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Macroeconomics

Fifth Edition

R. Glenn Hubbard
Columbia University

Anthony Patrick O'Brien
Lehigh University

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For Constance, Raph, and Will
—*R. Glenn Hubbard*

For Cindy, Matthew, Andrew, and Daniel
—*Anthony Patrick O'Brien*

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ABOUT THE AUTHORS



Glenn Hubbard, policymaker, professor, and researcher.

R. Glenn Hubbard is the dean and Russell L. Carson Professor of Finance and Economics in the Graduate School of Business at Columbia University and professor of economics in Columbia's Faculty of Arts and Sciences. He is also a research associate of the National Bureau of Economic Research and a director of Automatic Data Processing, Black Rock Closed-End Funds, KKR Financial Corporation, and MetLife. He received his Ph.D. in economics from Harvard University in 1983. From 2001 to 2003, he served as chairman of the White House Council of

Economic Advisers and chairman of the OECD Economic Policy Committee, and from 1991 to 1993, he was deputy assistant secretary of the U.S. Treasury Department. He currently serves as co-chair of the nonpartisan Committee on Capital Markets Regulation. Hubbard's fields of specialization are public economics, financial markets and institutions, corporate finance, macroeconomics, industrial organization, and public policy. He is the author of more than 100 articles in leading journals, including *American Economic Review*, *Brookings Papers on Economic Activity*, *Journal of Finance*, *Journal of Financial Economics*, *Journal of Money, Credit, and Banking*, *Journal of Political Economy*, *Journal of Public Economics*, *Quarterly Journal of Economics*, *RAND Journal of Economics*, and *Review of Economics and Statistics*. His research has been supported by grants from the National Science Foundation, the National Bureau of Economic Research, and numerous private foundations.



Tony O'Brien, award-winning professor and researcher.

Anthony Patrick O'Brien is a professor of economics at Lehigh University. He received his Ph.D. from the University of California, Berkeley, in 1987. He has taught principles of economics for more than 15 years, in both large sections and small honors classes. He received the Lehigh University Award for Distinguished Teaching. He was formerly the director of the Diamond Center for Economic Education and was named a Dana Foundation Faculty Fellow and Lehigh Class of 1961 Professor of Economics. He has been a visiting professor at the University of

California, Santa Barbara, and the Graduate School of Industrial Administration at Carnegie Mellon University. O'Brien's research has dealt with issues such as the evolution of the U.S. automobile industry, the sources of U.S. economic competitiveness, the development of U.S. trade policy, the causes of the Great Depression, and the causes of black–white income differences. His research has been published in leading journals, including *American Economic Review*, *Quarterly Journal of Economics*, *Journal of Money, Credit, and Banking*, *Industrial Relations*, *Journal of Economic History*, and *Explorations in Economic History*. His research has been supported by grants from government agencies and private foundations.

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FLEXIBILITY CHART

The following chart helps you organize your syllabus based on your teaching preferences and objectives:

Core	Optional	Policy
Chapter 1: Economics: Foundations and Models	Chapter 1 Appendix: Using Graphs and Formulas	
Chapter 2: Trade-offs, Comparative Advantage, and the Market System		
Chapter 3: Where Prices Come From: The Interaction of Demand and Supply		
	Chapter 4 Appendix: Quantitative Demand and Supply Analysis	Chapter 4: Economic Efficiency, Government Price Setting, and Taxes
		Chapter 5: The Economics of Health Care
	Chapter 6: Firms, the Stock Market, and Corporate Governance	
	Chapter 6 Appendix: Tools to Analyze Firms' Financial Information	
Chapter 7: Comparative Advantage and the Gains from International Trade		
Chapter 8: GDP: Measuring Total Production and Income		
Chapter 9: Unemployment and Inflation		
Chapter 10: Economic Growth, the Financial System, and Business Cycles		
Chapter 11: Long-Run Economic Growth: Sources and Policies		

Core	Optional	Policy
	Chapter 12: Aggregate Expenditure and Output in the Short Run	
	Chapter 12 Appendix: The Algebra of Macroeconomic Equilibrium	
Chapter 13: Aggregate Demand and Aggregate Supply Analysis		
	Chapter 13 Appendix: Macroeconomic Schools of Thought	
Chapter 14: Money, Banks, and the Federal Reserve System		
		Chapter 15: Monetary Policy
	Chapter 16 Appendix: A Closer Look at the Multiplier	Chapter 16: Fiscal Policy
		Chapter 17: Inflation, Unemployment, and Federal Reserve Policy
	Chapter 18: Macroeconomics in an Open Economy	
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PREFACE

Our approach in this new edition remains what it was in the first edition, published more than 10 years ago: To provide students and instructors with an economics text that delivers complete economics coverage with many real-world business examples. Our goal has been to teach economics in a “widget-free” way by using real-world business and policy examples. We are gratified by the enthusiastic response from students and instructors who used the first four editions of this book, which has made it one of the best-selling economic textbooks in the world. Much has happened, though, in the U.S. and world economies since we prepared the previous edition. We have incorporated many of these developments in the new real-world examples used in this edition.

New to the Fifth Edition

While our basic approach of placing applications in the forefront of the discussion remains the same, this new edition has been thoroughly revised. One exciting new addition is the significant expansion of the digital resources available to students and instructors with either the e-text version of the book or the MyEconLab supplement to the printed text.

New digital features located in MyEconLab

MyEconLab is a unique online course management, testing, and tutorial resource. It is included with the e-text version of the book or as a supplement to the print book. Students and instructors will find the following new online resources to accompany the fifth edition:

- **Videos:** There are approximately 65 *Making the Connection* features in the book that provide real-world reinforcement of key concepts. Each feature is now accompanied by a short video of the author explaining the key point of that *Making the Connection*. Each video is less than two minutes long and includes visuals, such as new photos or graphs, that are not in the main book. The goal of these videos is to summarize key content and bring the applications to life. Related assessment is included with each video. Our experience is that many students benefit from this type of online learning and assessment is embedded in each video.
- **Concept Checks:** Each section of each learning objective concludes with an online Concept Check that contains one or two multiple choice, true/false, or fill-in questions. These checks act as “speed bumps” that encourage students to stop and check their understanding of fundamental terms and concepts before moving on to the next section. The goal of this digital resource is to help students assess their progress on a section-by-section basis, so they can be better prepared for homework, quizzes, and exams.
- **Animations:** Graphs are the backbone of introductory economics, but many students struggle to understand and work with them. Each numbered figure in the text has a supporting animated version online. The goal of this digital resource is to help students understand shifts in curves, movements along curves, and changes in equilibrium values. Having an animated version of a graph helps students who have difficulty interpreting the static version found in the printed text. Graded practice exercises are included with the animations. Our experience is that many students benefit from this type of online learning.
- **Interactive Solved Problems:** Many students have difficulty applying economic concepts to solving problems. The goal of this digital resource is to help students overcome this hurdle by giving them a model of how to solve an economic problem by breaking it down step by step. Each *Solved Problem* in the printed text is accompanied by a similar problem online, so students can have more practice and build their problem-solving skills. These interactive tutorials help students learn to think like economists and apply basic problem-solving skills to homework, quizzes, and exams. The goal is for students to build skills they can use to analyze real-world economic issues they hear and read about in the news. Each

Solved Problem in MyEconLab and the digital eText also includes at least one additional graded practice exercise for students.

- **Graphs Updated with Real-Time Data from FRED:** Select graphs are continuously updated online with the latest available data from FRED (Federal Reserve Economic Data), which is a comprehensive, up-to-date data set maintained by the Federal Reserve Bank of St. Louis. Students can display a pop-up graph that shows new data plotted in the graph. The goal of this digital feature is to help students understand how to work with data and understand how including new data affects graphs.
- **Interactive Problems and Exercises Updated with Real-Time Data from FRED:** The end-of-chapter problems in most chapters include real-time data exercises that use the latest data from FRED. The goal of this digital feature is to help students become familiar with this key data source, learn how to locate data, and develop skills in interpreting data.

Summary of Changes to Chapters

- Chapter 5, “The Economics of Health Care,” was introduced in the fourth edition and proved popular with instructors and students. In revising the chapter for this edition, we added several new demand and supply graphs. Our purpose was to make the content more analytical and to make the chapter more effective as an example of applied demand and supply analysis. We also extensively updated the discussion of the debate over President Obama’s Patient Protection and Affordable Care Act.
- Chapter 8, “GDP: Measuring Total Production and Income,” includes a new discussion of the 2013 revisions to how GDP is calculated. Included is a new *Making the Connection*, “Adding More of Lady Gaga to GDP,” that illustrates the new treatment by the Bureau of Economic Analysis of spending on research and development, including spending on the preparation of artistic works.
- Chapter 11, “Long-Run Economic Growth: Sources and Policies,” includes a new section on “Is the United States Headed for Another Productivity Slowdown?” Several economists have recently made pessimistic forecasts of future U.S. growth rates. This new section helps students understand that important debate.
- Chapter 13, “Aggregate Demand and Aggregate Supply Analysis,” includes new coverage of the Austrian model in the chapter appendix on macroeconomic schools of thought.
- Chapter 14, “Money, Banks, and the Federal Reserve System,” includes a revised discussion of open market operations. Responding to the requests of several instructors, we now illustrate open markets using T-accounts.
- Chapter 15, “Monetary Policy,” includes a new section on “Fed Forecasts.” The disappointing pace of recovery from the 2007–2009 recession has led to increased interest in macroeconomic forecasting. In this new section, and elsewhere in the new edition, we have expanded coverage of this topic.
- Chapter 16, “Fiscal Policy,” has a revised discussion—including a new figure—on the debate over the 2009 stimulus package.
- Chapter 19, “The International Financial System,” has a revised discussion of the current state of the euro, including a new *Making the Connection*, “Why Did Iceland Recover So Quickly from the Financial Crisis?”

Other Changes to Chapters

- All companies in the chapter openers have been either replaced with new companies or updated with current information.
- Chapters 1–4 include new An Inside Look newspaper articles and analyses to help students apply economic thinking to current events and policy debates. Additional newspaper articles and analysis are updated weekly on [MyEconLab](#).

- There are 19 new Making the Connection features to help students tie economic concepts to current events and policy issues.
- There are 4 new *Solved Problems*. This feature helps students break down and answer an economic problem down step by step.
- To make room for the new content described earlier, we have cut approximately 14 *Making the Connections* and 4 *Solved Problems* from the previous edition and transferred them to the book's Instructor's Manual where they are available for instructors who wish to continue using them.
- Figures and tables have been updated, using the latest data available.
- Many of the end-of-chapter problems have been either replaced or updated. To most chapters, we have added one or two new problems that include a graph for students to analyze. Select chapters have a new category entitled *Real-Time-Data Exercises*.
- Finally, we have gone over the text literally line by line, tightening the discussion, re-writing unclear points, and making many other small changes. We are grateful to the many instructors and students who made suggestions for improvements in the previous edition. We have done our best to incorporate as many of those suggestions as possible.

New Chapter Openers, Making the Connections, Solved Problems, and Inside Looks

Here are the new or heavily revised chapter-opening business cases and accompanying *Inside Look* newspaper articles. The business or issue introduced in the chapter opener is revisited within the chapter in either a *Making the Connection* feature or a *Solved Problem* feature. The following are the features new to this edition. Please see the detailed table of contents for the list of features for all chapters.

Chapter 1, “Economics: Foundations and Models,” opens with a new discussion of why some doctors are leaving private practice and closes with *An Inside Look* newspaper article and analysis of how technology, such as the smartphone, may change the way doctors and patients will interact.

Chapter 2, “Trade-offs, Comparative Advantage, and the Market System,” opens with a new discussion of the manufacturing decisions facing managers at Tesla Motors and closes with *An Inside Look* that discusses how managers at Mercedes-Benz face those same decisions. New *Solved Problem 2.1* asks students to use a production possibilities frontier to analyze some of the choices managers at Tesla Motors face. This chapter also has a new *Making the Connection* on comparative advantage and housework.

Chapter 3, “Where Prices Come From: The Interaction of Demand and Supply,” opens with a new discussion of the market for smartphones and closes with *An Inside Look* about challenges Google and Apple face in this market. This chapter has three new *Making the Connections*: “Forecasting the Demand for iPhones,” “Are Tablet Computers Substitutes for E-Readers?” and “Coke and Pepsi Are Hit by U.S. Demographics.”

Chapter 4, “Economic Efficiency, Government Price Setting, and Taxes,” opens with a new discussion of how the sharing economy for rooms affects rent control policy and closes with *An Inside Look* about how the sharing economy affects efficiency.

Chapter 5, “The Economics of Health Care,” opens with a new discussion of how much businesses and employees pay for health insurance and the role of the Patient Protection and Affordable Care Act of 2010. New *Solved Problem 5.3* explores whether young, healthy people should buy health insurance. The chapter includes new Figure 5.4 on the externalities of vaccinations and new Figure 5.8 on the third-party payer system. It also includes a *Making the Connection* on how paying for health insurance affects the competitiveness of U.S. firms.

Chapter 6, “Firms, the Stock Market, and Corporate Governance,” opens with a new discussion of the benefits and costs of becoming a publicly owned firm. *New Solved Problem 6.2* explores whether a CEO should also be a chairman of the board of the same firm. There’s also a new *Making the Connection* that explores the performance of Facebook’s stock.

Chapter 7, “Comparative Advantage and the Gains from International Trade,” opens with a new discussion of the U.S. tariff on Chinese tires. The chapter includes a new *Making the Connection* on how the tire tariff affected Goodyear and a new *Making the Connection* on how the tariff affected the wider economy.

Chapter 8, “GDP: Measuring Total Production and Income,” opens with updated coverage of how the business cycle affects Ford Motor Company and includes a new *Making the Connection* about the 2013 changes to how the Bureau of Economic Analysis calculates GDP.

Chapter 9, “Unemployment and Inflation,” opens with a discussion of Caterpillar’s 2013 decision to lay off workers and includes a new *Making the Connection* on how to categorize those unemployed workers. A new *Solved Problem 9.5* explores how to calculate changes in real wages at Caterpillar.

Chapter 10, “Economic Growth, the Financial System, and Business Cycles,” opens with a discussion of how the business cycle affects appliance maker Whirlpool and includes a new section on the effect of the business cycle on Whirlpool. The chapter includes a new *Making the Connection* on growth rates in India.

Chapter 11, “Long-Run Economic Growth: Sources and Policies,” covers the increase in General Motors’ sales in China and the company’s plans to increase production capacity in that country. The chapter includes a new section on the pessimistic growth forecasts of some economists.

Chapter 12, “Aggregate Expenditure and Output in the Short Run,” opens with an updated opener on how fluctuating demand for computers affected Intel and includes a new *Making the Connection* on Intel moving into the market for perceptual computing and a new *Making the Connection* on how to account for iPhone imports.

Chapter 13, “Aggregate Demand and Aggregate Supply Analysis,” opens with an updated discussion of Federal Express and includes a new *Making the Connection* on why wages are sticky. The appendix includes a new discussion of the Austrian model.

Chapter 14, “Money, Banks, and the Federal Reserve System,” opens with a new discussion of the use of U.S. dollars in Zimbabwe and includes a new *Making the Connection* about the new online currency, Bitcoin. The discussion of open market operations now uses T-accounts.

Chapter 15, “Monetary Policy,” opens with a new discussion of how Federal Reserve policy affects businesses. The chapter includes a new section, including a new Table 15.1, on Federal Reserve forecasts, and a new figure showing movements in housing prices and rents.

Chapter 16, “Fiscal Policy,” opens with an updated discussion of whether government spending increases employment centered on the Tutor-Saliba construction company. The chapter includes new Figure 16.14 on the effect of the 2009 stimulus package on federal revenues and expenditures.

Chapter 17, “Inflation, Unemployment, and Federal Reserve Policy,” opens with a new discussion of monetary policy centered on the Parker Hannifin Corporation. The chapter includes a new *Making the Connection* on the debate over quantitative easing.

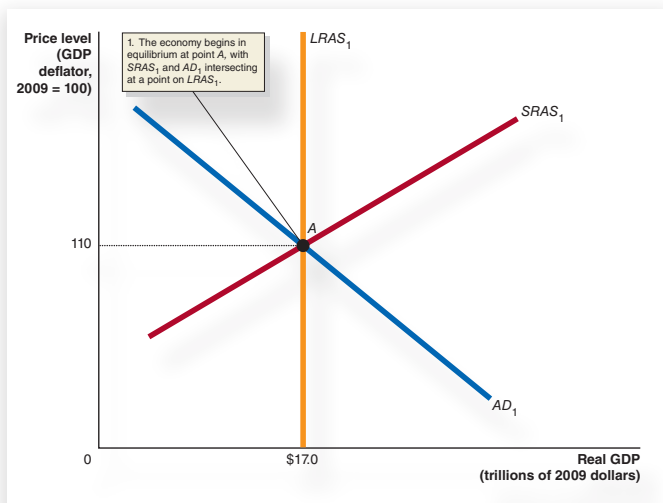
Chapter 18, “Macroeconomics in an Open Economy,” opens with an updated discussion of why a strong U.S. dollar hurts McDonald’s profits and includes a new *Making the Connection* on how a strong yen affects profits at Japanese companies.

Chapter 19, “The International Financial System,” opens with a new discussion about how Volkswagen deals with fluctuating exchange rates and includes a new *Making the Connection* about how Iceland recovered from the financial crisis of 2007–2009.

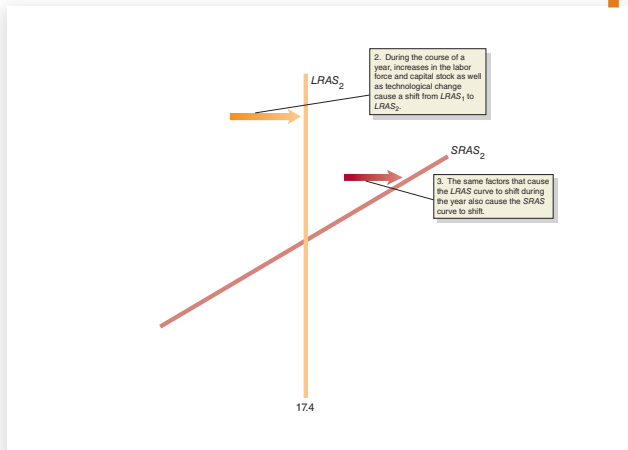
The Foundation: Contextual Learning and Modern Organization

Students come to study macroeconomics with a strong interest in understanding events and developments in the economy. We try to capture that interest and develop students’ economic intuition and understanding. We present macroeconomics in a way that is modern and based in the real world of business and economic policy. And we believe we achieve this presentation without making the analysis more difficult. We avoid the recent trend of using simplified versions of intermediate models, which are often more detailed and complex than what students need to understand the basic macroeconomic issues. Instead, we use a more realistic version of the familiar aggregate demand and aggregate supply model to analyze short-run fluctuations and monetary and fiscal policy. We also avoid the “dueling schools of thought” approach often used to teach macroeconomics at the principles level. We emphasize the many areas of macroeconomics where most economists agree. And we present throughout real business and policy situations to develop students’ intuition. Here are a few highlights of our approach to macroeconomics:

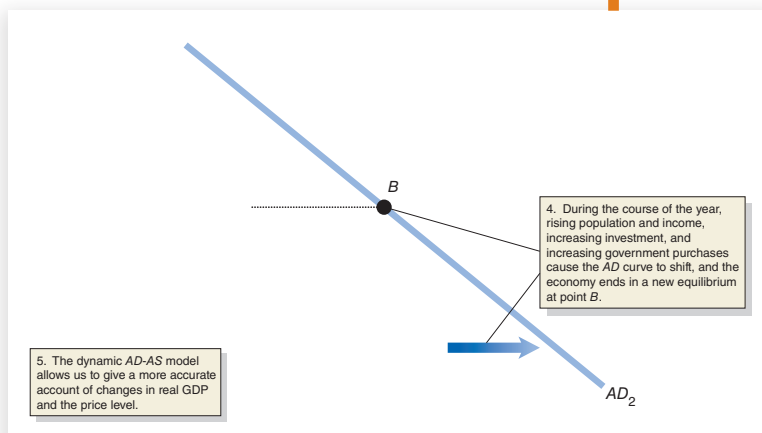
- **A broad discussion of macro statistics.** Many students pay at least some attention to the financial news and know that the release of statistics by federal agencies can cause movements in stock and bond prices. A background in macroeconomic statistics helps clarify some of the policy issues encountered in later chapters. In Chapter 8, “GDP: Measuring Total Production and Income,” and Chapter 9, “Unemployment and Inflation,” we provide students with an understanding of the uses and potential shortcomings of the key macroeconomic statistics, without getting bogged down in the minutiae of how the statistics are constructed. So, for instance, we discuss the important differences between the payroll survey and the household survey for understanding conditions in the labor market. We explain why financial markets react more strongly to news from the payroll survey. We provide a discussion of the employment–population ratio, which is not covered in some other books, but is regarded by many economists as a key measure of labor market performance. Chapter 15, “Monetary Policy,” discusses why the Federal Reserve prefers to measure inflation using the personal consumption expenditures price index rather than the consumer price index.
- **Early coverage of long-run topics.** We place key macroeconomic issues in their long-run context in Chapter 10, “Economic Growth, the Financial System, and Business Cycles,” and Chapter 11, “Long-Run Economic Growth: Sources and Policies.” Chapter 10 puts the business cycle in the context of underlying long-run growth and discusses what actually happens during the phases of the business cycle. We believe this material is important if students are to have the understanding of business cycles they will need to interpret economic events; this material is often discussed only briefly or omitted entirely in other books. We know that many instructors prefer to have a short-run orientation to their macro courses, with a strong emphasis on policy. Accordingly, we have structured Chapter 10 so that its discussion of long-run growth would be sufficient for instructors who want to move quickly to short-run analysis. Chapter 11 uses a simple neoclassical growth model to explain important growth issues. We apply the model to topics such as the decline of the Soviet economy, the long-run prospects for growth in China, the implications of the slowdown in productivity growth for the U.S. economy, and the failure of many developing countries to sustain high growth rates. And we challenge students with the discussion “Why Isn’t the Whole World Rich?”



The first acetate overlay adds the shifts in the long- and short-run aggregate supply curves.



The second acetate overlay adds the shifts in the aggregate demand curve to complete the dynamic model.



- A dynamic model of aggregate demand and aggregate supply.** We take a fresh approach to the standard aggregate demand and aggregate supply ($AD-AS$) model. We realize there is no good, simple alternative to using the $AD-AS$ model when explaining movements in the price level and in real GDP. But we know that more instructors are dissatisfied with the $AD-AS$ model than with any other aspect of the macro principles course. The key problem, of course, is that $AD-AS$ is a static model that attempts to account for dynamic changes in real GDP and the price level. Our approach retains the basics of the $AD-AS$ model but makes it more accurate and useful by making it more dynamic. We emphasize two points: First, changes in the position of the short-run (upward-sloping) aggregate supply curve depend mainly on the state of expectations of the inflation rate. Second, the existence of growth in the economy means that the long-run (vertical) aggregate supply curve shifts to the right every year. This “dynamic” $AD-AS$ model provides students with a more accurate understanding of the causes and consequences of fluctuations in real GDP and the price level. Chapter 13, “Aggregate Demand and Aggregate Supply Analysis,” includes a three-layer, full-color acetate for the key introductory dynamic $AD-AS$ graph (Figure 13.8, “A Dynamic Aggregate Demand and Aggregate Supply Model,” on page 435 and reproduced on the right). We created this acetate to help students see how the graph builds step by step and to help make the graph easier for instructors to present. The acetate will help instructors who want to use dynamic $AD-AS$ in class but believe the model needs to be developed carefully. We introduce this model in Chapter 13 and use it to discuss monetary policy in Chapter 15, “Monetary Policy,” and fiscal policy in Chapter 16, “Fiscal Policy.” The material on dynamic $AD-AS$ is presented in self-contained sections in Chapters 13, 15, and 16, so instructors may safely omit the sections on the dynamic $AD-AS$ model without any loss in continuity to the discussion of macroeconomic theory and policy.

- Extensive coverage of monetary policy.** Because of the central role monetary policy plays in the economy and in students’ curiosity about business and financial news, we devote two chapters—Chapters 15, “Monetary Policy,” and 17, “Inflation, Unemployment, and Federal Reserve Policy”—to the topic. We emphasize the issues involved in the Fed’s choice of monetary policy targets, and we include coverage of the Taylor rule. We include coverage of the debate over the Fed’s new policies, including quantitative easing.

- Coverage of both the demand-side and supply-side effects of fiscal policy.** Our discussion of fiscal policy in Chapter 16, “Fiscal Policy,” carefully distinguishes between

automatic stabilizers and discretionary fiscal policy. We also provide significant coverage of the supply-side effects of fiscal policy.

- **A self-contained but thorough discussion of the Keynesian income–expenditure approach.** The Keynesian income–expenditure approach (the “45°-line diagram,” or “Keynesian cross”) is useful for introducing students to the short-run relationship between spending and production. Many instructors, however, prefer to omit this material. Therefore, we use the 45°-line diagram only in Chapter 12, “Aggregate Expenditure and Output in the Short Run.” The discussion of monetary and fiscal policy in Chapter 15, “Monetary Policy,” and Chapter 16, “Fiscal Policy,” respectively, uses only the AD–AS model, making it possible to omit Chapter 12.
- **Extensive international coverage.** We include three chapters devoted to international topics: Chapter 7, “Comparative Advantage and the Gains from International Trade,” Chapter 18, “Macroeconomics in an Open Economy,” and Chapter 19, “The International Financial System.” Having a good understanding of the international trading and financial systems is essential to understanding the macroeconomy and to satisfying students’ curiosity about the economic world around them. In addition to the material in our three international chapters, we weave international comparisons into the narratives of several other chapters, including our discussion of labor market policies in Chapter 17, “Inflation, Unemployment, and Federal Reserve Policy,” and central banking in Chapter 14, “Money, Banks, and the Federal Reserve System.”
- **Flexible chapter organization.** Because we realize that there are a variety of approaches to teaching principles of macroeconomics, we have structured our chapters for maximum flexibility. For example, our discussion of long-run economic growth in Chapter 10, “Economic Growth, the Financial System, and Business Cycles,” makes it possible for instructors to omit the more thorough discussion of these issues in Chapter 11, “Long-Run Economic Growth: Sources and Policies.” Our discussion of the Keynesian 45°-line diagram is confined to Chapter 12, “Aggregate Expenditure and Output in the Short Run,” so that instructors who do not use this approach can proceed directly to aggregate demand and aggregate supply analysis in Chapter 13, “Aggregate Demand and Aggregate Supply Analysis.” While we devote two chapters to monetary policy, the first of these—Chapter 15, “Monetary Policy”—is a self-contained discussion, so instructors may safely omit the material in Chapter 17, “Inflation, Unemployment, and Federal Reserve Policy,” if they choose to. Finally, instructors may choose to omit all three of the international chapters (Chapter 7, “Comparative Advantage and the Gains from International Trade,” Chapter 18, “Macroeconomics in an Open Economy,” and Chapter 19, “The International Financial System”), cover just Chapter 7 on international trade, cover just Chapter 18, or cover Chapters 18 and 19 while omitting Chapter 7. Please refer to the flexibility chart on pages xxv–xxvi to help select the chapters and order best suited to your classroom needs.

Special Features:

A Real-World, Hands-on Approach to Learning Economics

Business Cases and *An Inside Look* News Articles

Each chapter-opening case provides a real-world context for learning, sparks students’ interest in economics, and helps unify the chapter. The case describes an actual company facing a real situation. The company is integrated in the narrative, graphs, and pedagogical features of the chapter. Many of the chapter openers focus on the role of entrepreneurs in developing new products and bringing them to the market. For example, Chapter 2 discusses Elon Musk of Tesla

Motors, Chapter 6 discusses Mark Zuckerberg of Facebook, and Chapter 13 discusses Fred Smith of FedEx. Here are a few examples of companies we explore in the chapter openers:

- Tesla Motors (Chapter 2, “Trade-offs, Comparative Advantage, and the Market System”)
- Apple (Chapter 3, “Where Prices Come From: The Interaction of Demand and Supply”)
- Facebook (Chapter 6, “Firms, the Stock Market, and Corporate Governance”)
- FedEx (Chapter 13, “Aggregate Demand and Aggregate Supply Analysis”)

CHAPTER
3

Chapter Outline and Learning Objectives

1. **The Demand Side of the Market**, page 70
Discusses the variables that influence demand.
2. **The Supply Side of the Market**, page 78
Discusses the variables that influence supply.
3. **Market Equilibrium: Putting Demand and Supply Together**, page 82
Uses a graph to illustrate market equilibrium.
4. **The Effect of Demand and Supply Shifts on Equilibrium**, page 85
Uses demand and supply graphs to predict changes in price and quantity.

Where Prices Come From: The Interaction of Demand and Supply



Smartphones: The Indispensable Product?

If you're like most students, professors, and businesspeople, you carry your cellphone or smartphone everywhere you go. With a cellphone, you can make and receive phone calls and text messages. With a smartphone, you can do much more: send and receive e-mails, check Facebook and other social media sites, share photos, and stream videos. By 2013, more than two million smartphones were being sold per day worldwide.

Ten years ago, the BlackBerry, sold by the Canadian-based firm Research In Motion, was the only widely used smartphone. The BlackBerry was expensive, though, and most buyers were businesspeople who wanted to send and answer e-mails while away from the office. When Apple introduced the iPhone in 2007, smartphones started to become popular with a wider market of consumers, including students. With the release of the iPhone 3G in 2008, Apple announced that a section of its immensely popular iTunes music and video store would be devoted to applications (or “apps”) for the iPhone. Major software companies, as well as individuals writing their first software programs, have posted games, calendars, dictionaries, and many other types of apps to the iTunes store. Apple sold more than 3 million iPhones within a month of launching the iPhone 3G.

Although initially Apple had a commanding share of the smartphone market, competitors soon appeared. Companies such as Samsung, Nokia, HTC, LG, Huawei, Microsoft, Sony, ZTE, and Panasonic introduced smartphones. Most of these manufacturers followed Apple in developing apps or providing users access to online app stores.

The intense competition among firms selling smartphones is a striking example of how the market for smartphones has become much more competitive since 2007. As many consumers indicated that they would pay more for a smartphone than a regular cellphone, firms scrambled to meet the demand for smartphones. Although intense competition is not always good news for firms trying to sell products, it is great news for consumers because it increases the available choice of products and lowers the prices consumers pay for those products.

AN INSIDE LOOK on page 92 discusses how Google faced the problem of not having enough of its Nexus 4 smartphones to meet customer demand, while Apple worried about overproduction of its iPhone 5.

Source: Brian X. Chen, “Smartphones Finally Surpass the Feature Phone,” *Wired* (June 19, 2013), http://www.wired.com/wired/archive/21.06/feature_phone.html; *Competition Drives Up Demand for Smartphones*, *New York Times*, April 16, 2013, and *Wired*, *A Brief History of Smartphones*, http://www.wired.com/wired/archive/21.06/feature_phone.html, June 18, 2013.

Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy S?

Suppose you want to buy a smartphone and are choosing between an Apple iPhone and a Samsung Galaxy S. If you buy an iPhone, you will have access to more applications—or “apps”—that can increase the enjoyment and performance of your smartphone. In addition, the iPhone is thin, lightweight, and sleek looking. One strategy Samsung can use to overcome those advantages is to compete based on price and value. Would you choose to buy a Galaxy S if it had a lower price than a comparable iPhone? If your income increased, would it affect your decision about which smartphone to buy? As you read this chapter, try to answer these questions. You can check your answers against those we provide on page 91 at the end of the chapter.

An *Inside Look* is a two-page feature that shows students how to apply the concepts from the chapter to the analysis of a news article. The feature appears at the end of Chapters 1–4. An *Inside Look* feature presents an excerpt from an article, analysis of the article, a graph(s), and critical thinking questions. Additional articles are located on MyEconLab, where they are continuously updated.

AN INSIDE LOOK

MOTLEY FOOL

Google's Smartphone Production Problems

Predicting mobile computing sales is a tough one, especially when rolling out a relatively new product. Unless the production numbers match sales expectations perfectly, investors are going to be disappointed. Just ask Apple (NASDAQ:AAPL).

On Monday (January 14, 2013), Apple cut orders from its iPhone 5 manufacturers by as much as half due to lack of demand. Forget that production changes often occur after the busy holiday shopping season, or that Apple could have previously placed massive orders to adjust supply chain problems with its new iPhone, or any other far reason: Investors weren't interested. Apple stock proceeded to drop over 3%, and remains below \$100 a share.

Google (NASDAQ:GOOG) and its Nexus 4 smartphone partner LG have found themselves in a similar situation as Apple, though on the opposite end of the spectrum. The problem for Google is too much demand internationally for its low-cost smartphone. It took all of 20 minutes for Google's Play store to sell out of what was then its new Nexus 4 for the international market, and the backlog of orders isn't improving.

He said, she said.

In response to concerns about production keeping up with Nexus 4

Google and Apple Face Supply and Demand Concerns in the Smartphone Market

Apple cut component deliveries and its share price got beaten down. Can you imagine if Apple planned for 40 million units, and were then forced to announce a jump up in production to meet demand for 10 more million iPhones? You can bet share prices would have soared.

Is it any wonder? Microsoft (NASDAQ:MSFT) hasn't released sales data on its Surface tablet, or why it was initially rolled out on such a minimal basis, with temporary retail outlets? If Microsoft CEO Steve Ballmer had shot for the moon relative to Surface sales, and didn't meet those lofty expectations, he'd feel the wrath of shareholders all the way up in Redmond, WA. Of course, if Ballmer understood expectations, and there was having production difficulty filling orders, shareholders would again be on the watch.

When it's said and done, supply and demand forecasting isn't an exact science. Sure, there's information that can be gleaned from changes in orders and amounts, but let's keep it in perspective. Do Google's issues with LG threaten to derail the online leader? Of course not. Take the 4% drop in Google's share price the past week for what it is: an opportunity.

Source: Tom Braggs, "Google's Smartphone Production Problems," *Motley Fool*, January 18, 2013.

Key Points in the Article

The demand for Google's Nexus 4 smartphone and the production problems prevented the company from supplying enough of the product to fill its orders. Google blamed the shortage on the phone's manufacturer, LG, while LG executives claimed that Google severely underestimated demand for the smartphone, especially in some European markets. Although Google was dealing with the problem of overproduction, Apple was worried about overproduction of its iPhone 5 in January 2013. Apple cut orders from its iPhone 5 manufacturers by as much as half due to falling demand. For both Google and Apple, the production issues resulted in declines in the companies' stock prices.

Analyzing the News

At the beginning of 2013, Apple and Google found themselves dealing with significant, but different, demand-related issues. Apple reduced its orders of iPhone 5s from its manufacturers by as much as 50 percent due to insufficient demand, while Google sought ways to increase production of its Nexus 4 due to high demand. Both companies misjudged the demand for their smartphones. Figure 1 below shows the increase in demand as a shift to the left of the demand curve from D_1 to D_2 , which illustrates the situation Apple faces for the iPhone 5. All else equal, a decrease in demand would decrease equilibrium price from P_1 to P_2 and decrease equilibrium quantity from Q_1 to Q_2 . Google faced an increase in demand for the Nexus 4, which is represented in Figure 1 by a shift to the right of the demand curve from D_1 to D_2 . All else equal, an increase in demand would increase equilibrium price from P_1 to P_2 and increase equilibrium quantity from Q_1 to Q_2 .

On the supply side, Google blamed the Nexus manufacturer LG for not being able to supply enough phones, and LG blamed Google for underestimating Nexus 4 sales. Regardless of which company was ultimately at fault, Google needed to increase the supply of its smartphones to meet the growing demand. By blaming Google for the supply problem, the wireless LG implied that that company had the capability of producing enough smartphones to cover the backlog of orders, so increasing the supply of Nexus 4 phones would apparently not be an issue on the manufacturing end. An increase in supply, which Google needed, is represented in Figure 2 by a shift from S_1 to S_2 . All else equal, an increase in supply would decrease the equilibrium price from P_1 to P_2 and increase the equilibrium quantity from Q_1 to Q_2 .

Apple expected sales of its iPhone 5 to increase in the first quarter of 2013 and chose to cut production of its smartphone in light of this expectation. A decrease in supply, such as Apple's reduction in production, is represented in Figure 2 by a shift from S_1 to S_2 . All else equal, a decrease in supply would increase the equilibrium price from P_1 to P_2 and decrease the equilibrium quantity from Q_1 to Q_2 .

Thinking Critically

1. Draw a demand and supply graph for the smartphone market. Show the change in the equilibrium price and quantity after Amazon enters the market by selling a smartphone.
2. Suppose that the federal government starts a new program that offers to reimburse low-income people for half the price of a new smartphone. Like a decrease and supply graph of the smartphone market to show the effect on equilibrium price and quantity as a result of Amazon entering the market and the government beginning this program. Can we be sure whether the equilibrium quantity of smartphones will increase? We can't be sure whether the equilibrium price of smartphones will increase? Briefly explain.



Figure 1 An increase in demand for smartphones shifts the demand curve to the left. All else equal, a decrease in demand would decrease equilibrium price and decrease equilibrium quantity both.



Figure 2 An increase in supply of smartphones shifts the supply curve to the right. All else equal, equilibrium price and equilibrium quantity both increase. A decrease in supply would have the opposite effect.

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Economics in Your Life

After the chapter-opening real-world business case, we include a personal dimension to the chapter opener with a feature titled *Economics in Your Life*, which asks students to consider how economics affects their lives. The feature piques the interest of students and emphasizes the connection between the material they are learning and their experiences.

Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy?

Suppose you want to buy a smartphone and are choosing between an Apple iPhone and a Samsung Galaxy S. If you buy an iPhone, you will have access to more applications—or “apps”—that can increase the enjoyment and performance of your smartphone. In addition, the iPhone is thin, lightweight, and sleek looking. One strategy Samsung can use to overcome these advantages is to compete based on price and value. Would you choose to buy a Galaxy S if it had a lower price than a comparable iPhone? If your income increased, would it affect your decision about which smartphone to buy? As you read this chapter, try to answer these questions. You can check your answers against those we provide on **page 91** at the end of this chapter.

At the end of the chapter, we use the chapter concepts to answer the questions asked at the beginning of the chapter.

Continued from page 69

Economics in Your Life

Will You Buy an Apple iPhone or a Samsung Galaxy?

At the beginning of this chapter, we asked you to consider two questions: Would you choose to buy a Samsung Galaxy S if it had a lower price than a comparable Apple iPhone? and Would your decision be affected if your income increased? To determine the answer to the first question, you have to recognize that the iPhone and the Galaxy S are substitutes. If you consider the two smartphones to be close substitutes, then you are likely to buy the one with the lower price. In the market, if consumers generally believe that the iPhone and the Galaxy S are close substitutes, a fall in the price of the iPhone will increase the quantity of iPhones demanded and decrease the demand for Galaxy Ss. Suppose that you are currently leaning toward buying the Galaxy S because its price is lower than the price of the iPhone. If an increase in your income would cause you to change your decision and buy the iPhone, then the Galaxy S is an inferior good for you.

The following are examples of the topics we cover in the *Economics in Your Life* feature:

- Will you buy an Apple iPhone or a Samsung Galaxy? (Chapter 3, “Where Prices Come From: The Interaction of Demand and Supply”)
- Is your take-home pay affected by what your employer spends on your health insurance? (Chapter 5, “The Economics of Health Care”)
- Is an employer likely to cut your pay during a recession? (Chapter 13, “Aggregate Demand and Aggregate Supply Analysis”)

Solved Problems

Many students have great difficulty handling applied economics problems. We help students overcome this hurdle by including in each chapter two or three worked-out problems tied to select chapter-opening learning objectives. Our goals are to keep students focused on the main ideas of each chapter and give them a model of how to solve an economic problem by breaking it down step by step. Additional exercises in the end-of-chapter *Problems and Applications* section are tied to every *Solved Problem*. Additional *Solved Problems* appear in the *Instructor's Manual* and the print *Study Guide*. In addition, the Test Item File includes problems tied to the *Solved Problems* in the main book.

88 CHAPTER 3 Where Prices Come From: The Interaction of Demand and Supply
The Effect of Demand and Supply Shifts on Equilibrium 89

Solved Problem 3.4

What Has Caused the Decline in Beef Consumption?

Whether you like to eat hamburger or roast beef, the source of the meat is a farmer who raises cattle. An article in the *New York Times* discussed how the cost to farmers of raising cattle for beef had been increasing. At the same time, consumer tastes had been changing, leading to a decline in the demand for beef. Use demand and supply graphs to illustrate your answers to the following questions:

Solving the Problem

Step 1: Review the chapter material. This problem is about how shifts in demand and supply curves affect the equilibrium price, so you may want to review the section "The Effect of Shifts in Demand and Supply over Time," which begins on page 87.

Step 2: Answer part (a) using demand and supply analysis. You are given the information that consumer tastes have changed, leading to a decline in demand for beef. So, the demand curve for beef has shifted to the left. You are also given the information that the cost of raising beef has increased. So, the supply curve for beef has also shifted to the left. The following graph shows both these shifts:

As Table 3.3 summarizes, if the demand curve and the supply curve both shift to the left, the equilibrium quantity must decrease. Therefore, we can answer part (a) by stating that we are certain that the equilibrium quantity of beef will decrease.

Step 3: Answer part (b) using demand and supply analysis. The graph we drew in Step 2 showed the equilibrium price of beef increasing. But given the information provided, the following graph would also be correct:

Unlike the graph in Step 2, which showed the equilibrium price increasing, this graph shows the equilibrium price decreasing. The uncertainty about whether the equilibrium price will increase or decrease is consistent with what we saw in Table 3.3 when the demand curve and the supply curve both shift to the left. Therefore, we can answer part (b) by stating that we cannot be certain whether the equilibrium price of beef will increase or decrease.

Extra Credit: During 2012 and 2013, the equilibrium quantity of beef decreased while the equilibrium price of beef increased. We can conclude that both the decrease in demand for beef and the decrease in the supply of beef contributed to the decline in beef consumption. That the price of beef rose indicates that the decrease in supply had a larger effect on equilibrium in the beef market than did the decrease in demand.

Your Turn: For more practice, do related problems 4.6, 4.7, and 4.8 on page 98 of the end of this chapter.

Don't Let This Happen to You

Remember: A Change in a Good's Price Does *Not* Cause the Demand or Supply Curve to Shift

Suppose a student is asked to draw a demand and supply graph to illustrate how an increase in the price of oranges would affect the market for apples, with other variables being constant. He draws the graph on the left and explains it as follows: "Because apples and oranges are substitutes, an increase in the price of oranges will cause an initial shift to the right in the demand curve for apples, from D_1 to D_2 . However, because this initial shift in the demand curve for apples results in a higher price for apples, P_2 , consumers will find apples less desirable, and the demand curve will shift to the left, from D_2 to D_3 , resulting in a final equilibrium price of P_3 ." Do you agree or disagree with the student's analysis?

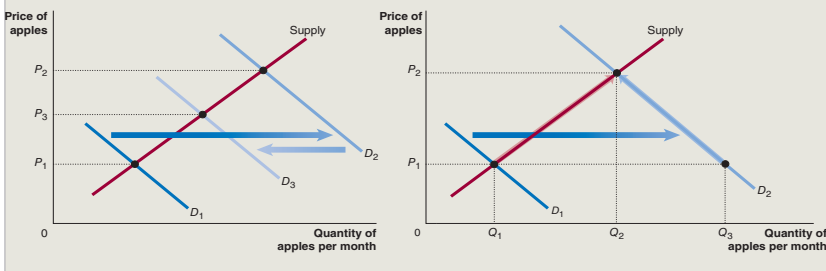
You should disagree. The student has correctly understood that an increase in the price of oranges will cause the demand curve for apples to shift to the right. But, the second demand curve shift the student describes, from D_2

to D_3 , will not take place. Changes in the price of a product do not result in shifts in the product's demand curve. Changes in the price of a product result only in movements along a demand curve.

The graph on the right shows the correct analysis. The increase in the price of oranges causes the demand curve for apples to increase from D_1 to D_2 . At the original price, P_1 , the increase in demand initially results in a shortage of apples equal to $Q_3 - Q_1$. But, as we have seen, a shortage causes the price to increase until the shortage is eliminated. In this case, the price will rise to P_2 , where both the quantity demanded and the quantity supplied are equal to Q_2 . Notice that the increase in price causes a decrease in the quantity demanded, from Q_3 to Q_2 , but does *not* cause a decrease in demand.

MyEconLab Study Plan

Your Turn: Test your understanding by doing related problems 4.13 and 4.14 on pages 98–99 at the end of this chapter.



Don't Let This Happen to You

We know from many years of teaching which concepts students find most difficult. Each chapter contains a box feature called *Don't Let This Happen to You* that alerts students to the most common pitfalls in that chapter's material. We follow up with a related question in the end-of-chapter *Problems and Applications* section.

Making the Connection

Each chapter includes two to four *Making the Connection* features that provide real-world reinforcement of key concepts and help students learn how to interpret what they read on the Web and in newspapers. Most *Making the Connection* features use relevant, stimulating, and provocative news stories focused on businesses and policy issues. One-third of them are new to this edition, and most others have

Making the Connection **Forecasting the Demand for iPhones**

One of the most important decisions that managers of any large firm face is which new products to develop. A firm must devote people, time, and money to design a new product, negotiate with suppliers, formulate a marketing campaign, and perform many other tasks. But any firm has only limited resources and so faces a trade-off: Resources used to develop one product will not be available to develop another product. Ultimately, the products a firm chooses to develop will be those that it believes will be the most profitable. So, to decide which products to develop, firms need to forecast the demand for those products.

David Sobotta, who worked at Apple for 20 years and eventually became its national sales manager, has described discussions at Apple during 2002 about whether to develop a tablet computer. According to Sobotta, representatives of the U.S. National Institutes of Health urged Apple to develop a tablet computer arguing that it would be particularly useful to doctors, nurses, and hospitals. In 2001, Bill Gates, chairman of Microsoft, had predicted that "within five years... [tablet PCs] will be the most popular form of PC sold in America." Apple's managers decided not to develop a tablet computer, however, because they believed the technology available at that time was too complex for an average computer user, and they also believed that the demand from doctors and nurses would be small. Apple's forecast was correct. Despite Bill Gates' prediction, in 2008 tablet computers made up only 1 percent of the computer market. According to Sobotta, "Apple executives had a theory that the route to success will not be through selling thousands of relatively expensive things, but millions of very inexpensive things like iPads."

Apple continued to work on smartphones, developing the technology to eliminate keyboards in favor of touch-screen displays. Rather than proceeding immediately to build a tablet computer, Steve Jobs, then Apple's CEO, realized he could use this technology in a different way: "I thought 'My God we can build a phone out of this.'" From its introduction in 2007, the iPhone was an immediate success. By mid-2013, Apple had



Will demand for iPhones continue to grow despite increasing competition?

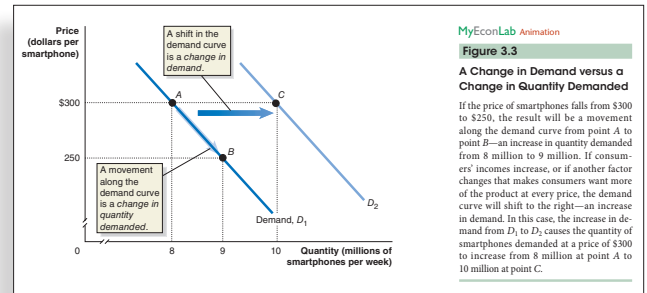
been updated. Several discuss health care, which remains a pressing policy issue. Each *Making the Connection* has at least one supporting end-of-chapter problem to allow students to test their understanding of the topic discussed.

Graphs and Summary Tables

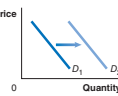
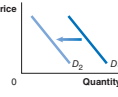
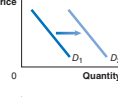
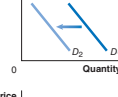
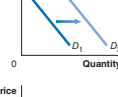
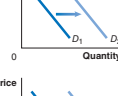
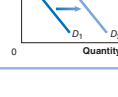
Graphs are an indispensable part of a principles of economics course but are a major stumbling block for many students. Every

chapter except Chapter 1 includes end-of-chapter problems that require students to draw, read, and interpret graphs. Interactive graphing exercises appear on the book's supporting Web site. We use four devices to help students read and interpret graphs:

1. Detailed captions
2. Boxed notes
3. Color-coded curves
4. Summary tables with graphs (see pages 76, 81, and 427 for examples)



76 CHAPTER 3 Where Prices Come From: The Interaction of Demand and Supply


Table 3.1	An increase in ...	shifts the demand curve ...	because ...
Variables That Shift Market Demand Curves	income (and the good is normal)		consumers spend more of their higher incomes on the good.
	income (and the good is inferior)		consumers spend less of their higher incomes on the good.
	the price of a substitute good		consumers buy less of the substitute good and more of this good.
	the price of a complementary good		consumers buy less of the complementary good and less of this good.
	taste for the good		consumers are willing to buy a larger quantity of the good at every price.
	population		additional consumers result in a greater quantity demanded at every price.
	the expected price of the good in the future		consumers buy more of the good today to avoid the higher price in the future.

Review Questions and Problems and Applications— Grouped by Learning Objective to Improve Assessment

All the end-of-chapter material—Summary, Review Questions, and Problems and Applications—is grouped under learning objectives. The goals of this organization are to make it easier for instructors to assign problems based on learning objectives, both in the book and in MyEconLab, and to help students efficiently review material that they find difficult. If students have difficulty with a particular learning objective, an instructor can easily identify which end-of-chapter questions and problems support that objective and assign them as homework or discuss them in class. Every exercise in a chapter's Problems and Applications section is available in MyEconLab. Using MyEconLab, students can complete these and many other exercises online, get tutorial help, and receive instant feedback and assistance on exercises they answer incorrectly. Also, student learning will be enhanced by having the summary material and problems grouped together by learning objective, which will allow them to focus on the parts of the chapter they find most challenging. Each major section of the chapter, paired with a learning objective, has at least two review questions and three problems.

As in the previous editions, we include one or more end-of-chapter problems that test students' understanding of the content presented in the *Solved Problem*, *Making the Connection*, and *Don't Let This Happen to You* special features in the chapter. Instructors can cover a feature in class and assign the corresponding problem for homework. The Test Item File also includes test questions that pertain to these special features.

Real-Time-Data Exercises

Most chapters end with at least two *Real-Time-Data Exercises* that help students become familiar with a key data source, learn how to locate data, and develop skills in interpreting data. *Real-Time-Data Analysis Exercises*, marked with , allow students and instructors to use the very latest data from FRED.

Integrated Supplements

The authors and Pearson Education/Prentice Hall have worked together to integrate the text, print, and media resources to make teaching and learning easier.

MyEconLab is a unique online course management, testing, and tutorial resource.

MyEconLab

For the Instructor

Instructors can choose how much or how little time to spend setting up and using MyEconLab. Here is a snapshot of what instructors are saying about MyEconLab:


MyEconLab offers [students] a way to practice every week. They receive immediate feedback and a feeling of personal attention. As a result, my teaching has become more targeted and efficient.—Kelly Blanchard, Purdue University

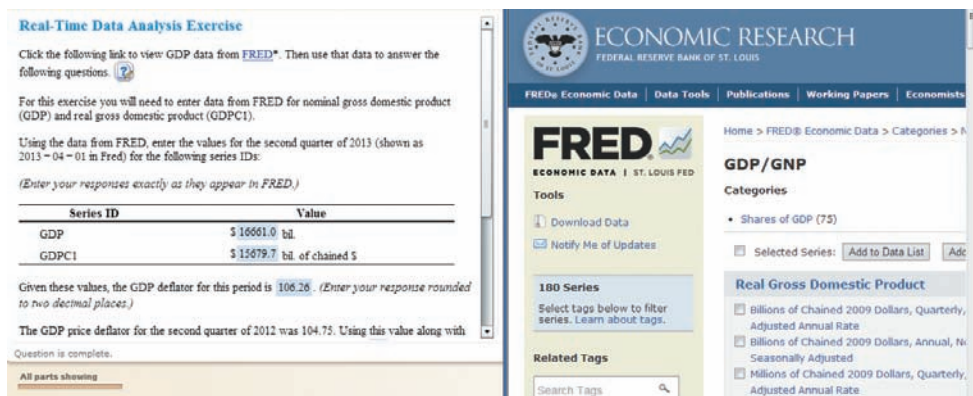
Students tell me that offering them MyEconLab is almost like offering them individual tutors.—Jefferson Edwards, Cypress Fairbanks College

MyEconLab's eText is great—particularly in that it helps offset the skyrocketing cost of textbooks. Naturally, students love that.—Doug Gehrke, Moraine Valley Community College

Each chapter contains two preloaded homework exercise sets that can be used to build an individualized study plan for each student. These study plan exercises contain tutorial resources, including instant feedback, links to the appropriate learning objective in the eText, pop-up definitions from the text, and step-by-step guided solutions, where appropriate. After the initial setup of the course by the instructor, student use of these materials requires no further instructor setup. The online grade book records each student's performance and time spent on the tests and study plan and generates reports by student or chapter.

Alternatively, instructors can fully customize MyEconLab to match their course exactly, including reading assignments, homework assignments, video assignments, current news assignments, and quizzes and tests. Assignable resources include:

- Preloaded exercise assignments sets for each chapter that include the student tutorial resources mentioned earlier
- Preloaded quizzes for each chapter that are unique to the text and not repeated in the study plan or homework exercise sets
- Study plan problems that are similar to the end-of-chapter problems and numbered exactly like the book to make assigning homework easier
- *Real-Time-Data Analysis Exercises*, marked with , allow students and instructors to use the very latest data from FRED. By completing the exercises, students become familiar with a key data source, learn how to locate data, and develop skills in interpreting data.



Real-Time Data Analysis Exercise

Click the following link to view GDP data from FRED*. Then use that data to answer the following questions.

For this exercise you will need to enter data from FRED for nominal gross domestic product (GDP) and real gross domestic product (GDPC1).

Using the data from FRED, enter the values for the second quarter of 2013 (shown as 2013-04-01 in FRED) for the following series IDs:

(Enter your responses exactly as they appear in FRED.)

Series ID	Value
GDP	\$ 16661.0 bil
GDPC1	\$ 15679.7 bil of chained \$

Given these values, the GDP deflator for this period is 106.26. (Enter your response rounded to two decimal places.)

The GDP price deflator for the second quarter of 2012 was 104.75. Using this value along with

Question is complete.

All parts showing

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Tools

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180 Series

Select tags below to filter series. Learn about tags.

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Search Tags

Home > FRED® Economic Data > Categories > A

GDP/GNP

Categories

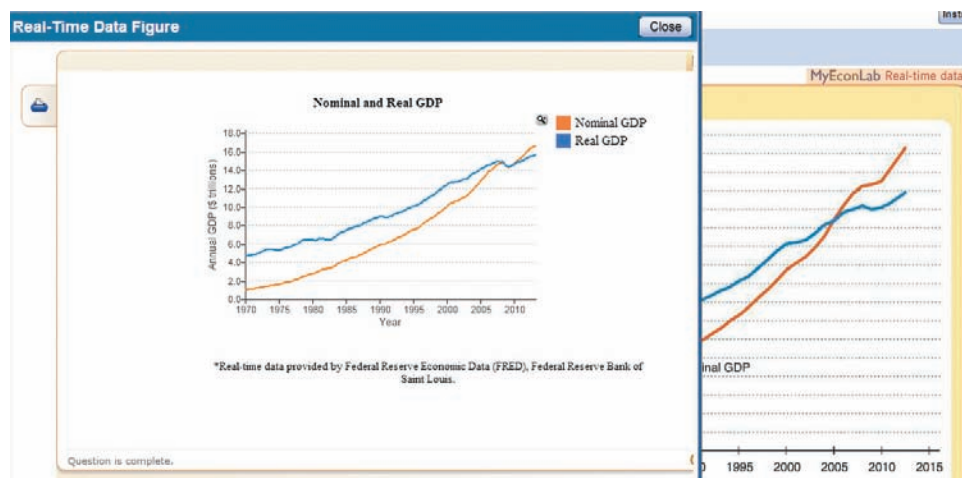
- Shares of GDP (75)

Selected Series:

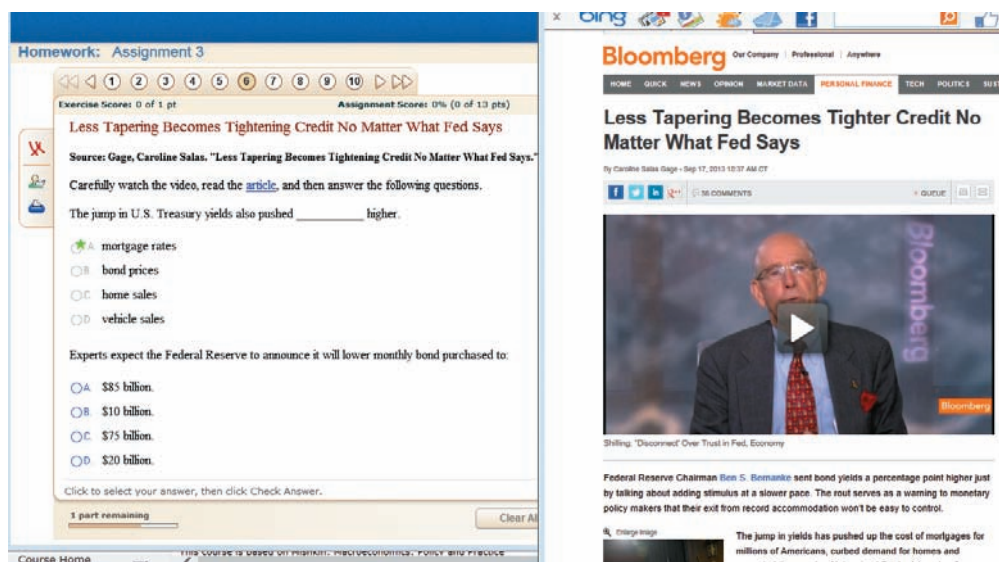
Real Gross Domestic Product

- Billions of Chained 2009 Dollars, Quarterly, Adjusted Annual Rate
- Billions of Chained 2009 Dollars, Annual, Not Seasonally Adjusted
- Millions of Chained 2009 Dollars, Quarterly, Adjusted Annual Rate

- In the eText available in MyEconLab, select figures labeled MyEconLab Real-time data allow students to display a pop-up graph updated with real-time data from FRED.



- *Current News Exercises*, provide a turnkey way to assign gradable news-based exercises in MyEconLab. Each week, Pearson scours the news, finds current macroeconomics articles, creates an exercise around these news articles, and then automatically adds them to MyEconLab. Assigning and grading current news-based exercises that deal with the latest macroeconomic events and policy issues has never been more convenient.



- *Experiments in MyEconLab* are a fun and engaging way to promote active learning and mastery of important economic concepts. Pearson's Experiments program is flexible and easy for instructors and students to use.
 - Single-player experiments allow your students to play against virtual players from anywhere at any time so long as they have an Internet connection.
 - Multiplayer experiments allow you to assign and manage a real-time experiment with your class.
 - Pre- and post-questions for each experiment are available for assignment in MyEconLab.

For a complete list of available experiments, visit www.myeconlab.com.

- Test Item File questions that allow you to assign quizzes or homework that will look just like your exams
- Econ Exercise Builder, which allows you to build customized exercises

Exercises include multiple-choice, graph drawing, and free-response items, many of which are generated algorithmically so that each time a student works them, a different variation is presented.

MyEconLab grades every problem type except essays, even problems with graphs. When working homework exercises, students receive immediate feedback, with links to additional learning tools.

Customization and Communication

MyEconLab in MyLab/Mastering provides additional optional customization and communication tools. Instructors who teach distance-learning courses or very large lecture sections find the MyLab/Mastering format useful because they can upload course documents and

assignments, customize the order of chapters, and use communication features such as Document Sharing, Chat, ClassLive, and Discussion Board.

[Related to Solved Problem #1] You have exams in economics and chemistry coming up and 5 hours available for studying. The following table shows the trade-offs you face in allocating the time you will spend in studying each subject.

Hours Spent Studying	Economics	Chemistry	Economics Midterm Score	Chemistry Midterm Score
A	5	0	94	71
B	4	1	92	80
C	3	2	89	85
D	2	3	85	80
E	1	4	80	75
F	0	5	73	71

Use the multipoint curve drawing tool to plot a production possibilities frontier (PPF) on the graph. The PPF is a curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology. Properly label this curve.

After plotting the final point of your multipoint curve, press the **Esc** key on your keyboard to end the line.

For the Student

MyEconLab puts students in control of their learning through a collection of testing, practice, and study tools tied to the online, interactive version of the textbook and other media resources. Here is a snapshot of what students are saying about MyEconLab:

- It was very useful because it had EVERYTHING, from practice exams to exercises to reading. Very helpful.—student, Northern Illinois University
- I would recommend taking the quizzes on MyEconLab because it gives you a true account of whether or not you understand the material.—student, Montana Tech
- It made me look through the book to find answers, so I did more reading.—student, Northern Illinois University

Students can study on their own or can complete assignments created by their instructor. In MyEconLab’s structured environment, students practice what they learn, test their understanding, and pursue a personalized study plan generated from their performance on sample tests and from quizzes created by their instructors. In Homework or Study Plan mode, students have access to a wealth of tutorial features, including:

- Instant feedback on exercises that helps students understand and apply the concepts
- Links to the eText to promote reading of the text just when the student needs to revisit a concept or an explanation
- Step-by-step guided solutions that force students to break down a problem in much the same way an instructor would do during office hours

As oil prices rose during 2006, the demand for alternative fuels increased. Ethanol, one alternative fuel, is made from corn. According to an article in the *Wall Street Journal*, the price of tortillas, which are made from corn, also rose during 2006:

“The price spike [in tortillas] is part of a ripple effect from the ethanol market.”

Source: Stephen Foweraker, “Industry Seeks to Raise Ethanol Levels in Fuel,” *Wall Street Journal*, January 25, 2007; and Mark Gongloff, “Tortilla Swoop,” *Wall Street Journal*, January 25, 2007.

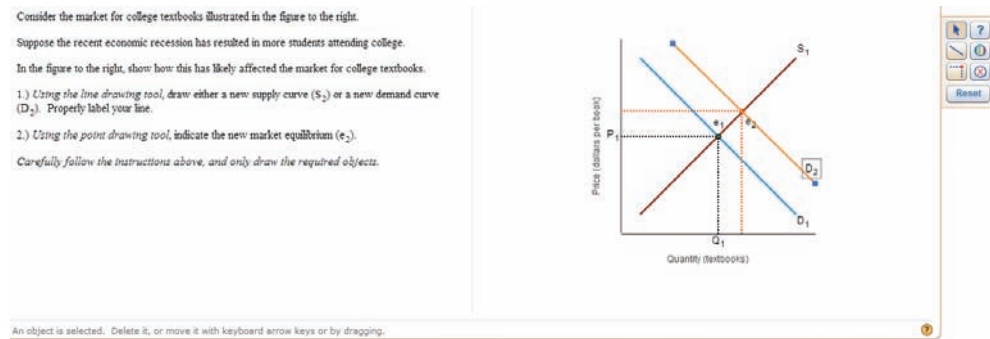
Click on the icon and use the model for the corn market to show the demand for ethanol. Be sure to note the equilibrium price and this shock.

Show how the change in the price of corn, caused by the increased demand for ethanol, affected the market for tortillas.

- 1.) Use the line drawing tool to show the effect on the tortilla market of corn. Properly label this line.
- 2.) Use the point drawing tool to identify the new point of equilibrium.

Carefully follow the instructions above, and only draw the required lines.

- Pop-up key term definitions from the eText to help students master the vocabulary of economics
- Links to the important features of the eText, such as *Solved Problem*, *Making the Connection*, *An Inside Look*, and *Don't Let This Happen to You*
- A graphing tool that is integrated into the various exercises to enable students to build and manipulate graphs to better understand how concepts, numbers, and graphs connect



Additional MyEconLab Tools

MyEconLab includes the following additional features:

- **eText**—In addition to the portions of eText available as pop-ups or links, a fully searchable eText is available for students who wish to read and study in a fully electronic environment.
- **Print upgrade**—For students who wish to complete assignments in MyEconLab but read in print, Pearson offers registered MyEconLab users a loose-leaf version of the print text at a significant discount.
- **Glossary flashcards**—Every key term is available as a flashcard, allowing students to quiz themselves on vocabulary from one or more chapters at a time.
- **MySearchLab**—MySearchLab provides extensive help on the research process and four exclusive databases of credible and reliable source material, including the New York Times, the Financial Times, and peer-reviewed journals.

MyEconLab content has been created through the efforts of Chris Annala, State University of New York–Geneseo; Charles Baum, Middle Tennessee State University; Peggy Dalton, Frostburg State University; Carol Dole, Jacksonville University; David Foti, Lone Star College; Sarah Ghosh, University of Scranton; Satyajit Ghosh, University of Scranton; Melissa Honig, Pearson Education; Woo Jung, University of Colorado; Courtney Kamauf, Pearson Education; Chris Kauffman, University of Tennessee–Knoxville; Russell Kellogg, University of Colorado–Denver; Noel Lotz, Pearson Education; Katherine McCann, University of Delaware; Daniel Mizak, Frostburg State University; Christine Polek, University of Massachusetts–Boston; Mark Scanlan, Stephen F. Austin State University; Leonie L. Stone, State University of New York–Geneseo; and Bert G. Wheeler, Cedarville University.

Other Resources for the Instructor

Instructor's Manual

Edward Scahill of the University of Scranton prepared the Instructor's Manual, which includes chapter-by-chapter summaries, learning objectives, extended examples and class exercises, teaching outlines incorporating key terms and definitions, teaching tips, topics for class discussion, new *Solved Problems*, new *Making*

the Connection features, and solutions to all review questions, problems, and real-time-data exercises in the book. The Instructor's Manual is available in print and for download from the Instructor's Resource Center (www.pearsonhighered.com/hubbard). The authors, Harry Ellis of the University of North Texas, and Robert Gillette of the University of Kentucky prepared the solutions to the end-of-chapter review questions and problems.

Test Item File

Randy Methenitis of Richland College prepared the Test Item File, which includes 4,000 multiple-choice, true/false, short-answer, and graphing questions. There are questions to support each key feature in the book. The Test Item File is available in print and for download from the Instructor's Resource Center (www.pearsonhighered.com/hubbard). Test questions are annotated with the following information:

- **Difficulty:** 1 for straight recall, 2 for some analysis, 3 for complex analysis
- **Type:** multiple-choice, true/false, short-answer, essay
- **Topic:** the term or concept the question supports
- **Learning outcome**
- **AACSB** (see description that follows)
- **Page number** in the text
- **Special feature in the main book:** chapter-opening business example, *Economics in Your Life*, *Solved Problem*, *Making the Connection*, and *Don't Let This Happen to You*

The Association to Advance Collegiate Schools of Business (AACSB)

The Test Item File author has connected select questions to the general knowledge and skill guidelines found in the AACSB Assurance of Learning Standards.



What Is the AACSB?

AACSB is a not-for-profit corporation of educational institutions, corporations, and other organizations devoted to the promotion and improvement of higher education in business administration and accounting. A collegiate institution offering degrees in business administration or accounting may volunteer for AACSB accreditation review. The AACSB makes initial accreditation decisions and conducts periodic reviews to promote continuous quality improvement in management education. Pearson Education is a proud member of the AACSB and is pleased to provide advice to help you apply AACSB Assurance of Learning Standards.

What Are AACSB Assurance of Learning Standards?

One of the criteria for AACSB accreditation is the quality of curricula. Although no specific courses are required, the AACSB expects a curriculum to include learning experiences in the following categories of Assurance of Learning Standards:

- Communication
- Ethical Reasoning
- Analytic Skills
- Use of Information Technology
- Multicultural and Diversity
- Reflective Thinking

Questions that test skills relevant to these standards are tagged with the appropriate standard. For example, a question testing the moral questions associated with externalities would receive the Ethical Reasoning tag.

How Can Instructors Use the AACSB Tags?

Tagged questions help you measure whether students are grasping the course content that aligns with the AACSB guidelines noted earlier. This in turn may suggest enrichment activities or other educational experiences to help students achieve these skills.

TestGen

The computerized TestGen package allows instructors to customize, save, and generate classroom tests. The test program permits instructors to edit, add, or delete questions from the Test Item File; analyze test results; and organize a database of tests and student results. This software allows for extensive flexibility and ease of use. It provides many options for organizing and displaying tests, along with search and sort features. The software and the Test Item Files can be downloaded from the Instructor's Resource Center (www.pearsonhighered.com/hubbard).

PowerPoint Lecture Presentation

Three sets of PowerPoint slides, prepared by Paul Holmes of State University of New York–Fredonia, are available:

1. A comprehensive set of PowerPoint slides can be used by instructors for class presentations or by students for lecture preview or review. These slides include all the graphs, tables, and equations in the textbook. Two versions are available—step-by-step mode, in which you can build graphs as you would on a blackboard, and automated mode, in which you use a single click per slide.
2. A comprehensive set of PowerPoint slides have Classroom Response Systems (CRS) questions built in so that instructors can incorporate CRS “clickers” into their classroom lectures. For more information on Pearson Education's partnership with CRS, see the section “Classroom Response Systems.” Instructors can download these PowerPoint presentations from the Instructor's Resource Center (www.pearsonhighered.com/hubbard).
3. A student version of the PowerPoint slides is available as .pdf files. This version allows students to print the slides and bring them to class for note taking. Instructors can download these PowerPoint presentations from the Instructor's Resource Center (www.pearsonhighered.com/hubbard).

Classroom Response Systems

Classroom Response Systems (CRS) is an exciting new wireless polling technology that increases the interactivity of large and small classrooms by enabling instructors to pose questions to their students, record results, and display the results instantly. Students can answer questions easily, using compact remote-control transmitters. Pearson Education has partnerships with leading CRS providers and can show you everything you need to know about setting up and using CRS. Pearson Education will provide the classroom hardware, text-specific PowerPoint slides, software, and support, and will also show you how your students can benefit! Please contact your local Pearson Education sales representative for more information.

Other Resources for the Student

In addition to MyEconLab, Pearson provides the following resources.

Study Guide

Jim Lee of Texas A&M University, Corpus Christi, prepared the Study Guide, which reinforces the textbook and provides students with the following:

- Chapter summaries
- Discussion of each learning objective

- Section-by-section reviews of the concepts presented
- Helpful study hints
- Additional Solved Problems to supplement those in the text
- Key terms with definitions
- Self-tests for each chapter, which include 40 multiple-choice questions plus a number of short-answer and true/false questions, with accompanying answers and explanations

PowerPoint Slides

For student use as a study aid or note-taking guide, PowerPoint slides, prepared by Paul Holmes of State University of New York–Fredonia, can be downloaded from MyEconLab or the Instructor's Resource Center and made available to students. The slides include:

- All graphs, tables, and equations in the text
- Figures in step-by-step mode and automated modes, using a single click per graph curve
- End-of-chapter key terms with hyperlinks to relevant slides



Instructors

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Accuracy Review Board and Reviewers

The guidance and recommendations of the following instructors helped us develop the revision plans for the fifth edition and the supplements package. While we could not incorporate every suggestion from every consultant board member, reviewer, or accuracy checker, we do thank each and every one of you and acknowledge that your feedback was indispensable in developing this text. We greatly appreciate your assistance in making this the best text it could be; you have helped teach a whole new generation of students about the exciting world of economics.

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 Charles Callahan III, State University of
 New York–Brockport
 Mark S. Chester, Reading Area Community College
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 Marc Fusaro, Arkansas Tech University
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 Mark Gius, Quinnipiac University
 Robert Godby, University of Wyoming
 William L. Goffe, Pennsylvania State University
 Anthony Gyapong, Pennsylvania State
 University—Abington
 Travis Hayes, University of Tennessee–Chattanooga
 Carol Hogan, University of Michigan–Dearborn
 Anisul M. Islam, University of Houston–Downtown
 Aaron Jackson, Bentley College
 Nancy Jianakoplos, Colorado State University
 Thomas C. Kinnaman, Bucknell University
 Mary K. Knudson, University of Iowa
 Faik A. Koray, Louisiana State University
 Stephan Kroll, California State University–Sacramento
 Tony Lima, California State University–East Bay
 Randy Methenitis, Richland College
 Normal C. Miller, Miami University
 David Mitch, University of Maryland–Baltimore County
 James A. Moreno, Blinn College
 Michael Potepan, San Francisco State University
 Mary L. Pranzo, California State University–Fresno
 Fernando Quijano, Dickinson State University
 Matthew Rafferty, Quinnipiac University
 Ratha Ramoo, Diablo Valley College
 Jeff Reynolds, Northern Illinois University
 Brian Rosario, University of California–Davis
 Joseph M. Santos, South Dakota State University
 Edward Scahill, University of Scranton
 Mark V. Siegler, California State University–Sacramento
 Rachel Small, University of Colorado–Boulder
 Stephen Smith, Bakersfield College
 Rajeev Sooreea, Pennsylvania State University–Altoona
 Rebecca Stein, University of Pennsylvania
 Ed Steinberg, New York University
 Michael Stone, Quinnipiac University
 Arlena Sullivan, Jones County Junior College
 Wendine Thompson–Dawson, University of Utah
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 Robert Beekman, University of Tampa
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 William L. Goffe, Pennsylvania State University
 Jane S. Himarios, University of Texas–Arlington
 Donn M. Johnson, Quinnipiac University
 Mark Karscig, Central Missouri State University
 Jenny Minier, University of Kentucky
 David Mitch, University of Maryland–Baltimore County
 Nicholas Noble, Miami University
 Michael Potepan, San Francisco State University
 Matthew Rafferty, Quinnipiac University
 Helen Roberts, University of Illinois–Chicago
 Robert Rosenman, Washington State University
 Joseph M. Santos, South Dakota State University
 Stephen Snyder, University of Pittsburgh
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Doug Conway, Mesa Community College
 John Eastwood, Northern Arizona University
 Price Fishback, University of Arizona
 Anne Williams, Gateway Community College

ARKANSAS

Jerry Crawford, Arkansas State University
 Marc Fusaro, Arkansas Tech University
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CALIFORNIA

Shawn Abbott, College of the Siskiyous
 Renatte Adler, San Diego State University
 Ercument Aksoy, Los Angeles Valley College
 Maneeza Aminy, Golden Gate University
 Kate Antonovics, University of California–San Diego
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 Robert Bise, Orange Coast Community College
 Victor Brajer, California State University–Fullerton
 Anne E. Bresnock, University of California–Los Angeles,
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 David Brownstone, University of California–Irvine
 Maureen Burton, California State Polytechnic
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 Annette Chamberlin, National College
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 Roger Frantz, San Diego State University
 Craig Gallet, California State University–Sacramento
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 Maria Giuili, Diablo Valley College
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 Lisa Grobar, California State University–Long Beach
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 Dewey Heinsma, Mt. San Jacinto Community College
 Jessica Howell, California State University–Sacramento
 Greg Hunter, California State University–Pomona
 John Ifcher, Santa Clara University
 Ahmed Ispahani, University of LaVerne
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 Jonathan Kaplan, California State University–Sacramento
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 Stephan Kroll, California State University–Sacramento
 David Lang, California State University–Sacramento
 Carsten Lange, California State Polytechnic
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 Don Leet, California State University–Fresno
 Rose LeMont, Modesto Junior College
 Tony Lima, California State University–East Bay
 Solina Lindahl, California Polytechnic State University–
 San Luis Obispo
 Roger Mack, DeAnza College
 Michael Marlow, California Polytechnic State University
 Kristen Monaco, California State University–Long Beach
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 Michael Bradley, George Washington University
 Colleen M. Callahan, American University

INTERNATIONAL

Minh Quang Dao, Carleton University–Ottawa, Canada

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Economics: Foundations and Models

Chapter Outline and Learning Objectives

1.1 Three Key Economic Ideas, page 4

Explain these three key economic ideas: People are rational; people respond to economic incentives; and optimal decisions are made at the margin.

1.2 The Economic Problem That Every Society Must Solve, page 8

Discuss how an economy answers these questions: What goods and services will be produced? How will the goods and services be produced? Who will receive the goods and services produced?

1.3 Economic Models, page 11

Understand the role of models in economic analysis.

1.4 Microeconomics and Macroeconomics, page 15

Distinguish between microeconomics and macroeconomics.

1.5 A Preview of Important Economic Terms, page 16

Define important economic terms.

Appendix: Using Graphs and Formulas,

page 24

Review the use of graphs and formulas.



Is the Private Doctor's Office Going to Disappear?

Traditionally, most doctors in the United States have worked in private practices that they owned themselves or in partnership with other doctors. Like other businesspeople, a doctor hires workers—nurses, physician's assistants, and receptionists—and buys or rents machinery and equipment. A doctor's income represents the profits from his or her practice, or the difference between the revenue received from patients and their health insurance plans and the costs to the doctor of wages, rent, loans, and insurance.

Increasingly, rather than owning a private practice, many doctors have chosen to work as salaried employees of hospitals. Although in 2000 nearly 60 percent of doctors were in private practice, by 2013 fewer than 40 percent were. What explains the increasing number of doctors who are giving up their private practices to become salaried employees of hospitals? Some doctors choose private practice because they like being their own boss. Other doctors prefer the more regular hours of working for a hospital, where they are less likely to be woken up at 2 A.M. to treat a patient with a medical emergency. Economists believe, though, that the best explanation for doctors abandoning private practice is that the doctors are acting in response to changing *economic incentives*. In fact, one of the key ideas that we will explore in this book is that we can often

predict behavior by assuming that people respond to economic incentives.

The economic incentives doctors face have changed in a number of ways. For example, soaring health care costs have led many private insurance companies, as well as the federal and state governments, to reduce the payments they make to doctors in return for treating patients. As a result, doctors in private practice have found their incomes fluctuating, which makes the steady income from a hospital salary more attractive. Congress passed President Barack Obama's package of health care changes in 2010. One rule requires most doctors and hospitals to convert to electronic medical record keeping. Although this change may improve the quality of health care, the computer systems required are expensive. Doctors can avoid this cost by leaving private practice for hospital employment. Other new rules have increased the amount of paperwork doctors must complete to be paid for treating patients.

AN INSIDE LOOK on page 18 discusses how technological change is affecting medical care.

Sources: Robert Kocher and Nikhil R. Sahni, "Hospitals' Race to Employ Physicians," *New England Journal of Medicine*, Vol. 364, No. 19, May 12, 2011, pp. 1790–1793; Julie Creswell and Reed Abelson, "A Hospital War Reflects a Bind for Doctors in the U.S.," *New York Times*, November 30, 2012; and Scott Gottlieb, "The Doctor Won't See You Now: He's Clocked Out," *Wall Street Journal*, March 14, 2013.

Economics in Your Life

Will There Be Plenty of Jobs Available in the Health Care Industry?

The U.S. Health Resources and Services Administration (HRSA) forecasts that there will be 866,400 doctors in the United States in 2020. The HRSA also forecasts that 922,000 doctors will be needed in 2020. In other words, this federal government agency forecasts that there will be a shortage of about 56,000 doctors in 2020. The U.S. Bureau of Labor Statistics forecasts that 9 of the 20 fastest growing occupations over the next 10 years will be in the medical field. But the availability of these jobs depends on the reliability of the forecasts. What is the basis for the forecasts on the availability of jobs in health care, and how reliable are the forecasts? As you read this chapter, try to answer this question. You can check your answer against the one we provide on **page 17** at the end of this chapter.

In this book, we use economics to answer questions such as the following:

- How are the prices of goods and services determined?
- Why have health care costs risen so rapidly?
- Why do firms engage in international trade, and how do government policies affect international trade?
- Why does the government control the prices of some goods and services, and what are the effects of those controls?

Economists do not always agree on the answers to every question. In fact, as we will see, economists engage in lively debate on some issues. In addition, new problems and issues are constantly arising. So, economists are always at work developing new methods to analyze economic questions.

All the topics we discuss in this book illustrate a basic fact of life: To attain our goals, we must make choices. We must make choices because we live in a world of **scarcity**, which means that although our wants are *unlimited*, the resources available to fulfill those wants are *limited*. You might like to own a BMW and spend each summer vacationing at five-star European hotels, but unless Bill Gates is a close and generous relative, you probably lack the funds to fulfill these dreams. Every day, you make choices as you spend your limited income on the many goods and services available. The finite amount of time you have also limits your ability to attain your goals. If you spend an hour studying for your economics midterm, you have one hour less to study for your history midterm. Firms and the government are in the same situation as you: They must also attain their goals with limited resources.

Economics is the study of the choices consumers, business managers, and government officials make to attain their goals, given their scarce resources.

We begin this chapter by discussing three important economic ideas that we will return to many times in the following chapters: *People are rational*, *people respond to economic incentives*, and *optimal decisions are made at the margin*. Then, we consider the three fundamental questions that any economy must answer: *What goods and services will be produced?* *How will the goods and services be produced?* and *Who will receive the goods and services produced?* Next, we consider the role of *economic models* in analyzing economic issues. **Economic models** are simplified versions of reality used to analyze real-world economic situations. We will explore why economists use models and how they construct them. Finally, we will discuss the difference between microeconomics and macroeconomics, and we will preview some important economic terms.

Scarcity A situation in which unlimited wants exceed the limited resources available to fulfill those wants.

Economics The study of the choices people make to attain their goals, given their scarce resources.

Economic model A simplified version of reality used to analyze real-world economic situations.

1.1 LEARNING OBJECTIVE

Explain these three key economic ideas: *People are rational*; *people respond to economic incentives*; and *optimal decisions are made at the margin*.

Market A group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade.

Three Key Economic Ideas

As you try to achieve your goals, whether they involve buying a new computer or finding a part-time job, you will interact with other people in *markets*. A **market** is a group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade. Examples of markets are the markets for smartphones, houses, haircuts, stocks and bonds, and labor. Most of economics involves analyzing what happens in markets. Throughout this book, as we study how people make choices and interact in markets, we will return to three important ideas:

1. People are rational.
2. People respond to economic incentives.
3. Optimal decisions are made at the margin.

People Are Rational

Economists generally assume that people are rational. This assumption does *not* mean that economists believe everyone knows everything or always makes the “best” decision. It means that economists assume that consumers and firms use all available information as they act to achieve their goals. Rational individuals weigh the benefits and costs of each action, and they choose an action only if the benefits outweigh the costs. For example, if Apple charges a price of \$299 for its latest iPhone, economists assume that the managers at Apple have estimated that this price will earn Apple the most profit. The managers may be wrong; perhaps a price of \$325 would be more profitable, but economists assume that the managers at Apple have acted rationally, on the basis of the information available to them, in choosing the price. Of course, not everyone behaves rationally all the time. Still, the assumption of rational behavior is very useful in explaining most of the choices that people make.

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People Respond to Economic Incentives

Human beings act from a variety of motives, including envy, compassion, and religious belief. While not ignoring other motives, economists emphasize that consumers and firms consistently respond to *economic incentives*. This point may seem obvious, but it is often overlooked. For example, according to an article in the *Wall Street Journal*, the FBI couldn't understand why banks were not taking steps to improve security in the face of an increase in robberies: “FBI officials suggest that banks place uniformed, armed guards outside their doors and install bullet-resistant plastic, known as a ‘bandit barrier,’ in front of teller windows.” FBI officials were surprised that few banks took their advice. But the article also reported that installing bullet-resistant plastic costs \$10,000 to \$20,000, and a well-trained security guard receives \$50,000 per year in salary and benefits. The average loss in a bank robbery is only about \$1,200. The economic incentive to banks is clear: It is less costly to put up with bank robberies than to take additional security measures. FBI agents may be surprised by how banks respond to the threat of robberies—but economists are not.

In each chapter, the *Making the Connection* feature discusses a news story or another application related to the chapter material. Read this *Making the Connection* for a discussion of whether people respond to economic incentives even when deciding how much to eat and how much to exercise.

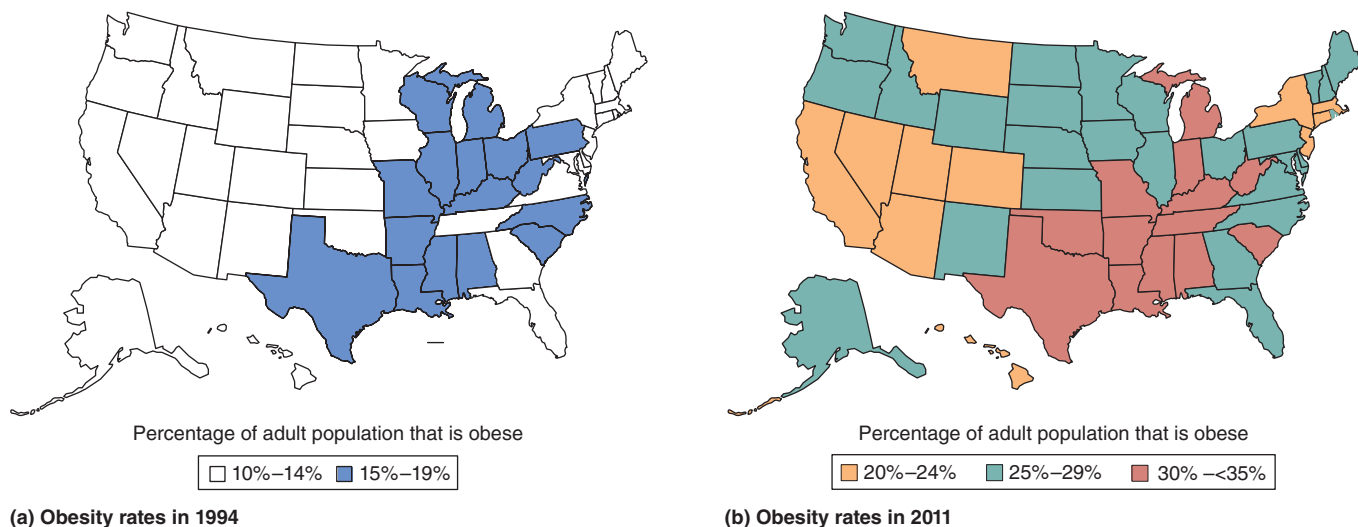
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Making the Connection MyEconLab Video

Does Health Insurance Give People an Incentive to Become Obese?

Obesity is an increasing problem in the United States. The U.S. Centers for Disease Control and Prevention (CDC) defines obesity for an adult as having a body mass index (BMI) of 30 or greater. The BMI measures a person's weight relative to the person's height. (The exact formula is: $BMI = (\text{Weight in pounds} / \text{Height in inches}^2) \times 703$.) A BMI of 30 is equivalent to a person 5'4" being 30 pounds overweight. Obesity is related to a variety of diseases, including heart disease, stroke, diabetes, and hypertension.

These two maps show the dramatic increase in obesity between 1994 and 2011. In 1994, in a majority of states between 10 percent and 14 percent of the adult population was obese, and in no state was more than 20 percent of the adult population obese. By 2011, in every state at least 20 percent of the adult population was obese, and in about three-quarters of the states, at least 25 percent of the adult population was obese.



Source: Centers for Disease Control and Prevention, "Prevalence of Self-Reported Obesity among U.S. Adults."

Many people who suffer from obesity have underlying medical conditions. For these people, obesity is an unfortunate medical problem that they cannot control. The fact that obesity is increasing, though, indicates that for some people obesity is the result of diet and lifestyle choices. Potential explanations for the increase in obesity include greater intake of high-calorie fast foods, insufficient exercise, and a decline in the physical activity associated with many jobs. The CDC recommends that teenagers get a minimum of 60 minutes of aerobic exercise per day, a standard that only 15 percent of high school students were meeting in 2013. In 1960, 50 percent of jobs in the United States required at least moderate physical activity. By 2013, only 20 percent of jobs did. As a result, a typical worker was burning off about 130 fewer calories per workday.

In addition to eating too much and not exercising enough, could health insurance be a cause of obesity? Obese people tend to suffer more medical problems and so incur higher medical costs. Obese people with health insurance that will reimburse them for only part of their medical bills or who have no health insurance must pay some or all of these higher medical bills themselves. People with health insurance that covers most of their medical bills will not suffer as large a monetary cost from being obese. In other words, by reducing some of the costs of obesity, health insurance may give people an economic incentive to gain weight.

At first glance, this argument may seem implausible. Some people suffer from medical conditions that can make physical activity difficult or that can cause weight gain even with moderate eating, so they may become obese whether they have health insurance or not. Some people are obese because of poor eating habits or lack of exercise, and they probably don't consider health insurance when deciding whether to have another slice of chocolate cake or to watch television instead of going to the gym. But if economists are correct about the importance of economic incentives, then we would expect that if we hold all other personal characteristics—such as age, gender, and income—constant, people with health insurance will be more likely to be overweight than people without health insurance.

Jay Bhattacharya and Kate Bundorf of Stanford University, Noemi Pace of the University of Venice, and Neeraj Sood of the University of Southern California, have analyzed the effects of health insurance on weight. Using a sample that followed nearly 80,000 people from 1989 to 2004, they found that after controlling for income, education, race, gender, age, and other factors, people with health insurance were significantly more likely to be overweight than people without health insurance. Having private health insurance increased BMI by 1.3 points, and having public health insurance, such as Medicaid, which is a program under which the government provides health care to low-income people, increased BMI by 2.3 points. These findings suggest that people

respond to economic incentives even when making decisions about what they eat and how much they exercise.

Sources: Centers for Disease Control and Prevention, “Prevalence of Self-Reported Obesity among U.S. Adults,” www.cdc.gov; Katherine M. Flegal, Margaret D. Carroll, Cynthia L. Ogden, and Lester R. Curtin, “Prevalence and Trends in Obesity among U.S. Adults, 1999–2008,” *Journal of the American Medical Association*, Vol. 303, No. 3, January 20, 2010, pp. 235–241; Jay Bhattacharya, Kate Bundorf, Noemi Pace, and Neeraj Sood, “Does Health Insurance Make You Fat?” in Michael Grossman and Naci H. Mocan, eds., *Economic Aspects of Obesity*, Chicago: University of Chicago Press, 2011; and Tara Parker-Pope, “Less Active at Work, Americans Have Packed on Pounds,” *New York Times*, May 25, 2011.

Your Turn: Test your understanding by doing related problems 1.6 and 1.7 on page 20 at the end of this chapter.

MyEconLab Study Plan

Optimal Decisions Are Made at the Margin

Some decisions are “all or nothing.” For instance, when an entrepreneur decides whether to open a new restaurant, she starts the new restaurant or she doesn’t. When you decide whether to enter graduate school or to take a job, you enter graduate school or you don’t. But rather than being all or nothing, most decisions in life involve doing a little more or a little less. If you are trying to decrease your spending and increase your saving, the decision is not really between saving all the money you earn or spending it all. Rather, many small choices are involved, such as whether to buy a caffè mocha at Starbucks every day or just three times per week.

Economists use the word *marginal* to mean “extra” or “additional.” Should you watch another hour of television or spend that hour studying? The *marginal benefit* (*MB*) of watching more television is the additional enjoyment you receive. The *marginal cost* (*MC*) is the lower grade you receive from having studied a little less. Should Apple produce an additional 300,000 iPhones? Firms receive *revenue* from selling goods. Apple’s marginal benefit is the additional revenue it receives from selling 300,000 more iPhones. Apple’s marginal cost is the additional cost—for wages, parts, and so forth—of producing 300,000 more iPhones. *Economists reason that the optimal decision is to continue any activity up to the point where the marginal benefit equals the marginal cost—* $MB = MC$. Often we apply this rule without consciously thinking about it. Usually you will know whether the additional enjoyment from watching a television program is worth the additional cost involved in not spending that hour studying, without giving the decision a lot of thought. In business situations, however, firms often have to make careful calculations to determine, for example, whether the additional revenue received from increasing production is greater or less than the additional cost of the production. Economists refer to analysis that involves comparing marginal benefits and marginal costs as **marginal analysis**.

In each chapter, you will see the feature *Solved Problem*. This feature will increase your understanding of the material by leading you through the steps of solving an applied economic problem. After reading the problem, test your understanding by doing the related problems that appear at the end of the chapter and in the study guide that accompanies this book. You can also complete Solved Problems on www.myeconlab.com and receive tutorial help.

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Marginal analysis Analysis that involves comparing marginal benefits and marginal costs.

Solved Problem 1.1

MyEconLab Interactive Animation

A Doctor Makes a Decision at the Margin

A doctor receives complaints from patients that her office isn’t open enough hours. So the doctor asks her office manager to analyze the effect of keeping her office open 9 hours per day rather than 8 hours. The doctor’s office manager tells her: “Keeping the office open an extra hour is a good idea because

the revenue from your practice will increase by \$300,000 per year when the office is open 9 hours per day.” Do you agree with the office manager’s reasoning? What, if any, additional information do you need to decide whether the doctor should keep her office open an additional hour per day?