



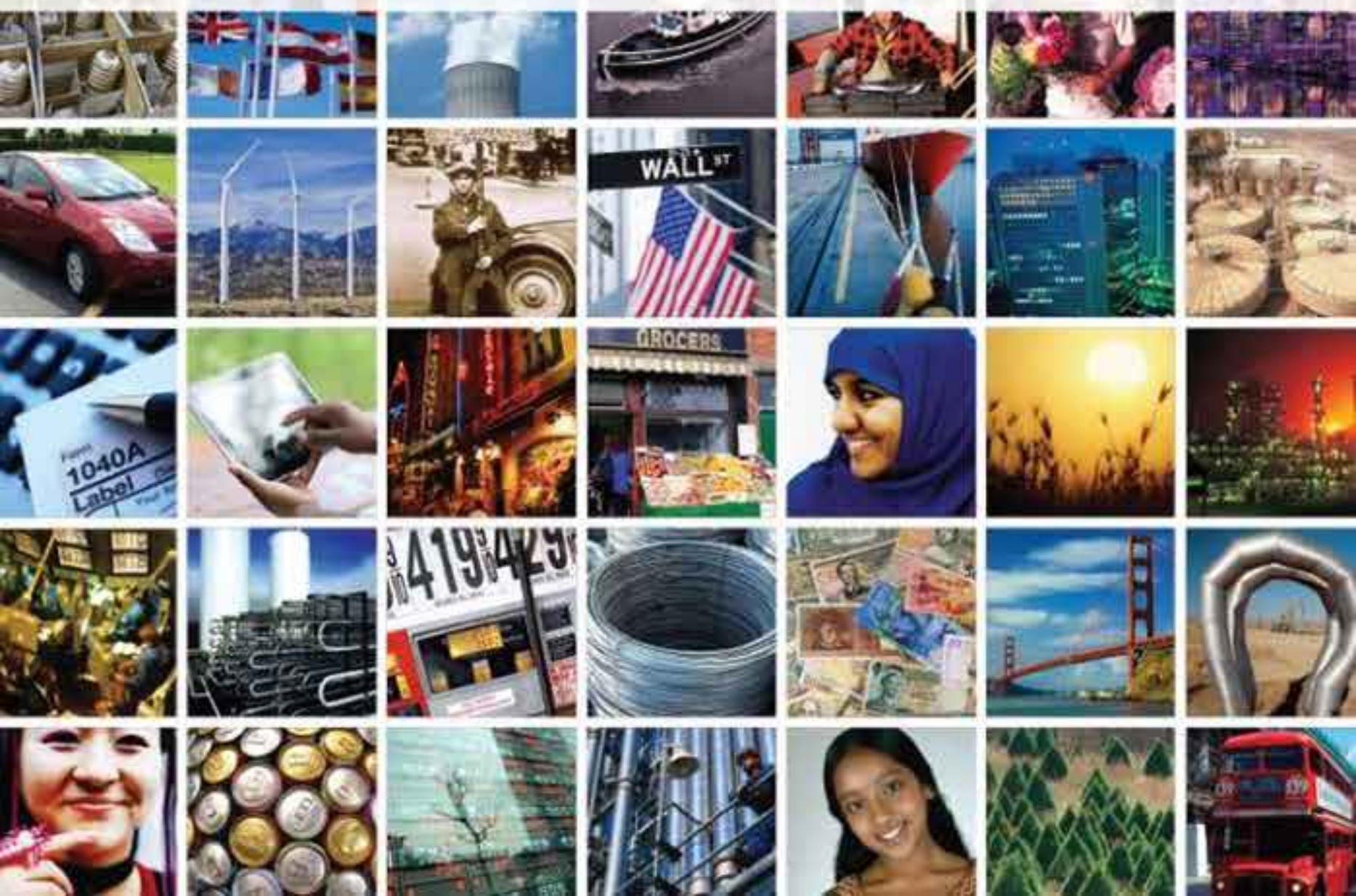
THIRD EDITION

Essentials of **ECONOMICS**

Krugman

Wells

Graddy



Applications in Economics



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ECONOMICS
THIRD EDITION

Paul Krugman • Robin Wells

PRINCETON UNIVERSITY

Kathryn Graddy

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*To beginning students everywhere,
which we all were at one time.*

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“Stories are good for us, whether we hear them, read them, write them, or simply imagine them. But stories that we read are particularly good for us. In fact I believe they are essential.”

Frank Smith, *Reading: FAQ*

FROM PAUL AND ROBIN

More than a decade ago, when we began writing the first edition of this textbook, we had many small ideas: particular aspects of economics that we believed weren't covered the right way in existing textbooks. But we also had one big idea: the belief that an economics textbook could and should be built around narratives, that it should never lose sight of the fact that economics is, in the end, a set of stories about what people do.

Many of the stories economists tell take the form of models—for whatever else they are, economic models are stories about how the world works. But we believed that students' understanding of and appreciation for models would be greatly enhanced if they were presented, as much as possible, in the context of stories about the real world, stories that both illustrate economic concepts and touch on the concerns we all face as individuals living in a world shaped by economic forces. Those stories have been integrated into every edition, including this one, which contains more stories than ever before. Once again, you'll find them in the openers, in boxed features like Economics in Action, For Inquiring Minds, and Global Comparisons, but now in our new Business Cases as well.

We have been gratified by the reception this storytelling approach has received, but we have also heard from users who urged us to expand the range of our stories to reach an even broader audience. In this edition of *Essentials of Economics* we have tried to expand the book's appeal with some carefully selected changes.

As in the previous edition, we've made extensive changes and updates in coverage to reflect current events—events that have come thick and fast in a turbulent, troubled world economy, which is affecting the lives and prospects of students everywhere. Currency is very important to us. We have also expanded our coverage of business issues, both because business experience is a key source of economic lessons and because most students will eventually find themselves working in the business world. We are especially pleased with how the new Business Cases have turned out and how they augment the overall number and richness of our stories.

We remain extremely fortunate in our reviewers, who have put in an immense amount of work helping us to make this book even better. And we are also deeply thankful to all the users who have given us feedback, telling us what works and, even more important, what doesn't.

Many things have changed since the second edition of this book. As you'll see, there's a great deal of new material, and there are some significant changes (and,

we hope, improvements) in pedagogy. But we've tried to keep the spirit the same. This is a book about economics as the study of what people do and how they interact, a study very much informed by real-world experience.

FROM KATHRYN

I enjoyed working on this third edition of *Essentials of Economics*. Much of the book is based on the third edition of Paul and Robin's *Economics*, which is their excellent, entertaining, and up-to-date principles text for the two-semester course. Feedback from reviewers on the second edition of *Essentials*, along with my own experience teaching a one-semester survey course, has guided the revision of this third edition.

In a one-semester course it is always a challenge to balance the depth of coverage of specific topics with breadth of coverage of essential topics on economics. My hope is that this third edition achieves this balance and at the end of the course leaves the students interested in economics and eager to learn more. A focus on global examples is once again an important feature of the book, reflecting both Paul and Robin's international experiences and my twelve years of living and working in the United Kingdom.

The Third Edition: What's New

We have learned with each new edition that there is always room for improvement. So, for the third edition, we undertook a revision with three goals in mind: to expand the book's appeal to business students, to be current in terms of topics covered and examples included, and to make the book more accessible. We hope that the following revisions lead to a more successful teaching experience for you.

New Business Case Studies

Now, more than ever, students entering the business community need a strong understanding of economic principles and their applications to business decisions. To meet this demand, each part now concludes with a set of real-world Business Cases, showing how the economic issues discussed in the part's chapters play out in the world of entrepreneurs and bottom lines.

The cases range from the story of the trading firm Li & Fung, which is in the business of making money from comparative advantage, to a look at how

apps like TheFind are making the retail market for electronics much more competitive, to an examination of how lean production techniques at Boeing and Toyota have impacted comparative advantage in the airline and auto industries. The cases provide insight into business decision making in both American and international companies and at recognizable firms like British Airways and Priceline.com. Lesser-known firms are also used to illustrate economic concepts behind the supply costs of labor during seasonal work (Kiva Systems and the debate on human versus robotic order fulfillment), and the positive externalities of economic geography during the digital boom (Silicon Valley in California and Route 128 outside Boston).

The chapters on the macroeconomy are treated in business cases as well, ranging from the 2009 bankruptcy of General Motors, once the symbol of American economic success, and its rebound in 2010, to a look at companies like Macroeconomic Advisers and the nonprofit Institute of Supply Management that forecast changes in GDP, to an examination of the productivity surge in retailing driven by improvements in global logistics at Walmart. The cases also place the individual consumer and firm in the macroeconomy with examples that illustrate the changing job market during a recession (Monster.com), the role of gift cards in secondary markets (PlasticJungle.com), and the value of “breakage” when individual consumers fail to pay down their gift cards completely.

Each case is followed by critical thinking questions that prompt students to apply the economics they learned in the chapter to real-life business situations (answers to these questions are found in the Instructor’s Resource Manual).

New Chapter: “Crises and Consequences”

This new chapter provides an up-to-date look at the 2008 financial crisis and the aspects of the banking system that allowed it to take place. Starting with the story of the Lehman Brothers collapse, the chapter integrates coverage on the dangers of banking, the trade-off between liquidity and rate of return, the emergence of “shadow banks,” and the early bank runs of the recession. Also covered: asset bubbles, financial contagion, financial panic, and a look at how the financial crisis fits into a long history of economic crises. The chapter concludes with a discussion of why banking crises are so bad for so many, and the role the government and regulation play in crises.

An Emphasis on Currency and Visual Exposition

The third edition is updated to remain the most current textbook on the market in its data, examples, and the

opening stories—a currency that drives student interest in each chapter.

Economics in Action: A Richer Story to Be Told

Students and instructors alike have always championed *Essentials of Economics* for its applications of economic principles, especially our Economics in Action feature. In the third edition, we have revised or replaced a significant number of Economics in Action applications in every single chapter. We believe this provides the richness of content that drives student and instructor interest. A list of all Economics in Action boxes appears on the inside front cover.

Opening Stories We have always taken great care to ensure that each chapter’s opening story illustrates the key concepts of that chapter in a compelling and accessible way. To continue to do so, almost every story in the third edition was updated and nearly a third were replaced in an effort to bridge the gap between economic concepts and student interest in the world around them. New openers include the story of Boeing’s Dreamliner and its genesis in the wind tunnels that the Wright brothers built at Kitty Hawk, the story of how flooding in Pakistan led to higher prices for blue jeans here at home, and we tell the story of China’s economic rise, surpassing Japan as the second largest economy, and the means economists use to measure such trends.

Worked Problems Virtually every chapter concludes with a worked problem that poses a realistic economic question and then uses the concepts presented in the chapter to help students solve it, step-by-step. Each worked problem has been carefully reviewed and revised in keeping with our emphasis on currency. New worked problems have been added on China’s exports of rare earths and on Tesla Motors, the producer of electric cars. Other worked problems have been updated using current examples and data. A full list of the Worked Problems can be found on the inside front cover of this book.

A More Visual Exposition The research tells us that students read more online, in shorter bursts, and respond better to visual representations of information than ever before. In the third edition, we’ve worked hard to present information in the format that best teaches students.

We’ve shortened our paragraphs for easier reading and included numbered and bulleted lists whenever content would allow. You will find helpful new summary tables in this edition. And, most helpful, are the new visual displays in the book, including the dynamic representations of the factors that shift demand (p. 78) and the factors that shift supply (p. 85), among others.

Tools for Learning

Every chapter is structured around a common set of features that help students learn while keeping them engaged.

Supply and Demand

BLUE JEAN BLUES



Ciaran Griffin/Thinkstock

How did flood-ravaged cotton crops in Pakistan lead to higher-priced blue jeans and more polyester in T-shirts?

IF YOU BOUGHT A PAIR OF BLUE jeans in 2011, you may have been shocked at the price. Or maybe not: fashions change, and maybe you thought you were paying the price for being fashionable. But you weren't—you were paying for cotton. Jeans are made of denim, which is a particular weave of cotton, and by late 2010, when jeans manufacturers were buying supplies for the coming year, cotton prices were more than triple their level just two years earlier. By December 2010, the price of a pound of cotton had hit a 140-year high, the highest cotton price since records began in 1870.

And why were cotton prices so high?

On one side, demand for clothing of all kinds was surging. In 2008–2009, as the world struggled with the effects of a financial crisis, nervous consumers cut back on clothing purchases. But by 2011, with the worst apparently over, buyers were back in force. On the supply

production. Most notably, Pakistan, the world's fourth-largest cotton producer, was hit by devastating floods that put one-fifth of the country underwater and virtually destroyed its cotton crop.

Fearing that consumers had limited tolerance for large increases in the price of cotton clothing, apparel makers began scrambling to find ways to reduce costs without offending consumers' fashion sense. They adopted changes like smaller buttons, cheaper linings, and—yes—polyester, doubting that consumers would be willing to pay more for cotton goods. In fact, some experts on the cotton market warned that the sky-high prices of cotton in 2010–2011 might lead to a permanent shift in tastes, with consumers becoming more willing to wear synthetics even when cotton prices came down.

At the same time, it was not all bad news for everyone connected with the cotton trade. In the United States, cotton

- › What a **competitive market** is and how it is described by the **supply and demand model**
- › What the **demand curve** and the **supply curve** are
- › The difference between **movements along a curve** and **shifts of a curve**
- › How the **supply and demand curves** determine a market's **equilibrium price** and **equilibrium quantity**
- › In the case of a **shortage** or **surplus**, how price moves the market back to **equilibrium**

WHAT YOU WILL LEARN IN THIS CHAPTER

Chapter Overviews offer students a helpful preview of the key concepts they will learn about in the chapter.

weaver and were reaping the higher prices. American farmers responded to sky-high cotton prices by sharply increasing the acreage devoted to the crop. None of this was enough, however, to produce immediate price relief.

Wait a minute: how, exactly, does flooding in Pakistan translate into higher jeans prices and more polyester in your T-shirts? It's a matter of supply and demand—but what does that mean? Many people use “supply and demand” as a sort of catchphrase to mean “the laws of the marketplace at work.” To economists, however, the concept of supply and demand has a precise meaning: it is a *model of how a market behaves* that is extremely useful for understanding many—but not all—markets.

In this chapter, we lay out the pieces that make up the *supply and demand model*, put them together, and show how this model can be used to understand how many—but not all—markets behave. ■

Opening Stories Each chapter begins with a compelling story that is often integrated throughout the rest of the chapter. More than a third of the stories in this edition are new, including the one shown here.

ECONOMICS > IN ACTION

BEATING THE TRAFFIC

Economics in Action cases conclude every major text section. This much-lauded feature lets students immediately apply concepts they've read about to real phenomena.

traffic problems, and many local authorities try to discourage crowded city center. If we think of an auto trip to the city people consume, we can use the economics of demand to

to reduce the demand for auto trips by lowering rates. Many metropolitan areas subsidize bus and rail ure commuters out of their cars. An alternative is to implements: several major U.S. cities impose high taxes ing garages and impose short time limits on parking e revenue and to discourage people from driving into

es—including Singapore, London, Oslo, Stockholm, and willing to adopt a direct and politically controversial congestion by raising the price of driving. Under “congestion pricing” (or “congestion charging” in the United Kingdom), a charge is imposed on cars entering the city center during business hours. Drivers buy passes, which are then debited electronically as they drive by monitoring stations. Compliance is monitored with automatic cameras that photograph license plates. Moscow is currently contemplating a congestion charge scheme to tackle the worst traffic jams of all major cities, with 40% of drivers reporting traffic jams exceeding three hours.

The current daily cost of driving in London ranges from £9 to £12 (about \$14 to \$19). And drivers who don't pay and are caught pay a fine of £120 (about \$190) for each transgression.

Not surprisingly, studies have shown that after the implementation of congestion pricing, traffic does indeed decrease. In the 1990s, London had some of the worst traffic in Europe. The introduction of its congestion charge in 2003 immediately reduced traffic in the London city center by about 15%, with overall traffic falling by 21% between 2002 and 2006. And there was increased use of substitutes, such as public transportation, bicycles, motorbikes, and ride-sharing.

In the United States, a pilot program in San Francisco implemented congestion pricing in 2007. Transportation experts predicted that raising prices during peak hours would be controversial, it would

Check Your Understanding questions allow students to immediately test their understanding of a section. Solutions appear at the back of the book.

CHECK YOUR UNDERSTANDING 3-1

- Explain whether each of the following events represents (i) a *shift of the demand curve* or (ii) a *movement along the demand curve*.
 - A store owner finds that customers are willing to pay more for umbrellas on rainy days.
 - When XYZ Telecom, a long-distance telephone service provider, offered reduced rates on weekends, its volume of weekend calling increased sharply.
 - People buy more long-stem roses the week of Valentine's Day, even though the prices are higher than at other times during the year.
 - A sharp rise in the price of gasoline leads many commuters to join carpools in order to reduce their gasoline purchases.

Solutions appear at the back of the book.

Global Stamps identify which boxes, cases, and applications are global in focus.



Cities can reduce traffic congestion by raising the price of driving.

Quick Review

- The **supply and demand model** is a model of a **competitive market**—one in which there are many buyers and sellers of the same good or service.
- The **demand schedule** shows how the **quantity demanded** changes as the price changes. A **demand curve** illustrates this relationship.
- The **law of demand** asserts that a higher price reduces the quantity demanded. Thus, demand curves normally slope downward.
- An increase in demand leads to a **rightward shift of the demand curve**: the quantity demanded rises for any given price. A decrease in demand leads to a **leftward shift**: the quantity demanded falls for any given price. A change in price results in a change in the quantity demanded and a **movement along the demand curve**.
- The five main factors that can shift the demand curve are changes in (1) the price of a related good, such as a **substitute** or a **complement**, (2) income, (3) tastes, (4) expectations, and (5) the number of consumers.
- The market **demand curve** is the horizontal sum of the **individual demand curves** for all consumers in the market.

Quick Reviews offer students a short, bulleted summary of key concepts in the section to aid understanding.

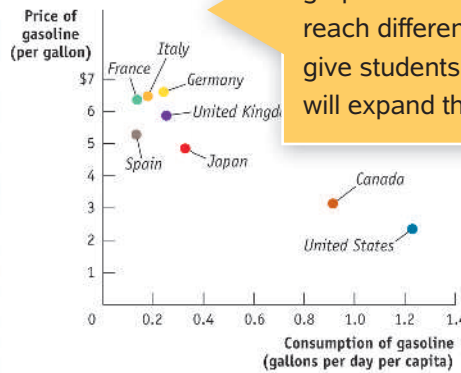


PAY MORE, PUMP LESS

For a real-world illustration of the law of demand, consider how gasoline consumption varies according to the prices consumers pay at the pump. Because of high taxes, gasoline and diesel fuel are more than twice as expensive in most European countries as in the United States. According to the law of demand, this should lead Europeans to buy less gasoline than Americans—and they do. As you can see from the figure, per person, Europeans consume less than half as much fuel as Americans, mainly because they drive smaller cars with better mileage.

Prices aren't the only factor affecting fuel consumption, but they're probably the main cause of the difference between European and American fuel consumption per person.

Source: U.S. Energy Information Administration, 2009.



Global Comparison boxes use real data from several countries as well as colorful graphs to illustrate how and why countries reach different economic outcomes. The boxes give students an international perspective that will expand their understanding of economics.

WORKED PROBLEM

Production Challenges for Tesla: The Model S

Tesla Motors, founded in 2003, exclusively produces electric cars and electric powertrains in a former Toyota factory in Fremont, California. The Tesla Roadster, a sports car, was the company's first design. Their newest design, available for 2012 delivery, is the Tesla Model S, a luxury sedan. The Model S uses no gasoline, has a range of up to 300 miles per charge, and has zero tailpipe emissions. Although demand for the car has been strong, production of the Model S at the Fremont plant is currently less than Tesla had anticipated.

Let's assume that Tesla engineers knew they needed to either build or buy a new factory in order to produce the new Model S. And, suppose that Tesla engineers and accountants estimated the following hypothetical cost structure per year based on full-year production at plants of different sizes.

| Plant size | Total cost (hundreds of millions of U.S. dollars) | | |
|------------|---|------------------|------------------|
| | 10,000 cars sold | 20,000 cars sold | 30,000 cars sold |
| A | \$1.75 | \$3.25 | \$5.5 |
| B | 2.0 | 3.0 | 5.0 |
| C | 2.5 | 4.0 | 4.5 |

When Toyotas were built there, the Fremont plant produced about 80,000 vehicles per year. Suppose that Tesla equipped the plant with the hopes of producing 30,000 Tesla vehicles per year, yet in its first few years of production, Tesla predicted sales would be only 20,000 vehicles per year. But, by 2012, because of production delays, actual sales dropped to less than 10,000 cars per year. Using the table, find Tesla's average total cost of production per car at a size C plant if only 20,000 cars are built. At a size C plant, what is the average total cost of production if only 10,000 cars are built?

Worked Problems

Chapters conclude with a worked problem that presents a realistic economic question and then helps students answer it, one step at a time, by applying key concepts from the chapter.

PITFALLS

DEMAND VERSUS QUANTITY DEMANDED

When economists say "an increase in demand," they mean a rightward shift of the demand curve, and when they say "a decrease in demand," they mean a leftward shift of the demand curve—that is, when they're being careful. In ordinary speech most people, including professional economists, use the word *demand* casually. For

example, an economist might say "the demand for air travel has doubled over the past 15 years, partly because of falling airfares." It's a common mistake to confuse demand with quantity demanded. It's a common mistake to confuse demand with quantity demanded. It's a common mistake to confuse demand with quantity demanded.

Pitfalls boxes clarify concepts that can be easily misunderstood by students new to economics.

TABLE 3-1 Factors That Shift Demand

| When this happens ... | ... demand increases | But when this happens ... | ... demand decreases |
|--|----------------------|--|----------------------|
| When the price of a substitute rises ... | | When the price of a substitute falls ... | |
| When the price of a complement falls ... | | When the price of a substitute rises ... | |

New! Summary Tables serve as a helpful study aid for readers. Many incorporate visuals to help students grasp important economic concepts.

TOOLS FOR LEARNING WALKTHROUGH

SUMMARY

1. The **supply and demand model** illustrates how a **competitive market**, one with many buyers and sellers, none of whom can influence the market price, works.

2. The **demand schedule** shows the **quantity demanded** at each price. A **shift of demand** says that, at a higher price, more people demand a

good. **Shifts of the supply curve**—a change in the quantity supplied at any given price. An increase in supply causes a rightward shift of the supply curve. A decrease in supply causes a leftward shift.

8. There are five main factors that shift the supply curve:

- A change in **input** prices
- A change in the prices of related goods and services
- A change in technology
- A change in expectations
- A change in the number of producers

End-of-Chapter Reviews include a brief but complete summary of key concepts, a list of key terms, and a comprehensive, high-quality set of end-of-chapter problems.

PROBLEMS

1. A survey indicated that chocolate is Americans' favorite ice-cream flavor. For each of the following, indicate the possible effects on demand, supply, or both as well as equilibrium price and quantity of chocolate ice cream.

- a. A severe drought in the Midwest causes dairy farmers to reduce the number of milk-producing cattle in their herds by a third. These dairy farmers supply cream that is used to manufacture chocolate ice cream.
- b. A new report by the American Medical Association reveals that chocolate does, in fact, have significant health benefits.

Case 2: There is a change in the price of a related good, which is reported as follows:

- b. The market for Case 1: The price of a related good falls. Case 2: The price of a related good rises.
- c. The market for Case 1: People cook breakfast less often. Case 2: People cook breakfast more often.
- d. The market for Case 1: The price of a related good falls. Case 2: The price of a related good rises.

KEY TERMS

Competitive market, p. 66
 Supply and demand model, p. 66
 Demand schedule, p. 67
 Quantity demanded, p. 67
 Demand curve, p. 68
 Law of demand, p. 68
 Shift of the demand curve, p. 70
 Movement along the demand curve, p. 70

Substitutes, p. 71
 Complements, p. 71
 Normal good, p. 72
 Inferior good, p. 72
 Individual demand curve, p. 73
 Quantity supplied, p. 76
 Supply schedule, p. 76
 Supply curve, p. 77
 Shift of the supply curve, p. 77

BUSINESS CASE • The Chicago Board of Trade



To understand the concept of an equilibrium price, it's helpful to do what we did in the discussion of demand: imagine that buyers are wandering around comparing the prices offered by different sellers. Some markets really do work that way. But cotton, wheat, and many other commodities are traded on "exchanges," which make prices much more transparent and make the movement to equilibrium almost instantaneous.

Modern exchanges began with wheat trading at the Chicago Board of Trade, founded in 1848. But in 1848, St. Louis, not Chicago, was the leading city in the American West, and it dominated the wheat trade. The wheat market in St. Louis was freewheeling and a lot like the story we told in the text. There was no central marketplace; sellers set up in various warehouses, or even stacked sacks of wheat on the levee, and buyers wandered around looking for the best deal.

In Chicago, however, sellers had a better idea. The Chicago Board of Trade, an association of the city's leading grain dealers, created a system in which wheat traders gathered in one place—the "pit"—where they called out or accepted to buy or sell. The Board guaranteed that these contracts would be fulfilled. This system meant that buyers could very quickly find sellers and vice versa, reducing the costs of doing business. It also ensured that everyone could see the latest price, so the price rose and fell very rapidly to clear the market. For example, news of bad weather in a wheat-growing area hundreds of miles away would send the price in Chicago soaring in a matter of minutes.

The Chicago Board of Trade went on to become the world's most important trading center for wheat and many other agricultural commodities, a status it retains to this day. And the Board's rise helped the rise of Chicago, too. The city, as Carl Sandburg put it in his famous poem, became

Hog Butcher for the World,
 Tool Maker, Stacker of Wheat,
 Player with Railroads and the Nation's Freight Handler

By 1890, Chicago had more than a million people, second only to New York. Making a better market, it turned out, was very good business indeed.

QUESTIONS FOR THOUGHT

1. In the text we mentioned how prices can vary in a tourist trap. Why was the wheat market in St. Louis a bit like a tourist trap, and why was Chicago different? What was the advantage of having buyers and sellers gathered in one place?

New! Business Cases

close each section, applying key economic principles to real-life business situations in both American and international companies. Each case includes critical thinking questions.

Advantages of This Book

Our basic approach to textbook writing remains unchanged:

- **Chapters build intuition through realistic examples.** In every chapter, we use real-world examples, stories, applications, and case studies to teach the core concepts and motivate student learning. The best way to introduce concepts and reinforce them is through real-world examples; students simply relate more easily to them.
- **Pedagogical features reinforce learning.** We've crafted a genuinely helpful set of features that are described in the preceding section, "Tools for Learning" on pages xxi–xxiv.
- **Chapters are accessible and entertaining.** We use a fluid and friendly writing style to make concepts accessible and, whenever possible, we use examples that are familiar to students.
- **Although easy to understand, the book also prepares students for further coursework.** There's no need to choose between two unappealing alternatives: a textbook that is "easy to teach" but leaves major gaps in students' understanding, or a textbook that is "hard to teach" but adequately prepares students for future coursework. We offer the best of both worlds.

Supplements and Media

Worth Publishers is pleased to offer an enhanced and completely revised supplements and media package to accompany this textbook. The package has been crafted to help instructors teach their principles course and to give students the tools to develop their skills in economics.

For Instructors

Instructor's Resource Manual with Solutions Manual

The Instructor's Resource Manual, revised by Nora Underwood, University of Central Florida, is a resource meant to provide materials and tips to enhance the classroom experience. The Instructor's Resource Manual provides the following:

- Chapter-by-chapter learning objectives
- Chapter outlines
- Teaching tips and ideas that include:
 - Hints on how to create student interest
 - Tips on presenting the material in class

- Discussion of the examples used in the text, including points to emphasize with your students
- Activities that can be conducted in or out of the classroom
- Hints for dealing with common misunderstandings that are typical among students
- Web resources (includes tips for using EconPortal)
- Solutions manual with detailed solutions to all of the end-of-chapter problems from the textbook

Test Bank Coordinator: Carlos Aguilar, El Paso Community College. The Test Bank provides a wide range of questions appropriate for assessing your students' comprehension, interpretation, analysis, and synthesis skills. Totalling over 4,500 questions, the Test Bank offers multiple-choice, true/false, and short-answer questions designed for comprehensive coverage of the text concepts. Questions have been checked for continuity with the text content, overall usability, and accuracy.

The Test Bank features include the following:

- To aid instructors in building tests, each question has been categorized according to its general *degree of difficulty*. The three levels are: *easy*, *moderate*, and *difficult*.
 - *Easy* questions require students to recognize concepts and definitions. These are questions that can be answered by direct reference to the textbook.
 - *Moderate* questions require some analysis on the student's part.
 - *Difficult* questions usually require more detailed analysis by the student.
- Each question has also been categorized according to a *skill descriptor*. These include: *Fact-Based*, *Definitional*, *Concept-Based*, *Critical Thinking*, and *Analytical Thinking*.
 - *Fact-Based Questions* require students to identify facts presented in the text.
 - *Definitional Questions* require students to define an economic term or concept.
 - *Concept-Based Questions* require a straightforward knowledge of basic concepts.
 - *Critical Thinking Questions* require the student to apply a concept to a particular situation.
 - *Analytical Thinking Questions* require another level of analysis to answer the question. Students must be able to apply a concept and use this knowledge for further analysis of a situation or scenario.

- To further aid instructors in building tests, each question is conveniently cross-referenced to the appropriate topic heading in the textbook. Questions are presented in the order in which concepts are presented in the text.
- The Test Bank includes questions with tables that students must analyze to solve for numerical answers. It also contains questions based on the graphs that appear in the book. These questions ask students to use the graphical models developed in the textbook and to interpret the information presented in the graph. Selected questions are paired with scenarios to reinforce comprehension.
- Questions have been designed to correlate with the various questions in the text. *Study Guide Questions* are also available in each chapter. This is a unique set of 25–30 questions per chapter that are parallel to the *Chapter Review Questions* in the printed Study Guide. These questions focus on the key concepts from the text that students should grasp after reading the chapter. These questions reflect the types of questions that the students have likely already worked through in homework assignments or in self-testing. These questions can also be used for testing or for brief in-class quizzes.

The Test Bank is available in CD-ROM format for both Windows and Macintosh users. With this program, instructors can easily create and print tests and write and edit questions. Tests can be printed in a wide range of formats. The software's unique synthesis of flexible word-processing and database features creates a program that is extremely intuitive and capable.

Lecture PowerPoint Presentation Created by Amy Scott, DeSales University, the enhanced PowerPoint presentation slides are designed to assist you with lecture preparation and presentations. The slides are organized by topic and contain graphs, data tables, and bulleted lists of key concepts suitable for lecture presentation. Key figures from the text are replicated and animated to demonstrate how they build. *Notes to the Instructor* are also included to provide added tips, class exercises, examples, and explanations to enhance classroom presentations. The slides have been designed to allow for easy editing of graphs and text. These slides can be customized to suit your individual needs by adding your own data, questions, and lecture notes. These files may be accessed on the instructor's side of the website.

For Students

Study Guide Prepared by Elizabeth Sawyer Kelly, University of Wisconsin–Madison, the Study Guide reinforces the topics and key concepts covered in the text. For each chapter, the Study Guide is organized as follows:

Before You Read the Chapter

- **Summary:** an opening paragraph that provides a brief overview of the chapter.
- **Objectives:** a numbered list outlining and describing the material that the student should have learned in the chapter. These objectives can be easily used as a study tool for students.
- **Key Terms:** a list of boldface key terms with their definitions—including room for note-taking.

After You Read the Chapter

- **Tips:** numbered list of learning tips with graphical analysis.
- **Problems and Exercises:** a set of 10–15 comprehensive problems.

Before You Take the Test

- **Chapter Review Questions:** a set of 30 multiple-choice questions that focus on the key concepts from the text students should grasp after reading the chapter. These questions are designed for student exam preparation. A parallel set of these questions is also available to instructors in the Test Bank.

Answer Key

- **Answers to Problems and Exercises:** detailed solutions to the Problems and Exercises in the Study Guide.
- **Answers to Chapter Review Questions:** solutions to the multiple-choice questions in the Study Guide—along with thorough explanations.

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The integrated online version of the Aplia media and the Krugman/Wells text includes:

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LEARNINGCurve
3.2.2 Understanding Shifts of the Demand Curve

Suppose that clothes from the thrift store are inferior goods. If incomes decrease

- demand will decrease.
- demand will increase.
- demand will decrease and then shift back to its original level.
- ~~demand will remain the same.~~

Whoops. The correct answer is not:
demand will remain the same.
 → If incomes decrease, demand for inferior goods will increase.
 Try again, **check the e-book**, GET A HINT, or click SHOW ME to see the answer and try another question.

- Index:1/1
- Topic: Test Questions
- Level: 2
- Answer: demand will increase.
- [edit item](#)

? Get a Hint
👁 Show Me

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 - **The complete test bank** for the textbook for use in creating exams, quizzes, or homework problems. Instructors can use built-in filters and settings to ensure the right questions are chosen and displayed to their preferences.
 - **The end-of-chapter problem sets** from the textbook which are carefully edited and available in a self-graded format—perfect for in-class quizzes and homework assignments.
 - **Electronically gradable graphing problems** using a robust graphing engine. Students will be asked to draw their response to a question, and the software will automatically grade that response. Graphing questions are tagged to appropriate textbook sections and range in difficulty level and skill.

Get your feet wet with our graphing tools: Let's imagine a market for Tabloid Newspapers.

Part 1: Select the Line tool and draw a downward-sloping line. Label it "Demand 1". Next, using the same tool, draw an upward-sloping line that intersects "Demand 1" and label it "Supply 1".

Part 2: Use the Double Drop Line tool to identify the price and quantity where the two lines intersect. Label it "Equilibrium 1".

Part 3: With the Line tool, draw a new downward-sloping line that is to the LEFT of "Demand 1". Label it "Demand 2". Use the Double Drop Line tool to show the new equilibrium price and quantity in the global market for this Allen Bigfoot Journalism. Label this point "Equilibrium 2." Feel momentarily happy that demand for sensational stories has fallen, then remember that it's only because of the rise in demand for substitute goods like reality TV.

Continue to play with the graph if you like. We know you are an economist, after all.

Coordinates: (100.00, 0.00)

Price of Tabloid Newspapers

Quantity of Tabloid Newspapers

Legend:

- Demand 1
- Supply 1
- Equilibrium 1
- Demand 2
- Equilibrium 2
- Unselected

Buttons: Erase All, Correct, Submit Answer, Try Again

Feedback: Well done! With News of the Universe having seen its last publishing days, both the price and equilibrium quantity of Tabloid Newspapers will drop. Now we'll have more time for the more serious content of Facebook.

Next Question

Acknowledgments

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Text Credits

Chapter 5, Source information for Table 5-1 on page 147: Eggs, beef: K. S. Huang and Biing-Hwan Lin, *Estimation of Food Demand and Nutrient Elasticities from Household Survey Data*, United States Department of Agriculture Economic Research Service Technical Bulletin, No. 1887 (Washington, DC: U.S. Department of Agriculture, 2000); **stationery, gasoline, airline travel, foreign travel:** H. S. Houthakker and Lester D. Taylor, *Consumer Demand in the United States, 1929–1970: Analyses and Projections* (Cambridge, MA: Harvard University Press, 1966); **housing, restaurant meals:** H. S. Houthakker and Lester D. Taylor, *Consumer Demand in the United States: Analyses and Projections*, 2nd ed. (Cambridge, MA: Harvard University Press, 1970).

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First Principles

COMMON GROUND



Seonghoon Cho/Bloomberg via Getty Images

One must choose.

THE ANNUAL MEETING OF THE American Economic Association draws thousands of economists, young and old, famous and obscure. There are book-sellers, business meetings, and quite a few job interviews. But mainly the economists gather to talk and listen. During the busiest times, 60 or more presentations may be taking place simultaneously, on questions that range from financial market crises to who does the cooking in two-earner families.

What do these people have in common? An expert on financial markets probably knows very little about the economics of housework, and vice versa. Yet an economist who wanders into the wrong seminar and ends up listening to presentations on some unfamiliar topic is nonetheless likely to hear much that is familiar. The reason is that all economic analysis is based on a set of common principles that apply to many different issues.

Some of these principles involve *individual choice*—for economics is, first of all, about the choices that individuals

make. Do you save your money and take the bus or do you buy a car? Do you keep your old smart-phone or upgrade to a new one? These decisions involve *making a choice* from among a limited number of alternatives—limited because no one can have everything that he or she wants. Every question in economics at its most basic level involves individuals making choices.

But to understand how an *economy* works, you need to understand more than how individuals make choices. None of us are Robinson Crusoe, alone on an island. We must make decisions in an environment that is shaped by the decisions of others. Indeed, in a modern economy even the simplest decisions you make—say, what to have for breakfast—are shaped by the decisions of thousands of other people, from the banana grower in Costa Rica who decided to grow the fruit you eat to the farmer in Iowa who provided the corn in your cornflakes.

Because each of us in a *market economy* depends on so many others—and

they, in turn, depend on us—our choices interact. So although all economics at a basic level is about individual choice, in order to understand how market economies behave we must also understand *economic interaction*—how my choices affect your choices, and vice versa.

Many important economic interactions can be understood by looking at the markets for individual goods, like the market for corn. But an economy as a whole has ups and downs, and we therefore need to understand economy-wide interactions as well as the more limited interactions that occur in individual markets.

Through the study of economics, we will discover common principles about individual choice and interaction. In this first section, we define key terms in economics. We then look in detail at twelve basic principles of economics—four principles involving individual choice, five involving the way individual choices interact, and three more involving economy-wide interactions. ■

WHAT YOU
WILL LEARN
IN THIS
CHAPTER

- › A set of definitions relating to economics and the economy
- › A set of principles for understanding the economics of how individuals make choices
- › A set of principles for understanding how economies work through the interaction of individual choices
- › A set of principles for understanding economy-wide interactions

An **economy** is a system for coordinating society's productive activities.

Economics is the social science that studies the production, distribution, and consumption of goods and services.

A **market economy** is an economy in which decisions about production and consumption are made by individual producers and consumers.

The **invisible hand** refers to the way in which the individual pursuit of self-interest can lead to good results for society as a whole.

The Ordinary Business of Life

Imagine that you could transport an American from the colonial period forward in time to our own era. (Isn't that the plot of a movie? Several, actually.) What would this time-traveler find amazing?

Surely the most amazing thing would be the sheer prosperity of modern America—the range of goods and services that ordinary families can afford. Looking at all that wealth, our transplanted colonial would wonder, “How can I get some of that?” Or perhaps he would ask himself, “How can my society get some of that?”

The answer is that to get this kind of prosperity, you need a well-functioning system for coordinating productive activities—the activities that create the goods and services people want and get them to the people who want them. That kind of system is what we mean when we talk about the **economy**. And **economics** is the social science that studies the production, distribution, and consumption of goods and services. As the great nineteenth-century economist Alfred Marshall put it, economics is “a study of mankind in the ordinary business of life.”

An economy succeeds to the extent that it, literally, delivers the goods. A time-traveler from the eighteenth century—or even from 1950—would be amazed at how many goods and services the modern American economy delivers and at how many people can afford them. Compared with any past economy and with all but a few other countries today, America has an incredibly high standard of living.

So our economy must be doing something right, and the time-traveler might want to compliment the person in charge. But guess what? There isn't anyone in charge. The United States has a **market economy**, in which production and consumption are the result of decentralized decisions by many firms and individuals. There is no central authority telling people what to produce or where to ship it. Each individual producer makes what he or she thinks will be most profitable; each consumer buys what he or she chooses.

The alternative to a market economy is a *command economy*, in which there is a central authority making decisions about production and consumption. Command economies have been tried, most notably in the Soviet Union between 1917 and 1991. But they didn't work very well. Producers in the Soviet Union routinely found themselves unable to produce because they did not have crucial raw materials, or they succeeded in producing but then found that nobody wanted their products. Consumers were often unable to find necessary items—command economies are famous for long lines at shops.

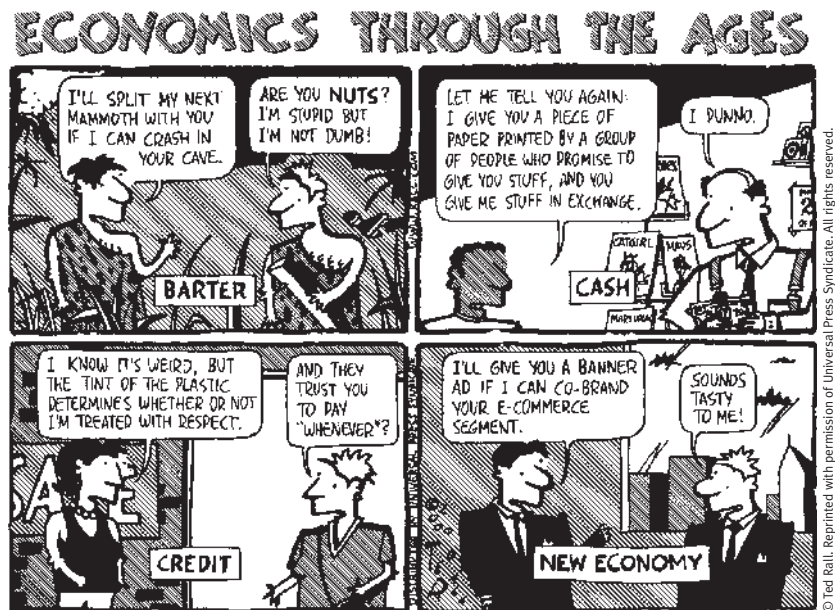
Market economies, however, are able to coordinate even highly complex activities and to reliably provide consumers with the goods and services they want. Indeed, people quite casually trust their lives to the market system: residents of any major city would starve in days if the unplanned yet somehow orderly actions of thousands of businesses did not deliver a steady supply of food. Surprisingly, the unplanned “chaos” of a market economy turns out to be far more orderly than the “planning” of a command economy.

In 1776, in a famous passage in his book *The Wealth of Nations*, the pioneering Scottish economist Adam Smith wrote about how individuals, in pursuing their own interests, often end up serving the interests of society as a whole. Of a businessman whose pursuit of profit makes the nation wealthier, Smith wrote: “[H]e intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.” Ever since, economists have used the term **invisible hand** to refer to the way a market economy manages to harness the power of self-interest for the good of society.

The study of how individuals make decisions and how these decisions interact is called **microeconomics**. One of the key themes in microeconomics is the validity of Adam Smith's insight: individuals pursuing their own interests often do promote the interests of society as a whole.

So part of the answer to our time-traveler's question—"How can my society achieve the kind of prosperity you take for granted?"—is that his society should learn to appreciate the virtues of a market economy and the power of the invisible hand.

But the invisible hand isn't always our friend. It's also important to understand when and why the individual pursuit of self-interest can lead to counterproductive behavior.



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My Benefit, Your Cost

One thing that our time-traveler would not admire about modern life is the traffic. In fact, although most things have gotten better in America over time, traffic congestion has gotten a lot worse.

When traffic is congested, each driver is imposing a cost on all the other drivers on the road—he is literally getting in their way (and they are getting in his way). This cost can be substantial: in major metropolitan areas, each time someone drives to work, instead of taking public transportation or working at home, he can easily impose \$15 or more in hidden costs on other drivers. Yet when deciding whether or not to drive, commuters have no incentive to take the costs they impose on others into account.

Traffic congestion is a familiar example of a much broader problem: sometimes the individual pursuit of one's own interest, instead of promoting the interests of society as a whole, can actually make society worse off. When this happens, it is known as **market failure**. Other important examples of market failure involve air and water pollution as well as the overexploitation of natural resources such as fish and forests.

The good news, as you will learn as you use this book to study microeconomics, is that economic analysis can be used to diagnose cases of market failure. And often, economic analysis can also be used to devise solutions for the problem.

Good Times, Bad Times

Normally our time-traveler would find shopping malls crowded with happy customers. But during the fall of 2008, stores across America became unusually quiet. The U.S. economy was depressed, and businesses were laying off workers in large numbers.

Such troubled periods are a regular feature of modern economies. The fact is that the economy does not always run smoothly: it experiences fluctuations, a series of ups and downs. By middle age, a typical American will have experienced three or four downs, known as **recessions**. (The U.S. economy experienced serious recessions beginning in 1973, 1981, 1990, 2001, and 2007.) During a severe recession, millions of workers may be laid off.

Microeconomics is the branch of economics that studies how people make decisions and how these decisions interact.

When the individual pursuit of self-interest leads to bad results for society as a whole, there is **market failure**.

A **recession** is a downturn in the economy.

Macroeconomics is the branch of economics that is concerned with overall ups and downs in the economy.

Economic growth is the growing ability of the economy to produce goods and services.

Individual choice is the decision by an individual of what to do, which necessarily involves a decision of what not to do.

Like market failure, recessions are a fact of life; but also like market failure, they are a problem for which economic analysis offers some solutions. Recessions are one of the main concerns of the branch of economics known as **macroeconomics**, which is concerned with the overall ups and downs of the economy. If you study macroeconomics, you will learn how economists explain recessions and how government policies can be used to minimize the damage from economic fluctuations.

Despite the occasional recession, however, over the long run the story of the U.S. economy contains many more ups than downs.

Onward and Upward

At the beginning of the twentieth century, most Americans lived under conditions that we would now think of as extreme poverty. Only 10% of homes had flush toilets, only 8% had central heating, only 2% had electricity, and almost nobody had a car, let alone a washing machine or air conditioning.

Such comparisons are a stark reminder of how much our lives have been changed by **economic growth**, the growing ability of the economy to produce goods and services. Why does the economy grow over time? And why does economic growth occur faster in some times and places than in others? These are key questions for economics because economic growth is a good thing, and most of us want more of it.

Quick Review

- **Economics** is the study of the production, distribution, and consumption of goods and services and how the **economy** coordinates these activities. In a **market economy**, the **invisible hand** works through individuals pursuing their own self-interest.
- **Microeconomics** is the study of how individuals make decisions and how these decisions interact, which sometimes leads to **market failure**. **Macroeconomics** is concerned with economic fluctuations, such as **recessions**, that can temporarily slow **economic growth**.

The “ordinary business of life” is really quite extraordinary, if you stop to think about it, and it can lead us to ask some very interesting and important questions.

In this book, we will describe the answers economists have given to these questions. But this book, like economics as a whole, isn’t a list of answers: it’s an introduction to a discipline, a way to address questions like those we have just asked. Or as Alfred Marshall put it: “Economics . . . is not a body of concrete truth, but an engine for the discovery of concrete truth.”

So let’s turn the key and start the ignition.

CHECK YOUR UNDERSTANDING 1-1

1. Which of the following statements describe features of a market economy?
 - a. The invisible hand harnesses the power of self-interest for the good of society.
 - b. A central authority makes decisions about production and consumption.
 - c. The pursuit of one’s own self-interest sometimes results in market failure.
 - d. Growth in a market economy is steady and without fluctuations.

Solutions appear at back of book.

Principles That Underlie Individual Choice: The Core of Economics

Every economic issue involves, at its most basic level, **individual choice**—decisions by an individual about what to do and what not to do. In fact, you might say that it isn’t economics if it isn’t about choice.

Step into a big store like a Walmart or Target. There are thousands of different products available, and it is extremely unlikely that you—or anyone else—could afford to buy everything you might want to have. And anyway, there’s only so much space in your dorm room or apartment. So will you buy another bookcase or a mini-refrigerator? Given limitations on your budget and

your living space, you must choose which products to buy and which to leave on the shelf.

The fact that those products are on the shelf in the first place involves choice—the store manager chose to put them there, and the manufacturers of the products chose to produce them. All economic activities involve individual choice.

Four economic principles underlie the economics of individual choice, as shown in Table 1-1. We'll now examine each of these principles in more detail.

TABLE 1-1 The Principles of Individual Choice

1. People must make choices because resources are scarce.
2. The opportunity cost of an item—what you must give up in order to get it—is its true cost.
3. “How much” decisions require making trade-offs at the margin: comparing the costs and benefits of doing a little bit more of an activity versus doing a little bit less.
4. People usually respond to incentives, exploiting opportunities to make themselves better off.

Principle #1: Choices Are Necessary Because Resources Are Scarce

You can't always get what you want. Everyone would like to have a beautiful house in a great location (and have help with the housecleaning), a new car or two, and a nice vacation in a fancy hotel. But even in a rich country like the United States, not many families can afford all that. So they must make choices—whether to go to Disney World this year or buy a better car, whether to make do with a small backyard or accept a longer commute in order to live where land is cheaper.

Limited income isn't the only thing that keeps people from having everything they want. Time is also in limited supply: there are only 24 hours in a day. And because the time we have is limited, choosing to spend time on one activity also means choosing not to spend time on a different activity—spending time studying for an exam means forgoing a night spent watching a movie. Indeed, many people are so limited by the number of hours in the day that they are willing to trade money for time. For example, convenience stores normally charge higher prices than a regular supermarket. But they fulfill a valuable role by catering to time-pressured customers who would rather pay more than travel farther to the supermarket.

This leads us to our first principle of individual choice:

People must make choices because resources are scarce.

A **resource** is anything that can be used to produce something else. Lists of the economy's resources usually begin with land, labor (the time of workers), capital (machinery, buildings, and other man-made productive assets), and human capital (the educational achievements and skills of workers). A resource is **scarce** when there's not enough of the resource available to satisfy all the ways a society wants to use it. There are many scarce resources. These include natural resources—resources that come from the physical environment, such as minerals, lumber, and petroleum. There is also a limited quantity of human resources—labor, skill, and intelligence. And in a growing world economy with a rapidly increasing human population, even clean air and water have become scarce resources.

Just as individuals must make choices, the scarcity of resources means that society as a whole must make choices. One way a society makes choices is by allowing them to emerge as the result of many individual choices, which is what usually happens in a market economy. For example, Americans as a group have only so many hours in a week: how many of those hours will they spend going to supermarkets to get lower prices, rather than saving time by shopping at convenience stores? The answer is the sum of individual decisions: each of the millions of individuals in the economy makes his or her own choice about where to shop, and the overall choice is simply the sum of those individual decisions.

A **resource** is anything that can be used to produce something else.

Resources are **scarce**—not enough of the resources are available to satisfy all the various ways a society wants to use them.

The real cost of an item is its **opportunity cost**: what you must give up in order to get it.

But for various reasons, there are some decisions that a society decides are best not left to individual choice. For example, the authors live in an area that until recently was mainly farmland but is now being rapidly built up. Most local residents feel that the community would be a more pleasant place to live if some of the land was left undeveloped. But no individual has an incentive to keep his or her land as open space, rather than sell it to a developer. So a trend has emerged in many communities across the United States of local governments purchasing undeveloped land and preserving it as open space. We'll see in later chapters why decisions about how to use scarce resources are often best left to individuals but sometimes should be made at a higher, community-wide, level.

Principle #2: The True Cost of Something Is Its Opportunity Cost

It is the last term before you graduate, and your class schedule allows you to take only one elective. There are two, however, that you would really like to take: Intro to Computer Graphics and History of Jazz.

Suppose you decide to take the History of Jazz course. What's the cost of that decision? It is the fact that you can't take the computer graphics class, your next best alternative choice. Economists call that kind of cost—what you must give up in order to get an item you want—the **opportunity cost** of that item. This leads us to our second principle of individual choice:

The opportunity cost of an item—what you must give up in order to get it—is its true cost.

So the opportunity cost of taking the History of Jazz class is the benefit you would have derived from the Intro to Computer Graphics class.

The concept of opportunity cost is crucial to understanding individual choice because, in the end, all costs are opportunity costs. That's because every choice you make means forgoing some other alternative. Sometimes critics claim that economists are concerned only with costs and benefits that can be measured in dollars and cents. But that is not true. Much economic analysis involves cases like our elective course example, where it costs no extra tuition to take one elective course—that is, there is no direct monetary cost. Nonetheless, the elective you choose has an opportunity cost—the other desirable elective course that you must forgo because your limited time permits taking only one. More specifically, the opportunity cost of a choice is what you forgo by not choosing your next best alternative.

You might think that opportunity cost is an add-on—that is, something *additional* to the monetary cost of an item. Suppose that an elective class costs additional tuition of \$750; now there is a monetary cost to taking History of Jazz. Is the opportunity cost of taking that course something separate from that monetary cost?

Well, consider two cases. First, suppose that taking Intro to Computer Graphics also costs \$750. In this case, you would have to spend that \$750 no matter which class you take. So what you give up to take the History of Jazz class is still the computer graphics class, period—you would have to spend that \$750 either way. But suppose there isn't any fee for the computer graphics class. In that case, what you give up to take the jazz class is the benefit from the computer graphics class *plus* the benefit you could have gained from spending the \$750 on other things.

Either way, the real cost of taking your preferred class is what you must give up to get it. As you expand the set of decisions that underlie each

choice—whether to take an elective or not, whether to finish this term or not, whether to drop out or not—you’ll realize that all costs are ultimately opportunity costs.

Sometimes the money you have to pay for something is a good indication of its opportunity cost. But many times it is not. One very important example of how poorly monetary cost can indicate opportunity cost is the cost of attending college. Tuition and housing are major monetary expenses for most students; but even if these things were free, attending college would still be an expensive proposition because most college students, if they were not in college, would have a job. That is, by going to college, students *forgo* the income they could have earned if they had worked instead. This means that the opportunity cost of attending college is what you pay for tuition and housing plus the forgone income you would have earned in a job.

It’s easy to see that the opportunity cost of going to college is especially high for people who could be earning a lot during what would otherwise have been their college years. That is why star athletes like LeBron James and entrepreneurs like Mark Zuckerberg, founder of Facebook, often skip or drop out of college.

Principle #3: “How Much” Is a Decision at the Margin

Some important decisions involve an “either-or” choice—for example, you decide either to go to college or to begin working; you decide either to take economics or to take something else. But other important decisions involve “how much” choices—for example, if you are taking both economics and chemistry this semester, you must decide how much time to spend studying for each. When it comes to understanding “how much” decisions, economics has an important insight to offer: “how much” is a decision made at the margin.

Suppose you are taking both economics and chemistry. And suppose you are a pre-med student, so your grade in chemistry matters more to you than your grade in economics. Does that therefore imply that you should spend *all* your study time on chemistry and wing it on the economics exam? Probably not; even if you think your chemistry grade is more important, you should put some effort into studying economics.

Spending more time studying chemistry involves a benefit (a higher expected grade in that course) and a cost (you could have spent that time doing something else, such as studying to get a higher grade in economics). That is, your decision involves a **trade-off**—a comparison of costs and benefits.

How do you decide this kind of “how much” question? The typical answer is that you make the decision a bit at a time, by asking how you should spend the next hour. Say both exams are on the same day, and the night before you spend time reviewing your notes for both courses. At 6:00 P.M., you decide that it’s a good idea to spend at least an hour on each course. At 8:00 P.M., you decide you’d better spend another hour on each course. At 10:00 P.M., you are getting tired and figure you have one more hour to study before bed—chemistry or economics? If you are pre-med, it’s likely to be chemistry; if you are pre-MBA, it’s likely to be economics.

Note how you’ve made the decision to allocate your time: at each point the question is whether or not to spend *one more hour* on either course. And in deciding whether to spend another hour studying for chemistry, you weigh the costs (an hour forgone of studying for economics or an hour forgone of sleeping) versus the benefits (a likely increase in your chemistry grade). As long as the benefit of studying chemistry for one more hour outweighs the cost, you should choose to study for that additional hour.

You make a **trade-off** when you compare the costs with the benefits of doing something.



Mark Zuckerberg understood the concept of opportunity cost.

Decisions about whether to do a bit more or a bit less of an activity are **marginal decisions**. The study of such decisions is known as **marginal analysis**.

An **incentive** is anything that offers rewards to people who change their behavior.

Decisions of this type—whether to do a bit more or a bit less of an activity, like what to do with your next hour, your next dollar, and so on—are **marginal decisions**. This brings us to our third principle of individual choice:

“How much” decisions require making trade-offs at the margin: comparing the costs and benefits of doing a little bit more of an activity versus doing a little bit less.

The study of such decisions is known as **marginal analysis**. Many of the questions that we face in economics—as well as in real life—involve marginal analysis: How many workers should I hire in my shop? At what mileage should I change the oil in my car? What is an acceptable rate of negative side effects from a new medicine? Marginal analysis plays a central role in economics because it is the key to deciding “how much” of an activity to do.

Principle #4: People Usually Respond to Incentives, Exploiting Opportunities to Make Themselves Better Off

One day, while listening to the morning financial news, the authors heard a great tip about how to park cheaply in Manhattan. Garages in the Wall Street area charge as much as \$30 per day. But according to the newscaster, some people had found a better way: instead of parking in a garage, they had their oil changed at the Manhattan Jiffy Lube, where it costs \$19.95 to change your oil—and they keep your car all day!

It’s a great story, but unfortunately it turned out not to be true—in fact, there is no Jiffy Lube in Manhattan. But if there were, you can be sure there would be a lot of oil changes there. Why? Because when people are offered opportunities to make themselves better off, they normally take them—and if they could find a way to park their car all day for \$19.95 rather than \$30, they would.

In this example economists say that people are responding to an **incentive**—an opportunity to make themselves better off. We can now state our fourth principle of individual choice:

People usually respond to incentives, exploiting opportunities to make themselves better off.

When you try to predict how individuals will behave in an economic situation, it is a very good bet that they will respond to incentives—that is, exploit opportunities to make themselves better off. Furthermore, individuals will *continue* to exploit these opportunities until they have been fully exhausted. If there really were a Manhattan Jiffy Lube and an oil change really were a cheap way to park your car, we can safely predict that before long the waiting list for oil changes would be weeks, if not months.

In fact, the principle that people will exploit opportunities to make themselves better off is the basis of *all* predictions by economists about individual behavior. If the earnings of those who get MBAs soar while the earnings of those who get law degrees decline, we can expect more students to go to business school and fewer to go to law school. If the price of gasoline rises and stays high for an extended period of time, we can expect people to buy smaller cars with higher gas mileage—making themselves better off in the presence of higher gas prices by driving more fuel-efficient cars.

One last point: economists tend to be skeptical of any attempt to change people’s behavior that *doesn’t* change their incentives. For example, a plan that calls on manufacturers to reduce pollution voluntarily probably won’t be effective because it hasn’t changed manufacturers’ incentives. In contrast, a plan that gives them a financial reward to reduce pollution is a lot more likely to work because it has changed their incentives.

FOR INQUIRING MINDS

CASHING IN AT SCHOOL

The true reward for learning is, of course, the learning itself. Many students, however, struggle with their motivation to study and work hard. Teachers and policy makers have been particularly challenged to help students from disadvantaged backgrounds, who often have poor school attendance, high dropout rates, and low standardized test scores. In a 2007–2008 study, Harvard economist Roland Fryer Jr. found that monetary incentives—cash rewards—could improve students' academic performance in schools in economically disadvantaged areas. How cash incentives work, however, is both surprising and predictable.

Fryer conducted his research in four different school districts, employing a different set of incentives and a different measure of performance in each. In New York, students were paid according to their scores on standardized tests; in Chicago, they were paid according to their grades; in Washington, D.C., they were paid according to attendance and good behavior as well as their grades; in Dallas, second-graders were paid each time they read a book. Fryer evaluated the results by comparing the performance of students who were in the program to other students in the same school who were not.

In New York, the program had no perceptible effect on test scores. In Chicago, students in the program got better grades and attended class more. In Washington, the program boosted the outcomes of the kids who are normally the hardest to reach, those with serious behavioral problems, raising their test scores by an amount equivalent to attending five extra months of school. The most dramatic results occurred in Dallas, where students significantly boosted their reading-comprehension test scores; results continued into the next year, after the cash rewards had ended.

So what explains the various results?

To motivate students with cash rewards, Fryer found that students had to believe that they could have a significant effect on the performance measure. So in Chicago, Washington, and Dallas—where students had a significant amount of control over outcomes such as grades, attendance, behavior, and the number of books read—the program produced significant results. But because New York students had little idea how to affect their score on a standardized test, the prospect of a reward had little influence on their behavior. Also, the timing of the reward matters: a \$1



Kris Timken/Getty Images

Cash incentives have been shown to improve student performance.

reward has more effect on behavior if performance is measured at shorter intervals and the reward is delivered soon after.

Fryer's experiment revealed some critical insights about how to motivate behavior with incentives. How incentives are designed is very important: the relationship between effort and outcome, as well as the speed of reward, matters a lot. Moreover, the design of incentives may depend quite a lot on the characteristics of the people you are trying to motivate: what motivates a student from an economically privileged background may not motivate a student from an economically disadvantaged one. Fryer's insights give teachers and policy makers an important new tool for helping disadvantaged students succeed in school.

So are we ready to do economics? Not yet—because most of the interesting things that happen in the economy are the result not merely of individual choices but of the way in which individual choices interact.

ECONOMICS > IN ACTION

BOY OR GIRL? IT DEPENDS ON THE COST

One fact about China is indisputable: it's a big country with lots of people. As of 2011, the population of China was 1,344,130,000. That's right: over *one billion three hundred million*.

In 1978, the government of China introduced the “one-child policy” to address the economic and demographic challenges presented by China's large population. China was very, very poor in 1978, and its leaders worried that the country could not afford to adequately educate and care for its growing population. The average Chinese woman in the 1970s was giving birth to more than five children during her lifetime. So the government restricted most couples, particularly those in urban areas, to one child, imposing penalties on those who defied the mandate. As a result, by 2011 the average number of births for a woman in China was only 1.5.

But the one-child policy had an unfortunate unintended consequence. Because China is an overwhelmingly rural country and sons can perform the manual

