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Essentials of Economics

Eleventh Edition

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ESSENTIALS OF ECONOMICS, ELEVENTH EDITION

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1 2 3 4 5 6 7 8 9 LWI 24 23 22 21 20 19

ISBN: 978-1-260-22533-4 (bound edition)
MHID 1-260-22533-X (bound edition)
ISBN 978-1-260-52128-3 (loose-leaf edition)
MHID 1-260-52128-1 (loose-leaf edition)

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Library of Congress Control Number: 2019933996

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About the Authors

©Bradley Schiller

Bradley R. Schiller has over four decades of experience teaching introductory economics at American University, the University of California (Berkeley and Santa Cruz), the University of Maryland, and the University of Nevada (Reno). He has given guest lectures at more than 300 colleges ranging from Fresno, California, to Istanbul, Turkey. Dr. Schiller's unique contribution to teaching is his ability to relate basic principles to current socioeconomic problems, institutions, and public policy decisions. This perspective is evident throughout *Essentials of Economics*.

Dr. Schiller derives this policy focus from his extensive experience as a Washington consultant. He has been a consultant to most major federal agencies, many congressional committees, and political candidates. In addition, he has evaluated scores of government programs and helped design others. His studies of income inequality, poverty, discrimination, training programs, tax reform, pensions, welfare, Social Security, and lifetime wage patterns have appeared in both professional journals and popular media. Dr. Schiller is also a frequent commentator on economic policy for television, radio, and newspapers.

Dr. Schiller received his PhD from Harvard and his BA degree, with great distinction, from the University of California (Berkeley). When not teaching, writing, or consulting, Professor Schiller is typically on a tennis court, schussing down a ski slope, or enjoying the crystal blue waters of Lake Tahoe.

©Karen Gebhardt

Karen Gebhardt is the Director of the Online Economics Program in the Department of Economics and regularly teaches in the Masters of the Environment program at the University of Colorado Boulder. Dr. Gebhardt has a passion for teaching economics. She has taught online since 2005, and regularly instructs on-campus large introductory courses in macro- and microeconomics; upper-division courses in Public Finance, Microeconomics, Money and Banking, and International Trade; and graduate courses in Public Finance and Environmental Statistics. She is an early adopter of technology in the classroom and advocates strongly for it because she sees the difference it makes in student engagement and learning. Dr. Gebhardt was the recipient of the Water Pik Excellence in Education Award in 2006 and was awarded the Colorado State University Best Teacher Award in 2015.

Dr. Gebhardt's research interests, publications, and presentations involve economics education and the economics of human–wildlife interaction. Before joining academia, she worked as an economist at the USDA/APHIS/Wildlife Services/National Wildlife Research Center conducting research on the interactions of humans and wildlife. Her current research focuses on using learning analytics to improve student learning outcomes in economics education with an emphasis on improving grades and completion rates in online courses.

In her free time, Dr. Gebhardt enjoys learning about new teaching methods that integrate technology, as well as rock climbing and camping in the Colorado Rockies and beyond.

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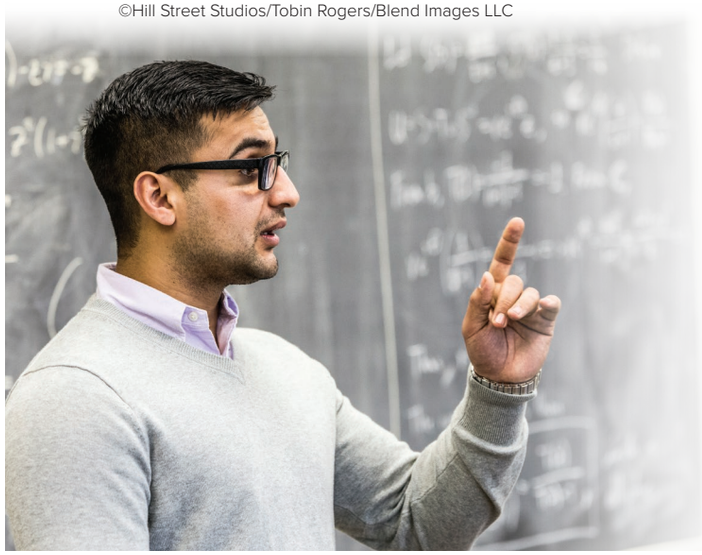

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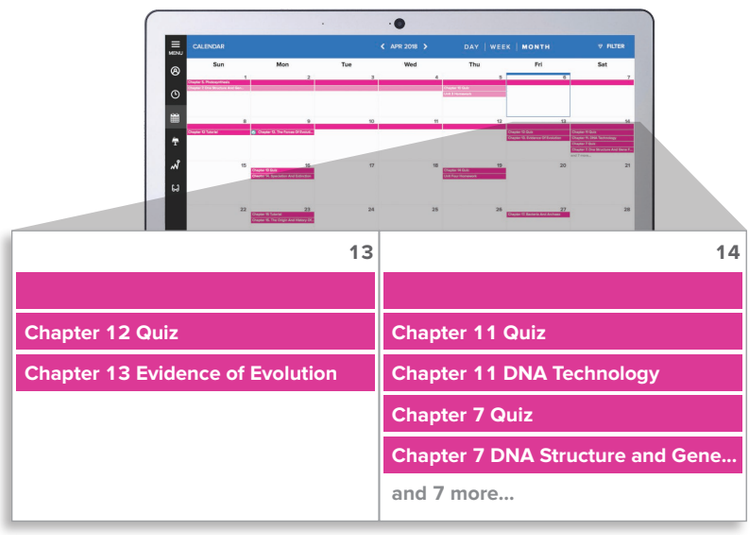

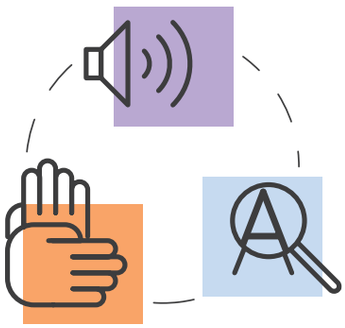

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Preface

Election campaigns bring out the best and the worst economic ideas. Virtually every candidate promises a "chicken in every pot," without regard to the supply of chickens. They will clean up the environment, fix our schools, put more police on the streets, build more affordable housing, and, of course, guarantee every American access to quality health care. And they'll do this while cutting taxes, subsidizing alternative energy sources, and rebuilding America's infrastructure.

Don't you wish you lived in such a utopia?! I know I do. And our students overwhelmingly embrace these promises.

The problem is, of course, that there is no such thing as a free lunch. Nor free health care, free environmental protection, or free infrastructure development. As economists, we know this; we know that resource scarcity requires us to make difficult choices about competing uses of those resources. We know that politicians can't place a chicken in every pot without allocating more resources to poultry production—and fewer resources to the production of other desired goods and services.

Our first task as instructors is to convince students of this basic fact of life—that every decision about resource use entails opportunity costs. If we can establish that beachhead early on, we have a decent chance of instilling in students a basic appreciation of economic theory.

The other challenge for us as instructors is to instill in students a sense of *why* the economic problems we analyze are important. We know that inflation and unemployment cause serious hardships. But most of our students haven't experienced the income losses that accompany unemployment or seen their retirement savings decimated by inflation. We have to explain and illustrate why the macro problems we seek to solve are politically, socially, and economically important.

The same reference gap exists in micro. Formulas and graphs illustrating externalities or monopoly pricing are meaningless abstractions to most students. If we want them to appreciate these concepts, we have to illustrate them with real-world examples (e.g., the death toll from secondhand smoke; the higher airfares that result on monopoly airplane routes). For most students, this course is their first exposure to economics. If we want them to understand the subject—maybe even pursue it further—we have got to relate our concepts and theories to the world that they live in. This has been the hallmark of *Essentials* from the beginning: introducing the core concepts of economics in a reality-based, policy-driven context. This eleventh edition continues that tradition.

WHAT, HOW, FOR WHOM?

The core theme that weaves through the entire text is the need to find the best possible answers to the basic questions of WHAT, HOW, and FOR WHOM to produce. Students are confronted early on with the reality that the economy doesn't always operate optimally at either the macro or micro level. In Chapter 1 they learn that markets sometimes fail to generate optimal outcomes, but also that government interventions can fail to improve economic performance. The policy challenge is to find the mix of market reliance and government regulation that generates the best possible outcomes. Every chapter ends with a Policy Perspectives feature that challenges students to apply the economic concepts they have just encountered to real-world policy issues. In Chapter 1 the policy question is, "Is 'Free' Health Care Really Free?"—a question that emphasizes the opportunity costs associated with all economic activity. In Chapter 10 the issue is "Is Another Recession Coming?"—which challenges students to think about the causes and advance indicators of

economic downturns. And Chapter 17 is devoted to explaining the perennial contrast between theory and reality, with a mixture of institutional, political, and theoretical factors. Students love that macro capstone.

FOCUS ON CORE CONCEPTS

It's impossible to squeeze all the content—and the excitement—of both micro and macro economics into a one-semester course, much less an abbreviated intro text. But economics is, after all, the science of choice. Instructors who teach a one-term survey of economics know how hard the content choices can be. There are too many topics, too many economic events, and too little time.

Few textbooks confront this scarcity problem directly. Some one-semester books are nearly as long as full-blown principles texts. The shorter ones tend to condense topics and omit the additional explanations, illustrations, and applications that are especially important in survey courses. Students and teachers alike get frustrated trying to pick out the essentials from abridged principles texts.

Essentials of Economics lives up to its name by making the difficult choices. The standard table of contents has been pruned to the core. The surviving topics are the essence of economic concepts. In microeconomics, for example, the focus is on the polar models of perfect competition and monopoly. These models are represented as the endpoints of a spectrum of market structures. Intermediate market structures—oligopoly, monopolistic competition, and the like—are noted but not analyzed. The goal here is simply to convey the sense that market structure is an important determinant of market outcomes. The contrast between the extremes of monopoly and perfect competition is sufficient to convey this essential message. The omission of other market structures from the outline also leaves more space for explaining and illustrating *how* market structure affects market behavior.

The same commitment to essentials is evident in the section on macroeconomics. Rather than attempt to cover all the salient macro models, the focus here is on a straightforward presentation of the aggregate supply–demand framework. The classical, Keynesian, and monetarist perspectives on aggregate demand (AD) and aggregate supply (AS) are discussed within that common, consistent framework. There is no discussion of neo-Keynesianism, rational expectations, public choice, or Marxist models. The level of abstraction required for such models is neither necessary nor appropriate in an introductory survey course. Texts that include such models tend to raise more questions than survey instructors can hope to answer. In *Essentials* students are exposed to only the ideas needed for a basic understanding of how macro economies function.

CENTRAL THEME

The central goal of this text is to convey a sense of how economic *systems* affect economic *outcomes*. When we look back on the twentieth century, we see how some economies flourished while others languished. Even the "winners" had recurrent episodes of slow, or negative, growth. The central analytical issue is how various economic systems influenced those diverse growth records. Was the relatively superior track record of the United States a historical fluke or a by-product of its commitment to market capitalism? Were the long economic expansions of the 1980s and 1990s the result of enlightened macro policy, more efficient markets, or just good luck? What roles did policy, markets, and (bad) luck play in the Great Recession of 2008–2009? What forces deserve credit for the accelerated economic growth of 2016–2019?

In the looming 2020 presidential election, economic issues will again be at the forefront (as Yale economist Ray Fair has been telling us for decades). President Trump will claim credit for the economic expansion of the last few years. Democrats will argue that the expansion started when President Obama was in office. Republicans will say the 2017 tax cuts propelled the economy forward. Democrats will counter that the 2017 tax cuts merely enriched the top 1 percent of U.S. households and ballooned budget deficits. President Trump will hail his trade and tariff policies as sources of economic strength; Democrats will emphasize how those same policies increased the cost of living for middle-class households.

How are students—and voters—supposed to sort out these conflicting claims? *Essentials* offers an analytical foundation for assessing both economic events and political platforms. Students get an initial bird's-eye view of the macro economy that relates macro determinants to macro outcomes. Then they get enough tools to identify cause-and-effect relationships and to sort out competing political claims.

A recurrent theme in *Essentials* is the notion that economic institutions and policies *matter.* Economic prosperity isn't a random occurrence. The right institutions and policies can foster or impede economic progress. The challenge is to know when and how to intervene.

This central theme is the focus of Chapter 1. Our economic accomplishments and insatiable materialism set the stage for a discussion of production possibilities. The role of economic systems and choices is illustrated with the starkly different "guns versus butter" decisions in North and South Korea, Russia, and the United States. The potential for both market failure (or success) and government failure (or success) is highlighted. After reading Chapter 1, students should sense that "the economy" is important to their lives and that our collective choices on how the economy is structured are important.

A GLOBAL PORTRAIT OF THE U.S. ECONOMY

To put some meat on the abstract bones of the economy, *Essentials* offers a unique portrait of the U.S. economy. Few students easily relate to the abstraction of the economy. They hear about specific dimensions of the economy but rarely see all the pieces put together. Chapter 2 fills this void by providing a bird's-eye view of the U.S. economy. This descriptive chapter is organized around the three basic questions of WHAT, HOW, and FOR WHOM to produce. The current answer to the WHAT question is summarized with data on GDP and its components. Historical and global comparisons are provided to underscore the significance of America's $21 trillion economy. Similar perspectives are offered on the structure of production and the U.S. distribution of income. An early look at the role of government in shaping economic outcomes is also provided. This colorful global portrait is a critical tool in acquainting students with the broad dimensions of the U.S. economy and is unique to this text.

REAL-WORLD EMPHASIS

The decision to include a descriptive chapter on the U.S. economy reflects a basic commitment to a real-world context. Students rarely get interested in stories about the mythical widget manufacturers that inhabit so many economics textbooks. But glimmers of interest—even some enthusiasm—surface when real-world illustrations, not fables, are offered.

Every chapter starts out with real-world applications of core concepts. As the chapters unfold, empirical illustrations continue to enliven the text analysis. The chapters end with a **Policy Perspectives** section that challenges the student to apply new concepts to real-world issues. The Policy Perspective in Chapter 3 ("Cap Water Prices in Natural Disasters?") highlights the challenges that policymakers face when markets shift in the wake of natural disasters.

POLICY PERSPECTIVES

CAP WATER PRICES IN NATURAL DISASTERS?

Hurricane Harvey was the second most costly natural disaster in the United States since 1900. When it slammed into the Houston area in August 2017, it destroyed thousands of homes, forced the evacuation of nearly 40,000 people, and caused massive flooding. It also damaged 10 water systems, temporarily cutting off water to thousands of homes and businesses. Bottled water became the only option for thousands of people.

The real-world approach of *Essentials* is reinforced by the boxed **News Wires** that appear in every chapter. The 72 News Wires offer up-to-date domestic and international applications of economic concepts. Some new examples that will particularly interest your students include:

- The opportunity cost (famine) of North Korea's rocket program.
- The impact of lower gas prices on sales of electric vehicles.
- The diversity in starting pay for various college majors.
- Taylor Swift's use of dynamic pricing for concerts.
- Tesla's new Gigafactory in Shanghai.
- The impact of the 2017 tax cuts on consumer spending.
- The price fixing conspiracy on canned tuna.
- How the strong dollar has made European vacations cheaper.

This is just a sampling of the stream of real-world applications that cascades throughout this text. Thirty-five of the News Wires are new to this edition.

NEWS WIRE INSATIABLE WANTS

NEVER ENOUGH MONEY!

A public opinion poll asked Americans how much money they would need each year to be "happy." In general, people said they needed twice as much income as they had at present to be happy.

Source: CNN/ORC POLL, May 29–June 1, 2014.

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NOTE: People always want more than they have. Even multimillionaires say they don't have enough to live "comfortably."

THEORY AND REALITY

In becoming acquainted with the U.S. economy, students will inevitably learn about the woes of the business cycle. As the course progresses, they will not fail to notice a huge gap between the pat solutions of economic theory and the dismal realities of occasional recession. This experience will kindle one of the most persistent and perplexing questions students have. If the theory is so good, why is the economy such a mess?

Economists like to pretend that the theory is perfect but politicians aren't. That's part of the answer, to be sure. But it isn't fair to either politicians or economists. In reality, the design and implementation of economic policy is impeded by incomplete information, changing circumstances, goal trade-offs, and politics. Chapter 17 examines these real-world complications. In this signature chapter, students get a more complete explanation of why the real world doesn't always live up to the promises of economic theory.

NEW IN THIS EDITION

The dedication of *Essentials* to introducing core economic principles in a real-world context requires every edition to focus on trending policies and front-page developments. As in earlier editions, this eleventh edition strives to arouse interest in economic theories by illustrating them in the context of actual institutions, policy debates, and global developments. The following list highlights both the essential focus of each chapter and the new material that enlivens its presentation:

Chapter 1: The Challenge of Economics—The first challenge here is to get students to appreciate the concept of *scarcity* and how it forces us to make difficult choices among desirable, but

competing, options. That is really the essence of economic thinking. How we make those choices is also critical. Political campaigns always seem to suggest that we can have it all, without higher taxes or other sacrifices. With the 2020 elections looming on the horizon, we have another chance to emphasize opportunity costs. The opportunity costs of North Korea's stepped-up rocket program and the implied costs of "affordable" health care also make for good illustrations. Chapter 1 includes eight new Problems, two new Discussion Questions, one new News Wire, and new opinion polls about fears of another recession in 2020 and the prospects for the next generation of Americans.

Chapter 2: The U.S. Economy—The purpose of this chapter is to give students an accurate picture of the size and content of the U.S. economy, especially as compared to other nations. Most students have no sense of how large the U.S. economy is or what it produces or trades. The description here is organized around the core questions of What, How, and For Whom output is produced. The portrait includes the latest data on U.S. and global output, income distributions, and government sectors. New News Wires on global happiness rankings, global inequalities, and manufacturing output vs. employment help put the changing answers to the What question into perspective. There are eight new Problems and a Policy Perspective on global poverty.

Chapter 3: Supply and Demand—This introduction to the market mechanism explains how markets set both prices and production for various goods. Interesting new News Wires include the shortages that accompany new iPhone launches and the impact of falling gasoline prices on sales of electric vehicles. Four new Problems and four new Discussion Questions are included, as well as a new Policy Perspective on post-hurricane price gouging.

Micro

Chapter 4: Consumer Demand—This chapter starts by looking at patterns of U.S. consumption, then analyzing the demand factors that shape those patterns. The elasticity of demand gets a lot of attention, as illustrated by consumer responses to iMac prices, price hikes at Starbucks, and higher gasoline prices (all new News Wires). There are four new Problems and three new Discussion Questions.

Chapter 5: Supply Decisions—The key point of this chapter is to highlight the difference between what firms *can* produce (as illustrated by the production function) and what they *want* to produce (as illustrated by profit-maximization calculations). The importance of marginal costs in the production decision gets its proper spotlight. The Tesla decision to build a "Gigafactory" in Shanghai is used to contrast the long-run *investment decision* and the short-run *production decision*. The addition of three new Discussion Questions keeps the topic lively.

Chapter 6: Competition—This first look at market structure emphasizes the lack of pricing power possessed by small, competitive firms. Perfectly competitive firms must relentlessly pursue cost reductions, quality improvements, and product innovation if they are to survive and prosper. Although few firms are perfectly competitive, competitive dynamics keep all firms on their toes. Those dynamics affect even the behavior of such giants as Apple (relentlessly trying to stay ahead of the pack)—not just the small T-shirt vendors on beach boardwalks (both new News Wires). How firms locate the most profitable rate of production with the use of market prices and marginal costs is illustrated. The chapter includes four new Problems and three new Discussion Questions. The chapter-ending Policy Perspective considers how competition helps rather than hurts society.

Chapter 7: Monopoly—As a survey introduction to economics, *Essentials* focuses on the differences in structure, behavior, and outcomes of only two market structures—namely, perfect competition and monopoly. This two-way contrast underscores the importance of market structure for social welfare. The monopoly produces less and charges more than a competitive market with the same cost structure, as illustrated with a step-by-step comparison of market behavior. The various barriers monopolies use to preserve their position and profits are illustrated as well. The chapter includes three new Problems, three new Discussion Questions, and three News Wires on monopoly-like behavior in Big Pharma, canned tuna, and oil.

Chapter 8: The Labor Market—The looming 2020 elections are showcasing very different views about income equality, minimum wages, unions, and mandatory workforce regulations.

This chapter delves into these issues by first illustrating how market wages are set and then examining how various interventions alter market outcomes. Highlighted stories include Dale Earnhardt's earnings, Nick Saban's salary and benefits at Alabama, minimum-wage proposals, and Bernie Sanders' critique of CEO pay. Of special interest to students is the latest data on salaries for college grads in various majors. There are three new Problems and four new Discussion Questions.

Chapter 9: Government Intervention–Another focus of every election is the appropriate role for government in a market-driven economy. This chapter identifies the core rationale for government intervention and offers new illustrations of public goods (Israel's "Iron Dome" anti-missile program) and externalities (the Keystone XL Pipeline). There is also new poll data on trust in government. The chapter includes four new Problems and one new Discussion Question.

Macro

Chapter 10: The Business Cycle–This introduction to macro examines the up-and-down history of the economy and then looks at the impact of cyclical instability on unemployment, inflation, and the distribution of income. The goal here is to get students to recognize why macro instability is a foremost societal concern. The latest macro data are incorporated, along with a new News Wire on seasonal unemployment, four new Problems, and one new Discussion Question.

Chapter 11: Aggregate Supply and Demand–This chapter gives students a conceptual overview of the macro economy, highlighting the role that market forces and other factors play in shaping macro outcomes. Aggregate supply (AS) and aggregate demand (AD) are assessed, with an emphasis on the distinction between curve positions and curve shifts (the source of instability). The bottom line is that either AS or AD must shift if macro outcomes are to change. A News Wire on the aftermath of Hurricane Harvey illustrates how an aggregate supply curve can shift. There are five new Problems and three new Discussion Questions. The Policy Perspectives section summarizes the broad policy options that President Trump and other presidents have at their disposal to alter market outcomes.

Chapter 12: Fiscal Policy–This chapter highlights the potential of changes in government spending and taxes to shift the AD curve. The power of the income multiplier is illustrated in the context of the AS/AD framework and operationalized with analysis of the 2017 income tax cuts. The implications of fiscal policy for budget deficits are also examined. Updated budget data are included, along with five new Problems and three new Discussion Questions.

Chapter 13: Money and Banks–ApplePay and Bitcoins are used to illustrate differences between *payment services* and *money*. A News Wire focuses on the methods of payment consumers utilize. The core of the chapter depicts how deposit creation and the money multiplier work, using a step-by-step illustration of each. The Policy Perspectives section assesses why Bitcoins aren't really "money." There are six new Problems and one new Discussion Question. A new News Wire highlights the importance of a stable currency by looking at the resort to barter in inflation-battered Venezuela.

Chapter 14: Monetary Policy–In this chapter, students first get an overview of how the Federal Reserve is organized, including an introduction to Jerome Powell. Then the three basic tools of monetary policy are illustrated, with an emphasis on how open-market operations work. The narrative then focuses on how the use of these monetary tools shifts the AD curve, ultimately affecting both output and prices. News about China's cut in reserve requirements helps illustrate the intended effects. The 2008–2015 spike in excess reserves is also discussed, along with the Fed's new policy targeting. The chapter includes seven new Problems and three new Discussion questions.

Chapter 15: Economic Growth–The challenge of every society is to grow its economy and lift living standards. This chapter reviews the world's growth experience and then highlights the factors that affect growth rates. Of special interest in today's policy context is the role of immigration in spurring growth. The chapter's Policy Perspectives section examines whether economic growth is desirable, a question which students often ask. There are eight new Problems and four new Discussion Questions.

International

Chapter 16: International Trade—Students are first introduced to patterns of global trade, highlighting international differences in export dependence and trade balances. Then the question of "why trade at all?" is explicitly addressed, leading into an illustration of comparative advantage. Of importance is also a discussion of the sources of resistance to free trade and the impact of trade barriers. A News Wire illustrates how some people lost from President Trump's tariff policies and how others won. In addition to updating all data, four new News Wires, five new Problems, and two new Discussion Questions are included.

Capstone

Chapter 17: Theory and Reality—This unique capstone chapter addresses the perennial question of why economies don't function better if economic theory is so perfect. The chapter reviews the major policy tools and their idealized uses. Then it contrasts theoretical expectations with real-world outcomes and asks why macro performance doesn't live up to its promise. Impediments to better outcomes are explored, and the chapter ends by asking students whether they favor more or less policy intervention. Lots of new data are incorporated, along with four new Problems and three new Discussion Questions.

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Many educational institutions today are focused on the notion of *assurance of learning*, an important element of some accreditation standards. *Essentials of Economics* is designed specifically to support your assurance of learning initiatives with a simple yet powerful solution.

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INSTRUCTOR'S RESOURCE MANUAL

The *Instructor's Resource Manual* is designed to assist instructors as they cope with the demands of teaching a survey of economics in a single term. The manual has been fully updated for the eleventh edition by Larry Olanrewaju of John Tyler Community College. Each chapter of the *Instructor's Resource Manual* contains the following features:

- *What is this chapter all about?* A brief summary of the chapter.
- *New to this edition* A list of changes and updates to the chapter since the last edition.
- *Lecture launchers* Designed to offer suggestions on how to launch specific topics in each chapter.
- *Common student errors* To integrate the lectures with the student *Study Guide,* this provides instructors with a brief description of some of the most common problems that students have when studying the material in each chapter.
- *News Wires* A list of News Wires from the text is provided for easy reference.
- *Annotated outline* An annotated outline for each chapter can be used as lecture notes.
- *Structured controversies* Chapter-related topics are provided for sparking small group debates that require no additional reading. Also accessible on the website.
- *Mini-debates* Additional chapter-related debate topics that require individual students to do outside research in preparation. Also accessible on the website.
- *Mini-debate projects* Additional projects are provided, cutting across all the chapters. These include several focus questions and outside research. Also accessible on the website.
- *Answers to the chapter questions and problems* The *Instructor's Resource Manual* provides answers to the end-of-chapter questions and problems in the text, along with explanations of how the answers were derived.
- *Answers to flipped and online class applications* Answers to web activities from the textbook are provided in the *Instructor's Resource Manual* as well as on the website.
- *Media exercise* Provides a ready-to-use homework assignment using current newspapers and/or periodicals to find articles that illustrate the specific issues.

Test Bank

The Test Bank has been rigorously revised for this eleventh edition of *Essentials*. Digital co-author Karen Gebhardt and Christopher Blake of Emory University assessed every problem in the Test Bank, assigning each problem a letter grade and identifying errors and opportunities for improvement. This author team assures a high level of quality and consistency of the test questions and the greatest possible correlation with the content of the text. All questions are coded according to chapter learning objectives, AACSB Assurance of Learning, and Bloom's Taxonomy guidelines. The computerized Test Bank is available in EZ Test, a flexible and easy-to-use electronic testing program that accommodates a wide range of question types, including user-created questions. Tests created in EZ Test can be exported for use with course management systems such as WebCT, BlackBoard, or PageOut. The program is available for Windows, Macintosh, and Linux environments. Additionally, you can access the test bank through McGraw-Hill *Connect*.

PowerPoints

Digital co-author Karen Gebhardt and Jennifer Rester-Savoie of Pearl River Community College have prepared a concise set of Instructor PowerPoint presentations to correspond with the tenth edition of *Essentials*. Developed using Microsoft PowerPoint software, these slides are a step-by-step review of the key points in each of the book's chapters. They are equally useful to the student in the classroom as lecture aids or for personal review at home or the computer lab. The slides use animation to show students how graphs build and shift.

Flipped and Online Class Applications

To keep *Essentials* connected to the real world, flipped and online class applications, updated by Charles Newton of Houston Community College, appear in the Instructor Resources section in *Connect* for each chapter. These require the student to access data or materials on a website and then use, summarize, or explain this external material in the context of the chapter's core economic concepts. The *Instructor's Resource Manual* provides answers to the web-based activities.

Digital Image Library

A digital image library of all figures from the textbook is available on the Instructor's Resource section in *Connect*. Professors can insert the exact images from the textbook into their presentation slides or simply post them for student viewing on their course management site.

ACKNOWLEDGMENTS

The eleventh edition continues to benefit from the prodigious contributions of my digital co-author, Karen Gebhardt. Karen is a distinguished teacher who won numerous awards for her pedagogical prowess. As the Director of the Online Economics Program in the Department of Economics at University of Colorado Boulder she continues to share her passion for teaching economics by teaching online, mentoring online instructors, and teaching face-to-face in the Masters of the Environment program. She has assumed responsibility for the digital content of the *Essentials* learning package, including an overhaul of the test bank, the *Connect* program, LearnSmart, and other digital products. She has done a marvelous job not only improving the content of each digital supplement, but also enhancing the symmetry between the text and all dimensions of the digital products. Students and instructors will share my gratitude for Karen's excellent work.

The following manuscript reviewers were generous in sharing their teaching experiences and offering suggestions for the revision:

Ruth Bandzak, *Chaffey College*
Ronald Dunbar, *Madison Area Technical College*
Omar A. Esqueda, *Tarleton State University*
Jack A. Green, *Wentworth Institute of Technology*
Staish Gupta, *Tacoma Community College*
Kosin Isariyawongse, *Edinboro University*
Syed H. Jafri, *Tarleton State University*
David Kisel, *St. Phillip's College*
Riley Moore, *Saint Martin's University*
Lawrence Overlan, *Wentworth Institute of Technology*
Jeffery Phillips, *Colby-Sawyer College*
Kimberly Anne Sims, *University of Tennessee*
Ariuna Taivan, *University of Minnesota-Duluth*

Reviewers and users of past editions of *Essentials* have also contributed to the evolution of this text.

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Vera Adamchik, *University of Houston at Victoria*
Jacqueline Agesa, *Marshall University*
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King Yik, *Idaho State University*
Yongjing Zhang, *Midwestern State University*
Richard Zuber, *University of North Carolina-Charlotte*

FINAL THOUGHTS

I am deeply grateful for the enormous success *Essentials* has enjoyed. Since its first publication, it has been the dominant text in the one-semester survey course. I hope that its brevity, content, style, and novel features will keep it at the top of the charts for years to come. The ultimate measure of the book's success, however, will be reflected in student motivation and learning. As the author, I would appreciate hearing how well *Essentials* lives up to that standard.

Bradley R. Schiller

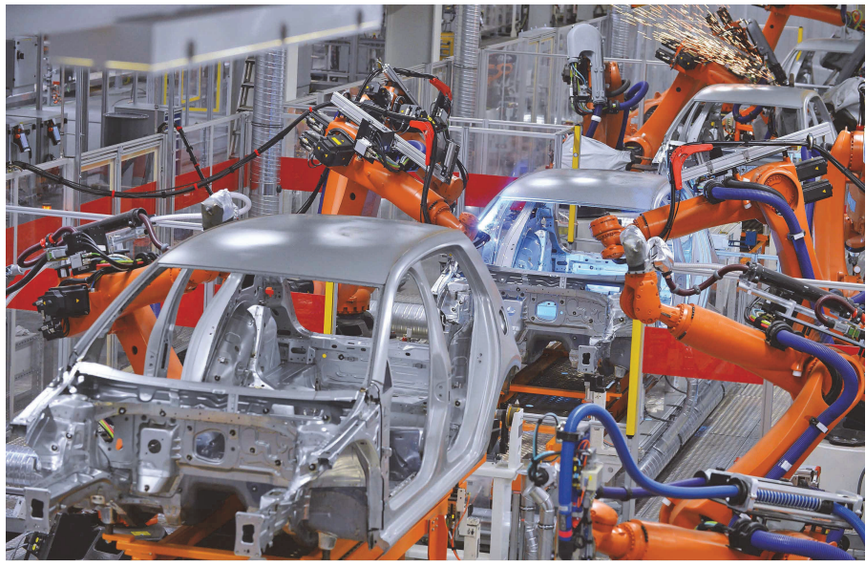
Contents in Brief

Contents

Section III MACROECONOMICS

CHAPTER TWO

The U.S. Economy



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LEARNING OBJECTIVES

After reading this chapter, you should be able to:

1. Explain how an economy's size is measured.
2. Describe the absolute and relative size of the U.S. economy.
3. Explain why the U.S. economy can produce so much.
4. Recount how the mix of U.S. output has changed over time.
5. Describe how (un)equally incomes are distributed.

We are surrounded by the economy but never really see it. We see only fragments, never the entirety. We see boutiques at the mall, never total retail sales. We visit virtual stores in cyberspace but can't begin to describe the dimensions of e-commerce. We pump gas at the service station but have no notion of how many millions of barrels of oil are consumed each day. We know every detail on our paychecks but don't have a clue about how much income the entire workforce earns. Most of us have no idea how our own income stacks up against that of the average U.S. household, much less that of earlier generations or other nations. Such details simply aren't a part of our daily agendas. For most people, the "economy" is just a vague reference to a mass of meaningless statistics.

The intent of this chapter is to provide a more user-friendly picture of the U.S. economy. This profile of the economy is organized around the three core questions of WHAT, HOW, and FOR WHOM. Our interest here is to see how these questions are answered at present in the United States—that is,

- WHAT goods and services does the United States produce?
- HOW is that output produced?
- FOR WHOM is the output produced?

We focus on the big picture without going into too much statistical detail. Along the way, we'll see how the U.S. economy stacks up against other nations.

Output	Amount
Measuring output	
. . . in physical terms	
Oranges	6 billion
Disposable razors	3 billion
Video games	70 million
Total	?
. . . in monetary terms	
6 billion oranges @ 20¢ each	$1.2 billion
3 billion razors @ 30¢ each	0.9 billion
70 million games @ $30 each	2.1 billion
Total	$4.2 billion

Table 2.1 Measuring Output It is impossible to add up all output when it is counted in *physical terms*. Accordingly, total output is measured in *monetary terms*, with each good or service valued at its market price. GDP refers to the total market value of all goods and services produced in a given time period. According to the numbers in this table, the total *value* of the oranges, razors, and video games produced is $4.2 billion.

WHAT AMERICA PRODUCES

In Chapter 1 we used the two-dimensional production possibilities curve to describe WHAT output combinations can be produced. In reality, the mix of output includes so many different products that we could never fit them on a graph. We can, however, sketch what the U.S. mix of output looks like and how it has changed over the years.

How Much Output

The first challenge in describing the actual output of an economy is to somehow add up the millions of different products produced each year into a meaningful summary. The production possibilities curve in Chapter 1 did this in *physical* terms for only two products (see Figure 1.1). We ended up at a specific mix of output with precise quantities of two goods. In principle we could list all of the millions of products produced each year. But such a list would be longer than this textbook and a lot less useful. We need a summary measure of how much is produced.

The top panel of Table 2.1 illustrates the problem of obtaining a summary measure of output. Even if we produced only three products—oranges, disposable razors, and video games—there is no obvious way of summarizing total output in *physical* terms. Should we count *units* of output? In that case oranges would appear to be the most important good produced. Should we count the *weight* of different products? In that case video game software would not count at all. Should we tally their *sizes*? Clearly *physical* measures of output aren't easy to aggregate.

If we use monetary *value* instead of physical units to compute total output, the accounting chore is much easier. In a market economy, every product commands a specific price. Hence the value of each product can be observed easily. ***By multiplying the physical output of each good by its price, we can determine the total value of each good produced.*** Notice in the bottom panel of Table 2.1 how easily the separate values for the output of oranges, razors, and video games can be added up. The resultant sum ($4.2 billion, in this case) is a measure of the *value of* total output.

Product	Physical Output		Unit Prices		Value of Output (billions)		
	Year 1	Year 2	Year 1	Year 2	Year 1 (@Year 1 Prices)	Year 2 (@Year 2 Prices)	Year 2 (@Year 1 Prices)
Oranges	6 billion	6 billion	$ 0.20	$ 0.40	$ 1.2	$ 2.4	$ 1.2
Razors	3 billion	3 billion	0.30	0.60	0.9	1.8	0.9
Video games	70 million	70 million	30.00	60.00	2.1	4.2	2.1
					$4.2	$8.4 Nominal Value	$4.2 Real Value

Table 2.2 Inflation Adjustments If prices rise, so does the *value* of output. In this example, the *nominal* value of output doubles from Year 1 to Year 2 solely as a result of price increases; physical output remains unchanged. *Real* GDP corrects for such changing price levels. In this case *real* GDP in Year 2, measured in Year 1 prices, is unchanged at $4.2 billion.

Gross Domestic Product

The summary measure of output most frequently used is called **gross domestic product (GDP)**. ***GDP refers to the total value of all final goods and services produced in a country during a given time period: It is a summary measure of a nation's output.*** GDP enables us to add oranges and razors and even video games into a meaningful summary of economic activity (see Table 2.1). The U.S. Department of Commerce actually does this kind of accounting every calendar quarter. Those quarterly GDP reports tell us how much output the economy is producing.

gross domestic product (GDP)
The total value of final goods and services produced within a nation's borders in a given time period.

Real GDP

Although GDP is a convenient summary of how much output is being produced, it can be misleading. GDP is based on both physical output and prices. Accordingly, from one year to the next either rising prices or an increase in physical output could cause **nominal GDP** to increase.

nominal GDP
The total value of goods and services produced within a nation's borders, measured in current prices.

Notice in Table 2.2 what happens when all prices double. The measured value of total output also doubles—from $4.2 to $8.4 billion. That sounds like an impressive jump in output. In reality, however, no more goods are being produced; *physical quantities* are unchanged. So the apparent jump in *nominal* GDP is an illusion caused by rising prices (inflation).

To provide a clearer picture of how much output we are producing, GDP numbers must be adjusted for inflation. These inflation adjustments delete the effects of rising prices by valuing output in *constant* prices. The end result of this effort is referred to as **real GDP**, an inflation-adjusted measure of total output.

real GDP
The inflation-adjusted value of GDP; the value of output measured in constant prices.

In 2018 the U.S. economy produced $20 *trillion* of output. That was a lot of oranges, razors, and video games—not to mention the tens of thousands of other goods and services produced.

International Comparisons

The $20 trillion of output that the United States produced in 2018 looks particularly impressive in a global context. The output of the entire world in that year was only $90 trillion. Hence the U.S. economy produces more than 20 percent of the entire planet's output. With less than 5 percent of the world's population, that's a remarkable feat. It clearly establishes the United States as the world's economic giant.

Figure 2.1 provides some specific country comparisons for a recent year. The U.S. economy is four times larger than Japan's, which is the world's third largest. It is fourteen times larger than Mexico's. In fact, the U.S. economy is so large that its output exceeds by a wide margin the *combined* production of *all* the countries in Africa and South America.

Per Capita GDP

per capita GDP
Total GDP divided by total population; average GDP.

Another way of putting these trillion-dollar figures into perspective is to relate them to individuals. This can be done by dividing a nation's total GDP by its population, a calculation that yields **per capita GDP**. Per capita GDP tells us how much output is potentially available to the average person. If we think of GDP again as a massive pie, per capita GDP would reveal the size of the average slice we could dole out. It doesn't tell us how large or small a slice anyone will get; it just tells us what the *average* person *could* get if the pie were sliced evenly. ***Per capita GDP is an indicator of how much output each person would get if all output were divided evenly among the population.***

In 2018 per capita GDP in the United States was approximately $59,000—more than four times the world average. Individual country comparisons are even more startling. In Ethiopia, Afghanistan, and Haiti, per capita incomes are less than $1,000—less than $3 per day.

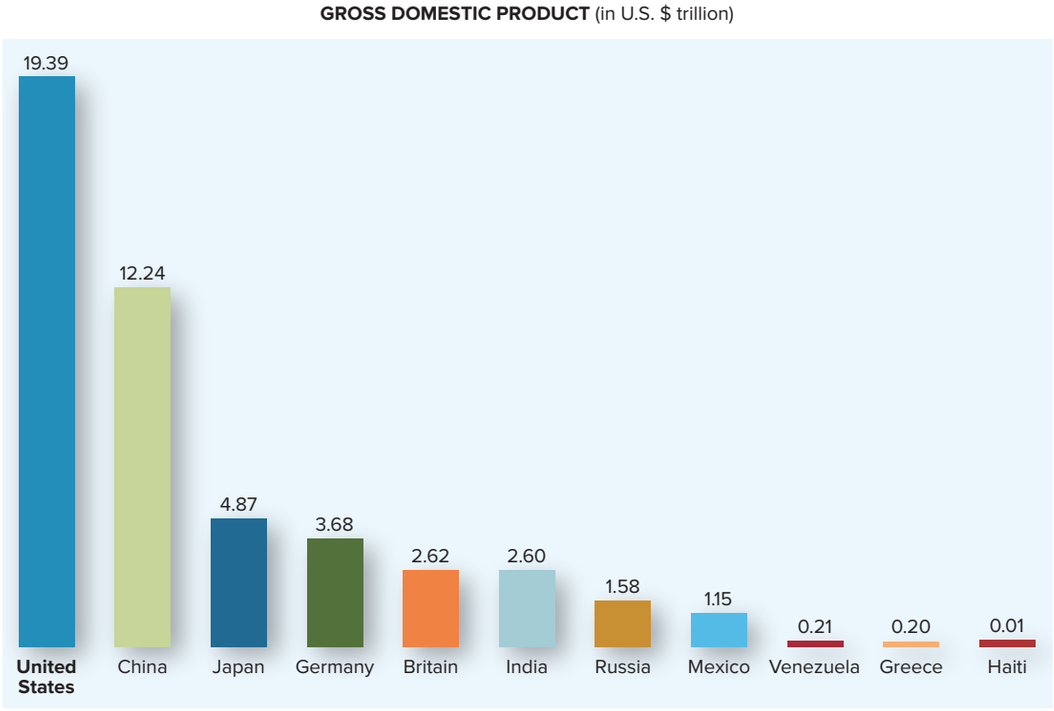

Figure 2.1 How Much Output Nations Produce The United States is by far the world's largest economy. America's annual output of goods and services is three times that of Japan and equal to all of Western Europe. The output of less developed countries is only a tiny fraction of U.S. output.

Source: *Gross Domestic Product 2017*, The World Bank Group, July 1, 2018.

Country	Per Capita Income
United States	$59,332
France	38,477
Japan	38,428
South Korea	29,743
Spain	28,157
Saudi Arabia	20,761
Greece	18,613
World average	**10,714**
Mexico	8,903
China	8,827
Cuba	6,000
Nigeria	1,969
Pakistan	1,548
Ethiopia	768
Haiti	766
Afghanistan	586

Table 2.3 Per Capita Incomes around the World The American standard of living is five times higher than the world average. People in the poorest nations of the world (e.g., Haiti, Ethiopia) barely survive on per capita incomes that are a tiny fraction of U.S. standards.

Source: *GDP per Capita (current US$)*, The World Bank Group, 2018.

Homeless people in the United States fare better than that—typically *much* better. Americans classified as poor have more food, more shelter, and more amenities than most people in the less developed nations even hope for. That is the reality depicted in the statistics of Table 2.3 and the accompanying photos.

U.S. Affluence vs. Global Squalor

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Historical Comparisons

Still another way of digesting the dimensions of the American economy is to compare today's living standards with those of earlier times. Some of your favorite consumer gadgets (e.g., smartphones, 4K TVs, iPads, wifi) didn't even exist a generation ago. People worked harder and got fewer goods and services. The living standards Americans now call "poor" resemble

the lifestyle of the middle class in the 1930s. Since 1900 the per capita output of the U.S. economy has risen 500 percent. That means you're now enjoying six times as many goods and services (and much better quality) than people did back then. We're so rich that we now spend over a billion dollars a year on closet organizers alone! And we spend over $70 billion on pet food and supplies—about twice as much as the *total* output of Congo's 80 million people. Although many of us still complain that we don't have enough, we enjoy an array of goods and services that other nations and earlier generations only dreamed about.

economic growth
An increase in output (real GDP); an expansion of production possibilities.

What's even more amazing is that our abundance keeps growing. America's real GDP increases by about 3 percent a year. That may not sound like much, but it adds up. With the U.S. population growing by only 1 percent a year, continued **economic growth** implies more output per person. Like interest accumulating in the bank, economic growth keeps adding to our standard of living. If real GDP keeps growing 2 percentage points faster than our population, per capita incomes will double again in approximately 35 years.

There is no certainty that the economy will continue to grow at that speed. From 1929 to 1939, real GDP didn't grow at all. As a consequence, U.S. living standards *fell* during the Great Depression. We had another setback in 2008–2009. But those are exceptions from the American norm of persistent growth. In other nations, the struggle between population growth and economic growth is a persistent source of anxiety. From 2008 to 2017, output per capita actually *declined* in Venezuela, Ukraine, Libya, South Sudan, and many other already poor nations.

Social Welfare

Although the United States is indisputably the world's largest economy, we must not confuse GDP with broader measures of social welfare. GDP is simply a measure of the volume of goods and services produced. That material production is just one element of our collective well-being. Environmental health and beauty, family harmony, charitable activity, personal security, friendship networks, social justice, good health, and religious convictions all affect our sense of well-being. Material possessions don't substitute for any of those other dimensions. In fact, production of material goods can occasionally *detract* from our social welfare by increasing pollution, congestion, or social anxiety levels. With more love, fewer crimes, and less pollution, our social welfare might increase even if GDP declined. That is one message of the World Happiness Report (see the News Wire "GDP vs. Happiness") that revealed that happiness and economic well-being aren't perfectly correlated.

NEWS WIRE GDP VS. HAPPINESS

WHY ARE THE FINNS SO HAPPY?

Finland is the world's happiest country. At least, that is the finding of surveys by a United Nations research team. Based on self-evaluations in over 150 nations, researchers found that Finns were most satisfied with their lives. Money was a significant factor in their well-being (Finland ranks 15th in GDP per capita), but so was social support, health, life expectancy, freedom of choice, generosity, and perceptions of corruption. The world's richest country, the United States, ranked 18th on the happiness index. Although money wasn't always the most important factor in perceived happiness, residents of the world's poorest nations consistently ranked themselves as the unhappiest people on Earth.

Source: *World Happiness Report 2018*, United Nations Sustainable Development Solutions Network, 2018.

NOTE: Income isn't the only determinant of happiness, but it is an important factor.

Although GDP is an incomplete measure of social welfare, it is still the single best measure of a nation's *economic* well-being. Way back in 1776 Adam Smith recognized that the wealth of nations was best measured by output produced rather than by the amount of gold possessed or resources owned. More output in poor nations will improve health, education, living standards, and even life expectancies. More output in the United States will not only increase our creature comforts, but also enable us to eliminate more diseases and even to clean up the environment.

The Mix of Output

In addition to the *amount* of total output, we care about its *content.* As the production possibilities curve illustrated in Chapter 1, there are many possible output combinations for any given level of GDP. In Chapter 1 we examined the different mixes of military and civilian output nations choose. We could also compare the number of cars produced to the number of homes, schools, or hospitals produced. Clearly the *content* of total output is important.

In the broadest terms, the content of output is usually described in terms of its major end uses rather than by specific products. ***The major uses of total output include***

- ***Household consumption.***
- ***Business investment.***
- ***Government services.***
- ***Exports.***

Consumer Goods

Consumer goods dominate the U.S. mix of output, accounting for more than two-thirds of total output. Consumer goods include everything from breakfast cereals and textbooks to music downloads and beach vacations—anything and everything consumers buy.

The vast array of products consumers purchase is classified into three categories: *durable goods*, *nondurable goods*, and *services*. Consumer durables are products that are expected to last at least three years. They tend to be big-ticket items like cars, appliances, TVs, and furniture. They are generally expensive and often are purchased on credit. Because of this, consumers tend to postpone buying durables when they are worried about their incomes. Conversely, consumers tend to go on durables spending sprees when times are good. This spending pattern makes durable goods output highly *cyclical*—that is, very sensitive to economic trends.

Nondurables and services are not as cyclical. Nondurables include clothes, food, gasoline, and other staples that consumers buy frequently. Services are the largest and fastest-growing component of consumption. At present, over half of all consumer output consists of medical care, entertainment, utilities, education, and other services.

Investment Goods

Investment goods are a completely different type of output. **Investment** goods include the plant, machinery, and equipment that are produced for use in the business sector. These investment goods are used

investment
Expenditures on (production of) new plant and equipment (capital) in a given time period, plus changes in business inventories.

1. To replace worn-out equipment and factories, thus *maintaining* our production possibilities.
2. To increase and improve our stock of capital, thereby *expanding* our production possibilities.

We also count as investment goods those products that businesses hold as inventory for later sale to consumers.

The economic growth that has lifted our living standards so high was fueled by past investments—the factories, telecommunications networks, and transportation systems built in the past. To keep raising our living standards, we have to keep churning out new plant and equipment. This requires us to limit our production of consumer goods (i.e., save) so scarce resources can be used for investment. This is not a great sacrifice in the United States since our consumption levels are already so high. In poor nations, however, reducing consumer goods production entails great sacrifices in the short run. Less than 15 percent of America's GDP today consists of investment goods (see Figure 2.2).

Note that the term *investment* here refers to real output—plant and equipment produced for the business sector. This is not the way most people use the term. People often speak, for example, of "investing" in the stock market. Purchases of corporate stock, however, do not create goods and services. Such *financial* investments merely transfer ownership of a corporation from one individual to another. Such financial investments may enable a corporation to purchase real plant and equipment. Tangible (economic) investment does not occur, however, until the plant and machinery are actually produced. Only tangible investment is counted in the mix of output.

Government Services

A third component of GDP is government services. Federal, state, and local governments purchase resources to police the streets, teach classes, write laws, and build highways. The resources used by the government for these purchases are unavailable for either consumption or investment. The production of government services currently absorbs one-fifth of total output (Figure 2.2).

income transfers
Payments to individuals for which no current goods or services are exchanged (e.g., Social Security, welfare, and unemployment benefits).

Notice the emphasis again on the production of real goods and services. The federal government *spends* nearly $4 trillion a year. Much of that spending, however, is in the form of income transfers, not resource purchases. **Income transfers** are payments to individuals for which no direct service is provided. Social Security benefits, welfare checks, food stamps, and unemployment benefits are examples of income transfers. Such transfer payments account for half of all federal spending (see Figure 2.3). This spending is *not* part of our output of goods and services. ***Only that part of federal spending used to acquire resources and produce services is counted in GDP.*** In 2018 federal purchases (production) of goods and services accounted for only 8 percent of total output.

State and local governments use far more of our scarce resources than does the federal government. These are the governments that build roads; provide schools, police, and firefighters; administer hospitals; and provide social services. The output of all these state and local governments accounts for roughly 13 percent of total GDP. In producing this output, they employ four times as many people (16 million) as does the federal government (4 million).

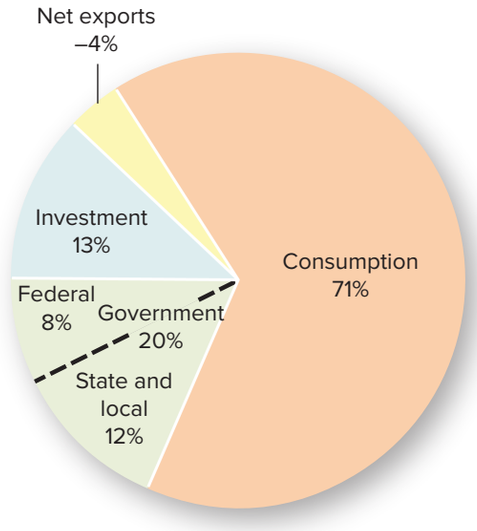


Figure 2.2 The Uses of GDP Total GDP amounted to $20 trillion in 2018. Over two-thirds of this output consisted of private consumer goods and services. The next largest share (20 percent) of output consisted of public sector goods and services. Investment absorbed 13 percent of GDP. Finally, because imports exceeded exports, we ended up consuming 4 percent more than we produced.

Source: Bureau of Economic Analysis.

Net Exports

Finally, we should note that some of the goods and services we produce each year are shipped abroad rather than consumed at home. That is to say, we **export** some of our output to other countries, for whatever use they care to make of it. Thus GDP—the value of output *produced* within the United States—can be larger than the sum of our own consumption, investment, and government purchases if we export some of our output.

exports
Goods and services sold to foreign buyers.

International trade is not a one-way street. While we export some of our own output, we also **import** goods and services from other countries. These imports may be used for consumption (Scotch whiskey, Samsung smartphones), investment (German ball bearings), or government (French radar screens). Whatever their use, imports represent goods and services that are used by Americans but are not produced in the United States.

imports
Goods and services purchased from foreign sources.

The GDP accounts subtract imports from exports. The difference represents *net* exports. In 2018 the value of exports was less than the value of imports. **When imports exceed exports, we are *using* more goods and services than we are *producing*.** Hence we have to subtract net imports from consumption, investment, and government services to figure out how much we actually *produced*. That is why net exports appear as a negative item in Figure 2.2.

Changing Industry Structure

As we noted earlier, many of the products we consume today did not exist 10 or even 2 years ago. We have also observed how much the volume of output has grown over time. ***As the economy has grown, the mix of output has changed dramatically.***

Decline in Farming

The most dramatic change in the mix of output has been the decline in the relative size of the farm sector. In 1900 farming was the most common occupation in the American economy. As Figure 2.4 illustrates, nearly 4 out of 10 workers were employed in agriculture back then.

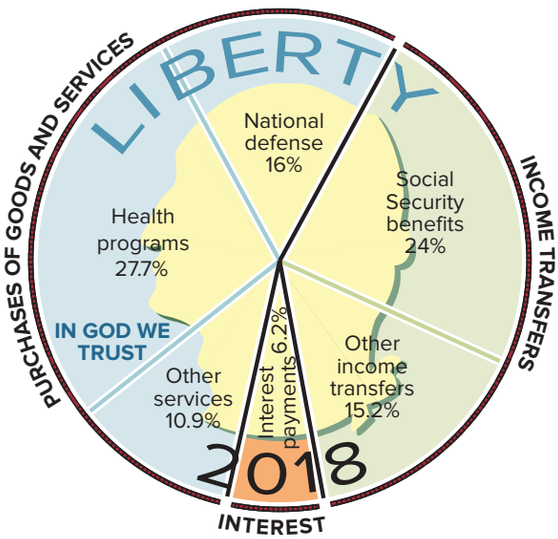


Figure 2.3 Federal Outlays, by Type The federal government spent nearly $4 trillion in 2018. Only half of all this spending was for goods and services (including national defense, health programs, and all other services). The rest was spent on income transfers (Social Security benefits, government pensions, welfare, unemployment benefits, etc.) and interest payments. Transfer payments are not counted in GDP.

Source: U.S. Office of Management and Budget.

Today the mix of output is radically different. Between 1900 and 2000 over 25 *million* people left farms and sought jobs in the cities. As a result, less than 2 percent of the workforce is now employed in agriculture. And their number keeps shrinking a bit further every year as new technology makes it possible to grow *more* food with *fewer* workers.

Decline of Manufacturing Share

Most of the farmers displaced by technological advances in the early 1900s found jobs in the expanding manufacturing sector. The industrial revolution that flourished in the late 1800s led to a massive increase in manufacturing activity (e.g., steel, transportation systems, automobiles, airplanes). Between 1860 and 1920, the manufactured share of GDP doubled, reaching a peak at 27 percent. World War II also created a huge demand for ships, airplanes, trucks, and armaments, requiring an enlarged manufacturing sector. After World War II, the manufactured share of output declined; it now accounts for less than 20 percent of total output.

The *relative* decline in manufacturing does not mean that the manufacturing sector has actually shrunk. ***As in farming, technological advances have made it possible to increase manufacturing output tremendously, even though employment in this sector has grown only modestly.*** Just in the last 50 years, manufactured *output* has increased fourfold even though manufacturing *employment* has increased only 20 percent. The same thing is happening in China and other countries (see the News Wire "Manufacturing: Fewer Jobs, More Output").

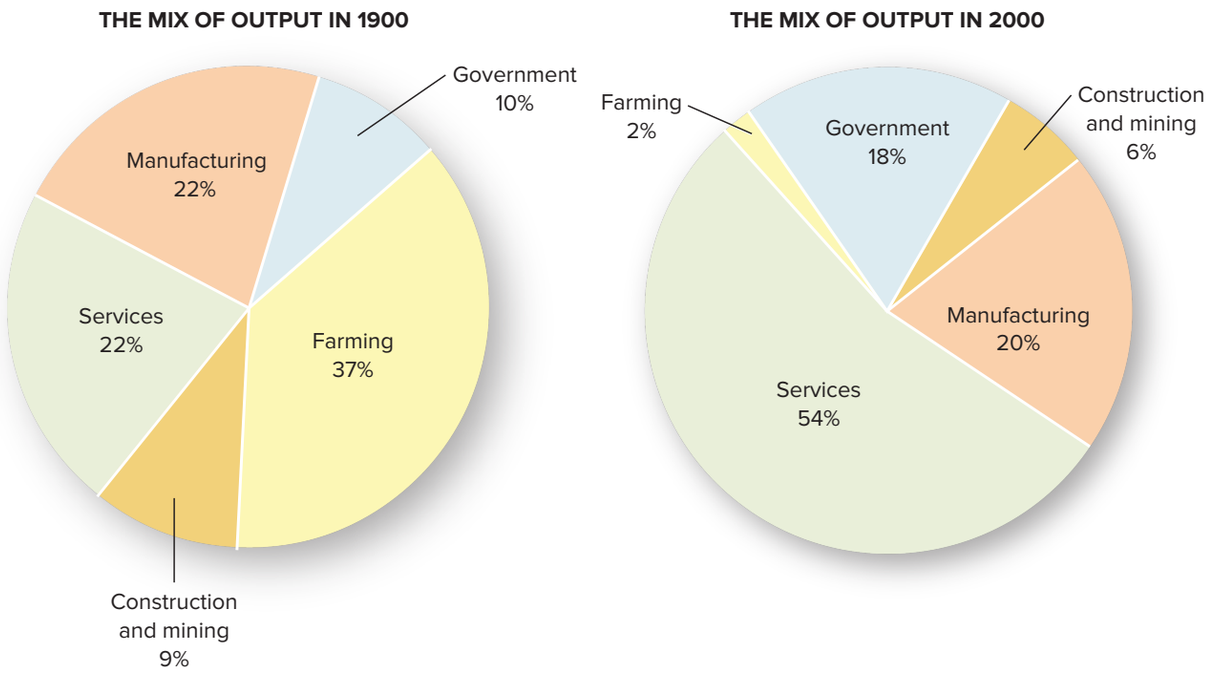


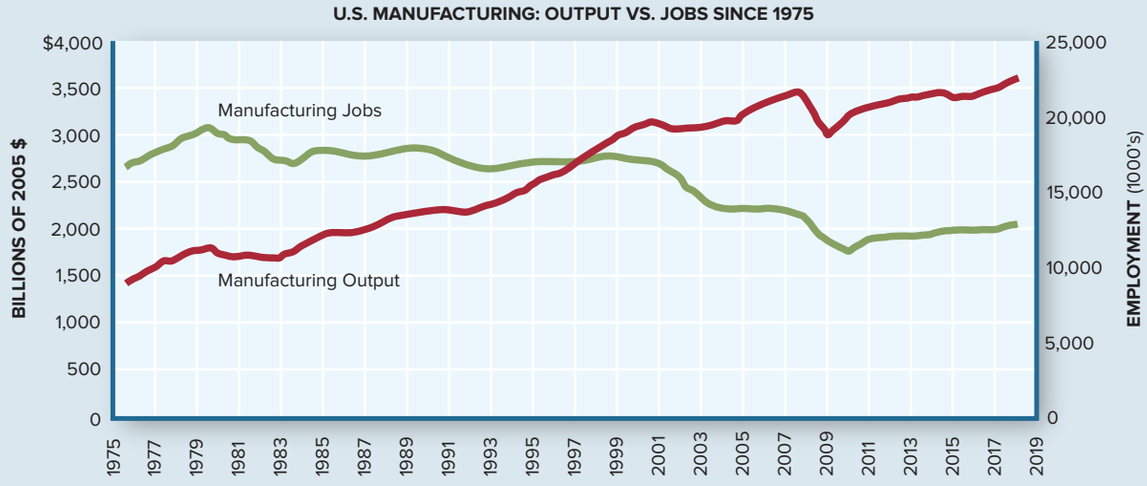
Figure 2.4 The Changing Mix of Output In the twentieth century the total output of the U.S. economy increased thirteenfold. As the economy grew, the farm sector shrank and the manufacturing *share* of total output declined. Since 1930 the American economy has been predominantly a service economy, with output and job growth increasingly concentrated in retail trade, education, health care, entertainment, personal and business services, and government. ■

Source: U.S. Department of Labor.

NEWS WIRE MANUFACTURING: FEWER JOBS, MORE OUTPUT

U.S. Manufacturing: Output vs. Jobs since 1975

Since 1975, manufacturing output has more than doubled, while employment in the sector has decreased by 31 percent. While these American job losses are indeed sobering, they are not an indication of declining U.S. competitiveness. In fact, these statistics reveal that the average American manufacturer is over three times more productive today than it was in 1975—a sure sign of economic progress.



Source: U.S. Bureau of Labor Statistics.

NOTE: As more output can be produced with fewer workers, manufacturing *employment* declines even while *output* increases. The displaced workers move into other industries (especially services).

Growth of Services

The *relative* decline in manufacturing is due primarily to the rapid expansion of the service sector. ***America has become largely a service economy.*** A hundred years ago less than 25 percent of the labor force was employed in the service sector; today service industries (including government) generate over 70 percent of total output. Among the fastest-growing service industries are health care, computer science and software, financial services, retail trade, business services, and law. According to the U.S. Department of Labor, this trend will continue; 98 percent of net job growth over the next 10 years will be in service industries.

Growth of Trade

International trade also plays an increasingly important role in how goods are produced. Roughly one-eighth of the output Americans produce is exported. As noted earlier, an even larger share of output is imported (hence the negative "net exports" in Figure 2.2).

What is remarkable about these international transactions is how fast they have grown. Advances in communications and transportation technologies make international trade and investment easier. You can click on a British clothier's website just as easily as on the site of a U.S. merchant. And consumers in other nations can easily purchase goods from American cybermerchants. Then FedEx or another overnight delivery service can move the goods across national borders. As a result, the volume of both imports and exports keeps growing rapidly. The growth of trade is also fueled by the increased consumption of *services* (e.g., travel, finance, movies, computer software) rather than goods. With trade in services, you don't even need overnight delivery.

HOW AMERICA PRODUCES

factors of production
Resource inputs used to produce goods and services (e.g., land, labor, capital, and entrepreneurship).

International trade has also affected HOW goods and services are produced. Hundreds of foreign-owned firms (e.g., Toyota, BMW, Shell, Air France) produce goods or services in the United States. Any output they produce within U.S. borders is counted in America's GDP. By contrast, U.S.-owned **factors of production** employed elsewhere (e.g., a Nike shoe factory in Malaysia, an Apple factory in China) don't contribute directly to U.S. output.

Factors of Production

Even without foreign investments, the United States would have ample resources to produce goods and services. The United States has the third largest population in the world (behind China and India). The United States also has the world's fourth largest land area (behind Russia, China, and, by a hair, Canada) and profuse natural resources (e.g., oil, fertile soil, and hydropower).

Abundant labor and natural resources give the United States a decided advantage. But superior resources alone don't explain America's economic dominance. After all, China has five times as many people as the United States and equally abundant natural resources. Yet China's annual output is only two-thirds as large as America's output.

Capital Stock

capital intensive
Production processes that use a high ratio of capital to labor inputs.

In part, America's greater economic strength is explained by the abundance of capital. America has accumulated a massive stock of capital—over $100 *trillion* worth of machinery, factories, and buildings. As a result, American production tends to be very **capital intensive**. The contrast with *labor-intensive* production in poorer countries is striking. A Chinese farmer mostly works with his or her hands and crude implements, whereas an American farmer works with computers, automated irrigation systems, and mechanized equipment. Ethiopian business managers don't have the computer networks or telecommunications systems that make American business so efficient. In Cuba few people have access to the Internet.

America's enormous output is made possible by huge investments in physical and human capital. In poorer countries, production is constrained by low levels of education and a scarcity of plant, equipment, and technology.
(left: ©Reed Kaestner/Getty Images; right: ©McGraw-Hill Education/Barry Barker, photographer)

Factor Quality

productivity
Output per unit of input (e.g., output per labor-hour).

The greater **productivity**—output per worker—of American workers reflects not only the capital intensity of the production process but also the *quality* of both capital and labor. America invests each year not just in *more* plant and equipment but in *better* plant and equipment. Today's new computer is faster and more powerful than yesterday's. Today's laser surgery makes yesterday's surgical procedures look primitive. Even textbooks get better each year. Such improvements in the quality of capital expand production possibilities.

Labor quality also improves with education and skill training. Indeed, one can invest in human capital much as one invests in physical capital. **Human capital** refers to the productive capabilities of labor. In the Stone Age, one's productive capacity was largely determined by physical strength and endurance. In today's economy, human capital is largely a product of education, training, and experience. Hence a country can acquire more human capital even without more bodies.

human capital
The knowledge and skills possessed by the workforce.

Over time, the United States has invested heavily in human capital. In 1940 only 1 out of 20 young Americans graduated from college; today over 35 percent of young people are college graduates. High school graduation rates have jumped from 38 percent to over 85 percent in the same time period. In some poor countries only one out of two youths ever *attends* high school, much less graduates (see the News Wire "Human Capital"). In certain nations, girls are virtually prohibited from getting an education. As a consequence, more than 1 billion people—one-sixth of the world's population—are unable to read or even write their own names.

America's tremendous output is thus explained not only by a wealth of resources but by the quality of these resources as well. ***The high productivity of the U.S. economy results from using highly educated workers in capital-intensive production processes.***

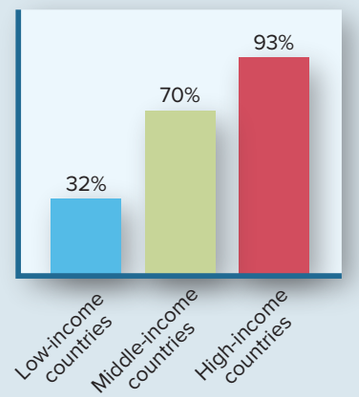
NEWS WIRE HUMAN CAPITAL

THE EDUCATION GAP BETWEEN RICH AND POOR NATIONS

Virtually all Americans attend high school, and roughly 85 percent graduate. In poor countries relatively few workers attend high school, and even fewer graduate. Over 30 percent of the girls your age are illiterate in the poorest nations. This education gap limits their productivity.

Source: *World Development Indicators: Participation in Education*, The World Bank Group, 2017.

ENROLLMENT IN SECONDARY SCHOOLS (PERCENTAGE OF SCHOOL-AGE YOUTH ATTENDING SECONDARY SCHOOLS)



NOTE: The high productivity of the American economy is explained in part by the quality of its labor resources. Workers in poorer, less developed countries get much less education or training.

Factor Mobility

Our continuing ability to produce the goods and services that consumers demand also depends on our agility in *reallocating* resources from one industry to another. Every year some industries expand and others contract. Thousands of new firms are created each year, and almost as many others disappear. In the process, land, labor, capital, and entrepreneurship move from one industry to another in response to changing demands and technology. In 1974 Apple Computer, Microsoft, Amgen, and Oracle didn't exist. In 1994 Google, Amazon, Yahoo, and Netflix hadn't yet been founded. In 2002 Facebook and Tesla were still concepts, not operational companies. Yet these companies collectively employ over 1 million people today. Uber didn't offer car services until 2010; now it employs hundreds of thousands of drivers. Where did these companies find all those workers? Many were new entrants into the labor market. But even more were people who left companies that were shutting down, shrinking, or simply not growing as fast. Without such labor mobility, new companies could never grow so fast.

The Private Sector: Business Types

The factors of production released from some industries and acquired by others are organized into productive entities we call *businesses*. A business is an organization that uses factors of production to produce specific goods or services. Actual production activity takes place in the 30 million business firms that participate in the U.S. product markets.

Business firms come in all shapes and sizes. A basic distinction is made, however, among three different legal organizations:

- Corporations
- Partnerships
- Proprietorships

The primary distinction among these three business forms lies in their ownership characteristics. A single proprietorship is a firm owned by one individual. A partnership is owned by a small number of individuals. A corporation is typically owned by many—even hundreds of thousands of—individuals, each of whom owns shares (stock) of the corporation. An important characteristic of corporations is that their owners (stockholders) are not personally responsible (liable) for the debts or actions of the company. So if a defective product injures someone, only the corporation—not the stockholders—will be sued. This limited liability makes it easier for corporations to pool the resources of thousands of individuals.

Corporate America

Because of their limited liability, corporations tend to be much larger than other businesses. Single proprietorships are typically quite small because few individuals have vast sources of wealth or credit. The typical proprietorship has less than $20,000 in assets, whereas the average corporation has assets in excess of $4 million. As a result of their size, corporations dominate market transactions in America, accounting for more than 60 percent of all business sales.

We can describe who's who in the business community, then, in two very different ways. In terms of numbers, the single proprietorship is the most common type of business firm in America. Proprietorships are particularly dominant in agriculture (the family farm), retail trade (the corner grocery store), and services (your dentist). In terms of size, however, the corporation is the dominant force in the U.S. economy (see Figure 2.5). The four largest nonfinancial corporations in the country (ExxonMobil, Walmart, CVS, and Apple) alone have more assets than *all* the 25 million proprietorships doing business in the United States. Even in agriculture, where corporate entities are still comparatively rare, the few agribusiness corporations are so large as to dominate many thousands of small farms.

The Government's Role

Although corporate America dominates the U.S. economy, it does not have the last word on WHAT, HOW, or FOR WHOM goods are produced. In our mixed economy, the government has a significant voice in all of these decisions. Even before America became an independent nation, royal charters bestowed the right to produce and trade specific goods. Even the European discovery of America was dependent on government financing and the establishment of exclusive rights to whatever treasures were found. Today over 50 federal agencies and thousands of state and local government entities regulate the production of goods. In the process, they profoundly affect HOW goods are produced.

Providing a Legal Framework

One of the most basic functions of government is to establish and enforce the rules of the game. In some bygone era maybe a person's word was sufficient to guarantee delivery or payment. Businesses today, however, rely more on written contracts. The government gives legitimacy

to contracts by establishing the rules for such pacts and by enforcing their provisions. In the absence of contractual rights, few companies would be willing to ship goods without prepayment (in cash). Without legally protected ownership rights, few individuals would buy or build factories. Even the incentive to write textbooks would disappear if government copyright laws didn't forbid unauthorized downloading or photocopying. ***By establishing ownership rights, contract rights, and other rules of the game, the government lays the foundation for market transactions.***

Protecting Consumers

Much government regulation is intended to protect the interests of consumers. One way to do this is to prevent individual business firms from becoming too powerful. In the extreme case, a single firm might have a **monopoly** on the production of a specific good. As the sole producer of that good, a monopolist could dictate the price, the quality, and the quantity of the product. In such a situation, consumers would likely end up with the short end of the stick—paying too much for too little.

monopoly
A firm that produces the entire market supply of a particular good or service.

To protect consumers from monopoly exploitation, the government tries to prevent individual firms from dominating specific markets. Antitrust laws prohibit mergers or acquisitions that threaten competition. The U.S. Department of Justice and the Federal Trade Commission also regulate pricing practices, advertising claims, and other behavior that might put consumers at an unfair disadvantage in product markets.

Government also regulates the safety of many products. Consumers don't have enough expertise to assess the safety of various medicines, for example. If they relied on trial and error to determine drug safety, they might not get a second chance. To avoid this calamity, the government requires rigorous testing of new drugs, food additives, and other products.

Protecting Labor

The government also regulates how our labor resources are used in the production process. As recently as 1920, children between the ages of 10 and 15 were employed in mines, factories, farms, and private homes. They picked cotton and cleaned shrimp in the South, cut sugar beets and pulled onions in the Northwest, processed coal in Appalachia, and pressed tobacco leaves in the mid-Atlantic states. They often worked six days a week in abusive conditions for a pittance in wages. Private employers got cheap labor, but society lost valuable resources when so much human capital remained uneducated and physically abused.

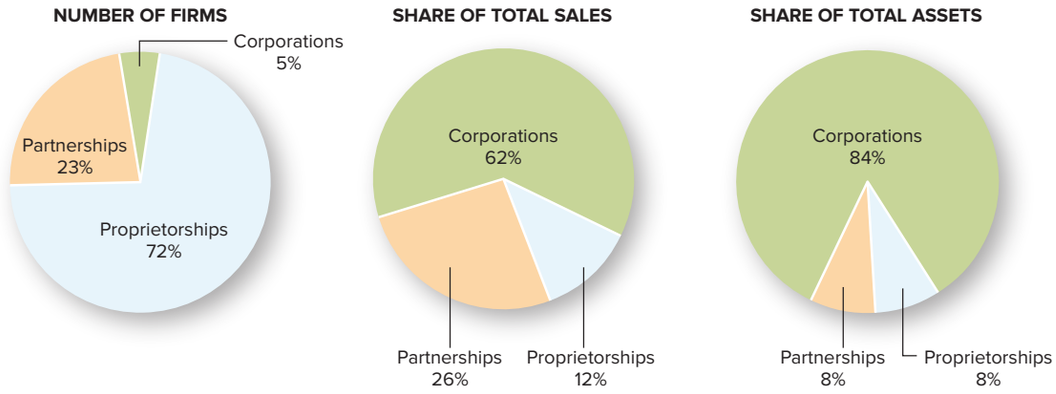


Figure 2.5 U.S. Business Firms: Numbers versus Size Proprietorships (individually owned companies) are the most common form of American business firm. Corporations are so large, however, that they account for most business sales and assets. Although only 5 percent of all firms are incorporated, corporations control 62 percent of all sales and 84 percent of all assets.

Source: "Statistical Abstract of the United States: 2014," U.S. Department of Labor.

First the state legislatures and then the U.S. Congress intervened to protect children from such abuse by limiting or forbidding the use of child labor and making school attendance mandatory. In poor nations, governments do much less to limit use of child labor. In Africa, for example, 40 percent of children under age 14 work to survive or to help support their families.

Government regulations further change HOW goods are produced by setting standards for workplace safety and even minimum pay, fringe benefits, and overtime provisions. After decades of bloody confrontations, the government also established the right of workers to organize and set rules for union–management relations. Unemployment insurance, Social Security benefits, disability insurance, and guarantees for private pension benefits also protect labor from the vagaries of the marketplace. They have had a profound effect on how much people work, when they retire, and even how long they live.

Protecting the Environment

In earlier times, producers didn't have to concern themselves with the impact of their production activities on the environment. The steel mills around Pittsburgh blocked out the sun with clouds of sulfurous gases that spewed out of their furnaces. Timber companies laid waste to broad swaths of forestland without regard to animal habitats or ecological balance. Paper mills used adjacent rivers as disposal sites, and ships at sea routinely dumped their waste overboard. Neither cars nor airplanes were equipped with controls for noise or air pollution.

externalities
Costs (or benefits) of a market activity borne by a third party; the difference between the social and private costs (or benefits) of a market activity.

In the absence of government intervention, such side effects would be common. Decisions on how to produce would be based on private costs alone, not on how the environment is affected. However, such **externalities**—spillover costs imposed on the broader community—affect our collective well-being. To reduce the external costs of production, the government limits air, water, and noise pollution and regulates environmental use.

Striking a Balance

All of these government interventions are designed to change HOW goods and services are produced. Such interventions reflect the conviction that the market alone would not always select the best possible way of producing goods and services. The market's answer to the HOW question would be based on narrow profit-and-loss calculations, not on broader measures of societal well-being. To redress this market failure, the government regulates production behavior.

As noted in Chapter 1, there is no guarantee that government regulation of HOW goods are produced always makes us better off. Excessive regulation may inhibit production, raise product prices, and limit consumer choices. In other words, *government* failure might replace *market* failure, leaving us no better off and possibly even worse off.

FOR WHOM AMERICA PRODUCES

However imperfect our answers to the WHAT and HOW questions might be, they cannot obscure how rich America is. As we have observed, the American economy produces a $20 trillion economic pie every year. The final question we have to address is how that pie will be sliced. Will everyone get an equal slice, or will some Americans be served gluttonous slices while others get only crumbs?

Were the slices of the pie carved by the market mechanism, the slices surely would not be equal. Markets reward individuals on the basis of their contribution to output. ***In a market economy, an individual's income depends on***

- ***The quantity and quality of resources owned.***
- ***The price that those resources command in the market.***

That's what concerned Karl Marx so much. As Marx saw it, the capitalists (owners of capital) had a decided advantage in this market-driven distribution. By owning the means of production, capitalists would continue to accumulate wealth, power, and income. Members of the proletariat would get only enough output to ensure their survival. Differences in income within the capitalist class or within the working class were of no consequence in the face of these class divisions. All capitalists were rich, while all workers were poor.

Marx's predictions of how output would be distributed turned out to be wrong in two ways. First, labor's share of total output has risen greatly over time. Second, differences *within* the labor and capitalist classes have become more important than differences between the classes. Many workers are rich, and a good many capitalists are poor. Moreover, the distinction between workers and capitalists has been blurred by profit-sharing plans, employee ownership, and widespread ownership of corporate stock. Accordingly, in today's economy it is more useful to examine how the economic pie is distributed across *individuals* rather than across labor and capitalist *classes.*

The Distribution of Income

Figure 2.6 illustrates how uneven the individual slices of the income pie are. Imagine dividing up the population into five subgroups of equal size, but sorted by income. Thus the top fifth (or **quintile**) would include that 20 percent of all households with the most income. The bottom fifth would include the 20 percent of households with the least income. The rest of the population would be spread across the other three quintiles.

quintile
One-fifth (e.g., of total population).

Figure 2.6 shows that the richest fifth of the population gets *half* of the income pie. By contrast, the poorest fifth gets a tiny sliver. The dimensions of this inequality are spelled out in Table 2.4. Both the figure and the table underscore how unequally the FOR WHOM question is settled in the United States.

As shocking as U.S. income inequalities might appear, incomes are distributed even less equally in many other countries. The News Wire "Global Inequalities" displays the share of total income received by the top decile (tenth) of households in various countries. In general, inequalities tend to be larger in poorer countries. As countries develop, the **personal distribution of income** tends to become more equal.

personal distribution of income
The way total personal income is divided up among households or income classes.

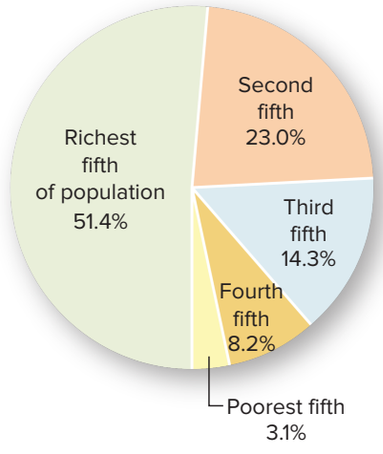


Figure 2.6 Slices of the U.S. Income Pie The richest fifth of U.S. households gets half of all the income—a huge slice of the income pie. By contrast, the poorest fifth gets only a sliver. Should the government do more to equalize the slices or let the market serve up the pie?

Source: *Share of Aggregate Income Received by Each Fifth and Top 5 Percent of Households*, U.S. Census Bureau, 2017.

Income Group	2017 Income (Dollars)	Average Income	Share of Total Income (Percent)
Highest fifth	Above $127,000	$221,800	51.4
Second fifth	78,000–127,000	99,000	23.0
Third fifth	47,000–78,000	61,600	14.3
Fourth fifth	25,000–47,000	35,400	8.2
Lowest fifth	0–25,000	13,300	3.1

Table 2.4 Unequal Incomes The size distribution of income indicates how total income is distributed among income classes. The lowest income class of our population (the lowest fifth) gets only 3.1 percent of total income while the highest income class (the highest fifth) gets half of total income.

Source: *Share of Aggregate Income Received by Each Fifth and Top 5 Percent of Households*, U.S. Census Bureau, 2017.

NEWS WIRE GLOBAL INEQUALITIES

INCOME SHARE OF THE RICH

Incomes tend to be distributed much less equally in poor countries than in rich ones. In developing countries, the top tenth of all households can receive 40–50 percent of all income. In the United States and other developed countries, inequality is often much less severe.

Country	Per Capita Income (2017)	Percentage of Total Income Received by Highest Decile
Namibia	$10,380	52
South Africa	12,870	51
Botswana	15,510	50
Zambia	3,810	44
Brazil	15,140	40
Honduras	13,430	37
Mexico	16,860	35
Haiti	1,760	31
China	14,320	31
United States	**55,980**	**31**
France	41,680	27
Spain	34,700	26
Great Britain	41,280	25
Sweden	48,700	23

Source: *World Development Indicators*, World Bank, 2018.

Income Mobility

Another important feature of any income distribution is how long people stay in any one position. Being poor isn't such a hardship if your poverty lasts only a week or even a month. Likewise, unequal slices of the economic pie aren't so unfair if the slices are redistributed frequently. In that case, everyone would have a chance to be rich or poor on occasion.

In reality, the slices of the pie are not distributed randomly every year. Some people get large slices every year, and other people always seem to end up with crumbs. Nevertheless, such *permanent* inequality is more the exception than the rule in the U.S. economy. One of the most

distinctive features of the U.S. income distribution is how often people move up and down the income ladder. This kind of income *mobility* makes lifelong incomes much less unequal than annual incomes. In many nations, income inequalities are much more permanent.

Government Redistribution: Taxes and Transfers

Regardless of how incomes are distributed elsewhere, Americans may still feel that the market fails to generate a "fair" distribution in this country. If so, the government acquires another responsibility; namely, to *redistribute* incomes. The mechanisms for reslicing the income pie are taxes and income transfers.

Income inequalities are more vivid in poor nations than in rich ones.

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Taxes

Taxes are also a critical mechanism for redistributing market incomes. A **progressive tax** does this by imposing higher tax *rates* on people with larger incomes. Under such a system a rich person pays not only more taxes, but also a larger *portion* of his or her income. Thus ***a progressive tax makes after-tax incomes more equal than before-tax incomes.***

The federal income tax is designed to be progressive. Individuals with less than $12,000 of taxable income paid no income tax in 2018 and might even have received a spendable tax credit from Uncle Sam. Low-income individuals paid a 10 percent tax rate and middle-income households confronted an average tax rate of 20 percent. Rich households faced a top federal income tax rate of 37 percent. Those differences in tax rates helped make (after-tax) incomes more equal.

progressive tax
A tax system in which tax rates rise as incomes rise.

Income Transfers

Taxes are only half the redistribution story. Equally important is who gets the income the government collects. The government completes the redistribution process by transferring income to consumers and providing services. The largest *income transfer* program is Social Security, which pays over $1 *trillion* a year to 60 million older or disabled persons. Although rich and poor alike get Social Security benefits, low-wage workers get more retirement benefits for every dollar of earnings. Hence the benefits of the Social Security program are distributed in a *progressive* fashion. Income transfers reserved exclusively for poor people—welfare benefits, food stamps, Medicaid, and the like—are even more progressive. As a result, ***the income transfer system gives lower-income households more output than the market itself would provide.*** In the absence of transfer payments and taxes, households in the lowest income quintile would get only 1 percent of total income. The tax transfer system raises their share to 3.1 percent (see Table 2.4). That's still not much of a slice, but it's more of the income pie than they got in the marketplace. To get a still larger slice, they need more market income or more government-led income redistribution.

POLICY PERSPECTIVES

CAN WE END GLOBAL POVERTY?

The United States is the economic powerhouse of the world. As we've seen, the 5 percent of the world's population that lives within our nation's borders consumes over 20 percent of the world's output. The four richest Americans—Jeff Bezos, Bill Gates, Mark Zuckerberg, and Warren Buffett—have more wealth than the combined total output of the world's 60 poorest countries (roughly 600 million people!). Even the 40 million officially classified "poor" people in the United States enjoy living standards that *3 billion* inhabitants of Earth can only dream of. According to the World Bank, 3 billion people scrape by on less than $3 per day. In the poorest nations—where half the world's population lives—only three of every four people have

access to safe water, and less than one of two have sanitation facilities. One-fourth of these people are undernourished; malnutrition is even higher among children. Not surprisingly, 12 percent of live births end in a child's death before age 5 (versus 0.8 percent in the United States). Illiteracy is the norm for those who survive beyond childhood.

Even America's "poor" look affluent by comparison to impoverished residents of some other countries.

In September 2000 the United Nations adopted a "Millennium Declaration" to reduce global poverty. Given the enormity of the task, the United Nations didn't vow to *eliminate* poverty, but instead just to *reduce* poverty, illiteracy, child mortality, and HIV/AIDS over a period of 15 years. We didn't achieve all those goals, but made substantial progress.

In September 2015, the United Nations renewed its commitment to ending global poverty. Its "Sustainable Development Goals" for the subsequent 15 years include the goal of elimination *extreme* poverty (income of less than $2 per day), while continuing to reduce all poverty (income of than $3 a day).

Is such an achievement possible? Can the world move 3 billion people—half the world's population—out of poverty in the span of 15 years?

Some say we could end global poverty if rich nations were more generous. At present, the rich nations of the world donate only 0.29 percent of their GDP to poor nations. Critics want higher levels of support. But even a doubling of development assistance wouldn't do the job. The only real hope for an end to global poverty is persistent economic growth. That's the challenge for poor nations and rich nations alike: figuring out how to accelerate economic growth so that the economic pie gets large enough to assure everyone an adequate slice. That's where economic theory can help.

CHAPTER 2 REVIEW

SUMMARY

- The answers to the WHAT, HOW, and FOR WHOM questions are reflected in the dimensions of the economy. These answers are the product of market forces and government intervention. **LO1**
- Gross domestic product (GDP) is the basic measure of how much an economy produces. It is the *value* of total output. **LO1**
- *Real* GDP measures the inflation-adjusted value of output; *nominal* GDP, the current dollar value. **LO1**
- The United States produces roughly $20 trillion of output, one-fifth of the world's total. American GDP per capita is four times the world average. **LO2**
- The high level of U.S. per capita GDP reflects the high productivity of American workers. Abundant capital, education, technology, training, and management all contribute to high productivity. **LO3**
- Over 70 percent of U.S. output consists of services. The service industries continue to grow faster than goods-producing industries. **LO4**
- Most of America's output consists of consumer goods and services. Investment goods account for less than 15 percent of total output. **LO4**
- Proprietorships and partnerships outnumber corporations nearly five to one. Nevertheless, corporate America produces over 60 percent of total output. **LO3**
- Government intervenes in the economy to establish the rules of the (market) game and to correct the market's answers to the WHAT, HOW, and FOR WHOM questions. The risk of government failure spurs the search for the right mix of market reliance and government regulation. **LO4**
- Incomes are distributed very unequally among households, with households in the highest income class (quintile) receiving 15 times more income than the average low-income (quintile) household. Inequality is even more severe in poor countries. **LO5**
- The progressive income tax system is designed to make after-tax incomes more equal. Tax-financed transfer payments such as Social Security and welfare also redistribute a significant amount of income. **LO5**

TERMS TO REMEMBER

Define the following terms:

gross domestic product (GDP)
nominal GDP
real GDP
per capita GDP
economic growth
investment
income transfers
exports
imports
factors of production
capital intensive
productivity
human capital
monopoly
externality
quintile
personal distribution of income
progressive tax

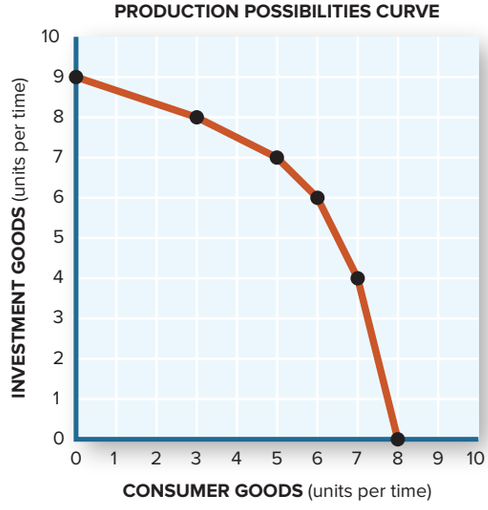
QUESTIONS FOR DISCUSSION

1. Americans already enjoy living standards that far exceed world averages. Do we have enough? Should we even try to produce more? **LO2**
2. Why do we measure output in value terms rather than in physical terms? For that matter, why do we bother to measure output at all? **LO1**
3. Why do people suggest that the United States needs to devote more resources to investment goods? Why not produce just consumption goods? **LO3**
4. The U.S. farm population has shrunk by over 25 million people since 1900. Where did they all go? Why did they move? **LO4**
5. Rich people have over 15 times as much income as poor people. Is that fair? How should output be distributed? **LO5**
6. If taxes were more progressive, would total output be affected? **LO5**
7. Why do income inequalities diminish as an economy develops? **LO5**
8. Why is per capita GDP so much higher in the United States than in Mexico? **LO3**
9. Do we need more or less government intervention to decide WHAT, HOW, and FOR WHOM? Give specific examples. **LO4**
10. **POLICY PERSPECTIVES** What can poor nations do to raise their living standards? **LO3**

PROBLEMS

connect

1.



Referring to the figure, **LO1**

a. What is the opportunity cost of increasing investment from 6 units to 8 units?

b. What will happen to future production possibilities if investment increases now?

c. What will happen to future production possibilities if only consumer goods are produced now?

2. Suppose the following data describe output in two different years: **LO1**

Item	Year 1	Year 2
Apples	20,000 @ $0.25 each	30,000 @ $0.30 each
Bicycles	700 @ $800 each	650 @ $900 each
Apps	10,000 @ $1.00 each	12,000 @ $2.00 each

a. Compute *nominal* GDP in each year.

b. By what percentage did nominal GDP increase between Year 1 and Year 2?

c. Now compute *real* GDP in Year 2 by using the prices of Year 1.

d. By what percentage did real GDP increase between Year 1 and Year 2?

3. GDP per capita in the United States was approximately $60,000 in 2019. Use the growth formula to answer the following questions: **LO1**

a. What will it be in the year 2025 if GDP per capita grows each year by 0 percent?

b. What will it be in the year 2025 if GDP per capita grows each year by 2 percent?

Growth formula:

$$\left(\text{future value}\right) = \left(\text{present value}\right) \times \left(1 + r\right)^{t}$$

present value = this year's GDP per capita

future value = GDP per capita in the future

r = rate of growth (in decimal form) per year

t = number of years of growth

4. Using income data from Table 2.3, if a McDonald's Happy Meal costs $3, how many Happy Meals *per week* could **LO5**

a. the average American afford?

b. the average Afghan afford?

5. Assume that total output is determined by this formula: **LO3**

$$\text{number of workers} \times \text{productivity} = \text{total output}$$

a. If the workforce is growing by 1 percent but productivity doesn't improve, how fast can output increase?

b. If productivity increases by 3 percent *and* the number of workers increases by 1 percent a year, how fast will output grow?

6. According to the News Wire "Manufacturing: Fewer Jobs, More Output," since 2000, **LO3**

a. has manufacturing output increased or decreased?

b. has employment increased or decreased?

c. has productivity increased or decreased?
(*Hint:* Productivity = total output ÷ number of workers)

7. According to Table 2.4, **LO5**
   a. what is the *average* income in the United States?
   b. what percentage of the average income of people in the highest fifth would have to be taxed away to bring them down to that average?
8. According to the News Wire "Global Inequalities," what is the average per capita income in nations where the highest-income decile gets **LO5**
   a. at least half of total income?
   b. less than 30 percent of total income?
9. Complete the following table and answer the following questions:

	Before-Tax Income	Tax Rate	Tax Paid	After-Tax Income
High-income family	$500,000	37%	_____	_____
Middle-income family	50,000	20%	_____	_____
Low-income family	20,000	10%	_____	_____

   What is the ratio of a high-income family's income to a low-income family's income (*a*) before taxes and (*b*) after taxes? (*c*) Is this tax progressive? **LO5**
10. **POLICY PERSPECTIVES** In 2018, the United States devoted about 0.19 percent of its $20 trillion GDP to development assistance. **LO2**
    a. How much money is that?
    b. How much aid does that imply for each of the 3 billion poor people in developing nations?

CHAPTER THREE

Supply and Demand

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LEARNING OBJECTIVES

After reading this chapter, you should be able to:

1. Explain why people participate in markets.
2. Describe what market demand and supply measure.
3. Depict how and why a market equilibrium is found.
4. Illustrate how and why demand and supply curves sometimes shift.
5. Explain how market shortages and surpluses occur.

A few years ago a Florida man tried to sell one of his kidneys on eBay. As his offer explained, he could supply only one kidney because he needed the other to survive. He wanted the bidding to start out at $25,000, plus expenses for the surgical removal and shipment of his kidney. He felt confident he could get at least that much money since thousands of people have potentially fatal kidney diseases.

He was right. The bids for his kidney quickly surpassed $100,000. Clearly there were lots of people with kidney disease who were willing and able to pay high prices to get a lifesaving transplant.

The seller never got the chance to sell his kidney to the highest bidder. Although organ transplants are perfectly legal in the United States, the purchase or sale of human organs is not. When eBay learned the pending sale was illegal, it shut down the man's advertisement.

Despite its illegality, there is clearly a market for human kidneys. That is to say, there are people who are willing to *sell* kidneys and others who are willing to *buy* kidneys. Those are sufficient conditions for the existence of a market. The market in kidneys happens to be illegal in the United States, but it is still a market, although illegal. The markets for drugs, prostitution, and nuclear warheads are also illegal, but still reflect the intentions of potential buyers and sellers.

Fortunately we don't have to venture into the underworld to see how markets work. You can watch markets work by visiting eBay or other electronic auction sites. Or you can simply go to the mall and watch people shop. In either location you will observe people deciding whether to buy or sell goods at various prices. That's the essence of market activity.

The goal in this chapter is to assess how markets actually function. How does the invisible hand of the market resolve the competing interests of buyers (who want low prices) and sellers (who want high prices)? Specifically,

- What determines the price of a good or service?
- How does the price of a product affect its production or consumption?
- Why do prices and production levels often change?

MARKET PARTICIPANTS

More than 340 million individual consumers, about 30 million business firms, and thousands of government agencies participate directly in the U.S. economy. Millions of foreigners also participate by buying and selling goods in American markets.

Goals

All these economic actors participate in the market to achieve specific goals. Consumers strive to maximize their own happiness; businesses try to maximize profits; government agencies attempt to maximize social welfare. Foreigners pursue the same goals as consumers, producers, or government agencies. In every case, they strive to achieve those goals by buying or selling the best possible mix of goods, services, or factors of production.

Constraints

The desire of all market participants to maximize something—profits, private satisfaction, or social welfare—is not their only common trait. Another element common to all participants is their *limited resources*. You and I cannot buy everything we desire; we simply don't have enough income. As a consequence, we must make *choices* among available products. We're always hoping to get as much satisfaction as possible for the few dollars we have to spend. Likewise, business firms and government agencies must decide how *best* to use their limited resources to maximize profits or public welfare. This is the scarcity problem we examined in Chapter 1. It is central to all economic decisions.

Specialization and Exchange

market
Any place where goods are bought and sold.

To maximize the returns on our limited resources, we participate in the **market**, buying and selling various goods and services. Our decision to participate in these exchanges is prompted by two considerations. First, most of us are incapable of producing everything we desire to consume. Second, even if we *could* produce all our own goods and services, it would still make sense to *specialize*, producing only one product and trading it for other desired goods and services.

Suppose you were capable of growing your own food, stitching your own clothes, building your own shelter, and even writing your own economics text. Even in this little utopia, it would still make sense to decide how *best* to expend your limited time and energy and to rely on others to fill in the gaps. If you were *most* proficient at growing food, you would be best off spending your time farming. You could then exchange some of your food output for the clothes, shelter, and books you desired. In the end, you'd be able to consume *more* goods than if you had tried to make everything yourself.

Our economic interactions with others are thus necessitated by two constraints:

- Our inability as individuals to produce all the things we desire.
- The limited amount of time, energy, and resources we possess for producing those things we could make for ourselves.

Together these constraints lead us to specialize and interact. Most of the interactions that result take place in the market.

MARKET INTERACTIONS

Figure 3.1 summarizes the kinds of interactions that occur among market participants. Note, first of all, that we have identified ***four separate groups of market participants:***

- ***Consumers.***
- ***Business firms.***
- ***Governments.***
- ***Foreigners.***

Domestically, the "consumers" rectangle includes all 340 million consumers in the United States. In the "business firms" box we have grouped all the domestic business enterprises that buy and sell goods and services. The third participant, "governments," includes the many separate agencies of the federal government, as well as state and local governments. Figure 3.1 also illustrates the role of foreigners.

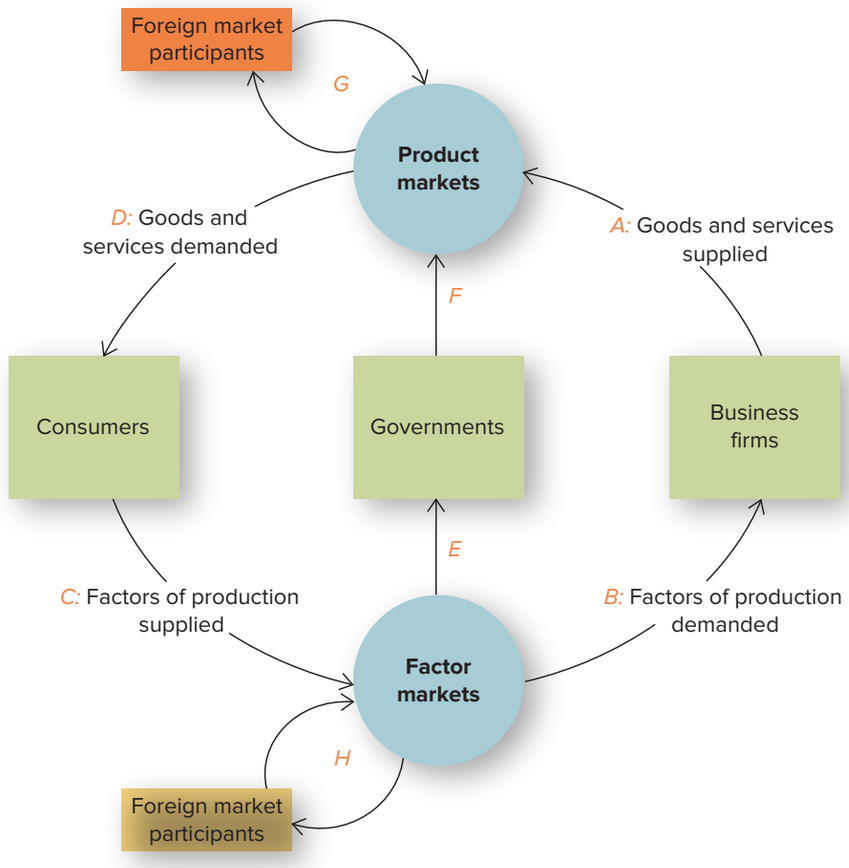


Figure 3.1 Market Interactions Business firms participate in markets by supplying goods and services to product markets (point *A*) and purchasing factors of production in factor markets (*B*).
Individual consumers participate in the marketplace by supplying factors of production such as their own labor (*C*) and purchasing final goods and services (*D*).
Federal, state, and local governments also participate in both factor (*E*) and product markets (*F*).
Foreigners participate by supplying imports, purchasing exports (*G*), and buying and selling resources (*H*). ■

The Two Markets

The easiest way to keep track of all this market activity is to distinguish two basic markets. Figure 3.1 does this by depicting separate circles (in blue) for product markets and factor markets.

Factor Markets

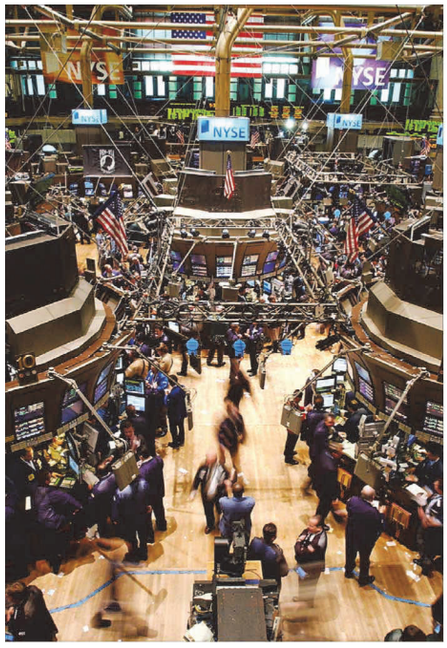
factor market
Any place where factors of production (e.g., land, labor, capital, entrepreneurship) are bought and sold.

In **factor markets**, factors of production are exchanged. Market participants buy or sell land, labor, or capital that can be used in the production process. When you go looking for work, for example, you are making a factor of production—your labor—available to producers. You are offering to *sell* your time and talent. The producers will hire you—*buy* your services in the factor market—if you are offering the skills they need at a price they are willing to pay.

Product Markets

product market
Any place where finished goods and services (products) are bought and sold.

The activity in factor markets is only half the story. At the end of a hard day's work, consumers go to the grocery store, the mall, or the movies to purchase desired goods and services—that is, to buy *products*. In this context, consumers again interact with business firms. This time, however, their roles are reversed: Consumers are doing the *buying*, and businesses are doing the *selling*. This exchange of goods and services occurs in **product markets**.



A market exists wherever buyers and sellers interact.
©Stephen Chernin/Getty Images

Governments also supply goods and services to product markets. The consumer rarely buys national defense, schools, or highways directly; instead such purchases are made indirectly through taxes and government expenditure. In Figure 3.1, the arrows running from governments through product markets to consumers remind us, however, that all government output is intended "for the people." In this sense, the government acts as an intermediary, buying factors of production (e.g., government employees) and providing certain goods and services consumers desire (e.g., police protection).

In Figure 3.1, the arrow connecting product markets to consumers (point *D*) emphasizes the fact that consumers, by definition, do not supply products. When individuals produce goods and services, they do so within the government or business sector. An individual who is a doctor, a dentist, or an economic consultant functions in two sectors. When selling services in the market, this person is regarded as a "business"; when away from the office, he or she is regarded as a "consumer." This distinction is helpful in emphasizing that ***the consumer is the final recipient of all goods and services produced.***

Locating Markets

Although we refer repeatedly to two kinds of markets, it would be a little foolish to go off in search of the product and factor markets. Neither a factor market nor a product market is a single, identifiable structure. The term *market* simply refers to any place where an economic exchange occurs—where a buyer and seller interact. The exchange may take place on the street, in a taxicab, over the phone, by mail, online, or through the classified ads of the newspaper. In some cases, the market used may in fact be quite distinguishable, as in the case of a retail store, the Chicago Commodity Exchange, or a state employment office. But whatever it looks like, ***a market exists wherever and whenever an exchange takes place.***

Dollars and Exchange

barter
The direct exchange of one good for another, without the use of money.

Sometimes people exchange one good for another directly. On eBay, for example, you might persuade a seller to accept some old DVDs in payment for the Xbox One she is selling. Or you might offer to paint someone's house in exchange for "free" rent. Such two-way exchanges are called **barter**.

The problem with bartered exchanges is that you have to find a seller who wants whatever good you are offering in payment. This can make shopping an extremely time-consuming process. Fortunately, most market transactions are facilitated by using money as a form of payment. If you go shopping for an Xbox, you don't have to find a seller craving old DVDs; all you have to do is find a seller willing to accept the dollar price you are willing to pay. Because money facilitates exchanges, ***nearly every market transaction involves an exchange of dollars for goods (in product markets) or resources (in factor markets).*** Money thus plays a critical role in facilitating market exchanges and the specialization they permit.

Supply and Demand

The two sides of each market transaction are called **supply** and **demand**. As noted earlier, we are *supplying* resources to the market when we look for a job—that is, when we offer our labor in exchange for income. But we are *demanding* goods when we shop in a supermarket—that is, when we are prepared to offer dollars in exchange for something to eat. Business firms may *supply* goods and services in product markets at the same time that they are *demanding* factors of production in factor markets.

supply
The ability and willingness to sell (produce) specific quantities of a good at alternative prices in a given time period, *ceteris paribus*.

demand
The ability and willingness to buy specific quantities of a good at alternative prices in a given time period, *ceteris paribus.*

Whether one is on the supply side or the demand side of any particular market transaction depends on the nature of the exchange, not on the people or institutions involved.

DEMAND

Although the concepts of supply and demand help explain what's happening in the marketplace, we are not yet ready to summarize the countless transactions that occur daily in both factor and product markets. Recall that ***every market transaction involves an exchange and thus some element of both supply and demand.*** Then just consider how many exchanges you alone undertake in a single week, not to mention the transactions of the other 340 million or so consumers among us. To keep track of so much action, we need to summarize the activities of a great many individuals.

Individual Demand

We can begin to understand how market forces work by looking more closely at the behavior of a single market participant. Let us start with Tom, a senior at Clearview College. Tom has majored in everything from art history to government in his five years at Clearview. He didn't connect with any of those fields and is on the brink of academic dismissal. To make matters worse, his parents have threatened to cut him off financially unless he graduates sometime soon. They want him to take courses that will lead to a job after graduation so they don't have to keep supporting him.

Tom thinks he has found the perfect solution: web design. Everything associated with the Internet pays big bucks. Plus, girls seem to think webbies are "cool." Or at least so Tom thinks. And his parents would definitely approve. So Tom has enrolled in web design courses.

Unfortunately for Tom, he never developed computer skills. Until he got to Clearview College, he thought mastering Sony's latest alien attack video game was the pinnacle of electronic wizardry. His parents gave him a MacBook Pro but he used it only to post on Facebook and to visit gaming message boards. The concept of using his computer for coursework, much less developing some web content, is completely foreign to him. To compound his problems, Tom doesn't have a clue about streaming, interfacing, animation, or the other concepts the web design instructor has outlined in the first lecture.

Given his circumstances, Tom is desperate to find someone who can tutor him in web design. But desperation is not enough to secure the services of a web architect. In a market-based economy, you must also be willing to *pay* for the things you want. Specifically, ***a demand***

exists only if someone is willing and able to pay for the good—that is, exchange dollars for a good or service in the marketplace. Is Tom willing and able to pay for the web design tutoring he so obviously needs?

Let us assume that Tom has some income and is willing to spend some of it to get a tutor. Under these assumptions, we can claim that Tom is a participant in the *market* for web design services.

opportunity cost
The most desired goods and services that are forgone in order to obtain something else.

But how much is Tom willing to pay? Surely Tom is not prepared to exchange *all* his income for help in mastering web design. After all, Tom could use his income to buy more desirable goods and services. If he spent all his income on a web tutor, that help would have an extremely high **opportunity cost**. He would be giving up the opportunity to spend that income on other goods and services. He might pass his web design class but have little else. That doesn't sound like a good idea to Tom. Even though he *says* he would be willing to pay *anything* to pass the web design course, he probably has lower prices in mind. Indeed, there are *limits* to the amount Tom is willing to pay for any given quantity of web design tutoring. These limits will be determined by how much income Tom has to spend and how many other goods and services he must forsake to pay for a tutor.

Tom also knows that his grade in web design will depend in part on how much tutoring service he buys. He can pass the course with only a few hours of design help. If he wants a better grade, however, the cost is going to escalate quickly.

Naturally Tom wants it all—an A in web design and a ticket to higher-paying jobs. But here again the distinction between *desire* and *demand* is relevant. He may *desire* to master web design, but his actual proficiency will depend on how many hours of tutoring he is willing to *pay* for.

demand schedule
A table showing the quantities of a good a consumer is willing and able to buy at alternative prices in a given time period, *ceteris paribus.*

We assume, then, that when Tom starts looking for a web design tutor he has in mind some sort of **demand schedule**, like that described in Figure 3.2. According to row *A* of this schedule, Tom is willing and able to buy only one hour of tutoring service per semester if he must pay $50 an hour. At such an "outrageous" price he will learn minimal skills and just pass the course. But that's all Tom is willing to buy at that price.

At lower prices, Tom would behave differently. According to Figure 3.2, Tom would purchase *more* tutoring services if the price per hour were *less.* At lower prices, he would not have to give up so many other goods and services for each hour of technical help. The reduced opportunity costs implied by lower service prices increase the attractiveness of professional help. Indeed, we see from row *I* of the demand schedule that Tom is willing to purchase 20 hours per semester—the whole bag of design tricks—if the price of tutoring is as low as $10 per hour.

Notice that the demand schedule doesn't tell us *why* Tom is willing to pay these specific prices for various amounts of tutoring. Tom's expressed willingness to pay for web design tutoring may reflect a desperate need to finish a web design course, a lot of income to spend, or a relatively small desire for other goods and services. All the demand schedule tells us is what this consumer is *willing and able* to buy, for whatever reasons.

Also observe that the demand schedule doesn't tell us how many hours of design help the consumer will *actually* buy. Figure 3.2 simply states that Tom is *willing and able* to pay for one hour of tutoring at $50 per hour, two hours at $45 per hour, and so on. How much service he purchases will depend on the actual price of web services in the market. Until we know that price, we cannot tell how much service will be purchased. Hence ***demand is an expression of consumer buying intentions, of a willingness to buy, rather than a statement of actual purchases.***

	Demand Schedule	
	Price of Tutoring (per Hour)	Quantity of Tutoring Demanded (Hours per Semester)
A	$50	1
B	45	2
C	40	3
D	35	5
E	30	7
F	25	9
G	20	12
H	15	15
I	10	20

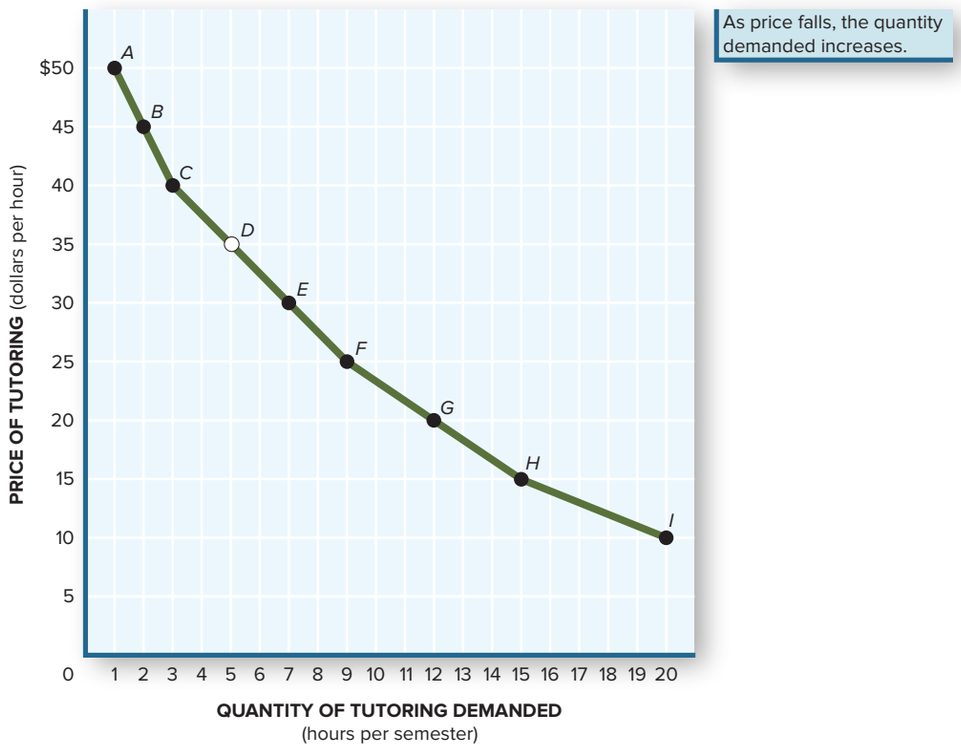


Figure 3.2 A Demand Schedule and Curve A **demand schedule** indicates the quantities of a good a consumer is able and willing to buy at alternative prices (*ceteris paribus*). The demand schedule indicates that Tom would buy five hours of web design tutoring per semester if the price were $35 per hour (row *D*). If tutoring were less expensive (rows *E*–*I*), Tom would purchase a larger quantity.

A **demand curve** is a graphical illustration of a demand schedule. Each point on the curve refers to a specific quantity that will be demanded at a given price. If the price of tutoring were $35 per hour, this curve tells us that Tom would purchase five hours of tutoring per semester (point *D*). Each point on the curve corresponds to a row in the above schedule. ■

demand curve
A curve describing the quantities of a good a consumer is willing and able to buy at alternative prices in a given time period, *ceteris paribus*.

A convenient summary of buying intentions is the **demand curve**, a graphical illustration of the demand schedule. The demand curve in Figure 3.2 tells us again that if the price of web design tutoring is $50 per hour (point *A*), this consumer is willing to pay for only one hour; if the price is $45 per hour (point *B*), he will pay for two hours; if the price is $40 per hour (point *C*), he will pay for three hours; and so on. Once we know what the market price of web tutoring actually is, a glance at the demand curve tells us how much service this consumer will buy.

What the notion of *demand* emphasizes is that the amount we buy of a good depends on its price. We seldom if ever decide to buy a certain quantity of a good at whatever price is charged. Instead we enter markets with a set of desires and a limited amount of money to spend. ***How much we actually buy of any good will depend on its price.***

law of demand
The quantity of a good demanded in a given time period increases as its price falls, *ceteris paribus*.

A common feature of demand curves is their downward slope. As the price of a good falls, people tend to purchase more of it. In Figure 3.2, the quantity of web tutorial services demanded increases (moves rightward along the horizontal axis) as the price per hour decreases (moves down the vertical axis). This inverse relationship between price and quantity is so common that we refer to it as the **law of demand**.

College administrators think the law of demand could be used to curb student drinking. Low retail prices and bar promotions encourage students to drink more alcohol. As the accompanying News Wire "Law of Demand" explains, higher prices would reduce the quantity of alcohol demanded.

NEWS WIRE LAW OF DEMAND

CAMPUS DRINKING AND ALCOHOL PRICES

Campus drinking is a common problem. And with that drinking comes a slew of problems, including traffic accidents, sexual assault, property crimes, and sexually transmitted diseases. One way to curb campus drinking is to increase the price of beer, wine, and booze. When the price of alcohol goes up, college students drink less. That's the conclusion from a Harvard survey of 22,831 students at 158 colleges. Students faced with a $1 increase above the average drink price of $2.17 will be 33 percent less likely to drink at all or as much. Dozens of other studies have confirmed that higher alcohol prices (e.g., via excise taxes) really do reduce campus drinking and its antisocial effects.

Source: News accounts.

NOTE: The law of demand predicts that the quantity demanded of any good—even beer and liquor—declines as its price increases.

Determinants of Demand

The demand curve in Figure 3.2 has only two dimensions—quantity demanded (on the horizontal axis) and price (on the vertical axis). This seems to imply that the amount of tutorial services demanded depends only on the price of that service. This is surely not the case. A consumer's willingness and ability to buy a product at various prices depend on a variety of forces. We call those forces *determinants of demand*. ***The determinants of market demand include***

- ***Tastes*** (desire for this and other goods).
- ***Income*** (of the consumer).
- ***Other goods*** (their availability and price).
- ***Expectations*** (for income, prices, tastes).
- ***Number of buyers***.

If Tom didn't have to pass a web design course, he would have no taste (desire) for web page tutoring and thus no demand. If he had no income, he would not have the ability to pay and

thus would still be out of the web design market. The price and availability of other goods affect the opportunity cost of tutoring services—that is, what Tom must give up. Expectations for income, grades, graduation prospects, and parental support also influence his willingness to buy such services.

Ceteris Paribus

ceteris paribus
The assumption that nothing else changes.

If demand is in fact such a multidimensional decision, how can we reduce it to only the two dimensions of price and quantity? This is the ***ceteris paribus*** trick we encountered earlier. To simplify their models of the world, economists focus on only one or two forces at a time and *assume* nothing else changes. We know a consumer's tastes, income, other goods, and expectations all affect the decision to buy web design services. But ***we focus on the relationship between quantity demanded and price.*** That is to say, we want to know what *independent* influence price has on consumption decisions. To find out, we must isolate that one influence, price, and assume that the determinants of demand remain unchanged.

The *ceteris paribus* assumption is not as far-fetched as it may seem. People's tastes (desires) don't change very quickly. Income tends to be fairly stable from week to week. Even expectations for the future are slow to change. Accordingly, the price of a good may be the only thing that changes on any given day. In that case, a change in price may be the only thing that prompts a change in consumer behavior.

Shifts in Demand

The determinants of demand do change, of course, particularly over time. Accordingly, ***the demand schedule and curve remain unchanged only so long as the underlying determinants of demand remain constant.*** If the *ceteris paribus* assumption is violated—if tastes, income, other goods, or expectations change—the ability or willingness to buy will change. When this happens, the demand curve will shift to a new position. This is referred to as a **shift in demand**.

Suppose, for example, that Tom wins $1,000 in the state lottery. This increase in his income would increase his ability to pay for tutoring services. Figure 3.3 shows the effect of this windfall on Tom's demand. The old demand curve, D_1, is no longer relevant. Tom's lottery winnings enable him to buy more tutoring services at any price. This is illustrated by the new demand curve, D_2. According to this new curve, lucky Tom is now willing and able to buy 11 hours of tutoring per semester at the price of $35 per hour (point d_2). This is a large increase in demand, as previously (before winning the lottery) he demanded only five hours at that price (point d_1).

With his higher income, Tom can buy more tutoring services at *every* price. Thus ***the entire demand curve shifts to the right when income goes up.*** Both the old (pre-lottery) and the new (post-lottery) demand curves are illustrated in Figure 3.3.

Income is only one of four basic determinants of demand. Changes in any of the other determinants of demand would also cause the demand curve to shift. Tom's taste for web design tutoring might increase dramatically, for example, if his other professors made the quality of personal web pages a critical determinant of course grades. His taste (desire) for web design services might increase even more if his parents promised to buy him a new car if he got an A in the course. Whatever its origins, ***an increase in taste (desire) or expectations also shifts the demand curve to the right.***

Other goods can also shift the demand curve. Hybrid vehicles became more popular when gasoline prices rose. The demand for gas-saving hybrids increased, while demand for gas guzzlers declined. The situation reversed itself in 2014–2016, when gasoline prices plummeted. Lower gasoline prices made electric vehicles (EVs) less attractive (see the News Wire "Shifts of Demand"). Sales of EVs declined, while sales of SUVs and trucks increased. The (leftward) shift in demand for EVs was caused by this decrease in the price of a substitute good. EV sales picked up again in 2018 when oil prices started rising.

NEWS WIRE SHIFTS OF DEMAND

LOW GAS PRICES HURT EV SALES

The price of gasoline is a major consideration for consumers deciding whether to buy an electric vehicle (EV) or a gasoline-fired vehicle. When gasoline prices are low, the lure of the EVs fades quickly. When gas prices fell sharply in 2014–2016, the hybrid share of California auto sales fell from 6.3 percent to 5.8 percent. Nationally, the impact was even more pronounced: EV sales declined by 13 percent while sales of gasoline-guzzling SUVs and pickup trucks rose by 37 and 41 percent, respectively. In 2018 the pattern reversed: Rising oil prices gave a boost to sales of EVs and slowed sales of gas guzzlers.

Source: News accounts of 2016–2018.

NOTE: Demand decreases (shifts left) when tastes diminish, the price of substitute goods declines, or income or expectations worsen. What happened here?

Movements versus Shifts

It is important to distinguish shifts of the demand curve from movements along the demand curve. ***Movements along a demand curve are a response to price changes for that good.*** Such movements assume that determinants of demand are unchanged. By contrast, ***shifts of the demand curve occur when the determinants of demand change.*** When tastes, income, other goods, or expectations are altered, the basic relationship between price and quantity demanded is changed (i.e., shifts).

For convenience, the distinction between movements along a demand curve and shifts of the demand curve have their own labels. Specifically, take care to distinguish

- ***Changes in quantity demanded:*** movements along a given demand curve in response to price changes of that good (such as from d_1 to d_2 in Figure 3.3).

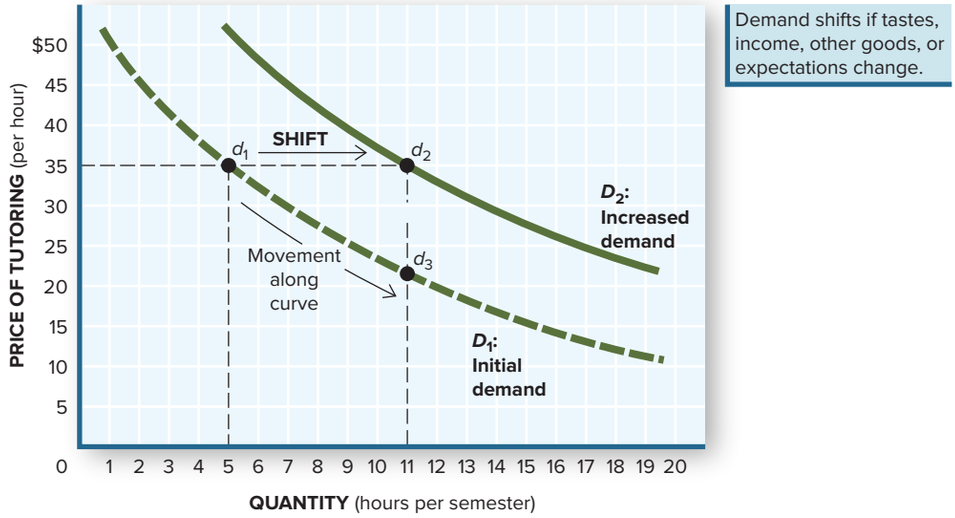


Figure 3.3 A Shift in Demand A demand curve shows how the quantity demanded changes in response to a change in price, *if* all else remains constant. But the determinants of demand may themselves change, causing the demand curve to *shift*.

In this case, an increase in income increases demand from D_1 to D_2. After this shift, Tom demands 11 hours (d_2), rather than 5 (d_1), at the price of $35. The quantity demanded at all other prices increases as well. ■

- ***Changes in demand:*** shifts of the demand curve due to changes in tastes, income, other goods, or expectations (such as from D_1 to D_2 in Figure 3.3).

The News Wire "Law of Demand" told how higher alcohol prices could reduce college drinking—pushing students up the demand curve to a smaller quantity demanded. College officials might also try to *shift* the entire demand curve leftward: If the penalties for campus drinking were increased, altered expectations might shift the demand curve to the left, causing students to buy less booze at any given price.

Tom's behavior in the web tutoring market is subject to similar influences. A change in the *price* of tutoring will move Tom up or down his demand curve. By contrast, a change in an underlying determinant of demand will shift his entire demand curve to the left or right.

Market Demand

The same forces that change an individual's consumption behavior also move entire markets. Suppose you wanted to assess the *market demand* for web tutoring services at Clearview College. To do that, you'd want to identify every student's demand for that service. Some students, of course, have no need or desire for professional web design services and are not willing to pay anything for such tutoring; they do not participate in the web design market. Other students have a desire for such services but not enough income to pay for them; they, too, are excluded from the web design market. A large number of students, however, not only have a need (or desire) for tutoring but also are willing and able to purchase such services.

market demand
The total quantities of a good or service people are willing and able to buy at alternative prices in a given time period; the sum of individual demands.

What we start with in product markets, then, is many individual demand curves. Then we combine all those individual demand curves into a single **market demand**. Suppose you would be willing to buy one hour of tutoring at a price of $80 per hour. George, who is also desperate to learn web design, would buy two hours at that price; and I would buy none, since my publisher (McGraw-Hill) creates a web page for me. What would our combined (market) demand for hours of design services be at that price? Our individual inclinations indicate that we would be willing to buy a total of three hours of tutoring if the price were $80 per hour. Our combined willingness to buy—our collective market demand—is nothing more than the sum of our individual demands. The same kind of aggregation can be performed for all the consumers in a particular market. The resulting ***market demand is determined by the number of potential buyers and their respective tastes, incomes, other goods, and expectations.***

The Market Demand Curve

Figure 3.4 provides a market demand schedule and curve for a situation in which only three consumers participate in the market. The three individuals who participate in this market obviously differ greatly, as suggested by their respective demand schedules. Tom *has* to pass his web design classes or confront college and parental rejection. He also has a nice allowance (income), so he can afford to buy a lot of tutorial help. His demand schedule is portrayed in the first column of the table in Figure 3.4 (and is identical to the one we examined in Figure 3.2). George, as we already noted, is also desperate to acquire some job skills and is willing to pay relatively high prices for web design tutoring. His demand is summarized in the second column under "Quantity of Tutoring Demanded."

The third consumer in this market is Lisa. Lisa already knows the nuts and bolts of web design, so she doesn't have much need for tutorial services. She would like to upgrade her skills, however, especially in animation and e-commerce applications. But her limited budget precludes paying a lot for help. She will buy some technical support only if the price falls to $30 per hour. Should tutors cost less, she'd even buy quite a few hours of design services.

The differing personalities and consumption habits of Tom, George, and Lisa are expressed in their individual demand schedules and associated curves, as depicted in Figure 3.4. To determine the *market* demand for tutoring services from this information, we simply add up these three separate demands. The end result of this aggregation is, first, a *market* demand

schedule (the last column in the table) and, second, the resultant *market* demand curve (the curve in Figure 3.4*d*). These market summaries describe the various quantities of tutoring services that Clearview College students are *willing and able* to purchase each semester at various prices.

Market Demand Schedule

	Price per Hour	Quantity of Tutoring Demanded (Hours per Semester)				
		Tom	+ George	+ Lisa	=	Total Quantity Demanded
A	$50	1	4	0		5
B	45	2	6	0		8
C	40	3	8	0		11
D	35	5	11	0		16
E	30	7	14	1		22
F	25	9	18	3		30
G	20	12	22	5		39
H	15	15	26	6		47
I	10	20	30	7		57

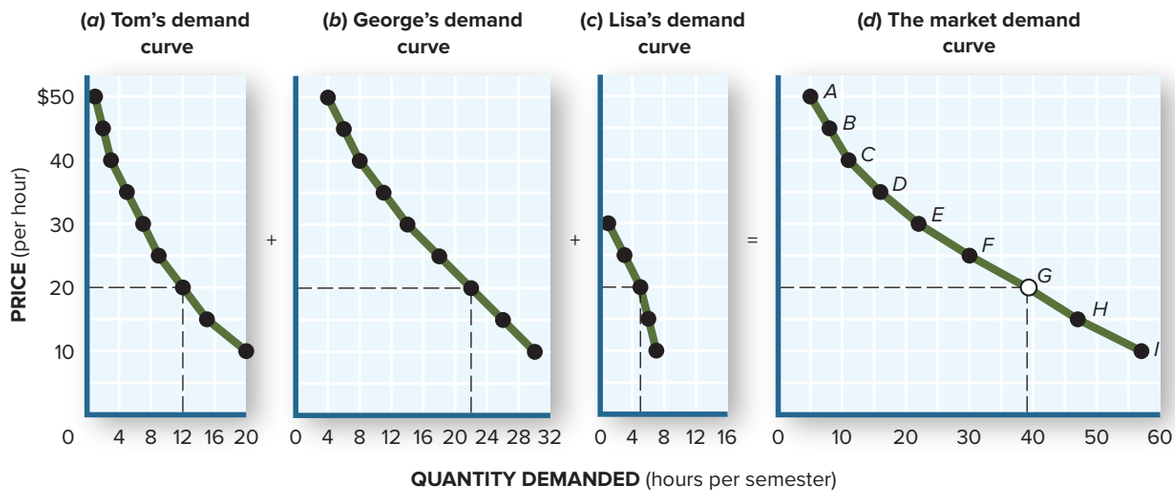


Figure 3.4 The Market Demand Schedule and Construction of the Market Demand Curve Market demand represents the combined demands of all market participants. To determine the total quantity of tutoring demanded at any given price, we add up the separate demands of the individual consumers. Row *G* of this demand schedule indicates that a *total* quantity of 39 hours of service per semester will be demanded at a price of $20 per hour. The market demand curve illustrates the same information. At a price of $20 per hour, the total quantity of web design services demanded would be 39 hours per semester (point *G*): 12 hours demanded by Tom, 22 by George, and 5 by Lisa. As price declines, the quantity demanded increases (the law of demand). ■

The Use of Demand Curves

So why does anybody care what the market demand curve looks like? What's the point of doing all this arithmetic and drawing so many graphs?

If you were a web designer at Clearview College, you'd certainly like to have the information depicted in Figure 3.4. What the market demand curve tells us is how much tutoring service could be sold at various prices. Suppose you hoped to sell 30 hours at a price of $30 per hour. According to Figure 3.4*d* (point *E*), students will buy only 22 hours at that price. Hence, you won't attain your sales goal. You could find that out by posting ads on campus and waiting for a response. It would be a lot easier, however, if you knew in advance what the market demand curve looked like.

Would this many fans show up if concert prices were higher?

©Frank Micelotta/Getty Images

People who promote music concerts need the same kind of information. They want to fill the stadium with screaming fans. But fans have limited income and desires for other goods. Accordingly, the number of fans who will buy concert tickets depends on the price. If the promoter sets the price too high, there will be lots of empty seats at the concert. If the price is set too low, the promoter will confront hoards of frustrated fans and may lose potential sales revenue. What the promoter wants to know is what price will induce the desired quantity demanded. If the promoter could consult a demand curve, the correct price would be evident.

SUPPLY

Even if we knew what the demand for every good looked like, we couldn't predict what quantities would be bought. The demand curve tells us only how much consumers are willing and able to buy at specific prices. We don't know the price yet, however. To find out what price will be charged, we've got to know something about the behavior of people who *sell* goods and services. That is to say, we need to examine the *supply* side of the marketplace. The **market supply** of a good reflects the collective behavior of all firms that are willing and able to sell that good at various prices.

market supply
The total quantities of a good that sellers are willing and able to sell at alternative prices in a given time period, *ceteris paribus.*

Determinants of Supply

Let's return to the Clearview campus for a moment. What we need to know now is how much web tutorial services people are willing and able to provide. Web page design can be fun, but it can also be drudge work, especially when you're doing it for someone else. Software programs like PhotoShop, Flash, and Muse have made web page design easier and more creative. But teaching someone else to design web pages is still work. So few people offer to supply web services just for the fun of it. Web designers do it for money. Specifically, they do it to earn income that they, in turn, can spend on goods and services they desire.

How much income must be offered to induce web designers to do a job depends on a variety of things. The ***determinants of market supply include***

- ***Technology.***
- ***Factor costs.***
- ***Other goods.***
- ***Taxes and subsidies.***
- ***Expectations.***
- ***Number of sellers.***

The technology of web design, for example, is always getting easier and more creative. With a program like PageOut, for example, it's very easy to create a basic web page. A continuous stream of new software programs (e.g., Fireworks, Dreamweaver) keeps stretching the possibilities for graphics, animation, interactivity, and content. These technological advances mean that web design services can be supplied more quickly and cheaply. They also make *teaching* web design easier. As a result, they induce people to supply more web design services at every price.

How much tutoring is offered at any given price also depends on the cost of factors of production. If the software programs needed to create web pages are cheap (or, better yet, free!), web designers can afford to charge lower prices. If the required software inputs are expensive, however, they will have to charge more money per hour for their services.

Other goods can also affect the willingness to supply web design services. If you can make more income waiting tables than you can designing web pages, why would you even boot up the computer? As the prices paid for other goods and services change, they will influence people's decisions about whether to offer web services.

In the real world, the decision to supply goods and services is also influenced by the long arm of Uncle Sam. Federal, state, and local governments impose taxes on income earned in the marketplace. When tax rates are high, people get to keep less of the income they earn. Some people may conclude that tutoring is no longer worth the hassle and withdraw from the market.

Expectations are also important on the supply side of the market. If web designers expect higher prices, lower costs, or reduced taxes, they may be more willing to learn new software programs. On the other hand, if they have poor expectations about the future, they may just find something else to do.

Finally, the *number* of available web designers will affect the quantity of service offered for sale at various prices. If there are lots of willing web designers on campus, a large quantity of tutoring services will be available.

The Market Supply Curve

law of supply
The quantity of a good supplied in a given time period increases as its price increases, *ceteris paribus*.

Figure 3.5 illustrates the market supply curve of web services at Clearview College. Like market demand, the market supply curve is the sum of all the individual supplier decisions about how much output to produce at any given price. The market supply curve slopes upward to the right, indicating that ***larger quantities will be offered at higher prices.*** This basic **law of supply** reflects the fact that increased output typically entails higher costs and so will be forthcoming only at higher prices. Higher prices may also increase profits and so entice producers to supply greater quantities.

Note that Figure 3.5 illustrates the *market* supply. We have not bothered to construct separate supply curves for each person who is able and willing to supply web services on the Clearview campus. We have skipped that first step and gone right to the *market* supply curve. Like the market demand curve, however, the market supply curve is based on the supply decisions of individual producers. The curve itself is computed by adding up the quantities each producer is willing and able to supply at every given price. Point *f* in Figure 3.5 tells us that those individuals are collectively willing and able to produce 90 hours of tutoring per semester at a price of $30 per hour. The rest of the points on the supply curve tell us how many hours of tutoring will be offered at other prices.

None of the points on the market supply curve (Figure 3.5) tell us how much tutoring service is actually being sold. ***Market supply is an expression of sellers' intentions, of the ability and willingness to sell, not a statement of actual sales.*** My next-door neighbor may be *willing* to sell his 1996 Honda Civic for $6,000, but it is most unlikely that he will ever find a buyer at that price. Nevertheless, his *willingness* to sell his car at that price is part of the *market supply* of used cars.

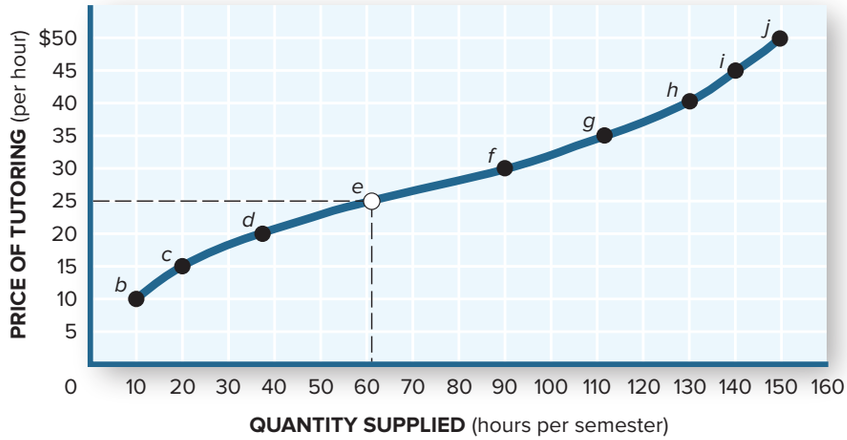


Figure 3.5 The Market Supply Curve The market supply curve indicates the *combined* sales intentions of all market participants. If the price of tutoring were $25 per hour (point *e*), the *total* quantity of tutoring service supplied would be 62 hours per semester. This quantity is determined by adding together the supply decisions of all individual producers.

Shifts in Supply

As with demand, there is nothing sacred about any given set of supply intentions. Supply curves *shift* when the underlying determinants of supply change. Thus we again distinguish

- ***Changes in quantity supplied:*** movements along a given supply curve.
- ***Changes in supply:*** shifts of the supply curve.

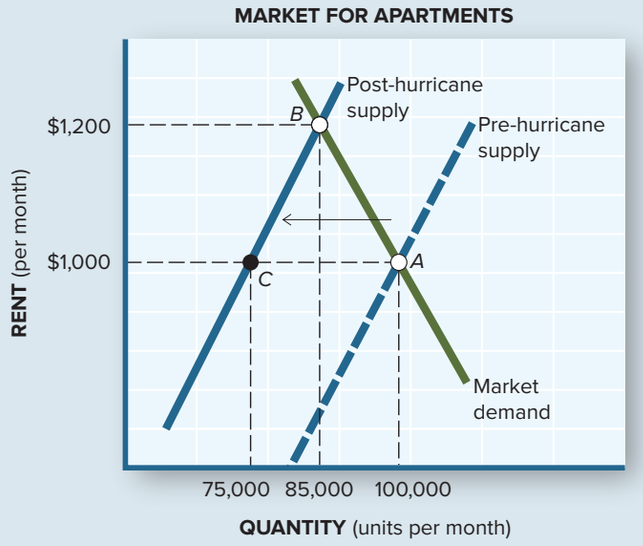
Our Latin friend *ceteris paribus* is once again the decisive factor. If the price of tutoring services is the only thing changing, then we can ***track changes in quantity supplied along the supply curve*** in Figure 3.5. But if *ceteris paribus* is violated—if technology, factor costs, other goods, taxes, or expectations change—then ***changes in supply are illustrated by shifts of the supply curve.*** The News Wire "Supply Shift" illustrates how Hurricane Harvey caused a leftward shift in the supply of Houston-area apartments, pushing rents higher.

NEWS WIRE SUPPLY SHIFT

RENTS RISING IN HURRICANE'S WAKE

Houston. Hurricane Harvey wiped out a massive chunk of the Houston-area housing stock. FEMA estimates that 203,000 homes were damaged and 12,700 destroyed. Somewhere between 15,000 and 20,000 apartment units suffered a similar fate. That damage created a severe imbalance in the housing market: more people seeking new housing and fewer units available. Local realtors say this imbalance has pushed apartment rents up by 15–20 percent.

©Dieter Spears/Getty Images



Source: News accounts of August–September 2017.

NOTE: If an underlying determinant of supply changes, the entire supply curve shifts. A hurricane reduced the available supply of apartments, causing rents to spike.

EQUILIBRIUM

equilibrium price
The price at which the quantity of a good demanded in a given time period equals the quantity supplied.

We now have the tools to determine the price and quantity of web tutoring services being sold at Clearview College. The market supply curve expresses the *ability and willingness* of producers to *sell* web services at various prices. The market demand curve illustrates the *ability and willingness* of Tom, George, and Lisa to *buy* web services at those same prices. When we put the two curves together, we see that ***only one price and quantity are compatible with the existing intentions of both buyers and sellers.*** This **equilibrium price** occurs at the intersection of the two curves in Figure 3.6. Once it is established, web tutoring services will cost $20 per hour. At that price, campus web designers will sell a total of 39 hours of tutoring service per semester—exactly the same amount that students wish to buy at that price.

Market Clearing

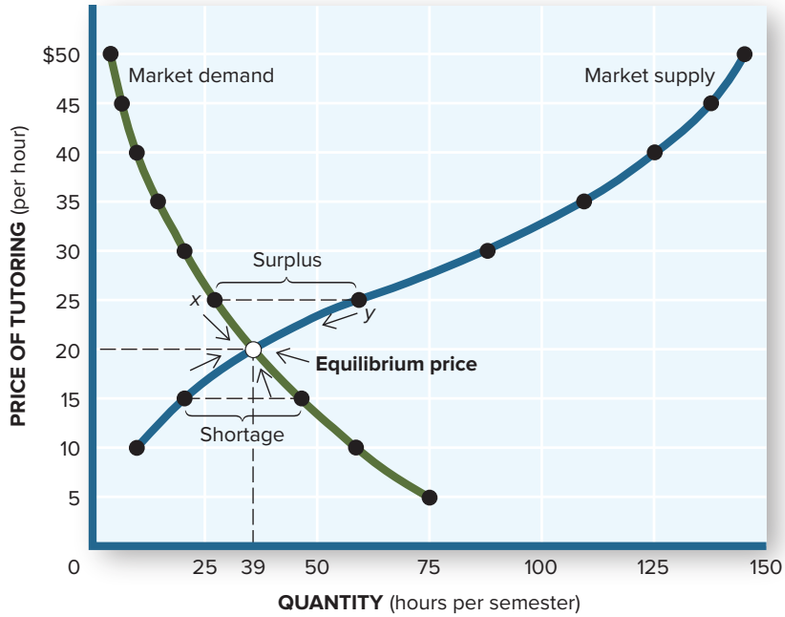
An equilibrium doesn't imply that everyone is happy with the prevailing price or quantity. Notice in Figure 3.6, for example, that some students who want to buy web tutoring don't get any. These would-be buyers are arrayed along the demand curve *below* the equilibrium. Because the price they are *willing* to pay is less than the equilibrium price, they don't get any tutoring.

Likewise, there are would-be sellers in the market who don't sell as much tutoring services as they might like. These people are arrayed along the supply curve *above* the equilibrium. Because they insist on being paid a price that is higher than the equilibrium price, they don't actually sell anything.

Although not everyone gets full satisfaction from the market equilibrium, that unique outcome is efficient. ***The equilibrium price and quantity reflect a compromise between buyers and sellers. No other compromise yields a quantity demanded that is exactly equal to the quantity supplied.***

THE INVISIBLE HAND

The equilibrium price is not determined by any single individual. Rather it is determined by the collective behavior of many buyers and sellers, each acting out his or her own demand or supply schedule. It is this kind of impersonal price determination that gave rise to Adam Smith's characterization of the market mechanism as the "invisible hand." In attempting to explain how the market mechanism works, the famed eighteenth-century economist noted a certain feature of market prices. The market behaves as if some unseen force (the invisible hand) were examining each individual's supply or demand schedule, then selecting a price that ensured an equilibrium. In practice, the process of price determination is not so mysterious; rather, it is a simple one of trial and error.



Price per Hour	Quantity Supplied (Hours per Semester)		Quantity Demanded (Hours per Semester)
$50	148		5
45	140		8
40	125	Market	11
35	114	surplus	16
30	90		22
25	62		30
20	39	**Equilibrium**	39
15	20	Market	47
10	10	shortage	57

Figure 3.6 Market Equilibrium Only at equilibrium is the quantity demanded equal to the quantity supplied. In this case, the **equilibrium price** is $20 per hour, and 39 hours is the **equilibrium quantity.**
At above-equilibrium prices, a market surplus exists—the quantity supplied exceeds the quantity demanded. At prices below equilibrium, a market shortage exists.
The intersection of the demand and supply curves determines the equilibrium price and output in this market. ■

Market Shortage

market shortage
The amount by which the quantity demanded exceeds the quantity supplied at a given price; excess demand.

Suppose for the moment that someone were to spread the word on the Clearview campus that tutors were available at only $15 per hour. At that price Tom, George, and Lisa would be standing in line to get help with their web classes, but campus web designers would not be willing to supply the quantity desired at that price. As Figure 3.6 confirms, at $15 per hour, the quantity demanded (47 hours per semester) would exceed the quantity supplied (20 hours per semester). In this situation, we speak of a **market shortage**—that is, an excess of quantity demanded over quantity supplied. At a price of $15 an hour, the shortage amounts to 27 hours of web service.

When a market shortage exists, not all consumer demands can be satisfied. Some people who are *willing* to buy tutoring services at the going price ($15) will not be able to do so. To assure themselves of good grades, Tom, George, Lisa, or some other consumer may offer to pay a *higher* price, thus initiating a move up the demand curve of Figure 3.6. The higher prices offered will in turn induce other enterprising students to offer more web tutoring, thus ensuring an upward movement along the market supply curve. Thus a higher price tends to call forth a greater quantity supplied, as reflected in the upward-sloping supply curve. Notice, again, that the *desire* to tutor web design has not changed: only the quantity supplied has responded to a change in price.

The accompanying News Wire "Market Shortage" illustrates what happens when tickets to special events are priced below equilibrium. In this case, it was the visit of Pope Francis to New York City in September 2015. Millions of Catholics and others wanted get a glimpse of the Pope. But there was limited room along the parade route and in Central Park where the Pope would speak. So, how to accommodate the throngs who wanted to see the Pope? The church decided to distribute 40,000 pairs of tickets to the faithful, in a sort of lottery. The lucky winners got tickets for free. The losers? They were willing to *pay* for those tickets. So, a *market* in papal tickets arose instantaneously, with "free" tickets priced as high as $3,000. The "scalpers" who were reselling tickets were blessed with huge profits. Had the tickets been priced at the market equilibrium initially, there wouldn't have been such an opportunity for scalping.

NEWS WIRE MARKET SHORTAGE

©Giulio Napolitano/Shutterstock

SCALPERS PROFITING GREATLY FROM POPE'S VISIT

New York. Pope Francis' visit to New York City was a blessed event. It was also a blessed opportunity for ticket scalpers. 93,000 New Yorkers applied for tickets to watch the Pope's procession through Central Park. But church officials had only 40,000 tickets to distribute, which they did by lottery—for free. That left 53,000 New Yorkers without tickets. It was a scalper's heaven. Sinful resellers immediately started hawking tickets online. The free tickets were simply mailed in a PDF to lottery winners, with no ID required, making them easy to resell. Scalped tickets sold for as much as $3,000 a pair. Although Church officials urged scalpers to repent, the opportunity for profit was irresistible.

Source: News accounts of September 2015.

NOTE: A below-equilibrium price creates a market shortage. When that happens, another method of distributing tickets—like scalping or time in line—must be used to determine who gets the available tickets.

A similar but less dramatic situation occurred when the iPhone 7 and 7 Plus were released in September 2016. At the initial list price of $649 for the 32GB model of the iPhone 7 and $769 for the 7 Plus, the quantity demanded greatly exceeded the quantity supplied (see the News Wire "Market Shortage"). To get one of the first iPhone 7s, people either had to wait for weeks or pay a premium price in resale markets like eBay or Craigslist.

NEWS WIRE MARKET SHORTAGE

APPLE iPHONE 7 SELLS OUT: SHIPPING DELAYS EXPECTED

The new iPhone 7 was supposed to hit store shelves on September 16, but the shelves were mostly empty. Apple reported that online orders—which began at 3:01 a.m. ET on September 9 in 28 nations—have already absorbed all available inventory of the iPhone 7 Plus and nearly all of the smaller iPhone 7s. The entry-level iPhone 7 is priced at $649, and the larger iPhone 7 Plus starts out at $769. Both phones offer better cameras than their predecessors, as well as water resistance, a faster processor, an improved home button, and new colors. The new jet-black version of the 7 Plus is especially popular and now has a seven- to eight-week shipping delay. The basic iPhone 7 has a two- to three-week delay as Apple ramps up production to meet the high demand.

Source: News accounts of September 9–20, 2016.

NOTE:If price is below equilibrium, the quantity demanded exceeds the quantity supplied. Consumers who were willing to pay the announced price of $649 for an iPhone 7 didn't necessarily get one.

Market Surplus

market surplus
The amount by which the quantity supplied exceeds the quantity demanded at a given price; excess supply.

A very different sequence of events occurs when a market surplus exists. Suppose for the moment that the web designers at Clearview College believed tutoring services could be sold for $25 per hour rather than the equilibrium price of $20. From the demand and supply schedules depicted in Figure 3.6, we can foresee the consequences. At $25 per hour, campus web designers would be offering more web tutoring services (point *y*) than Tom, George, and Lisa would be willing to buy at that price (point *x*). A **market surplus** of web services would exist, in that more tutoring was being offered for sale (supplied) than students cared to purchase (demanded) at the available price.

As Figure 3.6 indicates, at a price of $25 per hour, a market surplus of 32 hours per semester exists. Under these circumstances, campus web designers would be spending many idle hours at their computers, waiting for customers to appear. Their waiting will be in vain because the quantity of tutoring demanded will not increase until the price of tutoring falls. That is the clear message of the demand curve. The tendency of quantity demanded to increase as price falls is illustrated in Figure 3.6 by a movement along the demand curve from point *x* to lower prices and greater quantity demanded. As we move down the market demand curve, the desire for tutoring does not change, but the quantity of people who are able and willing to buy increases. Web designers at Clearview would have to reduce their price from $25 (point *y*) to $20 per hour in order to attract enough buyers.

U2 learned the difference between market shortage and surplus the hard way. Cheap tickets ($28.50) for its 1992 concerts not only filled up every concert venue but left thousands of fans clamoring for entry. The group began another tour in April 1997, with scheduled concerts in 80 cities over a period of 14 months. This time around, however, U2 was charging as much as $52.50 a ticket—nearly double the 1992 price. By the time it got to the second city, the group was playing in stadiums with lots of empty seats. The apparent market surplus led critics to label the 1997 PopMart tour a disaster. For its 2009, 360° Tour, U2 offered festival seating for only $30 and sold out every performance. By this process of trial and error, U2 ultimately located the equilibrium price for its concerts.

What we observe, then, is that ***whenever the market price is set above or below the equilibrium price, either a market surplus or a market shortage will emerge***. To overcome a surplus or shortage, buyers and sellers will change their behavior. Only at the *equilibrium* price will no further adjustments be required.

Business firms can discover equilibrium market prices by trial and error. If they find that consumer purchases are not keeping up with production, they may conclude that price is above the equilibrium. To get rid of their accumulated inventory, they will have to lower their prices (by a grand end-of-year sale, perhaps). In the happy situation where consumer purchases are outpacing production, a firm might conclude that its price was a trifle too low and give it a nudge upward. In either case, the equilibrium price can be established after a few trials in the marketplace.

Taylor Swift adopted this strategy for her 2018 "Reputation" tour. Earlier concerts had sold out within days of their announcement. Then thousands of tickets were resold on StubHub and other resale sites at much higher prices. Taylor concluded that she was pricing her tickets too low, permitting scalpers to take a big chunk of ticket revenue. For her Reputation tour, she chose "dynamic" pricing. That meant starting out with prices so high that scalpers couldn't make a resale profit. Then adjusting prices lower, moving down the demand curve and filling up the stadiums. In the early weeks of ticket sales, this strategy left thousands of tickets unsold. Critics began to assert that Taylor's popularity was waning and that her concerts would prove disastrous. But the strategy proved to be a success, with sales and attendance breaking all previous records. Trial and error worked in this case.

Changes in Equilibrium

The collective actions of buyers and sellers will quickly establish an equilibrium price for any product. ***No equilibrium price is permanent,*** however. The equilibrium price established in the Clearview College web services market, for example, was the unique outcome of specific demand and supply schedules. Those schedules are valid for only a certain time and place. They will rule the market only so long as the assumption of *ceteris paribus* holds.

In reality, tastes, incomes, the price and availability of other goods, or expectations could change at any time. When this happens, *ceteris paribus* will be violated, and the demand curve will have to be redrawn. Such a shift of the demand curve will lead to a new equilibrium price and quantity. Indeed, ***the equilibrium price will change whenever the supply or demand curve shifts.***

DEMAND SHIFTS

We can illustrate how equilibrium prices change by taking one last look at the Clearview College web services market. Our original supply and demand curves, together with the resulting equilibrium point (point E_1), are depicted in Figure 3.7. Now suppose that the professors at Clearview begin requiring more technical expertise in their web design courses. These increased course requirements will affect market demand. Tom, George, and Lisa will suddenly be willing to buy more web tutoring at every price than they were before. That is to say, the *demand* for web services will increase. We represent this increased demand by a rightward *shift* of the market demand curve, as illustrated in Figure 3.7.

Note that the new demand curve intersects the (unchanged) market supply curve at a new price (point E_2); the equilibrium price is now $30 per hour. This new equilibrium price will persist until either the demand curve or the supply curve shifts again.

SUPPLY AND DEMAND SHIFTS

Even more dramatic price changes may occur when *both* demand and supply shift. Suppose the demand for tutoring increased at the same time supply decreased. With demand shifting right and supply shifting left, the price of tutoring would jump.

The kinds of price changes described here are quite common. A few moments in a stockbroker's office or a glance through the stock pages of the daily newspaper should be testimony enough to the fluid character of market prices. If thousands of stockholders decide to sell Facebook shares tomorrow, you can be sure that the market price of that stock will drop. Notice how often other prices—in the grocery store, in the music store, or at the gas station—change. Then determine whether it was supply, demand, or both curves that shifted.

DISEQUILIBRIUM PRICING

The ability of the market to achieve an equilibrium price and quantity is evident. Nevertheless, people are often unhappy with those outcomes. At Clearview College, the students buying tutoring services feel that the price of such services is too high. On the other hand, campus web designers may feel that they are getting paid too little for their tutorial services.

Price Ceilings

Sometimes consumers are able to convince the government to intervene on their behalf by setting a limit on prices. In many cities, for example, poor people and their advocates have convinced local governments that rents are too high. High rents, they argue, make housing prohibitively expensive for the poor, leaving them homeless or living in crowded,

Figure 3.7 A New Equilibrium A rightward shift of the demand curve indicates that consumers are willing and able to buy a larger quantity at every price. As a consequence, a new equilibrium is established (point E_2), at a higher price and greater quantity. A shift of the demand curve occurs only when the assumption of *ceteris paribus* is violated—when one of the determinants of demand changes.

The equilibrium would also be altered if the determinants of supply changed, causing a shift of the market supply curve. ■

price ceiling
Upper limit imposed on the price of a good or service.

unsafe quarters. They ask government to impose a *limit* on rents in order to make housing affordable for everyone. Two hundred local governments—including New York City, Boston, Washington, DC, and San Francisco—have responded with rent controls. In all cases, rent controls are a **price ceiling**—an upper limit imposed on the price of a good or service.

Rent controls have a very visible effect in making housing more affordable. But such controls are *disequilibrium* prices and will change housing decisions in less visible and unintended ways. Figure 3.8 illustrates the problem. In the absence of government intervention, the quantity of housing consumed (q_e) and the prevailing rent (p_e) would be established by the intersection of market supply and demand curves (point *E*). Not everyone would be housed to his or her satisfaction in this equilibrium. Some of those people on the low end of the demand curve (below p_e) simply do not have enough income to pay the equilibrium rent p_e. They may be living with relatives or roommates they would rather not know. Or in extreme cases, they may even be homeless.

To remedy this situation, the city government imposes a rent ceiling of p_c. This lower price seemingly makes housing more affordable for everyone, including the poor. At the controlled rent p_c, people are willing and able to consume a lot more housing: The quantity *demanded* increases from q_e to q_d at point *A*.

But what about the quantity of housing *supplied*? Rent controls do not increase the number of housing units available. On the contrary, price controls tend to have the opposite effect. Notice in Figure 3.8 how the quantity *supplied* falls from q_e to q_s when the rent ceiling is enacted. When the quantity supplied slides down the supply curve from point *E* to point *B*, less housing is available than there was before.

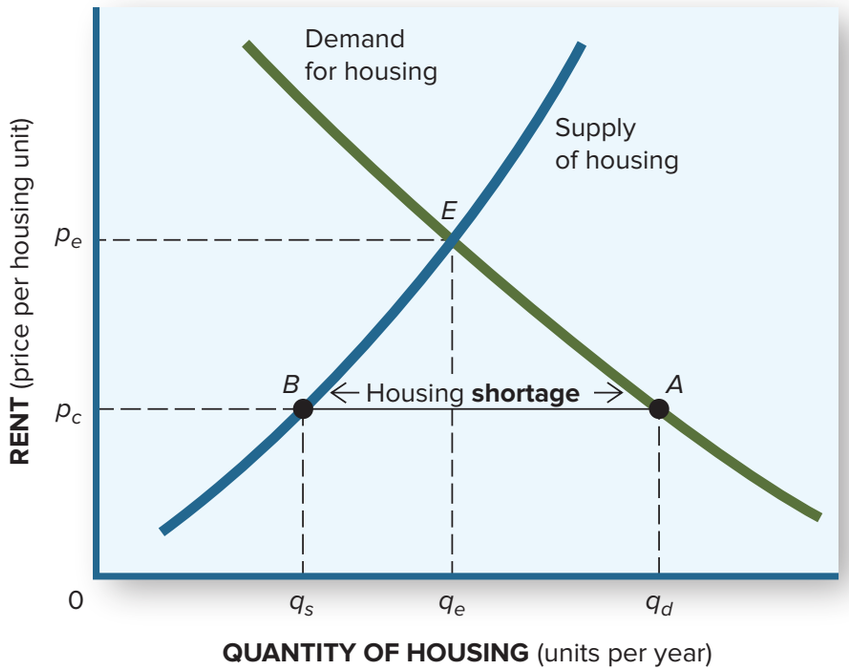


Figure 3.8 Price Ceilings Create Shortages Many cities impose rent controls to keep housing affordable. Consumers respond to the below-equilibrium price ceiling (p_c) by demanding more housing (q_d vs. q_e). But the quantity of housing supplied diminishes as landlords convert buildings to other uses (e.g., condos) or simply let rental units deteriorate. New construction also slows. The result is a housing shortage ($q_d - q_s$) and an actual reduction in available housing ($q_e - q_s$). ■

Thus ***price ceilings have three predictable effects; they***

- ***Increase the quantity demanded.***
- ***Decrease the quantity supplied.***
- ***Create a market shortage.***

You may well wonder where the "lost" housing went. The houses did not disappear. Some landlords simply decided that renting their units was no longer worth the effort. They chose, instead, to sell the units, convert them to condominiums, or even live in them themselves. Other landlords stopped maintaining their buildings, letting the units deteriorate. The rate of new construction slowed too, as builders decided that rent control made new construction less profitable. Slowly but surely the quantity of housing declines from q_e to q_s. Hence, ***imposing rent controls to make housing more affordable for some means there will be less housing for all.***

Figure 3.8 illustrates another problem. The rent ceiling p_c has created a housing shortage—a gap between the quantity demanded (q_d) and the quantity supplied (q_s). Who will get the increasingly scarce housing? The market would have settled this FOR WHOM question by permitting rents to rise and allocating available units to those consumers willing and able to pay the rent p_e. Now, however, rents cannot rise, and we have lots of people clamoring for housing that is not available. A different method of distributing goods must be found. Vacant units will go to those who learn of them first, patiently wait on waiting lists, or offer a gratuity to the landlord or renting agent. In New York City, where rent control has been the law for 80 years, people "sell" their rent-controlled apartments when they move elsewhere.

Price Floors

price floor
Lower limit imposed on the price of a good or service.

Artificially high (above-equilibrium) prices create similar problems in the marketplace. A **price floor** is a minimum price imposed by the government for a good or service. The objective is to raise the price of the good and create more income for the seller. Federal minimum wage laws, for example, forbid most employers from paying less than $7.25 an hour for labor.

Price floors are also common in the farm sector. To stabilize farmers' incomes, the government offers price guarantees for certain crops. The government sets a price guarantee of 18.75 cents per pound for domestically grown cane sugar. If the market price of sugar falls below 18.75 cents, the government promises to buy at the guaranteed price. Hence farmers know they can sell their sugar for 18.75 cents per pound, regardless of market demand.

Figure 3.9 illustrates the consequences of this price floor. The price guarantee (18.75¢) lies above the equilibrium price p_e (otherwise it would have no effect). At that higher price, farmers supply more sugar (q_s versus q_e). However, consumers are not willing to buy that much sugar: at that price they demand only the quantity q_d. Hence the ***price floor has three predictable effects: It***

- ***Increases the quantity supplied.***
- ***Reduces the quantity demanded.***
- ***Creates a market surplus.***

government failure
Government intervention that fails to improve economic outcomes.

In 2018 the government-guaranteed price (18.75¢) was 9 cents above the world price. That may not sound like a big difference, but it amounts to over $2 billion a year for U.S. consumers. At that higher price U.S. cane and beet sugar growers are willing to supply far more sugar than consumers demand. To prevent such a market surplus, the federal government sets limits on sugar production—and decides who gets to grow it. This is a classic case of **government failure**: Society ends up with the wrong mix of output (too much sugar), an increased tax burden (to pay for the surplus), an altered distribution of income (enriched sugar growers)—and a lot of political favoritism.

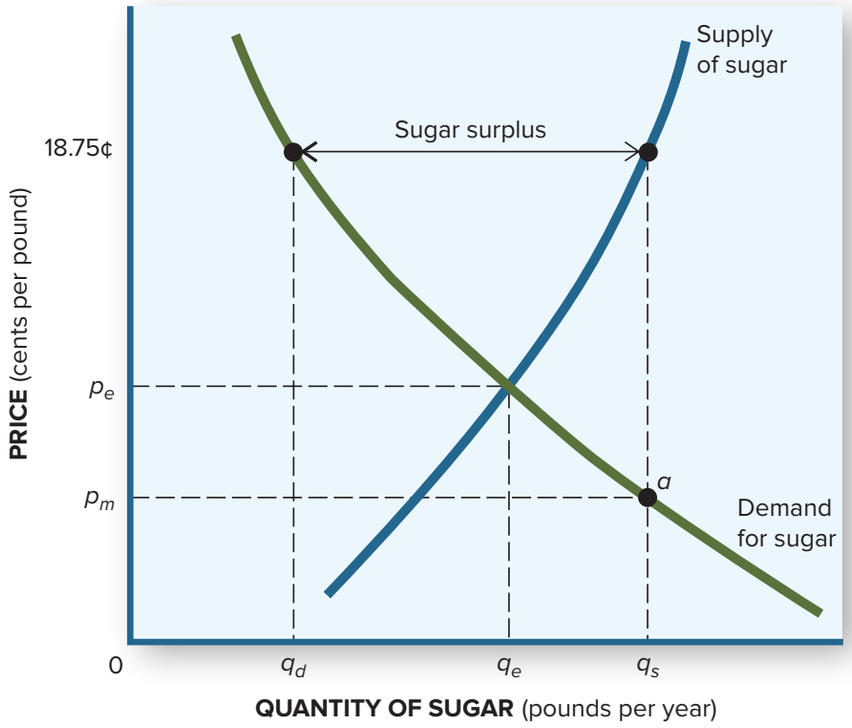


Figure 3.9 Price Floors Create Surplus The U.S. Department of Agriculture sets a minimum price for sugar at 18.75 cents. If the market price drops below 18.75 cents, the government will buy the resulting surplus. Farmers respond by producing the quantity q_s. Consumers would purchase the quantity q_s, however, only if the market price dropped to p_m (point *a* on the demand curve). The government thus has to purchase and store the surplus ($q_s - q_d$). ■

Laissez Faire

laissez faire
The doctrine of "leave it alone," of nonintervention by government in the market mechanism.

The apparent inefficiencies of price ceilings and floors imply that market outcomes are best left alone. This is a conclusion reached long ago by Adam Smith, the founder of modern economic theory. In 1776 he advocated a policy of **laissez faire**—literally, "leave it alone." As he saw it, the market mechanism was an efficient procedure for allocating resources and distributing incomes. The government should set and enforce the rules of the marketplace, but otherwise not interfere. Interference with the market—through price ceilings, floors, or other regulation—was likely to cause more problems than it could hope to solve.

market mechanism
The use of market prices and sales to signal desired outputs (or resource allocations).

The policy of laissez faire is motivated not only by the potential pitfalls of government intervention but also by the recognition of how well the market mechanism can work. Recall our visit to Clearview College, where the price and quantity of tutoring services had to be established. There was no central agency that set the price of tutoring service or determined how much tutoring service would be provided at Clearview College. Instead both the price of web services and its quantity were determined by the **market mechanism**—the interactions of many independent (decentralized) buyers and sellers.

WHAT, HOW, FOR WHOM

Notice how the market mechanism resolved the basic economic questions of WHAT, HOW, and FOR WHOM. The WHAT question refers to how much web tutoring to include in society's mix of output. The answer at Clearview College was 39 hours per semester. This

decision was not reached in a referendum but instead in the market equilibrium (see Figure 3.6). In the same way, but on a larger scale, millions of consumers and a handful of auto producers decide to include 17 million cars and trucks in each year's mix of output.

The market mechanism will also determine HOW these goods are produced. Profit-seeking producers will strive to produce web services and automobiles in the most efficient way. They will use market prices to decide not only WHAT to produce but also what resources to use in the production process.

Finally, the invisible hand of the market will determine who gets the goods produced. At Clearview College, who got tutorial help in web design? Only those students who were willing and able to pay $20 per hour for that service. FOR WHOM are all those automobiles produced each year? The answer is the same: Consumers who are willing and able to pay the market price for a new car.

OPTIMAL, NOT PERFECT

Not everyone is happy with these answers, of course. Tom would like to pay only $10 an hour for web tutoring. And some of the Clearview students do not have enough income to buy any assistance. They think it is unfair that they have to master web design on their own while richer students can have someone tutor them. Students who cannot afford cars are even less happy with the market's answer to the FOR WHOM question.

Although the outcomes of the marketplace are not perfect, they are often *optimal*. Optimal outcomes are the best possible given the level and distribution of incomes and scarce resources. In other words, we expect the choices made in the marketplace to be the best possible choices for each participant. Why do we draw such a conclusion? Because Tom and George and everyone else in our little Clearview College drama had (and continue to have) absolute freedom to make their own purchase and consumption decisions. And also because we assume that sooner or later they will make the choices they find most satisfying. The results are thus *optimal* in the sense that everyone has done as well as can be expected, given his or her income and talents.

The optimality of market outcomes provides a powerful argument for laissez faire. In essence, the laissez faire doctrine recognizes that decentralized markets not only work but also give individuals the opportunity to maximize their satisfaction. In this context, government interference is seen as a threat to the attainment of the "right" mix of output and other economic goals. Since its development by Adam Smith in 1776, the laissez faire doctrine has had a profound impact on the way the economy functions and what government does (or doesn't do).

POLICY PERSPECTIVES

CAP WATER PRICES IN NATURAL DISASTERS?

Hurricane Harvey was the second most costly natural disaster in the United States since 1900. When it slammed into the Houston area in August 2017, it destroyed thousands of homes, forced the evacuation of nearly 40,000 people, and caused massive flooding. It also damaged 10 water systems, temporarily cutting off water to thousands of homes and businesses. Bottled water became the only option for thousands of people.

The market response to the water crisis was predictable: The price of bottled water skyrocketed overnight. A bottle of water that cost $1 before Harvey struck was selling for $7–$9 a day later.

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Consumers accused retailers of profiteering from the natural disaster and demanded that the government intervene to outlaw "price gouging." Church groups and nonprofit organizations said it was immoral to hit consumers with such outrageous price hikes on a truly essential commodity. The Consumer Protection Division of the Texas Attorney General's office received more than 500 complaints of price gouging in the first few days of Harvey's aftermath.

Economists cautioned the attorney general about intervening. They said the high price of water would help solve the water crisis more quickly, for two reasons. First, the high price would induce consumers to use water as sparingly as possible. Second, that high price of water in the Houston area would induce sellers to truck in more water from Louisiana and other states. In other words, the high price would move consumers up the market demand curve and water companies up the market supply curve. Within days, more bottled water became available and prices eased.

What would have happened if the government had capped the price of bottle water at $1? Who would have gotten the water? Would the quantity supplied have increased?

CHAPTER 3 REVIEW

SUMMARY

- Consumers, business firms, government agencies, and foreigners participate in the marketplace by offering to buy or sell goods and services, or factors of production. Participation is motivated by the desire to maximize utility (consumers), profits (business firms), or the general welfare (government agencies). **LO1**
- All interactions in the marketplace involve the exchange of either factors of production or finished products. Although the actual exchanges can take place anywhere, we say that they take place in product markets or factor markets, depending on what is being exchanged. **LO1**
- People who are willing and able to buy a particular good at some price are part of the market demand for that product. All those who are willing and able to sell that good at some price are part of the market supply. Total market demand or supply is the sum of individual demands or supplies. **LO2**
- Supply and demand curves illustrate how the quantity demanded or supplied changes in response to a change in the price of that good. Demand curves slope downward; supply curves slope upward. **LO2**
- The determinants of market demand include the number of potential buyers and their respective tastes (desires), incomes, other goods, and expectations. If any of these determinants change, the demand curve shifts. Movements along a demand curve are induced only by a change in the price of that good. **LO4**
- The determinants of market supply include technology, factor costs, other goods, taxes, expectations, and the number of sellers. Supply shifts when these underlying determinants change. **LO4**
- The quantity of goods or resources actually exchanged in each market depends on the behavior of all buyers and sellers, as summarized in market supply and demand curves. At the point where the two curves intersect, an equilibrium price—the price at which the quantity demanded equals the quantity supplied—will be established. **LO3**
- A distinctive feature of the market equilibrium is that it is the only price–quantity combination that is acceptable to buyers and sellers alike. At higher prices, sellers supply more than buyers are willing to purchase (a market surplus); at lower prices, the amount demanded exceeds the quantity supplied (a market shortage). Only the equilibrium price clears the market. **LO3**
- Price ceilings and floors are disequilibrium prices imposed on the marketplace. Such price controls create an imbalance between quantities demanded and supplied. **LO5**
- The market mechanism is a device for establishing prices and product and resource flows. As such, it may be used to answer the basic economic questions of WHAT to produce, HOW to produce it, and FOR WHOM. Its apparent efficiency prompts the call for laissez faire—a policy of government nonintervention in the marketplace. **LO3**

TERMS TO REMEMBER

Define the following terms:

market
factor market
product market
barter
supply
demand
opportunity cost
demand schedule
demand curve
law of demand
ceteris paribus
shift in demand
market demand
market supply
law of supply
equilibrium price
market shortage
market surplus
price ceiling
price floor
government failure
laissez faire
market mechanism

QUESTIONS FOR DISCUSSION

1. What does the supply and demand for human kidneys look like? If a market in kidneys were legal, who would get them? How does a law prohibiting kidney sales affect the quantity of kidney transplants or their distribution? **LO2**
2. In the web tutoring market, what forces might cause **LO4**
   a. a rightward shift of demand?
   b. a leftward shift of demand?
   c. a rightward shift of supply?
   d. a leftward shift of supply?
   e. an increase in the equilibrium price?
3. Did the price of tuition at your school change this year? What might have caused that? **LO3**
4. Illustrate the market shortage for tickets to the Pope's New York City procession (see the News Wire "Market Shortage"). **LO5**
5. How does a reduction in the price of concert tickets affect
   a. the quantity of tickets demanded?
   b. the desire of fans for tickets? **LO2**
6. When concert tickets are priced below equilibrium, who gets them? Is this distribution of tickets fairer than a pure market distribution? Is it more efficient? Who gains or loses if all the tickets are resold (scalped) at the market-clearing price? **LO5**
7. Is there a shortage of on-campus parking at your school? How might the shortage be resolved? **LO5**
8. If rent controls are so counterproductive, why do cities impose them? How else might the housing problems of poor people be solved? **LO5**
9. Why did Apple set the initial price of the iPhone 7 below equilibrium (see the News Wire "Market Shortage")? Should Apple have immediately raised the price? **LO5**
10. **POLICY PERSPECTIVES** In the wake of Hurricane Harvey, gasoline prices doubled at many locations, with prices reaching as high as $20 per gallon. Who got gas at those prices? Should the government have put a lid on prices? If it did, who would have gotten the available gasoline? **LO5**

PROBLEMS

1. Using the "new demand" in Figure 3.7 as a guide, determine the size of the market surplus or shortage that would exist at a price of (*a*) $40 (*b*) $20 **LO5**
2. Based on the News Wire "Supply Shift," **LO3**, **LO5**
   a. what is the initial (pre-hurricane) equilibrium rent per month?
   b. how large is the pre-hurricane shortage?

c. what is the post-hurricane equilibrium rent?
d. what is the pre-hurricane equilibrium quantity?
e. what is the post-hurricane equilibrium quantity?
f. how large is the post-hurricane shortage at the pre-hurricane equilibrium rent?

3. According to the News Wire "Market Shortage," **LO5**
   a. how large was the market shortage at the Church-set price of $0?
   b. if the Church had sold the tickets for $100, how would have quantity demanded changed? (increased, decreased, not changed)
   c. if the Church sold the tickets for $100, would the market shortage been larger or smaller?
   d. if the Church sold the tickets for the equilibrium price, would a market shortage exist?
4. In September 2014 Apple was selling a gold version of the 128GB iPhone 6 for $949. Two days later that phone was advertised on eBay for a starting bid of $1,625. **LO5**
   a. Was this evidence of a market shortage or a market surplus?
   b. Graph this situation.
5. Given the following data, **LO2**
   a. complete the following tables;
   b. construct market supply and demand curves;
   c. identify the equilibrium price; and
   d. identify the amount of shortage or surplus that would exist at a price of $4.

Participant	Quantity Demanded (per Week)				
Price	$5	$4	$3	$2	$1
Demand side					
Al	1	2	3	4	5
Betsy	1	2	2	2	3
Casey	2	2	3	3	4
Daisy	2	3	4	4	6
Eddie	2	2	2	3	5
Market total	___	___	___	___	___

Participant	Quantity Supplied (per Week)				
Price	$5	$4	$3	$2	$1
Supply side					
Firm A	3	3	3	3	3
Firm B	7	5	4	4	2
Firm C	6	4	3	3	1
Firm D	6	5	4	3	0
Firm E	4	3	3	3	2
Market total	___	___	___	___	___

6. If a product becomes more popular, **LO4**
   a. Which curve will shift?
   b. Along which curve will price and quantity move?

   At the new equilibrium price, will
   c. price
   d. quantity be higher or lower?
7. Which curve shifts, and in what direction, when the following events occur in the domestic car market? **LO4**
   a. The U.S. economy falls into a recession.
   b. U.S. autoworkers go on strike.
   c. Imported cars become more expensive.
   d. The price of gasoline increases.
8. Assume the following data describe the gasoline market: **LO3**

Price per gallon	$3.50	3.25	3.00	2.75	2.50	2.25	2.00
Quantity demanded	30	31	32	33	34	35	36
Quantity supplied	36	34	32	30	28	26	24

   a. Graph the demand and supply curves.
   b. What is the equilibrium price?
   c. If supply at every price is reduced by 6 gallons, what will the new equilibrium price be?
   d. If the government freezes the price of gasoline at its initial equilibrium price, how much of a surplus or shortage will exist when supply is reduced as described in part *c*?
9. Using the News Wire "Law of Demand," answer the following questions: **LO2**
   a. According to the News Wire, what would be the response of students to a tax on alcohol that raises the price of alcoholic drinks by $1?
   b. Graph the response of students to higher alcohol prices.
10. If the equilibrium price for tickets to a Taylor Swift concert is $100 each, and she sells them for $80, **LO5**
    a. does she create a market surplus or shortage?
    b. Suppose scalpers buy 10,000 tickets and resell them for $100 each. How much profit do the scalpers earn?
11. **POLICY PERSPECTIVES** Hurricane Harvey damaged water systems, cutting off water to thousands in Houston. **LO5**
    a. What was the immediate impact on demand for bottled water?
    b. If the government capped the price of bottled water at $1, what would have happened?