# MICROECONOMICS

## PRINCIPLES & APPLICATIONS

SIXTH EDITION

ROBERT E. HALL & MARC LIEBERMAN

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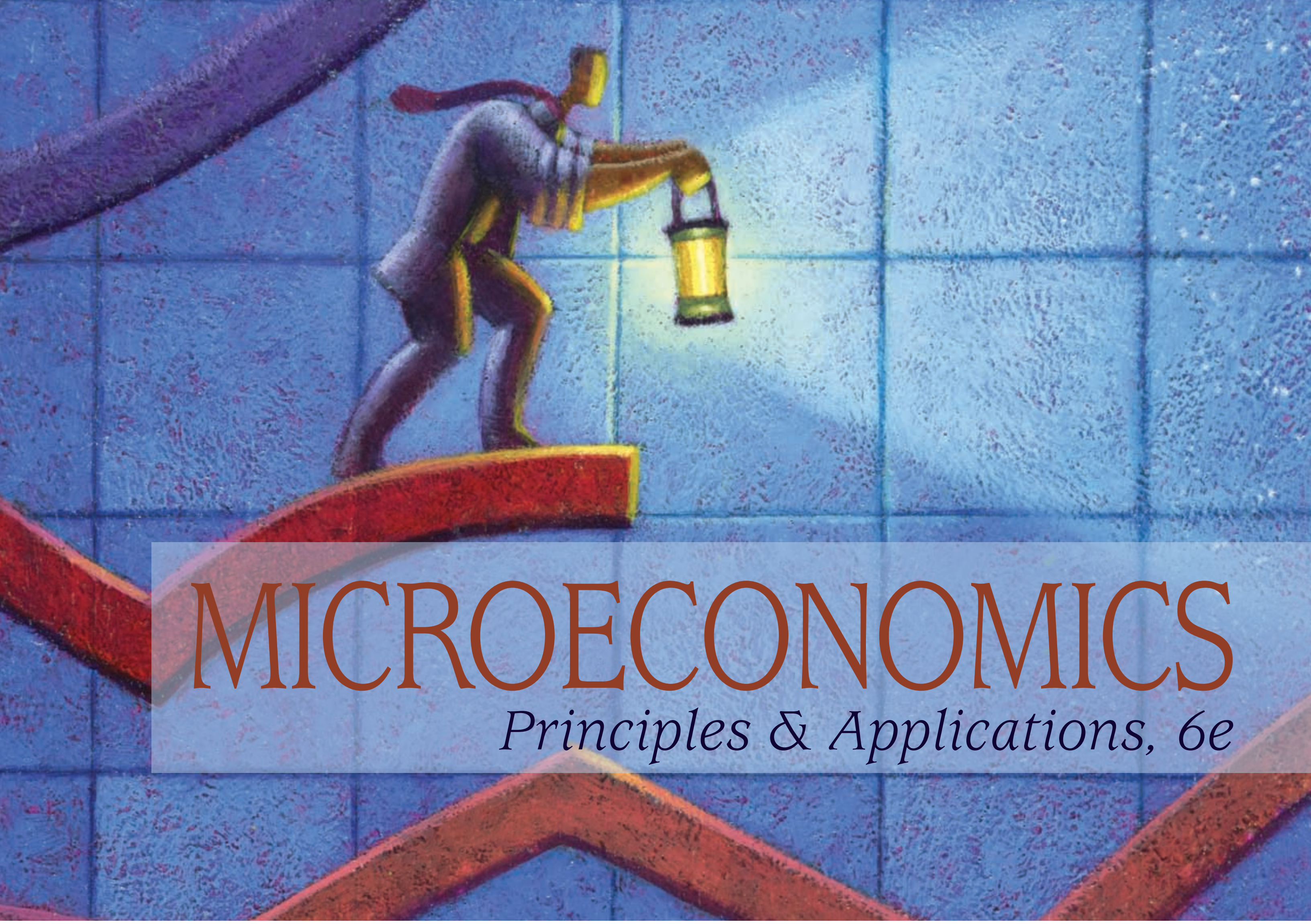
# USING THE THEORY



# MICROECONOMICS

## *Principles & Applications, 6e*

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*Robert E.* **HALL**
Department of Economics, Stanford University

*Marc* **LIEBERMAN**
Department of Economics, New York University

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# PREFACE

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*Microeconomics: Principles and Applications* is about economic principles and how economists use them to understand the world. It was conceived, written, and for the sixth edition, substantially revised to help your students focus on those basic principles and applications.

We originally decided to write this book because we thought that existing texts tended to fall into one of three categories. In the first category are the encyclopedias—the heavy tomes with a section or a paragraph on every topic or subtopic you might possibly want to present to your students. These books are often useful as reference tools. But because they cover so many topics—many of them superficially—the central themes and ideas can be lost in the shuffle.

The second type of text we call the "scrapbook." In an effort to elevate student interest, these books insert multicolored boxes, news clippings, interviews, cartoons, and whatever else they can find to jolt the reader on each page. While these special features are often entertaining, there is a trade-off: These books sacrifice a logical, focused presentation of the material. Once again, the central themes and ideas are often lost.

Finally, a third type of text, perhaps in response to the first two, tries to do less in every area—a *lot* less. But instead of just omitting extraneous or inessential details, these texts often throw out key ideas, models, and concepts. Students who use these books may think that economics is overly simplified and unrealistic. After the course, they may be less prepared to go on in the field, or to think about the economy on their own.

## A Distinctive Approach

Our approach is very different. We believe that the best way to teach principles is to present economics as a coherent, unified subject. This does not happen automatically. On the contrary, principles students often miss the unity of what we call "the economic way of thinking." The principles course then appears to be just "one thing after another," rather than the coherent presentation we aim for. For example, without proper guidance, students may view the analysis of goods markets, labor markets, and financial markets as entirely different phenomena, rather than as a repeated application of the same methodology with a new twist here and there.

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## Careful Focus

Because we have avoided the encyclopedic approach, we have had to think hard about what topics are most important. As you will see:

### We Avoid Nonessential Material

When we believed a topic was not essential to a basic understanding of economics, we left it out. However, we have striven to include core material to *support* an instructor who wants to present special topics in class. So, for example, we do not have separate chapters on environmental economics, agricultural economics, urban economics, health care economics, or comparative systems. But instructors should find in the text a good foundation for building any of these areas—and many others—into their course. And we have included examples from each of these areas as *applications* of core theory where appropriate throughout the text.

### We Avoid Distracting Features

This text does not have interviews, news clippings, or boxed inserts with only distant connections to the core material. The features your students *will* find in our book are there to help them understand and apply economic theory itself, and to help them avoid common mistakes in applying the theory (the Dangerous Curves feature).

### We Explain Difficult Concepts Patiently

By freeing ourselves from the obligation to introduce every possible topic in economics, we can explain the topics we *do* cover more thoroughly and patiently. We lead students, step-by-step, through each aspect of theory, through each graph, and through each numerical example. In developing this book, we asked other experienced teachers to tell us which aspects of economic theory were hardest for their students to learn, and we have paid special attention to these trouble spots.

### We Use Concrete Examples

Students learn best when they see how economics can explain the world around them. Whenever possible, we develop the theory using real-world examples. You will find numerous references to real-world corporations and government policies throughout the text. We often use real-world data on our conceptual graphs. When we employ hypothetical examples because they illustrate the theory more clearly, we try to make them realistic. In addition, almost every chapter ends with a thorough, extended application (the "Using the Theory" section) focusing on an interesting real-world issue.

## Features That Reinforce

To help students see economics as a coherent whole, and to reinforce its usefulness, we have included some important features in this book.

### The Three-Step Process

Most economists, when approaching a problem, begin by thinking about buyers and sellers, and the markets in which they come together to trade. They move on to characterize a market equilibrium, and then explore how the equilibrium changes when conditions change. To understand what economics is about, students need to understand this process and see it in different contexts. To help them do so, we have identified and stressed a "three-step process" that economists use in analyzing problems. The three key steps are:

1. **Characterize the Market.** Decide which market or markets best suit the problem being analyzed, and identify the decision makers (buyers and sellers) who interact there.
2. **Find the Equilibrium.** Describe the conditions necessary for equilibrium in the market, and a method for determining that equilibrium.
3. **Determine What Happens When Things Change.** Explore how events or government policies change the market equilibrium.

The steps themselves are introduced toward the end of Chapter 3. Thereafter, the content of most chapters is organized around this three-step process. We believe this helps students learn how to think like economists, and in a very natural way. And they come to see economics as a unified whole, rather than as a series of disconnected ideas.

### Dangerous Curves

Anyone who teaches economics for a while learns that, semester after semester, students tend to make the same familiar errors. In class, in office hours, and on exams, students seem pulled, as if by gravity, toward certain logical pitfalls. We've discovered in our own classrooms that merely explaining the theory properly isn't enough; the most common errors need to be *confronted,* and the student needs to be shown *specifically* why a particular logical path is incorrect. This was the genesis of our "Dangerous Curves" feature—boxes that anticipate the most common traps and warn students just when they are most likely to fall victim to them. We've been delighted to hear from instructors how effective this feature has been in overcoming the most common points of confusion for their students.

### Using the Theory

This text is full of applications that are woven throughout the narrative. In addition, almost every chapter ends with an extended application ("Using the Theory") that pulls together several of the tools learned in that chapter. These are not news clippings or world events that relate only tangentially to the material. Rather, they are step-by-step presentations that are rich with real-world detail. The goal is to show students how the tools of economics can explain things about the world—things that would be difficult to explain without those tools.

### Content Innovations

In addition to the special features just described, you will find some important differences from other texts in topical approach and arrangement. These, too, are designed to make the theory stand out more clearly, and to make learning easier. These are not pedagogical experiments, nor are they innovation for the sake of innovation. The differences you will find in this text are the product of years of classroom experience.

#### Scarcity, Choice, and Economic Systems (Chapter 2)

This early chapter, while covering standard material such as opportunity cost, also introduces some central concepts much earlier than other texts. Most importantly, it introduces the concept of *comparative advantage,* and the basic principle of *specialization and exchange.* We have placed them at the front of our book, because we believe they provide important building blocks for much that comes later. For example, comparative advantage and specialization *within* the firm help explain economies of scale (Chapter 7). International trade (Chapter 16) can be seen as a special application of these principles, extending them to trade between nations.

### Working with Supply and Demand (Chapter 4)

Our Chapter 4—in addition to analyzing price ceilings and floors—introduces two concepts not often found in principles texts, but which have become increasingly relevant. The first is how supply and demand can be used for *stock variables,* and not just flow variables. In the chapter, we treat housing as a stock variable, and then apply the model to the recent housing boom and bust. We also believe that teaching the stock-flow distinction early—with the rather intuitive case of housing—makes it easier to think about stock variables later, when students learn about the stock market (in micro), and the money market (for those who go on to macro).

The second concept introduced in this chapter is *leverage*. Although it has been at the heart of recent economic turmoil, it has not been part of the traditional principles pedagogy. We've introduced leverage in a simple, intuitive way in the body of Chapter 4. We then delve a bit deeper in the short appendix to that chapter, which explains the concept of owners' equity (in a home), and presents a simple *leverage ratio* that students can work with. Teaching this concept early creates a fresh connection to current policy debates, and it lays the foundation for later applications in the text. Students will see how leverage contributed to the recent housing boom and bust (in Chapter 4) as well as the moral hazard problem in financial institutions (Chapter 15).

### How Firms Make Decisions: Profit Maximization (Chapter 8)

Many texts introduce the theory of the firm using the perfectly competitive model first. While this has logical appeal to economists, we believe it is an unfortunate choice for students encountering this material for the first time. Leading with perfect competition forces students to simultaneously master the logic of profit maximization *and* the details of a rather counter-intuitive kind of market at the same time. Students quite naturally think of firms as facing *downward*-sloping demand curves—not horizontal ones. We have found that they have an easier time learning the theory of the firm with the more familiar, downward-sloping demand curve. Further, by treating the theory of the firm in a separate chapter, *before* perfect competition, we can separate concepts that apply in *all* market structures (the shapes of marginal cost and average cost curves, the *MC* and *MR* approach to profit maximization, the shutdown rule, etc.), from concepts that are unique to perfect competition (horizontal demand curve, marginal revenue the same as price, etc.). This avoids confusion later on.

### Monopolistic Competition and Oligopoly (Chapter 11)

Two features of our treatment are worth noting. First, we emphasize advertising, a key feature of both of these types of markets. Students are very interested in advertising and how firms make decisions about it. Second, we have omitted older theories of oligopoly that raised more questions than they answered, such as the kinked demand curve model. Our treatment of oligopoly is strictly game theoretic, but we have taken great care to keep it simple and clear. Here, as always, we provide the important tools to *support* instructors who want to take game theory further, without forcing every instructor to do so by including too much.

### Capital and Financial Markets (Chapter 13)

This chapter focuses on the common theme of these subjects: the present value of future income. Moreover, it provides simple, principles-level analyses of the stock and bond markets—something that students are hungry for but that many principles textbooks neglect.

### Description versus Assessment (Chapters 14 and 15)

In treating product market structures, most texts switch back and forth between the *description and analysis* of different markets on the one hand and their *efficiency properties* on the other. Our book deals with description and analysis first, and only then discusses efficiency, in two comprehensive chapters. The first of these (Chapter 14) covers the concept and measurement of economic efficiency, using Pareto improvements as well as consumer and producer surplus. The second (Chapter 15) deals with market failures and government's role in economic efficiency. This arrangement of the material permits instructors to focus on *description and prediction* when first teaching about market structures—a full plate, in our experience. Moreover, two chapters devoted to efficiency allows a more comprehensive treatment of the topic than we have seen elsewhere. Finally, our approach—in which students learn about efficiency *after* they have mastered the four market structures—allows them to study efficiency with the perspective needed to really understand it.

### Comparative Advantage and the Gains from International Trade (Chapter 16)

We've found that international trade is best understood through clear numerical examples, and we've developed them carefully in this chapter. We also try to bridge the gap between the economics and politics of international trade with a systematic discussion of winners and losers.

## ORGANIZATIONAL FLEXIBILITY

We have arranged the contents of each chapter, and the table of contents as a whole, according to our recommended order of presentation. But we have also built in flexibility.

### In Microeconomics

- Chapter 6 develops consumer theory with both marginal utility and (in an appendix) indifference curves, allowing you to present either method in class.
- If you wish to highlight international trade or present comparative advantage earlier in the course, you could assign Chapter 16 immediately following Chapter 3.
- If you wish to introduce consumer and producer surplus earlier in the course, all of Chapter 14 can be assigned after Chapter 10. And if you feel strongly that economic efficiency should be interwoven bit-by-bit with the chapters on market structure, Chapter 14 can be easily broken into parts. The relevant sections can then be assigned separately with Chapters 3, 5, 9, and 10.

Finally, we have included only those chapters that we thought were both essential and teachable in a yearlong course. But not everyone will agree about what is essential. While we—as authors—cringe at the thought of a chapter being omitted in the interest of time, we have allowed for that possibility. Nothing in Chapter 12 (Labor Markets), Chapter 13 (Capital and Financial Markets), Chapter 15 (Government's Role in Economic Efficiency), Chapter 16 (International Trade), is essential to any of the other chapters in the book. Skipping any of these should not cause continuity problems.

## NEW TO THE SIXTH EDITION

Our previous (fifth) edition was our most significant revision yet. This will not surprise anyone who was teaching an economics principles course during or after September 2008, when the financial crisis hit its peak. One of us (Lieberman) was teaching macro principles at the time and had the daily task of integrating the flood of unprecedented events into the course. When the semester was over, the two of us thought long and hard about what worked, what didn't, and how the principles course—both micro and macro—should respond to the changes we had seen.

In planning this new edition, we were gratified that the major pedagogical changes we had made in the fifth edition still seemed, in retrospect, to be the right ones. So you will not find any radical changes in approach this time. For faculty preparing lectures, this will be welcome news: Very few adjustments will be needed to present core concepts and models. For students, however, we think this revision will make a huge difference.

Our main goal in this edition was to provide students with a *smoother ride* through the text. Valuable suggestions from dozens of users—both instructors and students—were incorporated into every chapter. We paid particular attention to sections that were bogging students down, either deleting them or clarifying them. Many sections were rewritten from scratch to introduce a more careful, step-by-step approach. We removed some of the more complex Dangerous Curves boxes, trimmed down many others, and added about a dozen new ones. And, of course, we brought our examples and Using the Theory sections up to date, to engage with recent economic events.

### Changes That May Be of Interest

Aside from the general updating and streamlining mentioned above, we want to call attention to a few changes that *might* affect lectures for some instructors.

Chapter 2 has a new section on markets, ownership, and the invisible hand, as well as a discussion of mixed economies. Chapter 3's Using the Theory section on oil markets is now a much simpler supply-and-demand analysis. Chapter 8 (Profit Maximization) has a new discussion of total revenue and elasticity. In Chapter 9 (Perfect Competition), we've deleted the vertical portion of the firm's supply curve (below the shutdown price), and offered an entirely new Using the Theory on the zero-profit result.

Chapter 11 (Imperfect Competition) has several changes. First, we've eliminated Nash equilibrium. We've found that—without a more advanced treatment (too advanced for the principles level), Nash equilibrium creates more confusion than understanding. But we've added a section on concentration ratios and the Herfindahl-Hirschman Index, and an appendix that presents a simple model of cartel pricing. Chapter 11 now covers antitrust policy related to mergers only, and we've moved our more general material on antitrust (including the Sherman and Clayton Acts) to Chapter 15.

Chapter 13 (Capital and Financial Markets) has a vastly simplified and shortened treatment of the bond market, involving fewer bolded terms and graphs. In Chapter 14 (Economic Efficiency), we moved (and expanded) the treatment of elasticity and deadweight losses from the Using the Theory section into the body of the chapter. The Using the Theory itself now covers only the land tax.

Chapter 15 has a few important changes. First, the discussion of the free-rider problem has been moved from externalities to public goods. Second, the discussion of the Coase theorem has been shortened and simplified. And the Using the Theory section on moral hazard and the financial crisis has been entirely rewritten from a different perspective. It also includes new material on the Dodd-Frank Act (as it relates to moral hazard).

Finally, for those who incorporate the end-of-chapter problems into their courses, we should point out that these, too, have undergone changes: Some deleted, and dozens substantially revised or entirely new.

## For the Instructor

- The ***Instructor's Manual*** is revised by Dell Champlin, Oregon State University. The manual provides chapter outlines, teaching ideas, experiential exercises for many chapters, and solutions to all end-of-chapter problems.
- The ***Instructor Companion Site*** on the *Product Support Web Site*. This site at **http://login.cengage.com** features the essential resources for instructors, password-protected, in downloadable format: the *Instructor's Manual* in Word, the test banks in Word, and PowerPoint lecture and exhibit slides.
- The ***Microeconomics Test Bank*** is revised by Kenneth Slaysman of York College of Pennsylvania. It contains more than 2,500 multiple-choice questions. The test questions have been arranged according to chapter headings and subheadings, making it easy to find the material needed to construct examinations.
- ***ExamView Computerized Testing Software.*** ExamView is an easy-to-use test creation package compatible with both Microsoft Windows and Macintosh client software, and contains all of the questions in all of the printed test banks. You can select questions by previewing them on the screen, by number, or randomly. Questions, instructions, and answers can be edited, and new questions can easily be added.
- ***PowerPoint Lecture and Exhibit Slides.*** Available on the Web site and the IRCD, the PowerPoint presentations are revised by Andreea Chiritescu, Eastern Illinois University. These consist of speaking points in chapter outline format, accompanied by numerous key graphs and tables from the main text, many with animations to show movement of demand and supply curves.
- ***CengageCompose.*** With CengageCompose you can create your own print text to meet specific course learning objectives. Gather what you need from our vast library of market-leading course books and enrichment content, or add original material. Build your book the way you want it organized, personalized to your students. Publish your title with easy-to-use tools that guarantee you will get what you designed. For more information, contact your sales rep or go to **http://www.cengage.com/custom/**
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## For the Student

- ***Hall/Lieberman CourseMate.*** Multiple resources for learning and reinforcing principles concepts are now available in one place!

  CourseMate is your one-stop shop for the learning tools and activities to help students succeed. Available for a minimal additional cost, CourseMate provides a wealth of resources that help them study and apply economic concepts. As students read and study the chapters, they can access video tutorials with *Ask the Instructor Videos*. They can review with *Flash Cards* and the *Graphing Workshop* as well as check their understanding of the chapter with *interactive quizzing*.

  CourseMate gives you BBC News videos, EconNews articles, Economic Debates, Links to Economic Data, and more, organized by chapter to help your students get the most from *Microeconomics: Principles and Applications,* sixth edition, and from your lectures.

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- ***Aplia.*** Founded in 2000 by economist and Stanford professor Paul Romer, Aplia is dedicated to improving learning by increasing student effort and engagement. The most successful online product in economics by far, Aplia has been used by more than 1,000,000 students at more than 850 institutions. Visit **www.aplia.com/cengage** for more details. For help, answers, or a live demonstration, please contact Aplia at **support@aplia.com.**

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| Xiaodan Zhao | College of Saint Benedict and Saint John's University |

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## A Request

Although we have worked hard on the six editions of this book, we know there is always room for further improvement. For that, our fellow users are indispensable. We invite your comments and suggestions wholeheartedly. We especially welcome your suggestions for additional "Using the Theory" sections and Dangerous Curves. You may send your comments to either of us in care of South-Western.

Robert E. Hall

Marc Lieberman

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# ABOUT THE AUTHORS

## Robert E. Hall

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Robert E. Hall is the Robert and Carole McNeil Joint Professor of Economics at Stanford University and Senior Fellow at Stanford's Hoover Institution. His research focuses on the overall performance of the U.S. economy, including unemployment, capital formation, financial activity, and inflation. He has served as president, vice president, and Ely Lecturer of the American Economic Association and is a Distinguished Fellow of the association. Hall is an elected member of the National Academy of Sciences and Fellow of the American Academy of Arts and Sciences, the Society of Labor Economists, and the Econometric Society. He is director of the Research Program on Economic Fluctuations and Growth of the National Bureau of Economic Research. He was a member of the National Presidential Advisory Committee on Productivity. For further information about his academic activities, visit his Stanford Web site by googling "Robert E. Hall."

## Marc Lieberman

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Marc Lieberman is Clinical Professor of Economics at New York University. He received his PhD from Princeton University. Lieberman has taught graduate and undergraduate courses in microeconomics, macroeconomics, econometrics, labor economics, and international economics. He has taught Principles of Economics at Harvard, Vassar, the University of California at Santa Cruz, the University of Hawaii, and New York University. He has won NYU's Golden Dozen teaching award three times, and also the Economics Society Award for Excellence in Teaching. He was coeditor and contributor to *The Road to Capitalism: Economic Transformation in Eastern Europe and the Former Soviet Union*. Lieberman has consulted for Bank of America and for the Educational Testing Service. In his spare time, he is a professional screenwriter, and teaches screenwriting at NYU's School of Continuing and Professional Studies.

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CHAPTER 1

# What Is Economics?


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E*conomics*. The word conjures up all sorts of images: manic stock traders on Wall Street, an economic summit meeting in a European capital, an earnest television news anchor announcing good or bad news about the economy. . . . You probably hear about economics several times each day. What exactly *is* economics?

First, economics is a *social science*. It seeks to explain something about *society*, just like other social sciences, such as psychology, sociology, and political science. But economists generally ask different questions about society than other social scientists do, such as:

- Why are some countries poor and others rich? How can we help the worst-off countries escape extreme poverty?
- When a nation is struck by a natural disaster—such as a hurricane or earthquake—how are people's jobs, incomes, and living standards affected?
- Why do Americans who graduate from college earn so much more than those who don't?
- What determines how much we pay for the things we buy every month? What happens when governments try to change these prices?
- Why do the prices of financial assets like stocks, bonds, and foreign currency fluctuate so widely? Can these price movements be predicted?
- What causes economies to occasionally go haywire, suffering months or years of falling production and sustained joblessness? How should governments respond?

In this book, you'll learn how economics can help us answer these and many other questions. You'll also see that the answers share a common starting point: an exploration of how individuals and societies make decisions when they are faced with scarcity.

In fact, a good definition of economics, which stresses its differences from other social sciences, is:

***Economics** is the study of choice under conditions of scarcity.*

**Economics** The study of choice under conditions of scarcity.

This definition may appear strange to you. Where are the familiar words we ordinarily associate with economics: "money," "stocks and bonds," "prices," "budgets," and so on? As you will soon see, economics deals with all of these things and more. But first, let's take a closer look at two important ideas in this definition: scarcity and choice.

# Scarcity and Individual Choice

**Scarcity** A situation in which the amount of something available is insufficient to satisfy the desire for it.

Think for a moment about your own life. Is there anything you don't have that you'd *like* to have? Anything you'd like *more* of? If your answer is "no," congratulations! You are well advanced on the path of Zen self-denial. The rest of us, however, feel the pinch of limits to our material standard of living. This simple truth is at the very core of economics. It can be restated this way: We all face the problem of **scarcity**.

At first glance, it may seem that you suffer from an infinite variety of scarcities. There are so many things you might like to have right now—a larger room or apartment, a new car, more clothes . . . the list is endless. But a little reflection suggests that your limited ability to satisfy these desires is based on two more basic limitations: scarce *time* and scarce *spending power*.

*As individuals, we face a scarcity of time and spending power. Given more of either, we could each have more of the goods and services that we desire.*

The scarcity of spending power is no doubt familiar to you. We've all wished for higher incomes so that we could afford to buy more of the things we want. But the scarcity of time is equally important. So many of the activities we enjoy—seeing movies, taking vacations, making phone calls—require time as well as money. Just as we have limited spending power, we also have a limited number of hours in each day to satisfy our desires.

Because of the scarcities of time and spending power, each of us is forced to make *choices*. We must allocate our scarce *time* to different activities: work, play, education, sleep, shopping, and more. We must allocate our scarce *spending power* among different goods and services: housing, food, furniture, travel, and many others. And each time we choose to buy something or do something, we also choose *not* to buy or do something else.

In fact, what we choose *not* to buy or do—"the road not taken" as the poet Robert Frost put it—leads to an interesting way of thinking about *cost*.

## The Concept of Opportunity Cost

What does it cost you to go to the movies? If you answered 9 or 10 dollars because that is the price of a movie ticket, then you are leaving out a lot. Most of us are used to thinking of "cost" as the money we must pay for something. Certainly, the money we pay for goods or services is a *part* of its cost. But economics takes a broader view of costs. The true cost of any choice we make—buying a car, reading a book, or even taking a nap—is everything we must *give up* when we make that choice. This cost is called the *opportunity cost* of the choice because we give up the opportunity to enjoy other desirable things or experiences.

**Opportunity cost** What is given up when taking an action or making a choice.

*The* ***opportunity cost*** *of any choice is what we must forego when we make that choice.*

Opportunity cost is the most accurate and complete concept of cost—the one we should use when making our own decisions or analyzing the decisions of others.

Suppose, for example, it's 8 P.M. on a weeknight, and you're spending a couple of hours reading this chapter. As authors, that thought makes us very happy.

We know there are many other things you could be doing: going to a movie, having dinner with friends, playing ping-pong, earning some extra money, watching TV. . . . But—assuming you're still reading and haven't run out the door because we've given you better ideas—let's relate this to opportunity cost.

What *is* the opportunity cost of reading this chapter? Is it *all* of those other possibilities we've listed? Not really, because in the time it takes to read this chapter, you'd probably be able to do only *one* of those other activities. You'd no doubt choose whichever one you regarded as best. So, by reading, you sacrifice only the *best* choice among the alternatives that you could be doing instead.

*When the alternatives to a choice are mutually exclusive, only the next best choice—the one that would actually be chosen—is used to determine the opportunity cost of the choice.*

For many choices, the opportunity cost consists mostly of the money you actually pay out. If you spend $100 on a new pair of shoes, the most important thing you give up is $100, which is money you could spend on something else. But for other choices, money payments may be only a small part, or no part, of what is sacrificed. Doing a spring cleaning of your home, for example, will take you a lot of time, but very little money.

Economists often attach a monetary value to the time that we give up for a choice. This allows us to express a choice's opportunity cost in dollars—the number of dollars actually paid out plus the dollar value of the time given up. To see how this works, let's see how we might calculate the opportunity cost (in dollars) of an important choice you've already made: to attend college.

## An Example: The Opportunity Cost of College

What is the opportunity cost of attending college for an academic year (9 months)? A good starting point is to look at the actual monetary costs—the annual out-of-pocket expenses borne by you or your family. Table 1 shows the College Board's estimates of these expenses for the average student (ignoring scholarships). For example, the third column of the table shows that the average in-state resident at a four-year state college pays $7,605 in tuition and fees, $1,137 for books and supplies, $8,535 for room and board, and $3,062 for transportation and other expenses, for a total of $20,339 per year.

**TABLE 1**

**Average Out-of-Pocket Cost of a Year of College, 2010–2011**

| Type of Institution | Two-Year Public | Four-Year Public | Four-Year Private |
|---|---|---|---|
| Tuition and fees | $2,713 | $7,605 | $27,293 |
| Books and supplies | $1,133 | $1,137 | $1,181 |
| Room and board | $7,259 | $8,535 | $9,700 |
| Transportation and other expenses | $3,532 | $3,062 | $2,302 |
| Total out-of-pocket costs | $14,637 | $20,339 | $40,476 |

Source: *Trends in College Pricing*, 2010, The College Board, New York, NY.

Notes: Averages are enrollment-weighted by institution to reflect the average experience among students across the United States. Average tuition and fees at public institutions are for in-state residents only. Room and board charges are for students living on campus at four-year institutions and off-campus (but not with parents) at two-year institutions. Four-year private includes nonprofit only.

So, is that the average opportunity cost of a year of college at a public institution? Not really. Even if that is the amount you or your family actually pays out for college, this is not the dollar measure of the opportunity cost.

First, the $20,339 your family pays in this example most likely includes some expenses that are *not* part of the opportunity cost of college. These are payments you'd make whether or not you were in college. Let's suppose that if you *didn't* go to college, you would have lived in an apartment, and your expenses for rent and food would be equal to their college amounts: $8,535. Let's also suppose that you'd have transportation and other expenses equal to their college amounts: $3,062. Then these payments must be deducted from the opportunity cost of choosing college. Table 2 shows that when we deduct these payments, we're left with the additional dollars you pay out of pocket *because* you chose to attend college: $8,742. These dollars—spent on tuition and fees and books and supplies—are the only part of your money payments that are part of the opportunity cost. Money payments that are part of opportunity cost are called **explicit costs**. So your explicit costs of attending college are $8,742.

**Explicit cost** The dollars sacrificed—and actually paid out—for a choice.

**Implicit cost** The value of something sacrificed when no direct payment is made.

But college also has **implicit costs**—sacrifices for which no money changes hands. The biggest sacrifice in this category is *time*. But what is that time worth? That depends on what you *would* be doing if you weren't in school. For many students, the alternative would be working full-time at a job. If you are one of these students, attending college requires the sacrifice of the income you *could* have earned at a job—a sacrifice we call *foregone income*.

How much income is foregone when you go to college for a year? In 2010, the average yearly income of an 18- to 24-year-old high school graduate who worked full-time was about $24,000. If we assume that only nine months of work must be sacrificed to attend college (that is, you'd still work full-time in the summer), then foregone income is about 3/4 of $24,000, or $18,000. This is the implicit cost of a year of college.

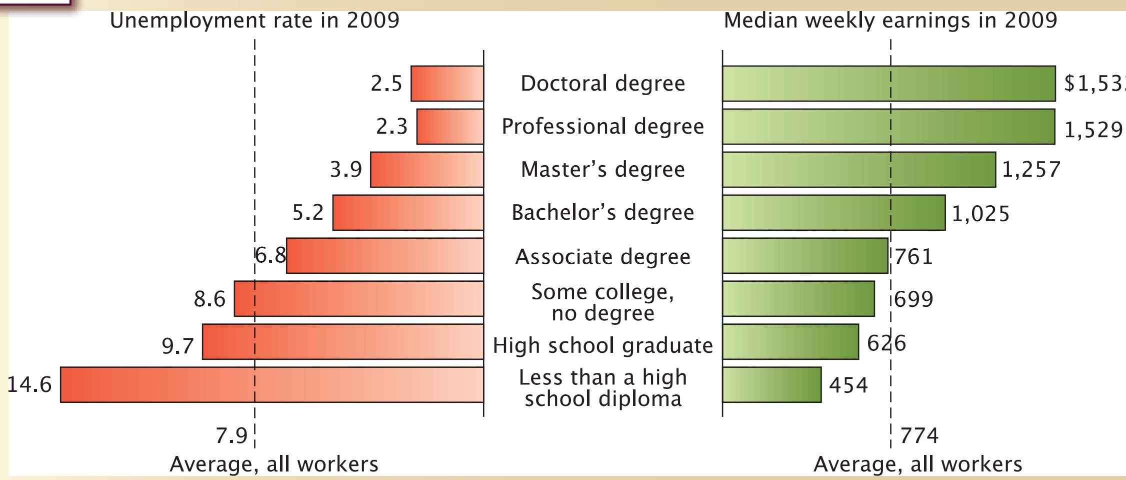
Summing the explicit and implicit costs gives us a rough estimate of the opportunity cost of a year in college, as shown in Table 2. For a public institution, we have $8,742 in explicit costs and $18,000 in implicit costs, giving us an opportunity cost of $26,742 per year. Notice that this is even greater than the total charges estimated by the College Board we calculated earlier. When you consider this opportunity cost for four years, its magnitude might surprise you. Without financial aid in the form of tuition grants or other fee reductions, the average in-state resident will sacrifice about $107,000 over four years at a state college. At a private college, we'd find (using calculations similar to those in Table 2) a total opportunity cost of about $186,000.

**TABLE 2**

**Sample Opportunity Cost Calculation for In-State Public University**

| | | | |
|---|---|---|---|
| | **Total out-of-pocket payments:** | **$20,339** | |
| | minus { out-of-pocket expenses you'd have without college } | − $8,535 | (room and board) |
| | | − $3,062 | (transportation and other) |
| = | **Explicit cost of college** | = **$8,742** | |
| | plus implicit cost | + $18,000 | (9 months foregone income) |
| = | **Opportunity cost of 1 year of college** | = **$26,742** | |

**FIGURE 1** **Education, Earnings and Employment**




Source: Bureau of Labor Statistics, Current Population Survey

Our analysis of the opportunity cost of college is an example of a general, and important, principle:

*The opportunity cost of a choice includes both explicit costs and implicit costs.*

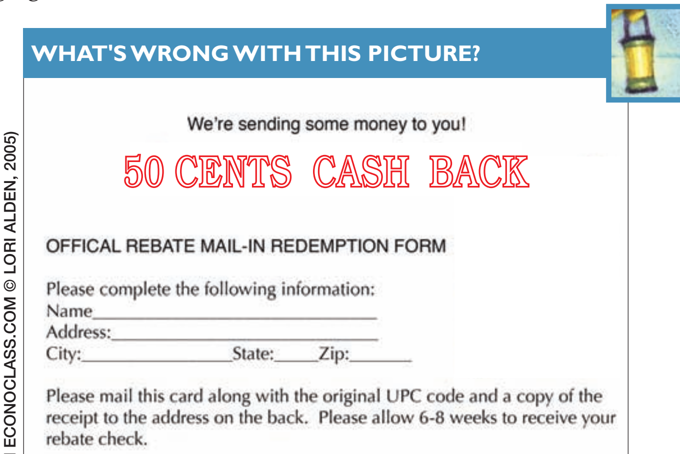
## A Brief Digression: Is College the Right Choice?

Before you start questioning your choice to be in college, there are a few things to remember. First, for many students, scholarships reduce the costs of college to less than those in our example. Second, in addition to its high cost, college has substantial *benefits*, including financial ones.

Figure 1 shows two examples of these financial benefits for the year 2009. The right side of the figure shows that full-time workers with bachelor's degrees earned substantially higher incomes ($1,025 per week) than those with only a high-school diploma ($626 per week). Moreover, as seen in the left side, college graduates were more likely to find full-time jobs; the unemployment rate of those with bachelor's degrees (5.2%) was substantially lower than for high-school graduates (9.7%). These advantages in earnings and employment prospects are seen year after year, in good times and bad. In spite of its high cost, attending college appears to be one of the best *financial* investments you can make.[1]

Finally, remember that we've left out of our discussion many non-financial benefits of attending college. These may be harder to estimate in dollar terms, but they could be very important to you. Do you enjoy taking classes and learning new things more than you'd enjoy working at the job you would have gotten

**WHAT'S WRONG WITH THIS PICTURE?**

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[1] If you are studying microeconomics, you'll learn more about the value of college as an investment and how economists value future earnings in a later chapter.

**DANGEROUS CURVES**

**If you think the opportunity cost of your time is zero . . .** What if you can't work extra hours for additional pay, so you cannot *actually* turn time into money? Does this mean that the opportunity cost of your time is zero?

If you think the answer is yes, the authors of this textbook would like to hire you for help with some household chores for 25 cents per hour. Does this sound like a good deal to you? It would, if the opportunity cost of your time really had no value. If it doesn't sound like a good deal, then the time you'd be giving up must have some positive value to you. If pressed, you could state that value in money terms—and it would no doubt exceed 25 cents per hour.

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instead? Do you have a more interesting social life in college than you'd otherwise have? In the future, will you get more satisfaction—above and beyond the extra earnings—from the jobs that will become available to you because of your college degree?

If you answered yes to any of these questions, then the full benefits of college are greater than the purely financial gains.

### Time Is Money

Our analysis of the opportunity cost of college points out a general principle, one understood by economists and non-economists alike. It can be summed up in the expression, "Time is money."

For some people, this maxim applies directly: When they spend time on something, they *actually* give up money—money they *could* have earned during that time. Consider Jessica, a freelance writer with a backlog of projects on which she can earn $25 per hour. For each hour Jessica spends *not* working, she sacrifices $25.

What if Jessica decides to see a movie? What is the opportunity cost in dollar terms? Suppose the ticket costs $10, and the entire activity takes three hours—including time spent getting there and back. And suppose that working is Jessica's next best alternative to seeing the movie. The opportunity cost is the sum of the explicit cost ($10 for the ticket) and the implicit cost ($75 for three hours of forgone income), making the total opportunity cost $85.

The idea that a movie "costs" $85 might seem absurd to you. But if you think about it, $85 is a much better estimate than $10 of what the movie actually costs Jessica. To see the movie, Jessica does indeed sacrifice $85.

Our examples about the cost of college and the cost of a movie point out an important lesson about opportunity cost:

> *The explicit (direct money) cost of a choice may only be a part—and sometimes a small part—of the opportunity cost of a choice.*

## Scarcity and Social Choice

Now let's think about scarcity and choice from *society's* point of view. What are the goals of our society? We want a high standard of living for our citizens, clean air, safe streets, good schools, and more. What is holding us back from accomplishing all of these goals in a way that would satisfy everyone? You already know the answer: scarcity. In society's case, the problem is a scarcity of **resources**—the things we use to make goods and services that help us achieve our goals.

**Resources** The labor, capital, land (including natural resources), and entrepreneurship that are used to produce goods and services.

### The Four Resources

Resources are the most basic elements used to make goods and services. We can classify resources into four categories:

**Labor** The time human beings spend producing goods and services.

**Capital** A long-lasting tool that is used to produce other goods.

- **Labor**—the time human beings spend producing goods and services.
- **Capital**—any long-lasting tool that is itself produced and helps us make other goods and services.

More specifically, **physical capital** consists of things like machinery and equipment, factory buildings, computers, and even hand-tools like hammers and screwdrivers. These are all long-lasting *physical* tools that we produce to help us make other goods and services.

**Physical capital** The part of the capital stock consisting of physical goods, such as machinery, equipment, and factories.

Another type of capital is **human capital**—the skills and knowledge possessed by workers. These satisfy our definition of capital: They are *produced* (through education and training), they help us produce *other* things, and they last for many years, typically through an individual's working life.

**Human capital** The skills and training of the labor force.

Note the word *long-lasting* in the definition. If something is used up quickly in the production process—like the flour a baker uses to make bread—it is generally *not* considered capital. A good rule of thumb is that capital should last at least a year, although most types of capital last considerably longer.

The **capital stock** is the total amount of capital at a nation's disposal at any point in time. It consists of all the capital—physical and human—created in previous periods that is still productively useful.

**Capital stock** The total amount of capital in a nation that is productively useful at a particular point in time.

- **Land**—the physical space on which production takes place, as well as the useful materials—*natural resources*—found under it or on it, such as crude oil, iron, coal, or fertile soil.
- **Entrepreneurship**—the ability (and the willingness to *use* it) to combine the *other* resources into a productive enterprise. An entrepreneur may be an *innovator* who comes up with an original idea for a business or a *risk taker* who provides her own funds or time to nurture a project with uncertain rewards.

**Land** The physical space on which production takes place, as well as the natural resources that come with it.

**Entrepreneurship** The ability and willingness to combine the *other* resources—labor, capital, and land—into a productive enterprise.

Anything *produced* in the economy comes, ultimately, from some combination of these four resources.

Think about the last lecture you attended at your college. Some resources were used *directly*: Your instructor's labor and human capital (his or her knowledge of economics); physical capital (the classroom building, a blackboard or projector); and land (the property on which your classroom building sits). Somebody played the role of entrepreneur, bringing these resources together to create your college in the first place. (If you attend a public institution, the entrepreneurial role was played by your state government.)

Many other inputs—besides those special inputs we call resources—were also used to produce the lecture. But these other inputs were themselves produced from resources, as illustrated in Figure 2. For example, the electricity used to power the lights in your classroom is an input, not a resource. But electricity is itself produced from resources, including crude oil, coal, or natural gas (land and natural resources); coal miners or oil riggers (labor); and electricity-generating turbines and power cables (capital).

**Input** Anything (including a resource) used to produce a good or service.

## Opportunity Cost and Society's Trade-offs

For an individual, opportunity cost arises from the scarcity of time and money. But for society as a whole, opportunity cost arises from the scarcity of *resources*. Our desire for goods is limitless, but we have limited resources to produce them. Therefore,

> *virtually all production carries an opportunity cost: To produce more of one thing, society must shift resources away from producing something else.*

**DANGEROUS CURVES**

**Resources versus inputs** The term *resources* is often confused with another more general term—**inputs.** An input is *anything* used to make a good or service. Inputs include not only resources but also many other things made from them (cement, rolled steel, electricity), which are, in turn, used to make goods and services. *Resources*, by contrast, are the *special* inputs that fall into one of four categories: labor, land, capital, and entrepreneurship. They are the ultimate source of everything that is produced.

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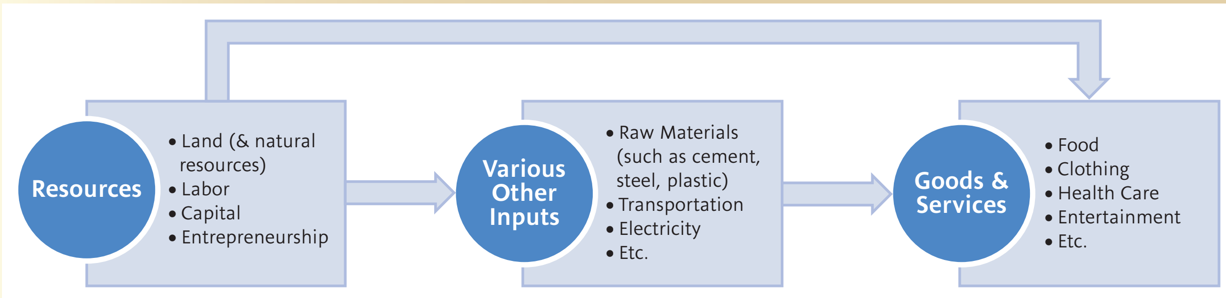
**FIGURE 2** **Resources and Production**




*All goods and services come ultimately from the four resources. Resources are used directly by firms that produce goods and services. Resources are also used indirectly, to make the other inputs firms use to produce goods and services.*



For example, we'd all like better health for our citizens. What would be needed to achieve this goal? Perhaps more frequent medical checkups for more people and greater access to top-flight medicine when necessary. These, in turn, would require more and better-trained doctors (labor and human capital), and more hospital buildings, laboratories, and high-tech medical equipment (physical capital). In order to produce more health care, we would have to pull resources—land, labor, capital, and entrepreneurship—out of producing other things that we also enjoy. We'd have more health care, but fewer movies, personal computers, cars, or other goods and services that would otherwise have been produced. The opportunity cost of improved health care, then, consists of those other goods and services we would have to do without.

## The World of Economics

The field of economics is surprisingly broad. It ranges from the mundane (why does a pound of steak cost more than a pound of chicken?) to the personal (how do couples decide how many children to have?) to the profound (could we ever have another Great Depression in the United States, with tens of millions plunged into sudden poverty?). With a field this broad, it is useful to have some way of classifying the different types of problems economists study and the different methods they use to analyze them.

### Microeconomics and Macroeconomics

**Microeconomics** The study of the behavior of individual households, firms, and governments; the choices they make; and their interaction in specific markets.

The field of economics is divided into two major parts: microeconomics and macroeconomics. **Microeconomics** comes from the Greek word *mikros*, meaning "small." It takes a close-up view of the economy, as if looking through a microscope. Microeconomics is concerned with the behavior of *individual* actors on the economic scene—households, business firms, and governments. It looks at the choices they make and how they interact with each other when they come together to trade *specific* goods and services. What will happen to the cost of movie tickets over the next five years? How many management-trainee jobs will open up for college graduates? These are microeconomic questions because they analyze individual *parts* of an economy rather than the *whole*.

**Macroeconomics**—from the Greek *makros*, or "large"—takes an *overall* view of the economy. Instead of focusing on the production of carrots or computers, macroeconomics lumps all goods and services together and looks at the economy's *total output*. Instead of focusing on employment of management trainees or manufacturing workers, it considers *total employment* in the economy. Macroeconomics focuses on the big picture and ignores the fine details.

**Macroeconomics** The study of the behavior of the overall economy.

## Positive and Normative Economics

The micro versus macro distinction is based on the level of detail we want to consider. Another useful distinction has to do with our *purpose* in analyzing a problem. **Positive economics** explains how the economy works, plain and simple. If someone says, "The decline in home prices during 2008 and 2009 was a major cause of the recent recession," he or she is making a positive economic statement. A statement need not be accurate or even sensible to be classified as positive. For example, "Government policy has no effect on our standard of living" is a statement that virtually every economist would regard as false. But it is still a positive economic statement. Whether true or not, it's about how the economy works and its accuracy can be tested by looking at the facts—and just the facts.

**Positive economics** The study of how the economy works.

**Normative economics** *prescribes solutions* to economic problems. It goes beyond just "the facts" and tells us what we should *do* about them. Normative economics requires us to make judgments about different outcomes and therefore depends on our values.

**Normative economics** The practice of recommending policies to solve economic problems.

If an economist says, "We should cut total government spending," he or she is engaging in normative economic analysis. Cutting government spending would benefit some citizens and harm others, so the statement rests on a value judgment. A normative statement—like "We should cut government spending"—cannot be proved or disproved by the facts alone.

Positive and normative economics are intimately related in practice. For one thing, we cannot properly argue about what we should or should not do unless we know certain facts about the world. Every normative analysis is therefore based on an underlying positive analysis. And a new understanding of positive economics often changes one's views on normative economics.

### Why Economists Disagree about Policy

Suppose the country is suffering from a serious recession—a significant, nationwide decrease in production and employment. Two economists are interviewed on a cable news show.

Economist A says, "We should increase government spending on roads, bridges, and other infrastructure. This would directly create jobs and help end the recession." Economist B says, "No, we should cut taxes instead. This will put more money in the hands of households and businesses, leading them to spend more and create jobs that way." Why do they disagree?

The disagreement might be based on *positive* economics—different views about how the economy works. Economist A might think that government spending will create more jobs, dollar for dollar,

**DANGEROUS CURVES**

**Seemingly positive statements** Be alert to statements that may *seem* purely positive, but contain hidden value judgments. Here's an example: "If we want to reduce greenhouse gas emissions, our society will have to use less gasoline." This may *sound* positive because it seems to refer only to a fact about the world. But it's also at least partly normative. Why? Cutting back on gasoline is just *one* policy among many that could reduce emissions. To say that we *must* choose this method makes a value judgment about its superiority to other methods. A purely positive statement on this topic would be, "Using less gasoline—with no other change in living habits—would reduce greenhouse gas emissions."

Similarly, be alert to statements that use vague terms that hide value judgments. An example: "All else equal, the less gasoline we use, the better our quality of life." Whether you agree or disagree, this is *not* a purely positive statement. People will disagree over the meaning of the phrase "quality of life" and what would make life better. This disagreement could not be resolved just by looking at the facts.

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than will tax cuts. Economist B might believe the reverse. Positive differences like these can arise because our knowledge of how the economy works—while always improving—remains imperfect.

But the disagreement might also stem from a difference in values—specifically, what each economist believes about government's proper role in the economy. Those toward the left of the political spectrum tend to believe that government should play a larger economic role. They tend to view increases in government spending more favorably. Those toward the political right tend to believe that government's role should be smaller. They would prefer tax cuts that result in more private, rather than government, spending. This difference in values can explain why two economists—even if they have the same *positive* views about the outcome of a policy—might disagree about its wisdom.

*Policy differences among economists arise from (1) positive disagreements (about the outcomes of different policies), and (2) differences in values (how those outcomes are evaluated).*

Policy disputes among economists are common. But on *some* policy issues, most economists agree. For example, in microeconomics there is wide agreement that certain types of goods and services should be provided by private business firms and that certain others are best provided by government.

In macroeconomics, almost all economists agree that some of the government policies during the Great Depression of the 1930s were mistakes that worsened and prolonged the economic downturn. When U.S. and global economies sank into a deep recession in 2008 and 2009, many feared a repeat of the Great Depression. Economists had some important disagreements about what the initial response of the U.S. and other governments should be. But they were virtually united in warning against repeating the mistakes of the 1930s.

Most governments heeded these warnings. Although the economic slump continued through 2010 and into 2011, another Great Depression was avoided. You will learn more about these areas of agreement among economists—as well as some important disagreements—in the chapters to come.

## Why Study Economics?

If you've read this far into the chapter, chances are you've already decided to allocate some of your scarce time to studying economics. We think you've made a wise choice. But it's worth taking a moment to consider what you might gain from this choice.

Why study economics?

### To Understand the World Better

Applying the tools of economics can help you understand global and catastrophic events such as wars, famines, epidemics, and depressions. But it can also help you understand much of what happens to you locally and personally—the salary you will earn after you graduate or the rent you'll pay on your apartment. Economics has the power to help us understand these phenomena because they result, in large part, from the choices we make under conditions of scarcity.

Economics has its limitations, of course. But it is hard to find any aspect of life about which economics does not have *something* important to say. Economics cannot explain why so many Americans like to watch television, but it *can* explain how TV networks decide which programs to offer. Economics cannot protect you from a robbery, but it *can* explain why some people choose to become thieves and why no society has chosen to eradicate crime completely. Economics will not improve your love life, resolve unconscious conflicts from your childhood, or help you overcome a fear of flying, but it *can* tell us how many skilled therapists, ministers, and counselors are available to help us solve these problems.

### To Achieve Social Change

If you are interested in making the world a better place, economics is indispensable. There is no shortage of serious social problems worthy of our attention—unemployment, hunger, poverty, disease, climate change, drug addiction, violent crime. Economics can help us understand the origins of these problems, explain why previous efforts to solve them haven't succeeded, and help us to design new, more effective solutions.

### To Help Prepare for Other Careers

Economics has long been a popular college major for individuals intending to work in business. But it has also been popular among those planning careers in politics, international relations, law, medicine, engineering, psychology, and other professions. This is for good reason: Practitioners in each of these fields often find themselves confronting economic issues. For example, lawyers increasingly face judicial rulings based on the principles of economic efficiency. And doctors need to understand how new technologies or changes in health care policy can affect their practices.

### To Become an Economist

Only a tiny minority of this book's readers will decide to become economists. This is welcome news to the authors, and after you have studied labor markets in your *microeconomics* course you will understand why. But if you do decide to become an economist—obtaining a master's degree or a PhD—you will find many possibilities for employment. The economists with whom you have most likely had personal contact are those who teach and conduct research at colleges and universities. But as many economists work outside of colleges and universities as work inside them. Economists are hired by banks to assess the risk of investing abroad; by manufacturing companies to help them determine new methods of producing, marketing, and pricing their products; by government agencies to help design policies to fight crime, disease, poverty, and pollution; by international organizations to help create and reform aid programs for less developed countries; by the media to help the public interpret global, national, and local events; and by nonprofit organizations to provide advice on controlling costs and raising funds more effectively.

## The Methods of Economics

One of the first things you will notice as you begin to study economics is the heavy reliance on *models*.

You have no doubt encountered many models in your life. As a child, you played with model trains, model planes, or model people (dolls). You may have also seen architects' cardboard models of buildings. These are all physical models, three-dimensional replicas that you can pick up and hold. Economic models, by contrast, are built with words, diagrams, and mathematical statements.

What, exactly, is a model?

*A **model** is an abstract representation of reality.*

**Model** An abstract representation of reality.

The two key words in this definition are *abstract* and *representation*. A model is not supposed to be exactly like reality. Rather, it *represents* reality by *abstracting* or