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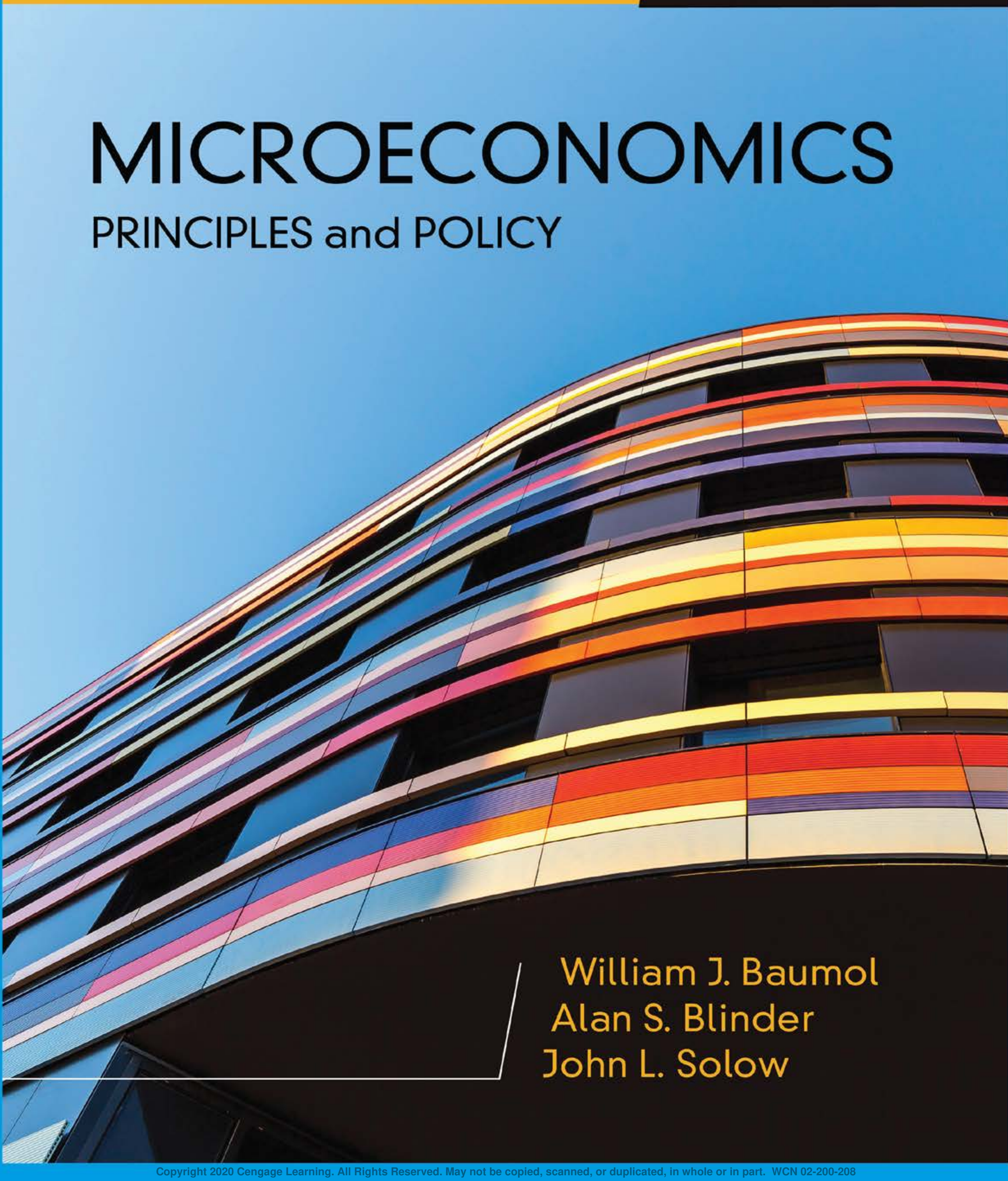
Fourteenth Edition

MICROECONOMICS

PRINCIPLES and POLICY



William J. Baumol
Alan S. Blinder
John L. Solow

Fourteenth Edition

MICROECONOMICS

PRINCIPLES and POLICY

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CENGAGE

***Microeconomics: Principles and Policy,* Fourteenth Edition**

William J. Baumol, Alan S. Blinder, and John L. Solow

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To our wonderful wives, Madeline Blinder and Catherine Solow.

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AVAILABLE VERSIONS

The Three Versions of This Book

	Economics: Principles and Policies	Economics: Principles and Policies	Microeconomics: Principles and Policies	Macroeconomics: Principles and Policies
1	What Is Economics?	X	X	X
2	The Economy: Myth and Reality	X	X	X
3	The Fundamental Economic Problem: Scarcity and Choice	X	X	X
4	Supply and Demand: An Initial Look	X	X	X
5	Consumer Choice: Individual and Market Demand	X	X	
6	Demand and Elasticity	X	X	
7	Production, Inputs, and Cost: Building Blocks for Supply Analysis	X	X	
8	Output, Price, and Profit: The Importance of Marginal Analysis	X	X	
9	The Financial Markets and the Economy: The Tail that Wags the Dog?	X	X	
10	The Firm and the Industry under Perfect Competition	X	X	
11	The Case for Free Markets: The Price System	X	X	
12	Monopoly	X	X	
13	Between Competition and Monopoly	X	X	
14	Limiting Market Power: Antitrust and Regulation	X	X	
15	The Shortcomings of Free Markets	X	X	
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PREFACE

It can be argued that, from the point of view of the general welfare, there are three topics of overriding importance in economics. One is the analysis of recessions and depressions, with the unemployment and general impoverishment they periodically bring. The second is economic growth and rising productivity, which, in the long run, is the way to raise standards of living in our country and throughout the world. The third is the distribution of income, where the issues of poverty and inequality take center stage.

In earlier editions of this book, before the problems stemming from the terrible worldwide economic crisis known as the Great Recession of 2007–2009 claimed—or perhaps we should say *reclaimed*—the spotlight, the new materials that we added from one edition to the next focused on the growth issue. Then, for two editions, the biggest changes came in the macroeconomic portions of the book, especially the parts relevant to understanding the financial crisis and the Great Recession. Those changes remain in this fourteenth edition—including the abandonment, almost unique among principles books, of pretending that there is only one interest rate. Instead, we explain and discuss the implications of having many different interest rates, based on differential risk.

The biggest changes in this edition come in the microeconomic portions of the book. We have reorganized several chapters substantially to highlight, first, the economist's argument for free markets—namely, that competitive markets lead to efficient allocations of resources—before turning to the presence of monopoly power and other market failures that lead to inefficient outcomes. The latter include expanded discussions of asymmetric information and the common-property resource problem.

In addition, we have added an entirely new chapter to this edition (Chapter 37) that examines 10 major economic concerns facing the society now and in the future—issues that will affect the lives of current students well after they graduate: Will artificially intelligent machines take their jobs? Who will pay for their health insurance? Is the national debt growing out of control? Will they benefit or be injured by globalization and are trade wars the answer? In each case, lessons learned in earlier chapters are relevant to the issue. But in each case, there are also important unanswered questions.

As in past revisions, this one includes literally hundreds of small changes to improve clarity of exposition and especially to update the text—both for relevant advances in economics and for recent events, particularly the aftermath of the Great Recession and the changes wrought by the Trump administration.

NOTE TO THE STUDENT

May we offer a suggestion for success in your economics course? Unlike some of the other subjects you may be studying, introductory economics is cumulative: Each week's lesson builds on what you have learned prior to that. You will save yourself a lot of frustration—and a lot of work—by keeping up on a week-to-week basis.

To assist you in doing so, we provide a chapter summary, a list of important terms and concepts, a selection of questions to help you review the contents of each chapter, as well as the answers to odd-numbered Test Yourself questions. Making use of these learning aids will help you master the material in your economics course. For additional assistance, we have prepared student supplements to help in the reinforcement of the concepts in this book and provide opportunities for practice and feedback.

MindTap

MindTap is a personalized teaching experience with relevant assignments that guide students to analyze, apply, and improve thinking, allowing you to measure skills and outcomes with ease.

- Personalized Teaching: Becomes yours with a Learning Path that is built with key student objectives. Control what students see and when they see it. Use it as-is or match it to your syllabus exactly—hide, rearrange, add, and create your own content.
- Guide Students: A unique learning path of relevant readings, multimedia, and activities that move students up the learning taxonomy from basic knowledge and comprehension to analysis and application.
- Promote Better Outcomes: Empower instructors and motivate students with analytics and reports that provide a snapshot of class progress, time in course, and engagement and completion rates.

MindTap for this edition has been thoroughly revised and improved to provide students with more resources and an enhanced learning experience. In addition to Aplia homework and flashcards, MindTap now also includes a bank of practice quiz questions for students to test themselves, GraphBuilder exercises in the interactive ebook, News Analysis articles, and Video Problem Walkthroughs.

Aplia

Aplia saves instructors valuable time they would otherwise spend on routine grading while giving students an easy way to stay on top of coursework with regularly scheduled assignments. Currently, Aplia supports college-level courses and has been used by more than 1,000,000 students at over 1,300 institutions. Aplia's economics students use interactive chapter assignments, tutorials, news analyses, and experiments to make economics relevant and engaging. Math and graphing tutorials help students overcome deficiencies in these crucial areas. Economics articles from top news sources challenge students to connect current events to course concepts.

End of Chapter and traditional homework problem sets allow students to work through the economic concepts they have learned in each chapter. Students can choose to "Grade It Now" on a homework problem and will receive instant feedback whether an answer is correct or incorrect. Students can then choose to complete another problem to test themselves on the same concept with randomization. Aplia End of Chapter will also be mobile enabled.

IN GRATITUDE

Our friends and colleagues Dean Alderucci, *New York University*; Rebecca Blank, *University of Michigan*; Gregory Chow, *Princeton University*; Avinash Dixit, *Princeton University*; Susan Feiner, *University of Southern Maine*; Claudia Goldin, *Harvard University*; Ronald Grieson, *University of California, Santa Cruz*; Daniel Hamermesh, *University of Texas*; Yuzo Honda, *Osaka University*; Peter Kenen, *Princeton University*; Melvin Krauss, *Stanford University*; Herbert Levine, *University of Pennsylvania*; Burton Malkiel, *Princeton University*; Edwin Mills, *Northwestern University*; Janusz Ordover, *New York University*; David H. Reiley Jr., *University of Arizona*; Uwe Reinhardt, *Princeton University*; Harvey Rosen, *Princeton University*; Joseph Seneca, *Rutgers University*; William Silber, *New York University*; Robert M. Solow, *MIT*; Laura Tyson, *University of California, Berkeley*; Martin Weitzman, *Harvard University*; and Lawrence White, *New York University* have all given generously of their knowledge in particular areas over the course of 14 editions. We have learned much from them and have shamelessly relied on their help. Alan Blinder also thanks Melissa Reed for research assistance in bringing this edition up to date.

Finally, we must acknowledge—with joy—our continuing debt to our wives, Hilda Baumol (the widow of the late William Baumol), and to Madeline Blinder, and Catherine Solow. They have suffered through the inescapable neglect and distraction that each new edition has imposed, for some as many as 14 times. Their tolerance and understanding have made no minor contribution to the project. We thank them most sincerely.

ABOUT THE AUTHORS

William J. Baumol

William J. Baumol, who was the co-author (with Alan Blinder) for the first 13 editions of this book, passed away in 2017 at the age of 95. He was born in New York City and received his BSS at the College of the City of New York and his Ph.D. at the University of London.

At his death, he was the Harold Price Professor of Entrepreneurship Emeritus at New York University, where he taught a course in introductory microeconomics, and the Joseph Douglas Green, 1895, Professor of Economics Emeritus and Senior Economist at Princeton University. He was a frequent consultant to the management of major firms in a wide variety of industries in the United States and other countries as well as to a number of governmental agencies. In several fields, including the telecommunications and electric utility industries, current regulatory policy is influenced by his explicit recommendations. Among his many contributions to economics are research on the theory of the firm, the contestability of markets, the economics of the arts and other services—the "cost disease of the services" is often referred to as "Baumol's disease"—and economic growth, entrepreneurship, and innovation. In addition to economics, he taught a course in wood sculpture at Princeton for about 20 years and was an accomplished painter.

Professor Baumol was president of the American Economic Association and three other professional societies, an elected member of the National Academy of Sciences, the American Philosophical Society, and the recipient of 11 honorary degrees.

Baumol was the author of hundreds of journal and newspaper articles and more than 45 books, including *Global Trade and Conflicting National Interests* (2000); *The Free-Market Innovation Machine* (2002); *Good Capitalism, Bad Capitalism* (2007); *The Microtheory of Innovative Entrepreneurship* (2010); and *The Cost Disease* (2012). His writings have been translated into more than a dozen languages.

Alan S. Blinder

Alan S. Blinder was born in New York City and attended Princeton University, where one of his teachers was William Baumol. After earning a master's degree at the London School of Economics and a Ph.D. at MIT, Blinder returned to Princeton, where he has taught since 1971, including teaching introductory macroeconomics since 1977. He is currently the Gordon S. Rentschler Memorial Professor of Economics and Public Affairs.

In January 1993, Blinder went to Washington as part of President Bill Clinton's first Council of Economic Advisers. Then, from June 1994 through January 1996, he served as vice chairman of the Federal Reserve Board. He thus played some role in formulating both fiscal and monetary policies, two topics discussed extensively in this book. He has also advised several presidential campaigns and numerous politicians.

Blinder has consulted for a number of the world's largest financial institutions, testified dozens of times before congressional committees, and been involved in several entrepreneurial start-ups. For many years, he has written newspaper and magazine articles on economic policy, including regular columns for the *Boston Globe*, *BusinessWeek*, and *The New York Times*. Currently, he has a regular monthly column in *The Wall Street Journal*. Blinder also appears frequently on PBS, CNBC, Bloomberg TV, and elsewhere. His book on the financial crisis (*After the Music Stopped*, Penguin, 2013) garnered many accolades and was a *New York Times* best-seller. His latest (non-textbook) book, *Advice and Dissent* (Basic Books, 2018) is about the clash between economics and politics.

Blinder has served as president of the Eastern Economic Association and vice president of the American Economic Association, which elected him a Distinguished Fellow in 2011. He has won numerous awards, including the Council for Economic Education's Visionary Award. He is a member of the American Philosophical Society, the American Academy of Arts and Sciences, the American Academy of Political and Social Science, and the Council on Foreign Relations.

Blinder and his wife have two grown sons, three grandsons, and live in Princeton, NJ.

John L. Solow

John L. Solow was born in Boston and attended Yale University. After spending a year at the Federal Energy Administration, he earned a master's degree and a Ph.D. in Economics at Stanford University. He taught at the University of Iowa from 1981 to 2019, and has taught Principles of Microeconomics since 1988. He is currently the White-Xander Professor of Economics in the College of Business at the University of Central Florida.

Solow has published articles in the areas of industrial organization and sports economics, and his research interests include sports economics, antitrust law and economics, and public policy. He has worked at the Electric Power Research Institute, served as a consultant to the U.S. Departments of Energy and Justice, Mid-American Energy, Qwest Telecommunications and numerous law firms, providing expert testimony in antitrust lawsuits. He has been a visiting scholar at Stanford University, the University of Auckland in New Zealand, and Monash University in Australia. Professor Solow is a member of the American Economic Association, the Western Economic Association, and the North American Association of Sports Economists.

Solow and his wife have a grown daughter and son, and live in Orlando, FL. He enjoys sailing, travel, and all Boston sports.

PART 1

Getting Acquainted with Economics

Welcome to economics! Some of your fellow students may have warned you that "econ is boring." Don't believe them—or at least, don't believe them too much. It is true that studying economics is hardly pure fun—we'll make you exercise your brain. But, a first course in economics can be an eye-opening experience. There is a vast and important world out there—the *economic* world—and this book is designed to help you understand it.

Have you ever wondered whether jobs will be plentiful or scarce when you graduate, or why college education becomes ever more expensive? Should the government be suspicious of big firms? Why can't pollution be eliminated? What happened to the U.S. economy in 2008–2009, and why has it performed so much better lately? If any of these questions have piqued your curiosity, read on. You may find that economics is more interesting than you thought!

It is only in later chapters that we will begin to give you the tools you need to begin carrying out your own economic analysis. However, the four chapters of Part 1, listed below, will introduce you to both the subject matter of economics and some of the methods that economists use to study their subject.

CHAPTERS

WHAT IS ECONOMICS? 1

Why does public discussion of economic policy so often show the abysmal ignorance of the participants? Why do I so often want to cry at what public figures, the press, and television commentators say about economic affairs?

ROBERT M. SOLOW, WINNER OF THE 1987 NOBEL PRIZE IN ECONOMICS

Economics is a broad-ranging discipline, both in the questions it asks and the methods it uses to seek answers. Many of the world's most pressing problems are economic in nature. The first part of this chapter gives you some idea of the sorts of issues that economic analysis helps to clarify and the kinds of solutions that economic principles suggest. The second part briefly introduces some tools that economists use. You are likely to find some of these tools useful in your career, personal life, and role as an informed citizen, long after this course is over.

CONTENTS

1-1 IDEAS FOR BEYOND THE FINAL EXAM

Elephants may never forget, but people do. We realize that most students forget much of what they learn in a course—perhaps with a sense of relief—soon after the final exam. That's life. Nevertheless, we hope you will remember some of the most significant economic ideas and, even more important, the ways of thinking about economic issues that will help you evaluate policies in the future.

To help you identify some of the most crucial concepts, we have selected 10 from the many in this book. Some offer key insights into the workings of the economy, and several bear on important policy issues that appear in media; others point out common misunderstandings that occur among even thoughtful observers. Many of them indicate that it takes more than just good common sense to analyze economic issues effectively. As the opening quote of this chapter suggests, many politicians who failed to understand basic economic principles could have made wiser decisions. The same holds for judges, university administrators, and even business executives.

Try this one on for size. Imagine you own a widget manufacturing company that rents a warehouse. Your landlord raises your rent by $10,000 per year. Should you *raise* the price of your widgets to try to recoup some of your higher costs, or should you *lower* your price to try to sell more and spread the so-called overhead costs over more products? In fact, as we shall see in Chapter 8, both answers are probably wrong!


Ideas for Beyond the Final Exam

The 7 "Ideas for Beyond the Final Exam," many of which are counterintuitive, will be sketched briefly here but discussed in depth when they occur in the course of the book—where they will be called to your attention by the special icon in the margin. Don't expect to master these ideas fully now, but as you read the book, notice how some of the ideas arise again and again in different contexts. By the end of the course, you will have a better grasp of when common sense works and when it fails, and you will be able to recognize common fallacies that are all too often offered by public figures, the press, and television commentators.

1-1a Idea 1: How Much Does It Really Cost?

Because no one has infinite riches, people are constantly forced to make choices. If you purchase a new computer, you may have to give up that trip you had planned. If a business decides to retool its factories, it may have to postpone its plans for new executive offices. If a government expands its defense program, it may be forced to reduce its outlays on civilian infrastructure.

The **opportunity cost** of any decision is the value of the next best alternative that the decision forces the decision maker to forgo.

Economists say that the true costs of such decisions are not the number of dollars spent on the computer, the new equipment, or the military, but rather *the value of what must be given up in order to acquire the item*—the vacation trip, the new executive offices, the roads and bridges. These are called **opportunity costs** because they represent the opportunities the individual, firm, or government must forgo to make the desired expenditure. Economists maintain that rational decision making must be based on opportunity costs, not just dollar costs (see Chapters 3, 8, 14, and 15). And as we will see later, taking opportunity cost into account in your personal planning will help you to make more rational decisions.

The cost of a college education provides a vivid example. How much do you think it *costs* to go to college? Most people are likely to answer by adding together their expenditures on tuition, room and board, books, and the like, and then deducting any scholarship funds they may receive. Suppose that amount comes to $20,000.

Economists keep score differently. They first want to know how much you would be earning if you were not attending college. Suppose that salary is $25,000 per year. This may seem irrelevant, but because you *give up* these earnings by attending college, they must be added to your tuition bill. You have that much less income because you are attending college. On the other side of the ledger, economists would not count *all* of the university's bill for room and board as part of the costs of your education. They would want to know how much *more* it costs you to live at school rather than at home. Economists would count only these *extra* costs as an educational expense because you would have incurred these costs whether or not you attended college. On balance, college is probably costing you much more than you think.

1-1b Idea 2: Attempts to Repeal the Laws of Supply and Demand—The Market Strikes Back

When a commodity is in short supply, its price naturally tends to rise. Sometimes disgruntled consumers badger politicians into "solving" this problem by making the high prices illegal—by imposing a ceiling on the price. Similarly, when supplies are plentiful—say, when fine weather produces extraordinarily abundant crops—prices tend to fall. Falling prices naturally dismay producers, who often try to get legislators to impose price floors.

Such attempts to repeal the laws of supply and demand usually backfire and sometimes produce results virtually the opposite of those intended. Where rent controls are adopted to protect tenants, housing grows scarce because the law makes it unprofitable to build and maintain apartments. When price floors are placed under agricultural products, surpluses pile up because people buy less.

As we will see in Chapter 4 and elsewhere in this book, such consequences of interference with the price mechanism are not accidental. They follow inevitably from the way in which free markets work.

1-1c Idea 3: The Surprising Principle of Comparative Advantage

China today produces many products that Americans buy in huge quantities, including toys, textiles, and electronic equipment. American manufacturers often complain about Chinese competition and demand protection from the flood of imports that, in their view, threatens American standards of living. President Trump has made such complaints one of the bases of his trade policy. Is this view justified?

Economists think that it is often false. They maintain that both sides normally gain from international trade. But what if the Chinese were able to produce *everything* more cheaply than we can? Wouldn't Americans be thrown out of work and our nation be impoverished?

A remarkable result, called the principle of *comparative advantage,* shows that, even in this extreme case, the two nations could still benefit by trading and that each could gain as a result! We will explain this principle in Chapter 3. For now, a simple parable will make the reason clear.

Suppose Sally grows up on a farm and is a whiz at plowing, but she is also a successful country singer who earns $4,000 per performance. Should Sally turn down singing engagements to leave time to work in the fields? Of course not. Instead, she should hire Alfie, a much less efficient farmer, to do the plowing for her. Sally may be better at plowing, but she earns so much more by singing that it makes sense for her to specialize in that and leave the farming to Alfie. Although Alfie is a less skilled farmer than Sally, he is an even worse singer.

So Alfie earns his living at a job at which he at least has a *comparative* advantage (his farming is not as inferior as his singing), and both Alfie and Sally gain from the trade. The same is true of two countries. Even if one of them is more efficient at everything, both countries can gain by producing the things they do best *comparatively*.

1-1d Idea 4: Trade Is a Win–Win Situation

One of the most fundamental ideas of economics is that both parties must expect to gain something in a voluntary exchange. Otherwise, why would they have agreed to the deal? This principle seems self-evident, yet it is amazing how often it is ignored in practice.

For example, it was widely believed for centuries that in international trade one country's gain from an exchange must be the other country's loss. Analogously, some people feel instinctively that if Ms. A profits handsomely from a deal with Mr. B, then Mr. B must have been exploited. Laws sometimes prohibit mutually beneficial exchanges between buyers and sellers—as when a loan transaction is banned because the interest rate is "too high" (Chapter 18), or when a willing worker is condemned to remain unemployed because the wage she is offered is "too low" (Chapter 19), or when the resale of tickets to sporting events ("ticket scalping") is outlawed even though the buyer is happy to get the ticket that she could not obtain at a lower price (Chapter 4).

In every one of these cases, well-intentioned but misguided reasoning blocks the possible mutual gains that arise from voluntary exchange and thereby interferes with one of the most basic functions of an economic system (see Chapter 3).

1-1e Idea 5: The Importance of Thinking at the Margin

We will devote much of this book to explaining and extolling a type of decision-making process called *marginal analysis* (see especially Chapters 5, 7, and 8), which we can best illustrate through an example.

Suppose an airline is told by its accountants that the full average cost of transporting one passenger from Los Angeles to New York is $300. Can the airline profit by offering a reduced fare of $200 to students who fly on a standby basis? The surprising answer is probably yes. The reason is that most of the costs of the flight must be paid whether the plane carries 20 passengers or 200 passengers.

Costs such as maintenance, landing rights, and ground crews are irrelevant to the decision of whether to carry *additional* standby passengers at reduced rates. The only costs that are relevant are the *extra* costs of writing and processing additional tickets, the food and beverages consumed by these passengers, the additional fuel required, and so on. These so-called *marginal costs* are probably quite small in this example. A passenger who pays the airline any amount more than it costs the airline to give her a seat that would otherwise be unused (the marginal cost of flying her) adds something to the company's profit. So it probably is more profitable to let students ride at low fares than to leave the seats empty.

In many real cases, a failure to understand marginal analysis leads decision makers to reject advantageous possibilities like the reduced fare in our example. These people are misled by using *average* rather than *marginal* cost figures in their calculations—an error that can be costly.

1-1f Idea 6: Externalities—A Shortcoming of the Market Cured by Market Methods

Markets are adept at producing the goods that consumers want and in just the quantities they desire. They do so by rewarding those who respond to what consumers want and who produce these commodities economically. This all works out well as long as each exchange involves only the buyer and the seller—and no one else. However, some transactions affect third parties who are not involved in the decision. Examples abound: A farmer sprays crops with toxic pesticides, but the poison seeps into the groundwater and affects the health of neighboring communities. People burn gasoline to drive cars, but the CO_2 emitted contributes to global climate change.

Such social costs are called *externalities* because they affect parties *external* to the economic transactions that cause them. Externalities escape the control of the market mechanism because no financial incentive motivates polluters to minimize the damage they do—as we will learn in Chapters 15 and 16. So business firms make their products as cheaply as possible, disregarding any environmental harm they may cause.

Yet Chapters 15 and 16 will point out a way for the government to use the market mechanism to control undesirable externalities. If the farmer and automobile driver are charged for the clean water they use and the CO_2 they emit, just as they are charged for any fertilizer and gasoline they consume, then they will have financial incentives to reduce the amount of pollution they generate. Thus, in this case, economists believe that market methods are often the best way to cure one of the market's most important shortcomings.

1-1g Idea 7: The Trade-Off between Efficiency and Equality

Wages and incomes have grown more unequal in the United States since the late 1970s. Highly skilled workers have pulled away from low-skilled workers. The rich have grown richer while the poor have become (relatively) poorer. In many European countries, however, inequality has not grown nearly as much. Yet, over the same time period, U.S. unemployment has generally been much lower than European unemployment.

Many economists see these phenomena as related. Europe and the United States have made different choices regarding how best to balance the conflicting claims of greater economic efficiency (more output and jobs) versus greater equality.

Roughly speaking, the American solution is to let markets work to promote efficiency—something they are very good at doing—with only minimal government interferences to reduce economic inequalities. (Some of these interferences are studied in Chapter 20.) However, much of continental Europe takes a different view. They find it scandalous that many Americans work for $7.25 per hour or less, with virtually no fringe benefits and no job security. European laws mandate not only relatively high minimum wages but also substantial fringe benefits and employment protections. Of course, European taxes must be much higher to pay for these programs.

As economists see it, each system's virtue is also its vice. There is an agonizing *trade-off* between the *size* of a nation's output and the degree of *equality* with which that output is distributed. European-style policies designed to divide the proverbial economic pie more equally inadvertently can cause the size of the pie to shrink. American-style arrangements that promote maximal efficiency and output may permit or even breed huge inequalities and poverty. Which system is better? There is no clear answer, but we will examine the issue in detail in Chapter 20.

1-1h Epilogue

These ideas are some of the more fundamental concepts you will find in this book—ideas that we hope you will retain beyond the final exam. There is no need to master them right now, for you will hear much more about each as you progress through the book. By the end of the course, you may be amazed to see how natural, or even obvious, they will seem.

1-2 INSIDE THE ECONOMIST'S TOOL KIT

We turn now from the kinds of *issues* economists deal with to some of the *tools* they use to grapple with them.

1-2a Economics as a Discipline

Although economics is clearly the most rigorous of the social sciences, it nevertheless looks decidedly more "social" than "scientific" when compared with, say, physics. An economist must be a jack-of-several-trades, borrowing modes of analysis from numerous fields. Mathematical reasoning is used prominently in economics, but so is historical study. And neither looks quite the same as when practiced by a mathematician or a historian. Statistics play a major role in modern economic inquiry, although economists have had to modify standard statistical procedures to fit their kinds of data.

1-2b The Need for Abstraction

Some students find economics unduly abstract and "unrealistic." The stylized world envisioned by economic theory seems only a distant cousin to the world they know. There is an old joke about three people—a chemist, a physicist, and an economist—stranded on a desert island with an ample supply of canned food but no tools to open the cans. The chemist offers an idea: lighting a fire under the cans might burst the cans. The physicist advocates building a catapult with which to smash the cans against some nearby boulders. The economist's suggestion? "Let's assume we have a can opener."

Economic theory *does* make some unrealistic assumptions—you will encounter some of them in this book—but some abstraction from reality is necessary because of the incredible complexity of the economic world, not because economists like to sound absurd.

Abstraction means ignoring many details so as to focus on the most important elements of a problem.

Compare the chemist's simple task of explaining the interactions of compounds in a chemical reaction with the economist's complex task of explaining the interactions of people in an economy. Are molecules motivated by greed or altruism, by envy or ambition? Do they ever imitate other molecules? Do forecasts about them influence their behavior? People, of course, do all these things and many more. It is, therefore, vastly more difficult to predict human behavior than to predict chemical reactions. If economists tried to keep track of every feature of human behavior, they would never get anywhere. Thus:

> **Abstraction from less important details is necessary to understand the functioning of anything as complex as the economy.**

An analogy will make it clear why economists **abstract** from details. Suppose you have just arrived for the first time in Los Angeles. You are now at the Los Angeles Civic Center—the point marked *A* in Maps 1 and 2, which are alternative maps of part of Los Angeles. You want to drive to the Los Angeles County Museum of Art, point *B* on each map. Which map would be more useful?

From *The Wall Street Journal*—Permission, Cartoon Features Syndicate.

"Yes, John, we'd all like to make economics less dismal . . ."

NOTE: The nineteenth-century British writer Thomas Carlyle described economics as the "dismal science," a label that stuck.

Map 1 has complete details of the Los Angeles road system, but this makes it hard to read and hard to use as a way to find the art museum. For this purpose, Map 1 is far too detailed, although for other purposes (for example, locating a small street in Hollywood) it may be far better than Map 2.

In contrast, Map 2 omits many minor roads—you might say they are *assumed away*—so that the freeways and major arteries stand out more clearly. As a result of this simplification, several routes from the Civic Center to the Los Angeles County Museum of Art emerge. For example, we can take the Hollywood Freeway west to Alvarado Boulevard, go south to Wilshire Boulevard, and then head west again. Although we *might* find a shorter route by poring over the details in Map 1, most strangers to the city would prefer to use Map 2. Similarly, economists try to *abstract* from a lot of confusing details while retaining the essentials.

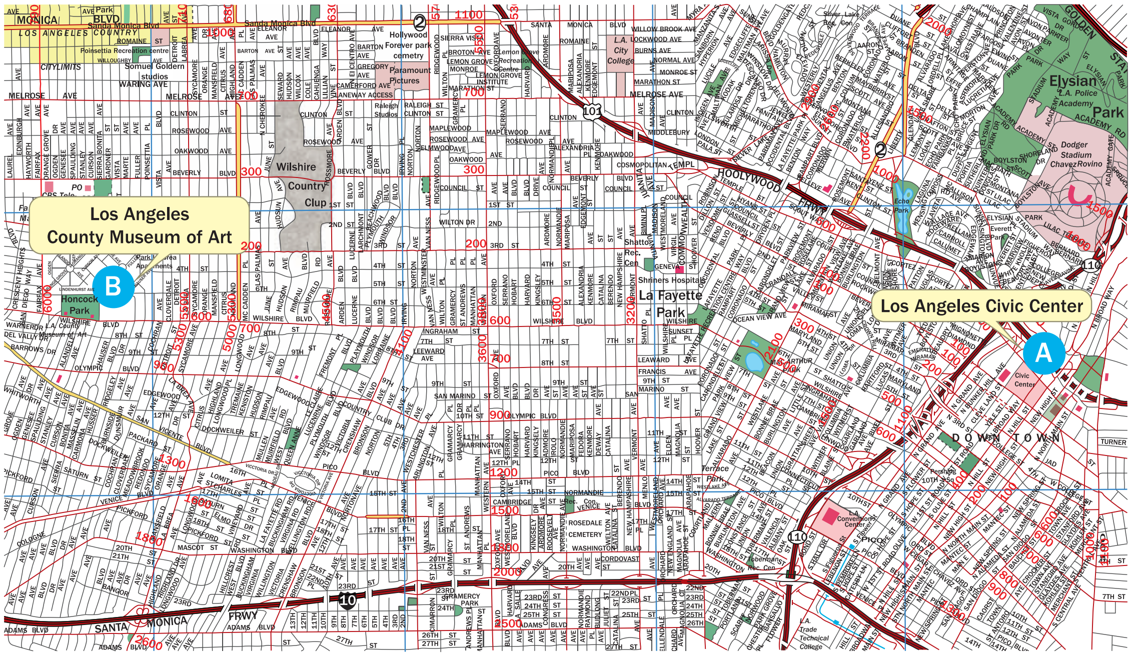
Map 3, however, illustrates that simplification can go too far. It shows little more than the major interstate routes and freeways that pass through the greater Los Angeles area and, therefore, will not help a visitor find the art museum. Of course, this map was never intended to be used as a detailed tourist guide, which brings us to an important point:

There is no such thing as one "right" degree of abstraction and simplification for all analytic purposes. The proper degree of abstraction depends on the purpose of the analysis. A model that is a gross oversimplification for one purpose may be needlessly complicated for another.

Economists are constantly seeking analogies to Map 2 rather than Map 3, walking the thin line between useful generalizations about complex issues and gross distortions of the pertinent facts. For example, suppose you want to learn why some people are fabulously rich whereas others are abjectly poor. People differ in many ways, too many to enumerate, much less to study. The economist must ignore most of these details to focus on the important ones. The color of a person's hair or eyes is probably not important for the problem but, unfortunately, the color of his or her skin probably is because of racial discrimination. Height and weight may be relatively unimportant, but education is very important. Proceeding in this way, we can pare Map 1 down to the manageable dimensions of Map 2. But there is

Map 1

Detailed Road Map of Los Angeles



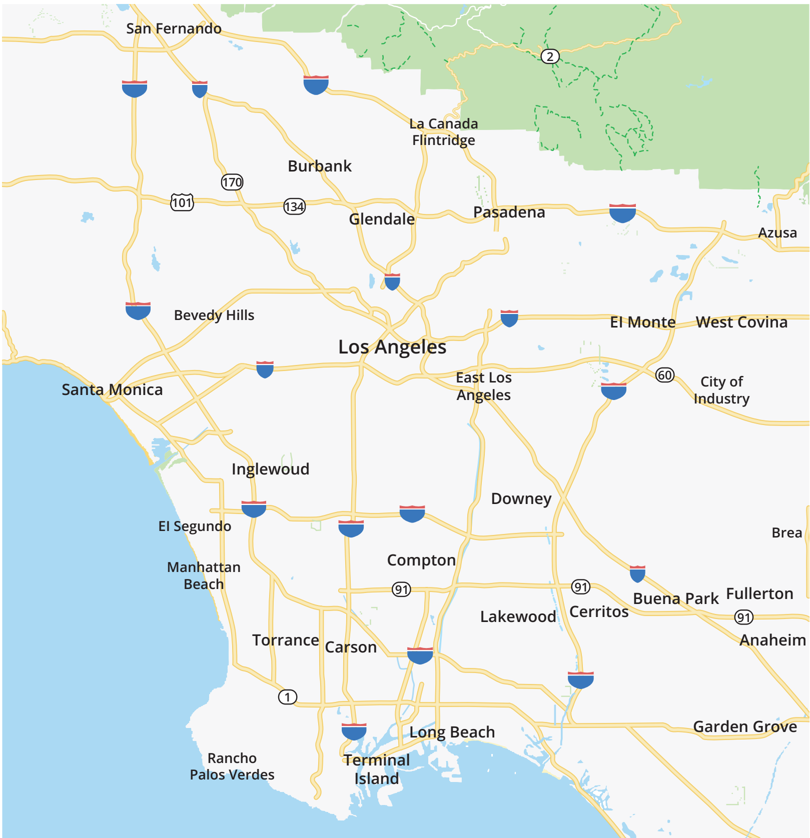
NOTE: Point *A* marks the Los Angeles Civic Center, and point *B* marks the Los Angeles County Museum of Art.

Map 2

Major Los Angeles Arteries and Freeways

Map 3

Greater Los Angeles Freeways



a danger of going too far, stripping away some of the crucial factors, so that we wind up with Map 3.

1-2c The Role of Economic Theory

A **theory** is a deliberate simplification of relationships used to explain how those relationships work.

Some students find economics "too theoretical." To see why we can't avoid **theory**, let's consider what we mean by that term.

To an economist or natural scientist, the word *theory* means something different from what it means in common speech. In science, a theory is *not* an untested assertion of alleged fact. The statement that aspirin provides protection against heart attacks is not a theory. It is a *hypothesis*, that is, a statement based on reasoning and some evidence, which will prove to be true or false once the right sorts of experiments have been completed. (Many cardiologists will argue that those experiments have been completed already.) But a theory is something different. It is a deliberate simplification (an abstraction) of reality that attempts to explain how some relationships work. It is an *explanation* of the mechanism behind observed phenomena. Thus, gravity forms the basis of theories that describe and explain the paths of the planets. Similarly, Keynesian theory (discussed in Parts 6 and 7) seeks to describe and explain how government policies affect unemployment and prices in the national economy.

People who have never studied economics often draw a false distinction between *theory* and *practical policy.* Politicians and businesspeople, in particular, often reject abstract economic theory as something that is best ignored by "practical" people. The irony of these statements is that

It is precisely the concern for policy that makes economic theory so necessary and important.

To analyze policy options, economists must deal with *possibilities that have not actually occurred.* For example, to learn how to shorten periods of high unemployment, they must investigate whether a proposed new policy that has never been tried can help. Or to determine which environmental programs will be most effective, they must understand how and why a market economy produces pollution and what might happen if the government taxed industrial waste discharges and automobile emissions. Such questions require some *theorizing*, not just examination of the facts, because we need to consider possibilities that have never occurred.

Two variables are said to be **correlated** if they tend to go up or down together. Correlation need not imply causation.

The facts, moreover, can sometimes be equivocal or misleading. Data often indicate that two variables move up and down together. But this statistical **correlation** does not prove that either variable *causes* the other. For example, when it rains, drivers slow down and there are also more traffic accidents. But no one thinks slower driving causes more accidents. Rather, we understand that both phenomena are caused by a common underlying factor—more rain. How do we know this? Not just by looking at the correlation between data on accidents and driving speeds. Data alone tell us little about cause and effect. We must use some simple *theory* as part of our analysis. In this case, the theory might explain that drivers know that they are more apt to have accidents on slippery roads.

Similarly, we must use theoretical analysis, and not just data, to understand *how,* if at all, different government policies will lead to lower unemployment or *how* a tax on emissions will reduce pollution.

Statistical correlation need not imply causation. Some theory is usually needed to interpret data.

1-2d What Is an Economic Model?

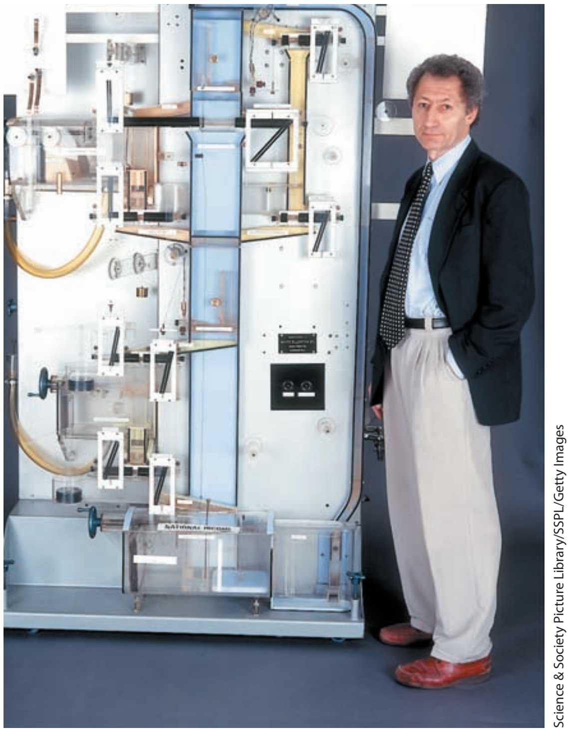
An **economic model** is a simplified, small-scale version of an aspect of the economy. Economic models are often expressed in equations, by graphs, or in words.

An **economic model** is a representation of a theory or a part of a theory, often used to gain insight into cause and effect. The notion of a "model" is familiar enough to children, and economists—like other researchers—use the term the same way children do.

A child's model airplane looks and operates much like the real thing, but it is smaller and simpler, so it is easier to manipulate and understand. Engineers for Boeing also build models of planes. Although their models are far larger and much more elaborate than a child's toy, they use them for the same purposes: to observe the workings of these aircraft "up close" and to experiment to see how the models behave under different circumstances. ("What happens if I do this?") From these experiments, they make educated guesses as to how the real-life version will perform.

Economists use models for similar purposes. The late A. W. Phillips, an engineer-turned-economist, was talented enough to construct a working model of the determination of national income in a simple economy by using colored water flowing through pipes. For years this contraption graced the basement of the London School of Economics. Although this book will explain models with words and diagrams, Phillips's engineering background enabled him to depict the theory with tubes, valves, and pumps.

Because many of the models used in this book are depicted in diagrams, for those of you who need review, we explain the construction and use of various types of graphs in the appendix to this chapter. Don't be put off by seemingly abstract models. Think of them as useful road maps and remember how hard it would be to find your way around Los Angeles without one.



Science & Society Picture Library/SSPL/Getty Images

A. W. Phillips built this model in the early 1950s to illustrate Keynesian theory.

1-2e Reasons for Disagreements: Imperfect Information and Value Judgments

"If all the earth's economists were laid end to end, they could not reach an agreement," or so the saying goes. Politicians and reporters are fond of pointing out that economists can be found on both sides of many public policy issues. If economics is a science, why do economists so often disagree? After all, astronomers do not debate whether the earth revolves around the sun or vice versa.

This question reflects a misunderstanding of the nature of science. Disputes are normal at the frontier of any science. For example, astronomers once argued vociferously over whether the earth revolves around the sun. Nowadays, they argue about gamma-ray bursts, dark matter, and other esoterica. These arguments go mostly unnoticed by the public because few of us understand what they are talking about. But economics is a *social* science. Its disputes are aired in public, and all sorts of people feel free to join economic debates.

Furthermore, economists actually agree on much more than is commonly supposed. Virtually all economists, regardless of their politics, agree that taxing polluters is one of the best ways to protect the environment (see Chapters 15 and 16), that rent controls can ruin a city (Chapter 4), and that free trade among nations is usually preferable to the erection of barriers through tariffs and quotas. The list could go on and on. It is probably true that the number of issues about which economists agree *far* exceeds the number of subjects on which they disagree.

Finally, many disputes among economists are not scientific disputes at all. Sometimes the pertinent facts are simply unknown. For example, you will learn in Chapter 16 that the appropriate financial penalty to levy on a polluter depends on quantitative estimates of the harm done by the pollutant—knowledge that is not always at hand. Similarly, although there is wide scientific agreement that the earth is slowly warming, there are disagreements over how costly that is. Such disputes make it difficult to agree on concrete policy proposals.

Another important source of disagreements is that economists, like other people, come in all political stripes, ranging from far right to far left. Each may make different value judgments, and so each may hold a different view of the "right" solution to a public policy problem—even if they agree on the underlying analysis. Here are two examples:

1. We suggested early in this chapter that policies that lower inflation are likely to raise unemployment. Many economists believe they can measure the amount of unemployment that must be endured to reduce inflation by a given amount. However,

they disagree about whether it is worth having, say, 3 million more people out of work for a year to cut the inflation rate by 1 percentage point.

2. In designing an income tax, society must decide how much of the burden to put on upper-income taxpayers. Some people believe the rich should pay a disproportionate share of the taxes. Others disagree, believing it is fairer to levy the same income tax rate on everyone.

Economists cannot answer questions like these any more than nuclear physicists could have determined whether dropping the atomic bomb on Hiroshima was a good idea. The decisions rest on moral judgments that can be made only by the citizenry through its elected officials.

Although economic science can contribute theoretical and factual knowledge on a particular issue, the final decision on policy questions often rests either on information that is not currently available or on social values and ethical opinions about which people differ, or on both.

Summary

1. To help you get the most out of your first course in economics, we have devised a list of 10 important ideas that you will want to retain beyond the final exam. Briefly, they are the following:
   a. **Opportunity cost** is the correct measure of cost.
   b. Attempts to fight market forces often backfire.
   c. Nations can gain from trade by exploiting their *comparative advantages*.
   d. Both parties can gain in a voluntary exchange.
   e. Good decisions typically require *marginal analysis*, which weighs added costs against added benefits.
   f. Externalities may cause the market mechanism to malfunction, but this defect can often be repaired by market methods.
   g. There is a trade-off between efficiency and equality. Many policies that promote one damage the other.
2. Common sense is not always a reliable guide in explaining economic issues or in making economic decisions.
3. Because of the great complexity of human behavior, economists are forced to **abstract** from many details, to make generalizations that they know are not quite true, and to organize what knowledge they have in terms of some theoretical structure called a "model."
4. **Correlation** need not imply causation.
5. Economists use simplified models to understand the real world and predict its behavior, much as a child uses a model airplane to learn how planes work.
6. Although these **economic models,** if skillfully constructed, can illuminate important economic problems, they rarely can answer the questions that confront policy makers. Value judgments involving such matters as ethics are needed for this purpose, and economists are no better equipped than anyone else to make them.

Key Terms

abstraction 7
correlation 10
economic model 10
opportunity costs 4
theory 10

Discussion Questions

1. Think about a way you would construct a model of how your college is governed. Which officers and administrators would you include and exclude from your model if the objective were one of the following:
   a. To explain how decisions on financial aid are made
   b. To explain the quality of the faculty

   Relate this to the map example in the chapter.
2. Relate the process of abstraction to the way you take notes in a lecture. Why do you not try to transcribe every word uttered by the lecturer? Why don't you write down just the title of the lecture and stop there? How do you decide, roughly speaking, on the correct amount of detail?
3. Explain why a government policymaker cannot afford to ignore economic theory.

Appendix *Using Graphs: A Review*[1]

As noted in the chapter, economists often use graphs to explain and analyze models. Indeed, this book is full of graphs. But that is not the only reason for studying how graphs work. Most college students will deal with graphs in the future, perhaps frequently. You will see them online. If you become a doctor, you will use graphs to keep track of your patients' progress. If you join a business firm, you will use them to check profit or performance at a glance. This appendix introduces some of the techniques of graphic analysis—tools you will use throughout the book and, more important, very likely throughout your working career.

Graphs Used in Economic Analysis

Economic graphs are invaluable because they can display a large quantity of data quickly and because they facilitate data interpretation and analysis. They enable the eye to take in at a glance important statistical relationships that would be far less apparent from written descriptions or long lists of numbers.

Two-Variable Diagrams

Much of the economic analysis found in this and other books requires that we keep track of two **variables** simultaneously.

A variable is something measured by a number; it is used to analyze what happens to other things when the size of that number changes (varies).

For example, in studying how markets operate, we will want to keep one eye on the *price* of a commodity and the other on the *quantity* of that commodity that is bought and sold.

For this reason, economists frequently find it useful to display real or imaginary figures in a two-variable diagram, which simultaneously represents the behavior of two economic variables. The numerical value of one variable is measured along the horizontal line at the bottom of the graph (called the *horizontal axis*), starting from the **origin** (the point labeled "0"), and the numerical value of the other variable is measured up the vertical line on the left side of the graph (called the *vertical axis*), also starting from the origin.

The "0" point in the lower-left corner of a graph where the axes meet is called the origin. Both variables are equal to zero at the origin.

Figures 1(a) and 1(b) are typical graphs used in economic analysis. They depict an imaginary *demand curve*, represented by the red dots in Figure 1(a) and the heavy red line in Figure 1(b). The graphs show the price of natural gas on their vertical axes and the quantity of gas people want to buy at each price on the horizontal axes. The dots in Figure 1(a) are connected by the continuous red curve labeled *DD* in Figure 1(b).

Economic diagrams are generally read just as one would read latitudes and longitudes on a map. On the demand curve in Figure 1, the point marked *a* represents a hypothetical combination of price and quantity of natural gas demanded by customers in St. Louis. By drawing a horizontal line leftward from that point to the vertical axis, we learn that at this point the average price for gas in St. Louis is $3 per thousand cubic feet. By dropping a line straight down to the horizontal axis, we find that consumers want 80 billion cubic feet per year at this price, just as the data in Table 1 show. The other points on the graph give similar information. For example, point *b* indicates that if natural gas in St. Louis were to cost only $2 per thousand cubic feet, quantity demanded would be higher—it would reach 120 billion cubic feet per year.

Notice that information about price and quantity is *all* we can learn from the diagram. The demand curve will not tell us what kinds of people live in St. Louis, the size of their homes, or the condition of their furnaces. It tells us about the quantity demanded at each possible price—no more, no less.

A diagram abstracts from many details, some of which may be quite interesting, so as to focus on the two variables of primary interest—in this case, the price of natural gas and the amount of gas that is demanded at each price. All of the diagrams used in this book share this basic feature. They cannot tell the reader the "whole story," any more than a map's latitude and longitude figures for a particular city can make someone an authority on that city.

Table 1

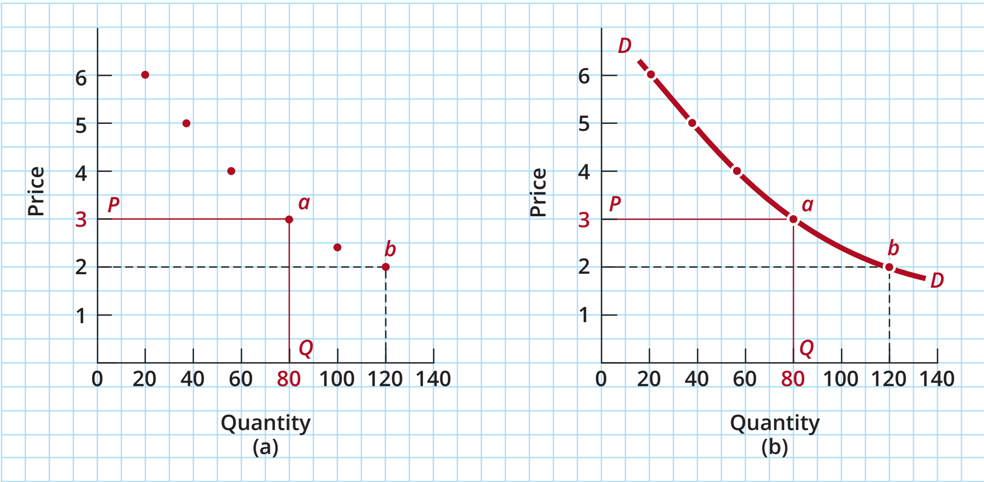
Quantities of Natural Gas Demanded at Various Prices

Price (per thousand cubic feet)	$2	$3	$4	$5	$6
Quantity demanded (billions of cubic feet per year)	120	80	56	38	20

[1] Students who have some acquaintance with geometry and feel comfortable with graphs can safely skip this appendix.

Figure 1

A Hypothetical Demand Curve for Natural Gas in St. Louis



NOTE: Price is in dollars per thousand cubic feet; quantity is in billions of cubic feet per year.

The Definition and Measurement of Slope

One of the most important features of economic diagrams is the rate at which the line or curve being sketched runs uphill or downhill as we move to the right. The demand curve in Figure 1 clearly slopes downhill (the price falls) as we follow it to the right (that is, as consumers demand more gas). In such instances, we say that *the curve has a negative slope, or is negatively sloped, because one variable falls as the other one rises.*

The slope of a straight line is the ratio of the vertical change to the corresponding horizontal change as we move to the right along the line between two points on that line, or, as it is often said, the ratio of the "rise" over the "run."

The four panels of Figure 2 show all possible types of slope for a straight-line relationship between two unnamed variables called Y (measured along the vertical axis) and X (measured along the horizontal axis). Figure 2(a) shows a *negative slope*, much like our demand curve in the previous graph. Figure 2(b)shows a *positive slope*, because variable Y rises (we go uphill) as variable X rises (as we move to the right). Figure 2(c) shows a *zero slope*, where the value of Y is the same irrespective of the value of X. Figure 2(d) shows an *infinite slope*, meaning that the value of X is the same irrespective of the value of Y.

Slope is a numerical concept, not just a qualitative one. The two panels of Figure 3 show two positively sloped straight lines with different slopes. The line in Figure 3(b) is clearly steeper, but by how much? The labels should help you compute the answer. In Figure 3(a), a horizontal movement, AB, of 10 units (13 – 3) corresponds to a vertical movement, BC, of 1 unit (9 – 8). So the slope is $BC/AB = 1/10$. In Figure 3(b), the same horizontal movement of 10 units corresponds to a vertical movement of 3 units (11 – 8). So the slope is 3/10, which is larger—the rise divided by the run is greater in Figure 3(b).

By definition, the slope of any particular straight line is the same, no matter where on that line we choose to measure it. That is why we can pick any horizontal distance, AB, and the corresponding slope triangle, ABC, to measure slope. But this is not true for curved lines.

Curved lines also have slopes, but the numerical value of the slope differs at every point along the curve as we move from left to right.

The four panels of Figure 4 provide some examples of **slopes of curved lines**. The curve in Figure 4(a) has a negative slope everywhere, and the curve in Figure 4(b) has a positive slope everywhere. But these are not the only possibilities. In Figure 4(c) we encounter a curve that has a positive slope at first but a negative slope later on. Figure 4(d) shows the opposite case: a negative slope followed by a positive slope.

We can measure the slope of a smooth curved line numerically *at any particular point* by drawing a *straight* line that *touches*, but does not *cut*, the curve at the point in question. Such a line is called a **tangent to the curve**.

The slope of a curved line at a particular point is defined as the slope of the straight line that is tangent to the curve at that point.

Figure 5 shows tangents to the red curve at two points. Line tt is tangent at point T, and line rr is tangent at point

Figure 2

Different Types of Slope of a Straight-Line Graph

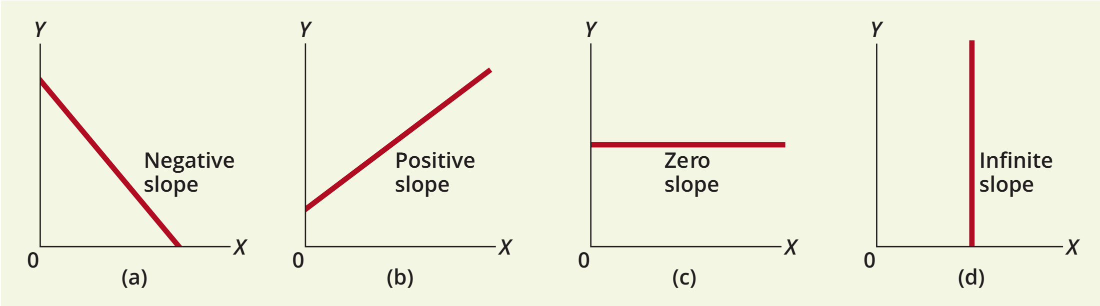


Figure 3

How to Measure Slope

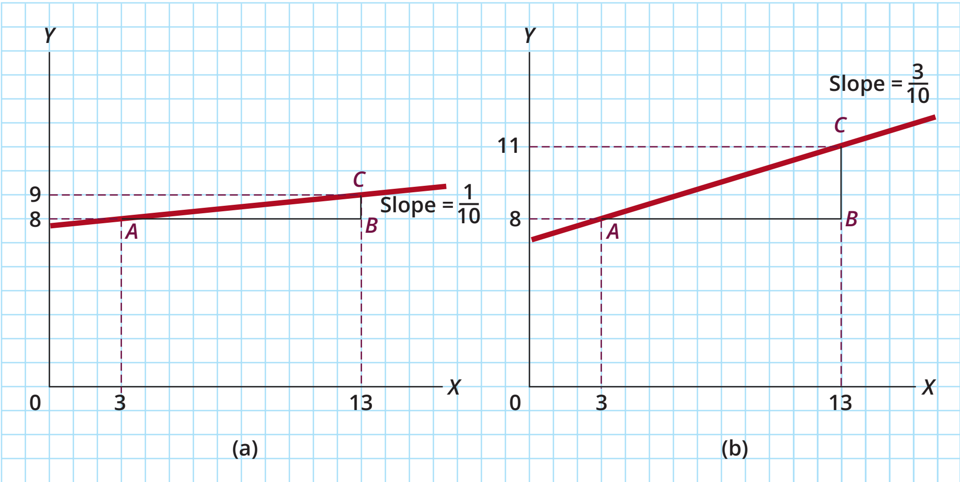
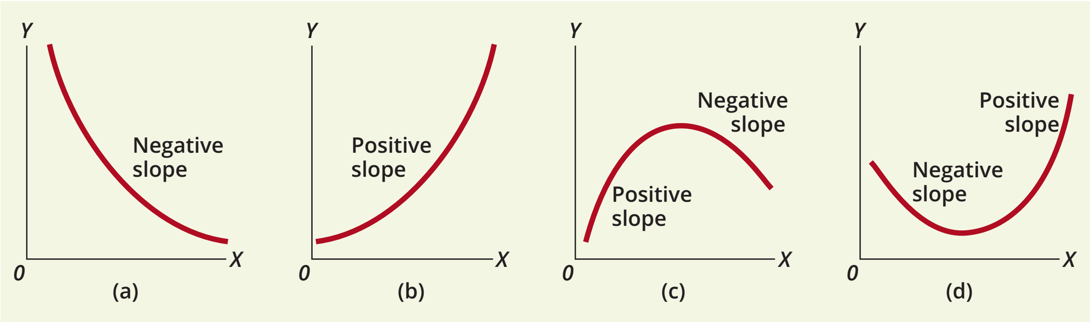


Figure 4

Behavior of Slopes in Curved Graphs



R. We can measure the slope of the curve at these two points by applying the definition. The calculation for point T, then, is the following:

$$\text{Slope at point } T = \text{Slope of line } tt = \frac{\text{Distance } BC}{\text{Distance } BA} = \frac{(1-5)}{(3-1)} = \frac{-4}{2} = -2$$

A similar calculation yields the slope of the curve at point R, which, as we can see from Figure 5, must be smaller numerically. That is, the tangent line rr is less steep than line tt:

$$\text{Slope at point } R = \text{Slope of line } rr = \frac{(5-7)}{(8-6)} = \frac{-2}{2} = -1$$

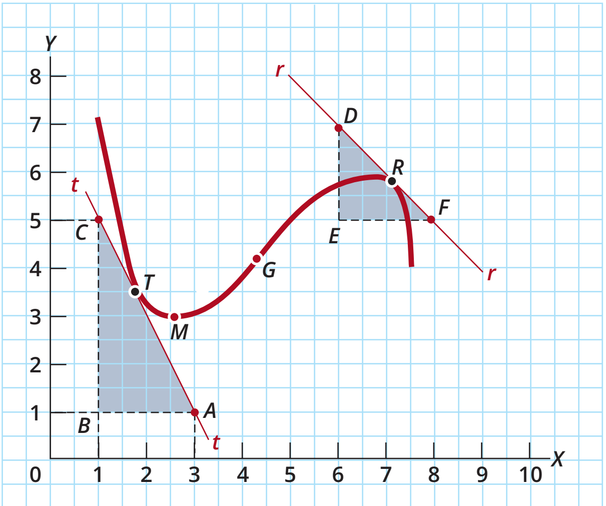
Exercise Show that the slope of the curve at point G is about 1.

What would happen if we tried to apply this graphical technique to the high point in Figure 4(c) or to the low point in Figure 4(d)? Take a ruler and try it. The tangents that you construct should be horizontal, meaning that they should have a slope exactly equal to zero. It is always true that where the slope of a *smooth* curve changes from positive to negative, or vice versa, there will be at least one point whose slope is zero.

Curves shaped like smooth hills, as in Figure 4(c), have a zero slope at their *highest* point. Curves shaped like valleys, as in Figure 4(d), have a zero slope at their *lowest* point.

Figure 5

How to Measure Slope at a Point on a Curved Graph



Rays through the Origin and 45° Lines

The point at which a straight line cuts the vertical (Y) axis is called the **Y-intercept**.

The *Y*-intercept of a line or a curve is the point at which it touches the vertical axis (the *Y*-axis). The *X*-intercept is defined similarly.

For example, the Y-intercept of the line in Figure 3(a) is a bit less than 8.

Lines whose *Y*-intercept is zero have so many special uses in economics and other disciplines that they have been given a special name: a ray through the origin, or a ray.

Figure 6 shows three rays through the origin, and the slope of each is indicated in the diagram. The ray in the center (whose slope is 1) is particularly useful in many economic applications because it marks points where X and Y are equal (as long as X and Y are measured in the same units). For example, at point A we have $X = 3$ and $Y = 3$; at point B, $X = 4$ and $Y = 4$. A similar relation holds at any other point on that ray.

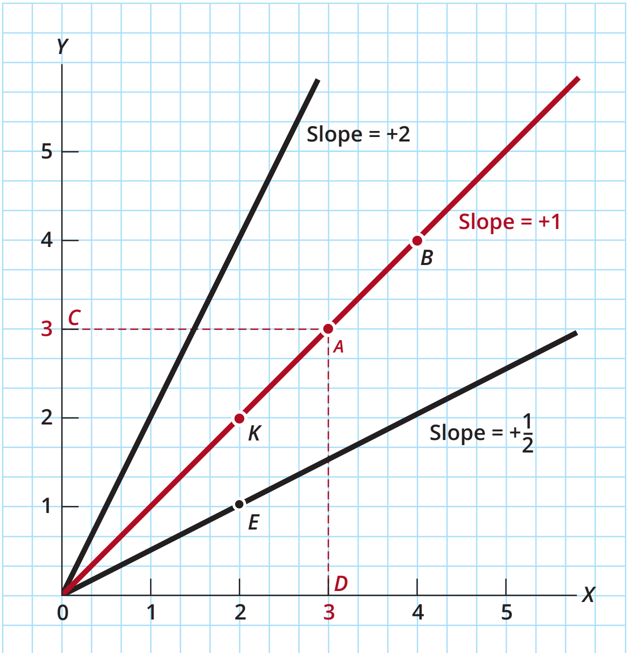
How do we know that this is always true for a ray whose slope is 1? If we start from the origin (where both X and Y are zero) and the slope of the ray is 1, we know from the definition of slope that

$$\text{Slope} = \frac{\text{Vertical change}}{\text{Horizontal change}} = 1$$

This implies that the vertical change and the horizontal change are always equal, so the two variables must always remain equal. Any point along that ray

Figure 6

Rays through the Origin



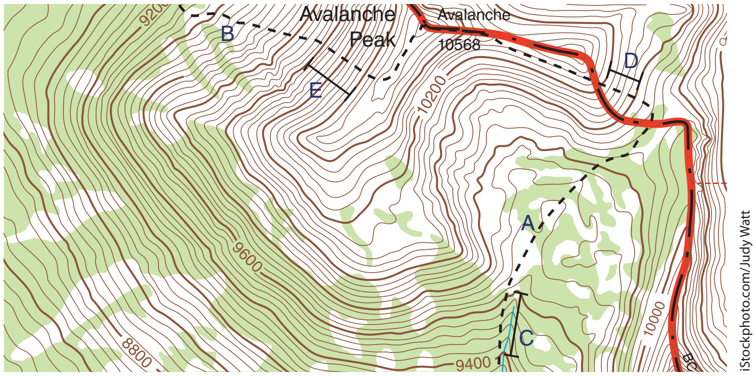
(for example, point A) is exactly equal in distance from the horizontal and vertical axes (length DA = length CA)—the number on the X-axis (the abscissa) will be the same as the number on the Y-axis (the ordinate).

Rays through the origin with a slope of 1 are called 45° lines because they form an angle of 45° with the horizontal axis. A 45° line marks off points where the variables measured on each axis have equal values.[2]

If a point representing some data is above the 45° line, we know that the value of Y exceeds the value of X. Similarly, whenever we find a point below the 45° line, we know that X is larger than Y.

Figure 7

A Geographic Contour Map



Squeezing Three Dimensions into Two: Contour Maps

Sometimes problems involve more than two variables, so two dimensions just are not enough to depict them on a graph. This is unfortunate, because the surface of a sheet of paper is only two-dimensional. When we study a business firm's decision-making process, for example, we may want to keep track simultaneously of three variables: how much labor it employs, how much raw material it purchases from other firms, and how much output it creates.

Luckily, economists can use a well-known device for collapsing three dimensions into two—a *contour map*. Figure 7 is a contour map of the area around Avalanche Peak in Yellowstone National Park. On some of the irregularly shaped "rings" on this map, we find numbers (like **10,200**) indicating the height (in **feet**) above sea level at that particular spot on the hill. Thus, unlike other maps, which give only latitudes and longitudes, this contour map (also called a topographical map) exhibits *three* pieces of information about each point: latitude, longitude, and altitude.

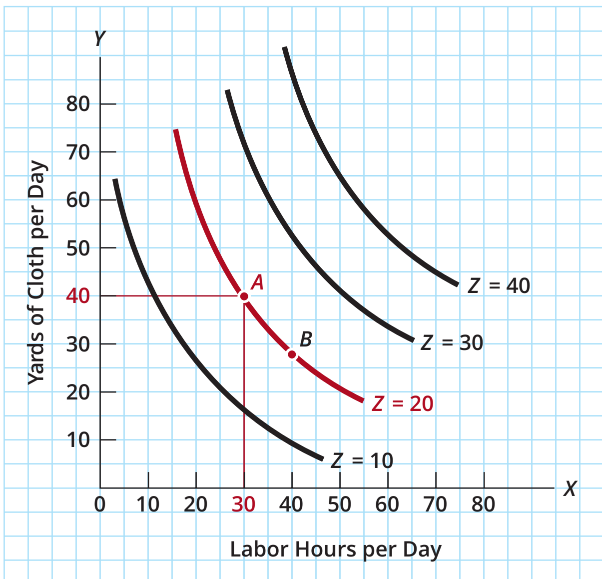
Figure 8 looks more like the contour maps encountered in economics. It shows how a third variable, called Z (think of it as the firm's output of textiles, for example), varies as we change either variable X (think of it as the firm's employment of labor) or variable Y (think of it as the use of cloth). Just like the geographical contour map, any point on the diagram conveys three pieces of data. At point A, we can read off the values of X and Y in the conventional way (X is 30 and Y is 40), and we can also note the value of Z by finding out on which contour line point A falls. (It is on the $Z = 20$ contour.) So point A is able to tell us that 30 hours of labor and 40 yards of cloth produce 20 units of output per day. The contour line that indicates 20 units of output shows the various combinations of labor and cloth a manufacturer can use to produce 20 units of output. Economists call such maps **production indifference maps**.

A production indifference map is a graph whose axes show the quantities of two inputs that are used to produce some output. A curve in the graph corresponds to some given quantity of that output, and the different points on that curve show the different quantities of the two inputs that are just enough to produce the given output.

Although most of the analyses presented in this book rely on the simpler two-variable diagrams, contour maps will find their applications, especially in the appendices to Chapters 5 and 7.

Figure 8

An Economic Contour Map



[2] The definition assumes that both variables are measured in the same units.

Summary

1. Because graphs are used so often to portray economic models, it is important for students to acquire some understanding of their construction and use. Fortunately, the graphs used in economics are usually not very complex.
2. Most economic models are depicted in two-variable diagrams. We read data from these diagrams just as we read the latitude and longitude on a map: each point represents the values of two variables at the same time.
3. In some instances, three variables must be shown at once. In these cases, economists use contour maps, which, as the name suggests, show "latitude," "longitude," and "altitude" all at the same time.
4. Often, the most important property of a line or curve drawn on a diagram is its slope, which is defined as the ratio of the "rise" over the "run," or the vertical change divided by the horizontal change as one moves along the curve. Curves that go uphill as we move to the right have positive slopes; curves that go downhill have negative slopes.
5. By definition, a straight line has the same slope wherever we choose to measure it. The slope of a curved line changes, but the slope at any point on the curve can be calculated by measuring the slope of a straight line tangent to the curve at that point.

Key Terms

45° lines 17
origin (of a graph) 13
production indifference maps 17
ray through the origin, or ray 16
slope of a straight (or curved) line 14
tangent to a curve 14
variable 13
***Y*-intercept 16**

Test Yourself

1. Portray the following hypothetical data on a two-variable diagram:

Academic Year	Total Enrollment	Enrollment in Economics Courses
2012–2013	3,000	300
2013–2014	3,100	325
2014–2015	3,200	350
2015–2016	3,300	375
2016–2017	3,400	400

Measure the slope of the resulting line, and explain what this number means.

2. From Figure 5, calculate the slope of the curve at point M.
3. Arthur believes that the number of job offers he will get depends on the number of courses in which his grade is B+ or better. He concludes from observation that the following figures are typical:

Number of grades of B+ or better	0	1	2	3	4
Number of job offers	1	3	4	5	6

Put these numbers into a graph like Figure 1(a). Measure and interpret the slopes between adjacent dots.

4. In Figure 6, determine the values of X and Y at point K and at point E. What do you conclude about the slopes of the lines on which K and E are located?
5. In Figure 8, interpret the economic meaning of points A and B. What do the two points have in common? What is the difference in their economic interpretation?

2 THE ECONOMY: MYTH AND REALITY

E pluribus unum (Out of many, one)

MOTTO ON U.S. CURRENCY

This chapter introduces you to the U.S. economy and its role in the world. It may seem that no such introduction is necessary, for you probably have lived your entire life in the United States. Every time you work at a summer or part-time job, pay your college bills, or buy a slice of pizza, you not only participate in the American economy—you also observe something about it.

But the casual impressions we acquire in our everyday lives, though sometimes correct, are often misleading. Experience shows that most Americans—not just students—either are unaware of, or harbor grave misconceptions about, some of the most basic economic facts. One popular myth holds that most of the goods that Americans buy are made in China. They aren't. Another is that business profits account for a third or more of the price we pay for a typical good or service. They don't. Also, "everyone knows" that the number of federal government employees has grown rapidly over the past few decades. It hasn't.

So, before we begin to develop *theories* of how the economy works, it is useful to get an accurate picture of what our economy is really like. The late Senator Daniel Patrick Moynihan (D-NY), a celebrated academic before he became a politician, famously said that everyone is entitled to their own opinions, but not their own facts. Let's look at some of those facts.

CONTENTS

2-1 THE AMERICAN ECONOMY: A THUMBNAIL SKETCH

For openers, the U.S. economy is the biggest national economy on earth, for two very different reasons. First, there are a lot of us. The population of the United States is just under 330 million—making it the third most populous nation on earth after China and India. That vast total includes children, retirees, full-time students, institutionalized people, and the

Lee Lorenz The New Yorker Collection/The Cartoon Bank.

"And may we continue to be worthy of consuming a disproportionate share of this planet's resources."

unemployed, none of whom produce much output. But as of 2017, the *working* population of the United States numbered over 53 million. As long as they are reasonably productive, that many people are bound to produce vast amounts of goods and services. And they do.

But population is not the main reason why the U.S. economy is by far the world's biggest. After all, despite having nearly four times the population, India's economy is less than one-sixth the size of that of the United States. The second reason why the U.S. economy is so large is that we are a very rich country. American workers are among the most productive in the world. In 2017, our economy produced over $59,000 worth of goods and services for every living American—about $125,000 for every *working* American. If each of the 50 states was a separate country, California would be the sixth-largest national economy on earth!

Factors of production are the broad categories—land, labor, capital, natural resources, and entrepreneurship—into which we classify the economy's different productive inputs.

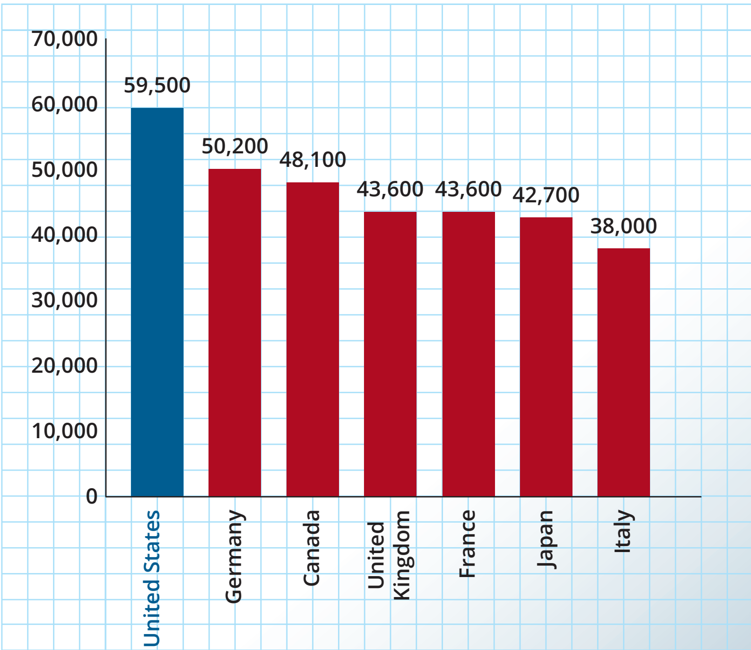
The **outputs** of a firm or an economy are the goods and services it produces.

Why are some countries (like the United States) so rich and others (like India) so poor? That is one of the central questions of economics. It is useful to think of an economic system as a machine that takes **inputs**, such as labor and other things we call **factors of production**, and transforms them into **outputs**, or the things people want to consume. The American economic machine performs this task with extraordinary efficiency, whereas the Indian machine runs quite inefficiently (though it is improving rapidly). Learning why this is so is one of the chief reasons to study economics.

U.S. Share of World GDP—It's Nice to Be Rich

The roughly 7.5 billion people of the world produced approximately $76 trillion worth of goods and services in 2016. The United States, with only about 4.5 percent of that population, turned out almost 25 percent of all the output. As the accompanying graph shows, among the seven largest developed countries of the world, the United States is still the leader in goods and services, with $59,500 worth of GDP produced per person. These seven major industrial economies (the United States, Canada, Germany, the United Kingdom, Japan, France, and Italy), which account for just over 10 percent of global population, generated more than 45 percent of world output in 2017. But their share has been falling as giant developing nations like China and India grow rapidly.

2017 Gross Domestic Product (GDP) per Capita in 7 Industrial Countries



SOURCE: Central Intelligence Agency, *The World Factbook*, https://www.cia.gov/library/publications/the-world-factbook/rankorder/rawdata_2004.txt

Note: Foreign GDPs are converted to U.S. dollars using exchange rates.

Thus, what makes the American economy bigger than all the others—at least for now—is our unique combination of prosperity and population. There are richer countries in the world, like Switzerland, and there are more populous countries, like India. But no nation combines a huge population with high per capita income the way the United States does. China, with an economy less than two-thirds the size of ours, is the only nation that comes close—although per capita income in China, where the labor force alone is more than double the size of the entire U.S. population, is far lower than here.

Although the United States is a rich and populous country, the 50 states certainly were not created equal. Population density varies enormously—from a high of about 1,200 people per square mile in crowded New Jersey to a low of just one person per square mile in the wide-open spaces of Alaska. Income variations are much less pronounced, but still, in 2016, the average income for a family of four in Mississippi was only about half that in Maryland.

2-1a A Private-Enterprise Economy

Part of the secret of America's economic success is that free markets and private enterprise have flourished here. Today, private enterprise and capitalism are the rule, not the exception, around the globe. But the United States has taken the idea of free markets—in which individuals and businesses voluntarily buy and sell things—further than most nations. It remains the "land of opportunity."

Every country has a mixture of public and private ownership of property. Even in the darkest days of communism, Russians owned their own personal possessions. In our country, the post office and the electricity-producing Tennessee Valley Authority are enterprises of the federal government, and many cities and states own and operate mass transit facilities and sports stadiums. But the United States stands out among the world's nations as being among the most "privatized." Few industrial assets are publicly owned in the United States; even many city bus companies and almost all utilities (such as electricity, gas, and telephones) are run as private companies. In Europe, they are often government enterprises, though there has been substantial movement toward privatization.

The United States also has one of the most "marketized" economies on earth. The standard measure of the total output of an economy is called **gross domestic product (GDP)**, a term that appears frequently in the news. The share of GDP that passes through markets in the United States is enormous. Although government purchases of goods and services amount to about 20 percent of GDP, much of that is purchased from private businesses. Direct government production of goods is extremely rare in the U.S.

Gross domestic product (GDP) is the sum of the money values of all final goods and services produced in the domestic economy and sold on organized markets during a specified period of time, usually a year.

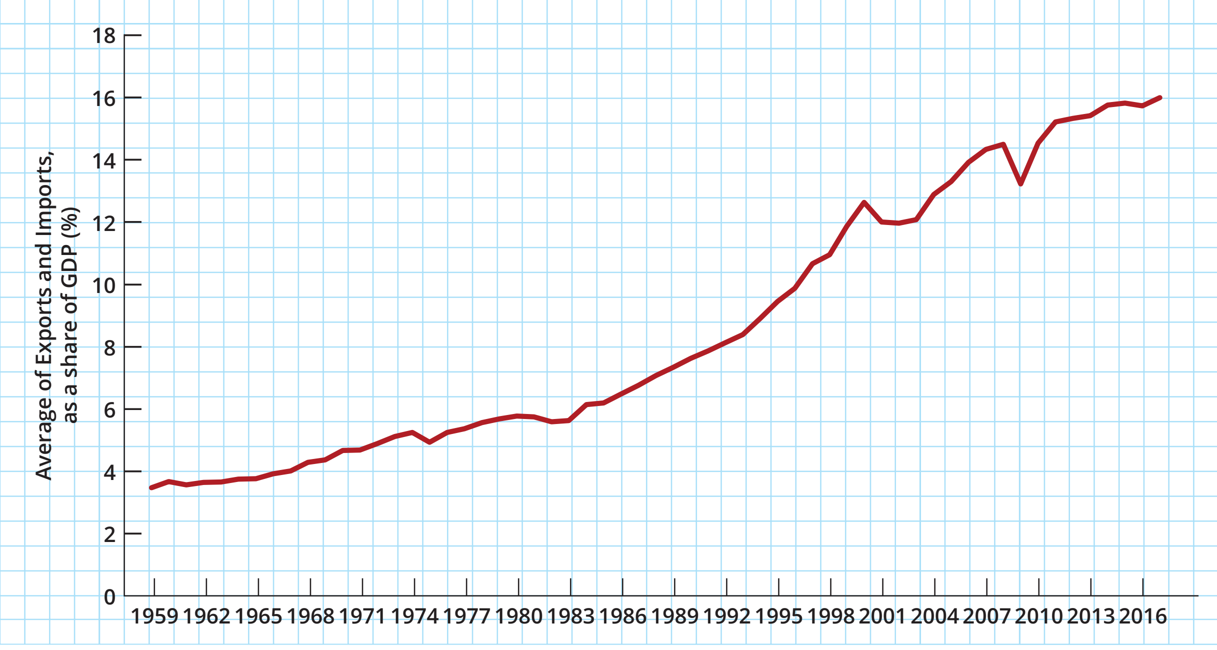
2-1b A Relatively "Closed" Economy

All nations trade with one another, and the United States is no exception. As of 2017, our annual exports were over $2.3 trillion and our annual imports were around $2.9 trillion. That's a lot of money, and so is the gap between them. But America's international trade often gets more attention than it deserves. The fact is that we still produce most of what we consume and consume most of what we produce, although the shares of imports and exports have been growing, as Figure 1 shows. In 1959, the average of exports and imports was only 3.5 percent of GDP, a tiny fraction of the total. It has since gone up to an all-time high of over 14.5 percent in 2017. Although this is no longer negligible, it still means that over 85 percent of what Americans buy every year is made in the United States.

Among the most severe misconceptions about the U.S. economy is the myth that this country no longer manufactures anything, but imports everything from, say, China. In fact, as of 2017, only 15 percent of U.S. GDP was imported, with imports from China making up less than one-sixth of those imports.

Figure 1

Share of U.S. Gross Domestic Product (GDP) Exported and Imported, 1959–2017



SOURCE: *Economic Report of the President* (Washington, D.C.: U.S. Government Printing Office, 2017), http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=ERP.

An **open economy** is one that trades with other nations in goods and services, and perhaps also trades in financial assets. An economy is called relatively open if its exports and imports constitute a large share of its GDP.

An economy is considered relatively **closed** if its exports and imports constitute a small fraction of GDP.

Economists use the terms *open* and *closed* to indicate how important international trade is to a nation. A common measure of "openness" is the average of exports and imports, expressed as a share of GDP. Thus, the Netherlands is considered an extremely **open economy** because it imports and exports more than three-quarters of its GDP. (See Table 1.) By this criterion, the United States stands out as the most **closed economy** among the advanced, industrial nations. We export and import a smaller share of GDP than all of the other countries listed in the table.

2-1c A Growing Economy . . .

The next salient fact about the U.S. economy is its growth; it gets bigger almost every year (see Figure 2). Gross domestic product in 2017 was more than $19 trillion; as noted earlier, that's about $59,000 per American. Measured in dollars of constant purchasing power,[1] the U.S. GDP was more than five times as large in 2017 as it was in 1960. Of course, there were many more people in America in 2017 than there were then. But even correcting for population growth, America's real GDP *per capita* was three times higher in 2017 than in 1960. That's still not a bad performance: Living standards tripled in 57 years.

Looking back further, the purchasing power of the average American increased nearly ninefold over the twentieth century! That's a remarkable number. To get an idea of what it means, just think how much poorer your family would become if it started out with an average U.S. income and then, suddenly, eight dollars out of nine were taken away. Most Americans at the end of the nineteenth century could not afford vacations; the men had one good suit of clothing, which they often listed in their wills; and they wrote with ink that was kept in inkwells that froze every winter.

Table 1

Openness of Various National Economies, 2016

	Openness
Netherlands	76.9%
Germany	42.1
Mexico	39.1
Canada	32.2
United Kingdom	29.0
Russia	23.1
China	18.5
Japan	15.6
United States	**13.3**

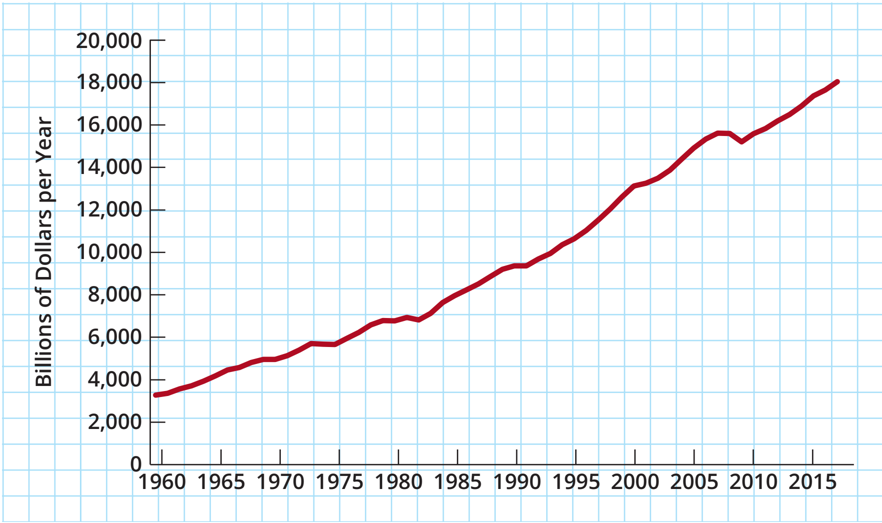
NOTE: Openness calculated as the average of imports and exports as a percentage of GDP in current U.S. dollars.

SOURCE: The World Bank, National Accounts Data, "Exports of goods and services (Current US$)," "Imports of goods and services (Current US$)," and "GDP (Current US$)," https://data.worldbank.org/.

[1] This concept is called *real* GDP.

Figure 2

Real Gross Domestic Product (GDP) since 1960



SOURCE: Bureau of Economic Analysis, National Economic Accounts, "Current Dollar and Real Domestic Product," http://www.bea.gov/national.

NOTE: Real (inflation-adjusted) GDP figures are in billions of chained 2012 dollars.

2-1d But with Bumps along the Growth Path

Although the cumulative growth performance depicted in Figure 2 is impressive, America's economic growth has been quite irregular. We have experienced alternating periods of good and bad times, which are called *economic fluctuations* or sometimes just *business cycles*. In some years—five since 1960, to be exact—GDP actually declined. Such periods of *declining* economic activity are called **recessions**.

A **recession** is a period of time during which the total output of the economy falls.

The bumps along the American economy's historic growth path are barely visible in Figure 2, but they stand out more clearly in Figure 3, which displays the same data in a different way. Here we plot not the *level* of real GDP each year but, rather, its *growth rate*—the percentage change from the previous year. Now the booms and busts that delight and distress people—and swing elections—stand out clearly. From 1983 to 1984, for example, real GDP grew by more than 7 percent, which helped ensure Ronald Reagan's landslide reelection. But from 2008 to 2009, real GDP actually dropped sharply, causing all sorts of social and political distress.

One important consequence of these ups and downs in economic growth is that *unemployment* varies considerably from one year to the next (see Figure 4). During the Great Depression of the 1930s, unemployment ran as high as 25 percent of the workforce, but it fell to barely over 1 percent during World War II. Just within the past decade, the national unemployment rate has been as high as 10.1 percent (in October 2009) and as low as 3.8 percent (in May 2018). In human terms, that 6.3 percentage point difference represents over 10 million workers. Understanding why joblessness varies so dramatically, and what we can do about it, is another major reason for studying economics.

2-2 THE INPUTS: LABOR AND CAPITAL

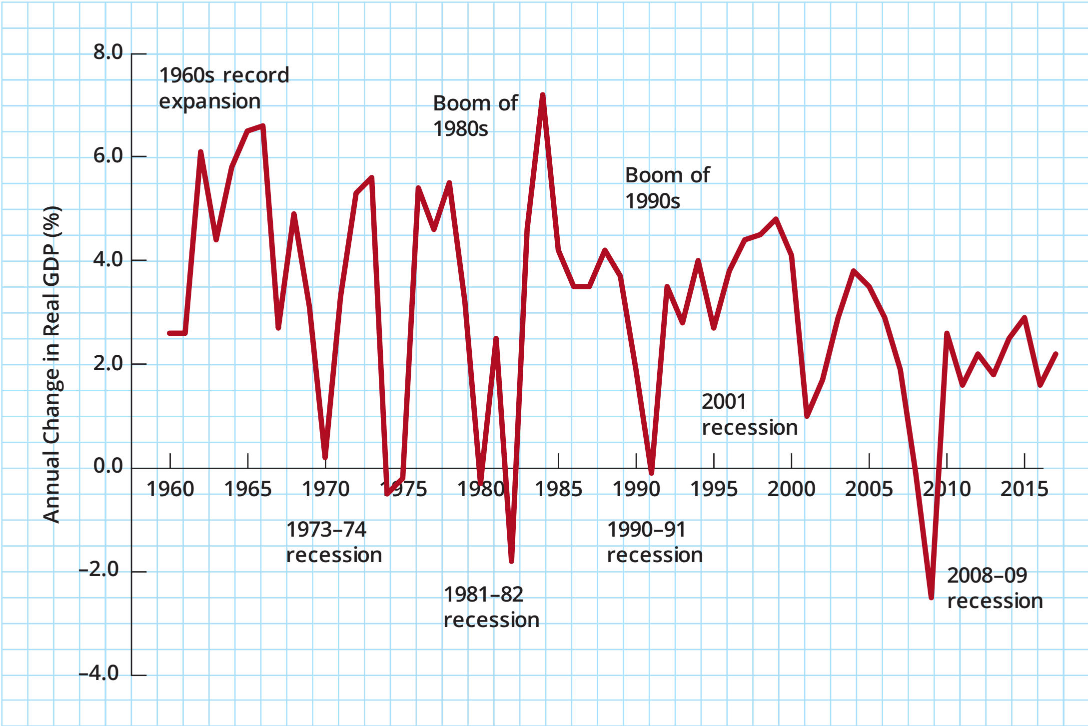
Let's now return to the analogy of an economy as a machine turning inputs into outputs. The most important input is human labor: the men and women who run the machines, work behind the desks, and serve you in stores.

2-2a The American Workforce: Who Is in It?

We have already mentioned that as of 2017, about 53 million Americans held jobs. Just over 53 percent of these workers were men; nearly 47 percent were women. This ratio represents a drastic change from two generations ago, when most women worked only

Figure 3

The Growth Rate of Real Gross Domestic Product (GDP) in the United States since 1960

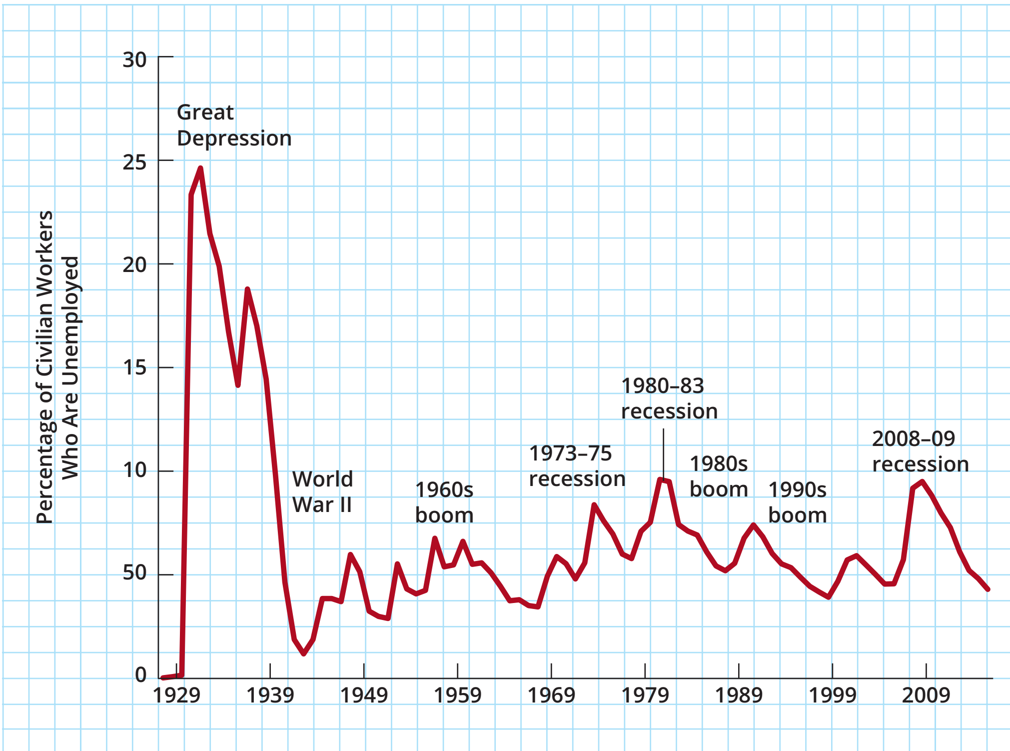


NOTE: Growth rates are for 1959–1960, 1960–1961, and so on.

SOURCE: Bureau of Economic Analysis, National Economic Accounts, "Current Dollar and Real Domestic Product," http://www.bea.gov/national.

Figure 4

The Unemployment Rate in the United States since 1929



SOURCE: *Economic Report of the President* (Washington, D.C.: U.S. Government Printing Office, 2017), http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=ERP; and Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970* (Washington, D.C.: U.S. Government Printing Office, 1975).

Unemployment Rates in Europe

For roughly the first quarter-century after World War II, unemployment rates in the industrialized countries of Europe were significantly lower than those in the United States. Then, in the mid-1970s, rates of joblessness in Europe leaped, with double-digit rates becoming common. And they have been higher than U.S. unemployment rates in most years since. In 2017, the unemployment rate in the United States was well below that in most European economies. Put on a comparable basis by the Organization for Economic Co-operation and Development (OECD), unemployment rates in eight leading countries in 2017 were:

U.S.	**4.4%**
Italy	11.3
France	9.6
Sweden	6.7
Canada	6.5
Australia	5.6
United Kingdom	4.5
Germany	3.8
Japan	2.9

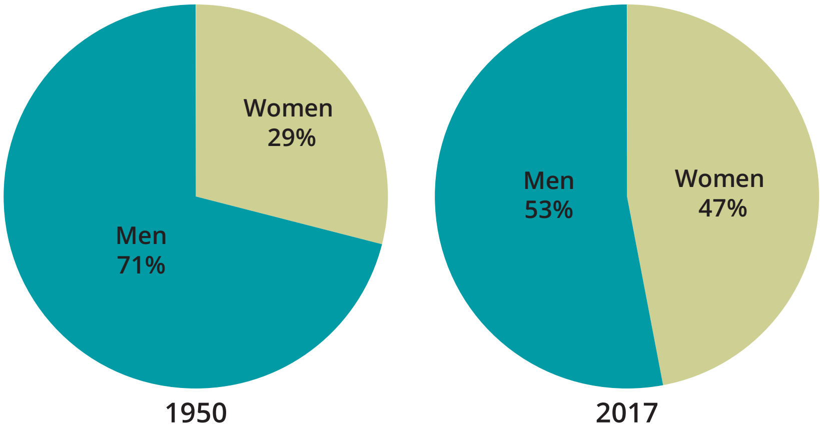
leesr/Panther Media GmbH/Alamy Stock Photo

SOURCE: OECD, "Harmonised unemployment rate (HUR)" https://data.oecd.org/unemp/harmonised-unemployment-rate-hur.htm#indicator-chart

at home (see Figure 5). Indeed, the massive entrance of women into the paid labor force was one of the major social transformations of American life during the second half of the twentieth century. In 1950, women accounted for just under 30 percent of the American labor force; as of 2017, women made up almost half of the labor force. As Figure 6 shows, the share of women in the labor forces of other industrial countries has also been growing. The expanding role of women in the labor market has raised many controversial questions—whether they are discriminated against (the evidence suggests

Figure 5

The Composition of Employment by Sex, 1950 and 2017

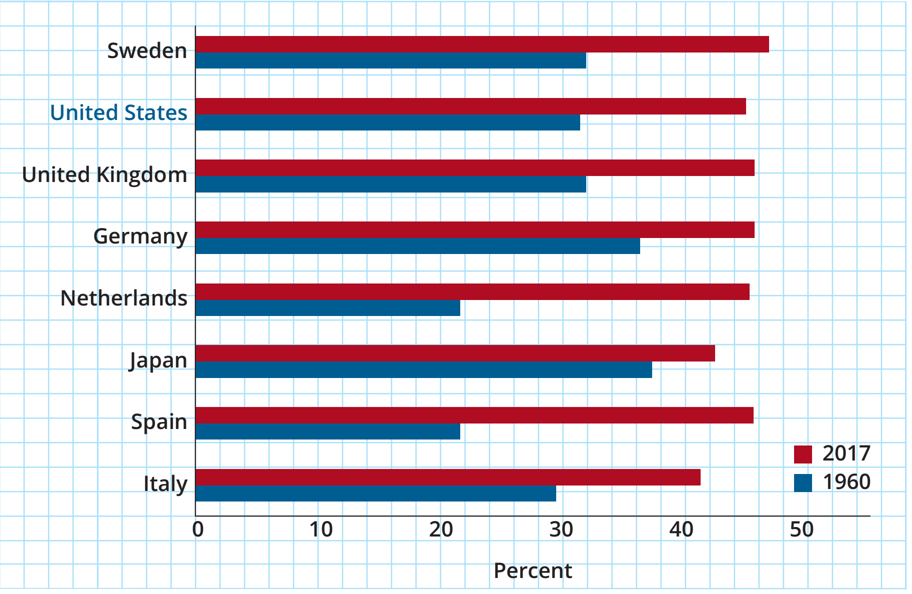


SOURCE: U.S. Bureau of Labor Statistics.

NOTE: As of 2017, over 153 million Americans held jobs. Data are for the civilian, noninstitutional population 16 years old and older.

Figure 6

Working Women as a Percentage of the Labor Force, 1960 versus 2017



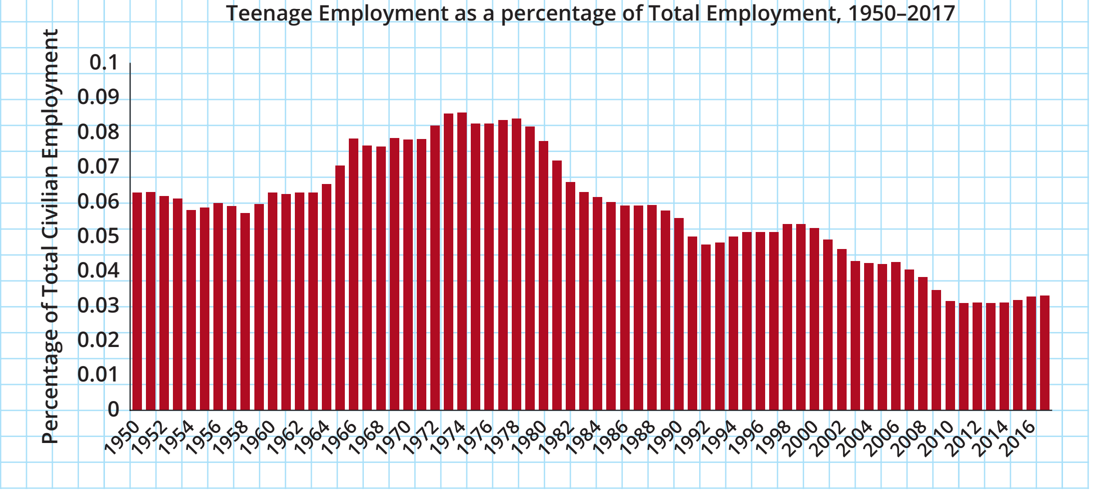
SOURCES: "A Survey of Women and Work," *The Economist*, July 18, 1998, p. 4; and Organization for Economic Cooperation and Development, *Annual Labor Force Statistics*, various years, http://stats.oecd.org.

that they are), whether the government should compel employers to provide maternity leave, and so on.

In contrast to women, the percentage of teenagers in the workforce has dropped significantly since its peak in the mid-1970s, although it has come back a bit lately (see Figure 7). Young men and women ages 16 to 19 accounted for 8.6 percent of employment in 1974 but only 3 percent in 2016. As the baby boom gave way to the baby bust, people under 20 became scarce resources! Still, almost 5 million teenagers hold jobs in the U.S. economy today. Most teenagers fill low-wage jobs at fast-food restaurants, amusement parks, and the like. Few can be found in the nation's factories.

Figure 7

Employment Status of the Civilian, Noninstitutional Population by Sex, Age, and Race



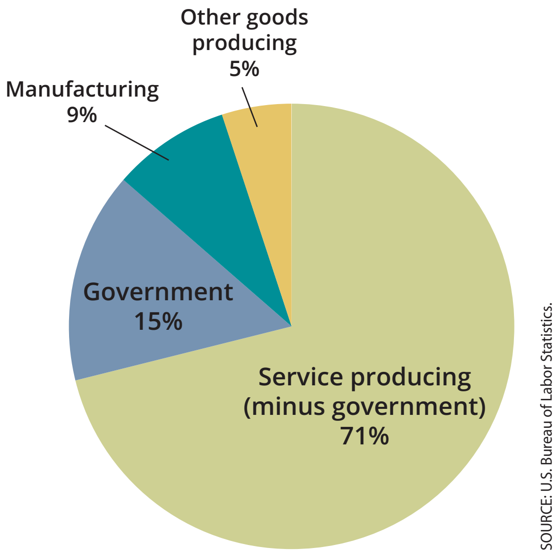
SOURCE: U.S. Bureau of Labor Statistics.

Data are for civilian, noninstitutional population 16 to 19 years old.

2-2b The American Workforce: What Does It Do?

Figure 8

Civilian Non-Farm Payroll Employment by Sector, 2016



What do these 53 million working Americans do? The only real answer is: almost anything you can imagine. In 2016, America had 99,860 architects, 271,200 computer programmers, over 676,980 carpenters, 3.3 million truck drivers, 631,610 lawyers, 619,530 secretaries, 151,290 kindergarten teachers, 26,960 pediatricians, 70,030 tax preparers, 16,680 physicists, 315,910 fire fighters, and 19,380 economists.[2]

Figure 8 shows the breakdown by sector. It holds some surprises for most people. The majority of American workers—like workers in all developed countries—produce services, not goods. In 2016, almost 71 percent of all non-farm workers in the United States were employed by private service industries, whereas only about 14 percent produced goods. These legions of service workers included about 22.6 million in educational and health services, over 20 million in business and professional services, and more than 15 million in retail trade. (The biggest single private employer in the country was Walmart.) By contrast, manufacturing companies in the United States employed only 12 million people, and almost a third of those worked in offices rather than in factories. The Homer Simpson image of the typical American worker as a blue-collar worker is really quite misleading.

As of 2016, federal, state, and local governments employed about 21.6 million people but, contrary to another popular misconception, few of these civil servants work for the *federal* government. Federal *civilian* employment was about 2.8 million—about 10 percent lower than it was in the 1980s. (The armed forces employed about another 1.1 million men and women in uniform.) State and local governments provided 18.8 million jobs—or almost seven times the number of federal government jobs. In addition to the jobs categorized in Figure 8, over 2 million people were working on farms in the United States, and 8.7 million were self-employed.

As Figure 9 shows, *all* industrialized countries have become "service economies" in recent decades. To a considerable degree, this shift to services reflects the arrival of the "Information Age." Activities related to computers, to research, to the transmission of information by teaching and publication, and other information-related activities are providing most of the new jobs. This means that, in the rich economies, workers who moved out of manufacturing jobs into the service sectors did not go predominantly into low-skill jobs such as dishwashing or housecleaning. Many found employment in service jobs in which education and experience provide great advantages. At the same time, technological change has made it possible to produce more and more manufactured products using fewer and fewer workers. Such labor-saving innovation in manufacturing has allowed a considerable share of the labor force to move out of goods-producing jobs and into services.

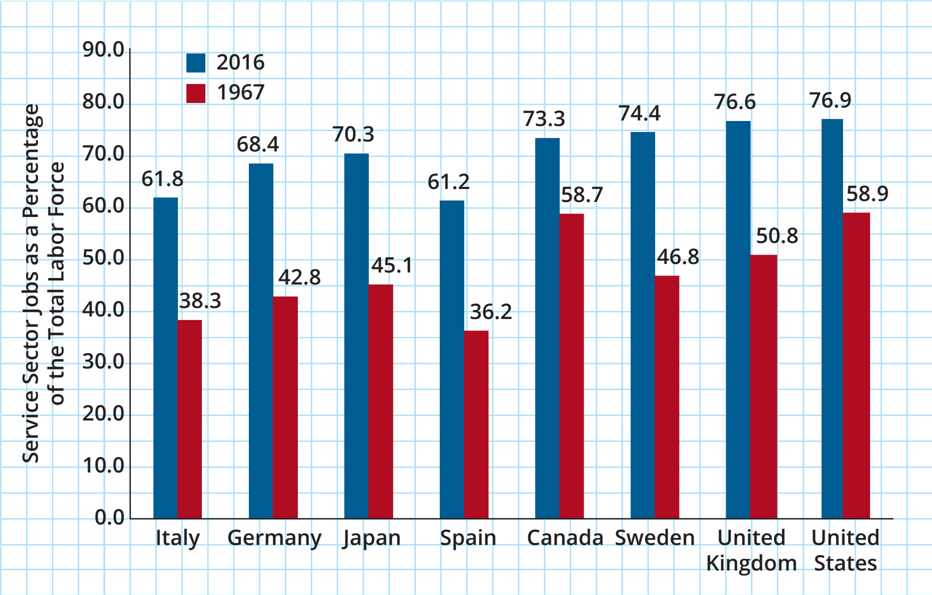
2-2c The American Workforce: What Does It Earn?

Altogether, U.S. workers' wages accounted for more than 60 percent of the income that the production process generated in 2016. That figures out to an average hourly wage in the whole economy of almost $26 in 2016—plus fringe benefits like health insurance and pensions, which can contribute an additional 30 to 40 percent for some workers. Because

[2] U.S. Bureau of Labor Statistics, www.bls.gov.

Figure 9

The Growing Share of Service Sector Jobs, 1967 versus 2016



SOURCE: Organization for Economic Cooperation and Development, *Labor Force Statistics*, various years, http://stats.oecd.org.

the average workweek was about 34 hours long in 2016, a typical weekly paycheck in the United States was around $890 before taxes (but excluding the value of benefits). That is hardly a princely sum, and most college graduates can expect to earn substantially more.[3] But that pay is typical of average wage rates in a rich country like the United States.

Wages throughout northern Europe are similar. Indeed, workers in a number of other industrial countries now receive higher compensation than American workers do—a big change from the situation a few decades ago. According to the Conference Board, U.S. manufacturing workers made less than those in Sweden, Germany, and Belgium in 2015 (see Figure 10). However, U.S. compensation levels still remain above those in the United Kingdom, Italy, and Canada, among others.

2-2d Capital and Its Earnings

After deducting the small sliver of income that goes to the owners of land and natural resources, the rest of national income mainly accrues to the owners of *capital*—the machines and buildings that make up the nation's industrial plants.

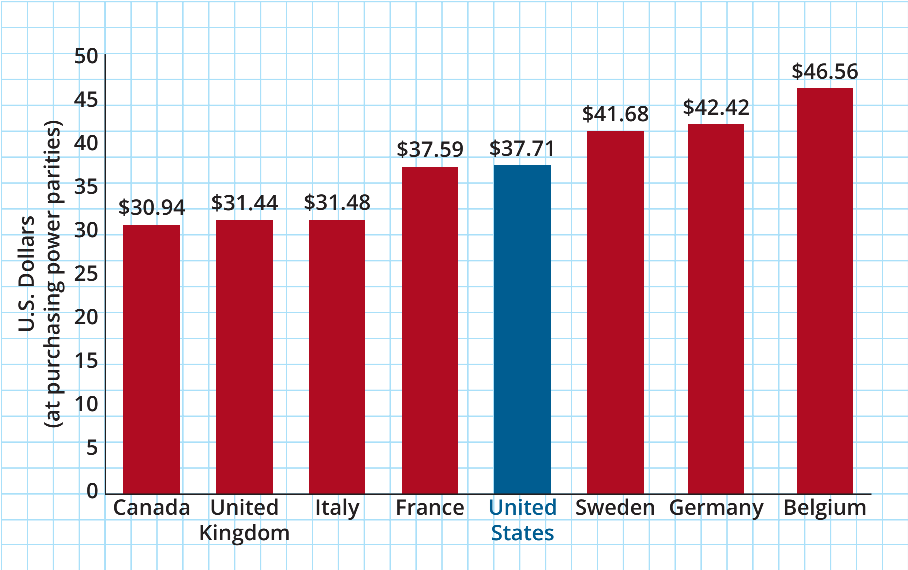
The total market value of these business assets—a tough number to estimate—is believed to be in the neighborhood of $40 trillion. Because that capital earns an average rate of return of about 10 percent before taxes, total earnings of capital—including corporate profits, interest, and all the rest—come to about $4 trillion. (These are *very* rough numbers.)

Public opinion polls routinely show that Americans have a distorted view of the level of business profits in our society. The man and woman on the street believe that corporate profits after tax account for about 36 percent of the price of a typical product. (See the box "Public Opinion on Corporate Profits" on the next page.) The correct number is closer to 7 percent.

[3] As of 2016, high school graduates typically earned just 60 percent of what workers with undergraduate college degrees were earning. Data from Bureau of Labor Statistics, "Labor Force Statistics from the Current Population Survey." Earnings by education, http://www.bls.gov/emp/ep_chart_001.htm.

Figure 10

Average Hourly Compensation Rates in Manufacturing, 2015

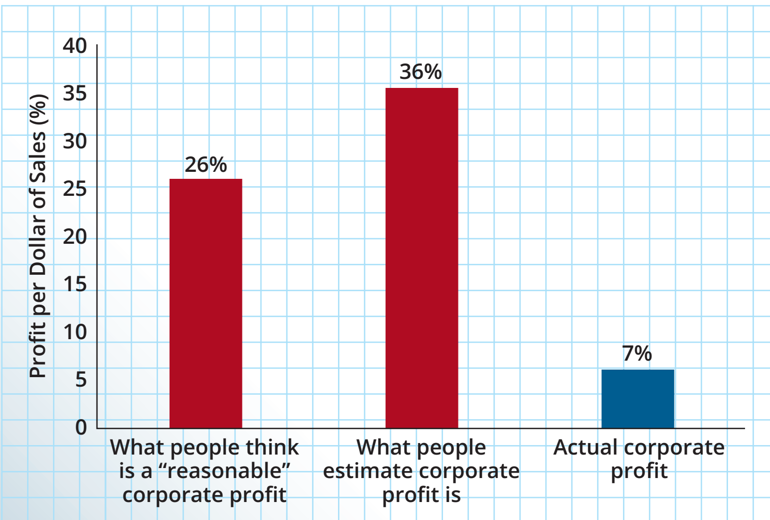


SOURCE: The Conference Board, International Labor Comparisons (2015), Manufacturing Hourly Compensation Costs, U.S. dollars, 2015, https://www.conference-board.org/.

2-3 THE OUTPUTS: WHAT DOES AMERICA PRODUCE?

What does all this labor and capital produce? Consumer spending accounts for nearly 70 percent of GDP. And what an amazing variety of goods and services it buys. In 2017, American households spent two-thirds of their budgets on services, with housing commanding the largest share (followed closely by health care). The other 32 percent of consumer expenditures went for goods.

Public Opinion on Corporate Profits



A 2013 public opinion poll found that the average American thought that corporate profits *after taxes* amounted to 36 percent of sales for the typical manufacturing company. At the time, the actual profit share was closer to 7 percent! Interestingly, when a poll years earlier asked how much profit was "reasonable," the mean response was 26 cents on every dollar of sales—more than six times as large as profits actually were at that time.

SOURCES: "Public Opinion Survey," *Reason-Rupe Public Opinion Survey* (Princeton, NJ: Princeton Survey Research Associates International, May 2013. The older poll was: "Public Attitudes toward Corporate Profits," *Public Opinion Index* (Princeton, NJ: Opinion Research Corporation, June 1986).

With consumption accounting for about 70 percent of GDP, only about 30 percent is left for all other uses. That includes government services (buying such things as airplanes, guns, and the services of soldiers, teachers, and bureaucrats), business purchases of machinery and industrial structures, and consumer purchases of new houses.

2-4 THE CENTRAL ROLE OF BUSINESS FIRMS

Calvin Coolidge once said that "the business of America is business," a statement that is often ridiculed. But, he was largely right. When we peer inside the economic machine that turns inputs into outputs, we see mainly private companies. Astonishingly, in 2016, there were almost 30 million business firms in the United States—about one for every 11 people!

The owners and managers of these businesses hire people, acquire or rent capital goods, and arrange to produce things consumers want to buy. Sound simple? It isn't. Around 8 percent of businesses fail each year.[4] (Compare that with F grades in colleges and universities.) A few succeed spectacularly. (Ask Mark Zuckerberg or Jeff Bezos.) Some do both. Fortunately for the U.S. economy, the lure of riches induces hundreds of thousands of people to start new businesses every year—against the odds.

A number of the biggest firms do business all over the world, just as foreign-based *multinational corporations* do business here. Indeed, some people claim that it is now impossible to determine the true "nationality" of a multinational corporation—which may have factories in 10 or more countries, sell its wares all over the world, and have stockholders in dozens of nations. (See the box "Is That an American Company?") Ford, for example, generates more profits abroad than at home, and the Toyota you drive was probably assembled in the United States.

Is That an American Company?

Robert Reich, who was Secretary of Labor in the Clinton administration, argued some years ago that it was already nearly impossible to define the nationality of a multinational company. Although many scholars think Reich exaggerated the point, no one doubts that he had one—nor that the nationalities of corporations have become increasingly blurred since then. Here's what he wrote in 1991:

> What's the difference between an "American" corporation that makes or buys abroad much of what it sells around the world and a "foreign" corporation that makes or buys in the United States much of what it sells? . . . The mind struggles to keep the players straight. In 1990, Canada's Northern Telecom was selling to its American customers telecommunications equipment made by Japan's NTT at NTT's factory in North Carolina.
>
> If you found that one too easy, try this: Beginning in 1991, Japan's Mazda would be producing Ford Probes at Mazda's plant in Flat Rock, Michigan. Some of these cars would be exported to Japan and sold there under Ford's trademark.
>
> A Mazda-designed compact utility vehicle would be built at a Ford plant in Louisville, Kentucky, and then sold at Mazda dealerships in the United States. Nissan, meanwhile, was designing a new light truck at its San Diego, California, design center. The trucks would be assembled at Ford's Ohio truck plant, using panel parts fabricated by Nissan at its Tennessee factory, and then marketed by both Ford and Nissan in the United States and in Japan. Who is Ford? Nissan? Mazda?

Mark Elias/Bloomberg/Getty Images

SOURCE: Robert B. Reich, *The Work of Nations* (New York: Knopf, 1991), pp. 124, 131.

[4] This number is the average of the business failure rates for 2013; U.S. Census Bureau, Business Dynamic Statistics, accessed online at https://www.census.gov/ces/dataproducts/bds/.

Firms compete with other companies in their *industry*. Most economists believe that this *competition* is the key to industrial efficiency. A sole supplier of a commodity will find it easy to make money and may, therefore, fail to innovate or control costs. Its management is liable to become relaxed and sloppy. But a company besieged by dozens of competitors eager to take its business away must constantly seek ways to innovate, to cut costs, and to build a better mousetrap. The rewards for business success can be magnificent. But the punishment for failure is severe.

2-5 WHAT'S MISSING FROM THE PICTURE? GOVERNMENT

Thus far, we have the following capsule summary of how the U.S. economy works: Almost 30 million private businesses, energized by the profit motive, employ about 53 million workers and about $40 trillion of capital. These firms bring their enormously diverse wares to a bewildering variety of different markets, where they try to sell them to more than 320 million consumers.

It is in *markets*—places where goods and services are bought and sold—that these millions of households and businesses meet to conduct transactions, as depicted in Figure 11. Only a few of these markets are concrete physical locations, such as fish markets or stock exchanges. Most are more abstract "places," where business may be conducted by telephone or over the Internet—even if the commodity being traded is a physical object. For example, there are few centralized *physical* marketplaces for buying cars or computers, but there are highly competitive markets for these goods nonetheless—and you can buy either online.

As Figure 11 suggests, firms use their receipts from selling goods and services in the markets for *outputs*; to pay wages to employees and interest and profits to the people who provide capital in the markets for *inputs*. These income flows, in turn, enable consumers to purchase the goods and services that companies produce. This circular flow of money, goods, and factors of production lies at the center of the analysis of how the national economy works, as we will see later in this book. All these activities are linked by a series of interconnected markets, some of which are highly competitive and others of which are less so.

But the story so far leaves out something important: the role of *government*, which is pervasive even in our decidedly free-market economy. Just what does government do in the U.S. economy and other economies—and why?

Figure 11

The Circular Flow of Goods and Money