desires

The third, and most important, assumption made by economists about market participants is that they confront **scarce resources**. For example, there is simply not enough time, money, or other resources for the typical consumer to satisfy all of his or her desires. Human beings have relatively limitless desires, and no matter how wealthy they become, resources will never be plentiful enough to ensure that all their desires can be fulfilled.

If individuals rationally pursue their goals but have limited resources, choices must be made. Specifically, one must decide which goal to pursue and how far to pursue it. Microeconomics explores this process of making choices subject to resource constraints.

1.6 Opportunity Cost

Whenever you pursue one goal, you limit the extent to which your other goals can be satisfied with your scarce resources. For example, suppose that after getting your bachelor's degree and working for a few years, you enroll in a full-time, two-year MBA program. What would the cost of this choice be? You would incur some **explicit costs**, such as tuition, books, and parking. The dollars spent on such items could have been devoted to the pursuit of other goals. You would also face **implicit costs** associated with your own use of time and other resources in the pursuit of a particular activity versus alternatives. For example, instead of going to business school, you could have continued working and making $40,000 per year. The $40,000 in annual forgone wages would be an implicit cost associated with pursuing an MBA. In other words, the time and effort devoted to pursuing the MBA instead could have been used to generate $40,000 in each of the two years that you attended graduate business school.

explicit costs
money used in the pursuit of a goal that could otherwise have been spent on an alternative objective

implicit costs
costs associated with an individual's use of his or her own time and other resources in the pursuit of a particular activity versus alternatives

To understand why implicit costs matter, assume that, relative to the option of remaining at work, the MBA entails explicit costs (such as tuition) of $70,000 and will increase your postgraduate lifetime earnings by $60,000. In this case, you likely would not leave your job to pursue the MBA. The $60,000 increase in postgraduate earnings would be outweighed by the combined $70,000 in explicit costs and $80,000 in implicit costs of two years' lost wages.

The concepts of explicit and implicit costs also apply to the production side of a market. For firms making production decisions, explicit costs are those that are usually counted as costs in conventional accounting statements. They include payroll, raw materials, insurance, electricity, interest on debt, and so on. Implicit costs reflect the fact that a firm's resources can be allocated to other uses—Time Warner, for example, can reallocate its resources from magazine publishing to the production of interactive video products.

economic cost or opportunity cost
the sum of explicit and implicit costs

The sum of the explicit and implicit costs associated with using some resource in a particular way is defined to be the resource's **economic cost** or **opportunity cost**. The concept of opportunity cost forces us to recognize that costs are not just money payments but also sacrificed alternatives. Where more than two uses for a resource exist and the resource can be

devoted to only one use at a time, the opportunity cost of using the resource in a particular way is the value of the resource in its best alternative use. So, if your options are business school, continuing to work in your current job for $40,000 per year, and switching to a similarly demanding job that only pays $30,000 per year, you would take into account only the implicit cost of giving up your current job in determining the opportunity cost of pursuing the MBA.

APPLICATION 1.2

Why the King Left Cleveland in 2010, and Can Benefits in Sports Be Measured?

In 2010, basketball star LeBron James (dubbed "the King") had to decide between staying with the Cleveland Cavaliers in Ohio and switching to one of several other teams bidding for his services. LeBron's decision to join the Miami Heat required an analysis similar to the one we have just spelled out for enrolling in a full-time MBA program. LeBron had to take into account the explicit costs involved with playing for a particular team as well as the implicit costs associated with forgone alternatives.

Not all the costs are obvious. For example, while the Cavaliers offered a more generous salary package staying in Ohio would have also involved paying greater state and local income taxes on salary as well as endorsement income. Indeed, Richard Vedder, an economist at Ohio University, estimated that the net present value of income tax savings just on salary to LeBron from living in Miami as opposed to his home town of Akron, Ohio, was $6–8 million. The combined state and local income tax rate in Akron is 7 percent versus 0 percent for Miami, Florida. The rates are even high in New York City (12.85 percent) and New Jersey (9 percent)—the locations of two other teams that were actively in the running for LeBron's services.

Estimating the explicit benefits to LeBron associated with various teams also is no easy matter. How can one put a value, for example, on playing with two particular friends (Dwayne Wade and Chris Bosh) who were already stars on the Miami Heat squad? How about calculating the benefit associated with a greater likelihood of winning the NBA championship through playing with the Heat versus the Cavaliers?

Economics is predicated on the assumption that people take such benefits and costs into account when making decisions. And, while costs and benefits may be difficult to measure, and can change over time (note that LeBron opted to return to Cleveland in 2014 an account of the value he placed on being back home), economics presumes that individuals strive to place values on these costs and benefits in seeking to make rational choices.

For another example from the sports world, consider whether public funds should be devoted to building a new stadium. This was the case faced by Minnesota officials when their professional football team, the Vikings, threatened to leave without a partial public subsidy for a new $870 million stadium to replace the existing Metrodome in downtown Minneapolis. In addition to more direct benefits that a sports franchise provides a locality, policymakers had to estimate whether the stadium subsidy could at least partly be justified by the civic pride and purpose generated by the Vikings for Minnesotans.

Economists Aju Fenn and John Crooker estimated that, as of 2002, the average Minnesotan derived a benefit on the order of $530 annually from the joy and pride of having the Vikings in Minnesota.[1] Although some other economists question the estimates due to the extent to which suryvey-to-based evidence accurately reflects individual actual willingness to spend money, the Fenn and Crooker study does indicate that while the benefits of fandom in sports are not priceless, they are also nonzero and need to be incorporated into decisions such as whether to provide public funds for a new local stadium.

[1]Aju J. Fenn and John R. Crooker, "Estimating Local Welfare Generated by an NFL Team Under Credible Threat of Relocation," *Southern Economic Journal*, 76, No. 1 (July 2009), pp. 198–223.

Economic versus Accounting Costs

accounting costs costs reported in companies' net income statements generated by accountants

Because opportunity costs are not always readily apparent (especially their implicit components), they often are not accurately reflected in companies' net income statements. For example, consider a family-run grocery store in downtown Tokyo whose owners acquired the property several generations ago for almost nothing. From an accounting perspective, the grocery store may appear to be generating positive net income: revenue exceeds the sum of **accounting costs** comprising payroll, electricity, insurance, wholesale grocery costs, and so on. Still, the grocery store may be losing money from an economic perspective once the

opportunity cost of the land on which it sits is taken into account. That is, the land could be sold or rented to someone else. This choice will generate payments that are sacrificed when the family uses the land to run a grocery. These forgone earnings represent an opportunity cost—and this cost can be significant. For example, the value of just the Imperial Palace grounds situated in the heart of Tokyo has been estimated to exceed, in certain years, the total value of real estate in the state of California.

APPLICATION 1.3 The Accounting and Economic Costs of SOX

In the wake of several high-profile corporate scandals such as Enron, Tyco, Arthur Andersen, and Adelphia, the U.S. Congress passed the Sarbanes-Oxley Act (SOX) in 2002. Signed into law soon thereafter by President Bush, SOX was intended to significantly enhance corporate governance by changing the rigor with which publicly traded companies reported their finances, communicated with shareholders, and governed themselves.

While well intentioned, the accounting costs to corporations from complying with SOX have been substantial. Based on surveys of publicly traded firms by Korn/Ferry, Foley & Larder, and A.R.C. Morgan, the annual accounting costs of complying with SOX appear to range from $11 billion to $26 billion.

These accounting costs, however, pale in comparison to the economic costs of SOX, which have been estimated to be as high as $140 billion annually.[2] Among these harder-to-measure but much more substantial costs are the fact that SOX diverts the attention of senior management from doing business. As the chief accounting officer of General Motors has noted: "The real cost isn't the incremental dollars, it is having people that should be focused on the business focused instead on complying with the details of the [SOX] rules." SOX also exposes executives to greater litigation risks and stiffer penalties. As a result, CEOs are less likely to take riskier, entrepreneurial actions, consequently changing their business strategies and potentially reducing the value of their firms—and altering the future of the U.S. economy.

To gauge the economic costs associated with SOX, Professor Ivy Zhang of the University of Minnesota employed what is known as an "event-study" analysis focusing on the legislative events or "news" leading to the passage of SOX in July 2002. The analysis examined broad movements in the stock market and used well-known statistical techniques to isolate the impact of a particular factor—in this case, the Sarbanes-Oxley legislation. The analysis indicated that, holding constant other factors, the cumulative abnormal return of the stock market stemming from the legislative events leading to the passage of SOX was significantly negative and translated into a loss of over 12 percent ($1.4 trillion) of the total market value ($11.3 trillion) of publicly traded firms in the United States.

[2]Ivy Zhang, "Economic Consequences of the Sarbanes-Oxley Act of 2002," *Journal of Accounting and Economics*, 44, Nos. 1–2 (September 2007), pp. 74–115.

Sunk Costs

sunk costs
costs that have already been incurred and are beyond recovery

Although opportunity costs may not be readily apparent, they should always be taken into account when making economic decisions. The opposite is the case for **sunk costs**—costs that have already been incurred and are beyond recovery. Even though sunk costs are usually quite apparent, they need to be ignored when making economic decisions.

Consider the case of the Miami Heat, who negotiated a 6-year, $110 million contract with LeBron James in 2010. The contract involves a signing bonus of $20 million, plus annual payments averaging $15 million, should the Heat exercise their option of playing James. But suppose that after the contract is signed, a player comparable in talent to James offers his services to the Heat for $96 million for the next 6 years—annual payments of $16 million. What should the Heat management do? The answer is, stick with James. Once the $20 million signing bonus has been paid to James, it is a sunk cost. The opportunity cost of exercising the James option is thus $90 million (the remaining amount that must be paid to James) versus the $96 million it would cost to hire the rival player.

APPLICATION 1.4

Why It Was Profitable to Demolish a Profitable Hong Kong Hotel

In June 1995, the 26-story Hong Kong Hilton, the first five-star hotel in the central business district of Hong Kong, was smashed to rubble. The hotel was demolished despite the facts that accounting statements showed $25 million in profit being earned on $58 million in revenue in 1994; $16 million had recently been spent to rebuild the hotel's lobby—more than the hotel cost to build in 1963; and the owner of the hotel had to pay $125 million to Hilton's parent company to break the last 20 years of the hotel's management contract. Why did the demolition make sense? With the astronomically high rental prices for office space in Hong Kong, property consultants estimated that an extra $70 million in rental income per year could be earned by constructing an office tower on the site historically occupied by the hotel.

1.7 Production Possibility Frontier

production possibility frontier (*PPF*)
a depiction of all the different combinations of goods that a rational actor with certain personal goals can attain with a fixed amount of resources

We can display in graphical form the basic economic assumptions about market actors as well as the concept of opportunity cost. Specifically, a **production possibility frontier (*PPF*)** depicts all the different combinations of goods that a rational actor with certain personal goals can attain with a fixed amount of resources. For example, suppose you are president of a university. By effectively employing the resources on your campus, such as the faculty and staff, classrooms, libraries, laboratories, dorms, cyclotron, and so on, you can produce two possible services: research and teaching.

Based on the resources at your disposal, assume that the different combinations of research and teaching that your university can produce each year are represented by the *PPF* depicted in Figure 1.1. At one extreme, if your university were devoted solely to research, you could produce 1,000 units of research and 0 units of teaching (point *A*) with your limited resources. At the other extreme, if classroom instruction were the overriding objective, your university could produce a maximum of 500 units of teaching and 0 units of research (point *Z*). Of course, you need not be at either of the two extremes on your *PPF*. You also have the option of producing a mix of 500 units of research and 250 teaching units (point *E*) or, for that matter, any point lying on or inside (such as *Y*) the straight-line segment that we have drawn connecting endpoints *A* and *Z* of the *PPF* shown in Figure 1.1.

Figure 1.1

A Production Possibility Frontier (*PPF*)
A *PPF* depicts the three basic assumptions made by economists about market participants (goal-oriented behavior, scarce resources, and rationality) as well as the concept of opportunity cost. With a nonsatiable desire for both research (R) and teaching (T), a university president would prefer to be as far to the northeast as possible on the graph. Scarce resources limit the president to any combination on or below the *PPF* boundary *AZ*. Rational behavior implies that the president will choose to be on the boundary as opposed to below it. Opportunity cost is reflected by the slope of the *PPF*.