

macroeconomics

Principles, Applications, and Tools

EIGHTH EDITION

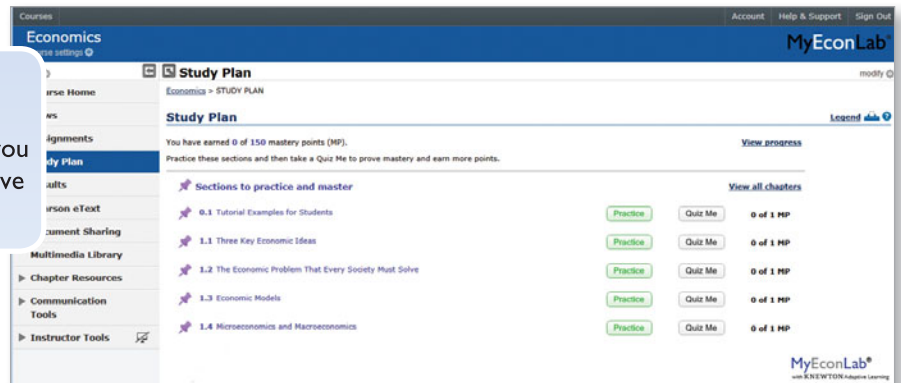
O'Sullivan | **Sheffrin** | **Perez**

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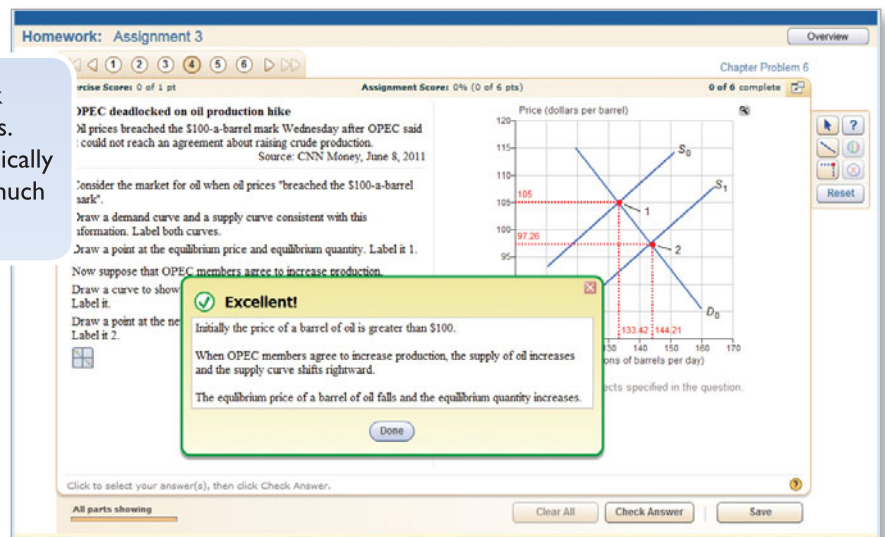
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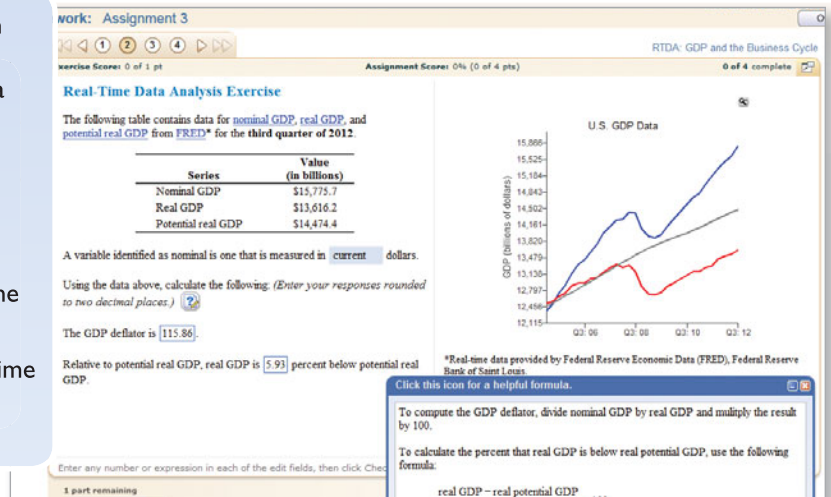
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Up-to-date macro data is a great way to engage in and understand the usefulness of macro variables and their impact on the economy. Real-Time Data Analysis exercises communicate directly with the Federal Reserve Bank of St. Louis's FRED site, so every time FRED posts new data, students see new data.

End-of-chapter exercises accompanied by the Real-Time Data Analysis icon  include Real-Time Data versions in **MyEconLab**.

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work: Assignment 3
RTDA: GDP and the Business Cycle
Exercise Score: 0 of 1 pt
Assignment Score: 0% (0 of 4 pts)
0 of 4 complete

Real-Time Data Analysis Exercise

The following table contains data for nominal GDP, real GDP, and potential real GDP from FRED* for the third quarter of 2012.

Series	Value (in billions)
Nominal GDP	\$15,775.7
Real GDP	\$13,616.2
Potential real GDP	\$14,474.4

A variable identified as nominal is one that is measured in **current** dollars.

Using the data above, calculate the following. (Enter your responses rounded to two decimal places.)

The GDP deflator is .

Relative to potential real GDP, real GDP is percent below potential real GDP.

*Real-time data provided by Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis

Click this icon for a helpful formula.

To compute the GDP deflator, divide nominal GDP by real GDP and multiply the result by 100.

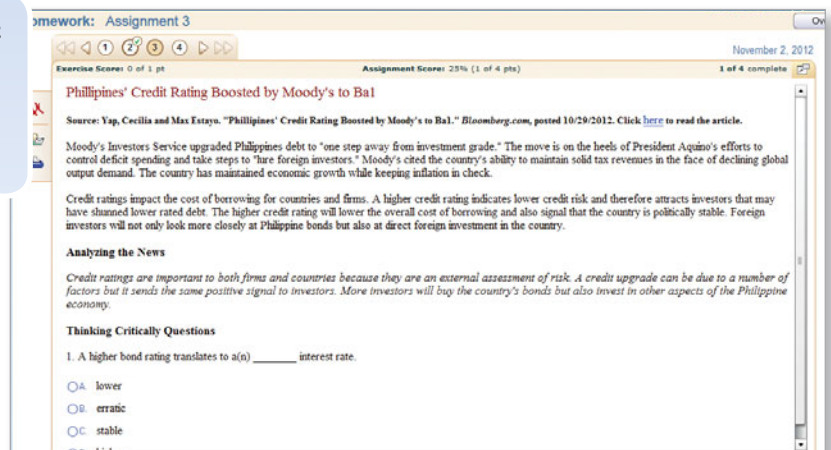
To calculate the percent that real GDP is below real potential GDP, use the following formula:

$$\frac{\text{real GDP} - \text{real potential GDP}}{\text{real potential GDP}}$$

1 part remaining

Current News Exercises

Posted weekly, we find the latest microeconomic and macroeconomic news stories, post them, and write auto-graded multi-part exercises that illustrate the economic way of thinking about the news.



work: Assignment 3
November 2, 2012
Exercise Score: 0 of 1 pt
Assignment Score: 25% (1 of 4 pts)
1 of 4 complete

Philippines' Credit Rating Boosted by Moody's to Baa1

Source: Yap, Cecilia and Max Estayn. "Philippines' Credit Rating Boosted by Moody's to Baa1." *Bloomberg.com*, posted 10/29/2012. Click [here](#) to read the article.

Moody's Investors Service upgraded Philippines debt to "one step away from investment grade." The move is on the heels of President Aquino's efforts to control deficit spending and take steps to "hare foreign investors." Moody's cited the country's ability to maintain solid tax revenues in the face of declining global output demand. The country has maintained economic growth while keeping inflation in check.

Credit ratings impact the cost of borrowing for countries and firms. A higher credit rating indicates lower credit risk and therefore attracts investors that may have shunned lower rated debt. The higher credit rating will lower the overall cost of borrowing and also signal that the country is politically stable. Foreign investors will not only look more closely at Philippine bonds but also at direct foreign investment in the country.

Analyzing the News

Credit ratings are important to both firms and countries because they are an external assessment of risk. A credit upgrade can be due to a number of factors but it sends the same positive signal to investors. More investors will buy the country's bonds but also invest in other aspects of the Philippine economy.

Thinking Critically Questions

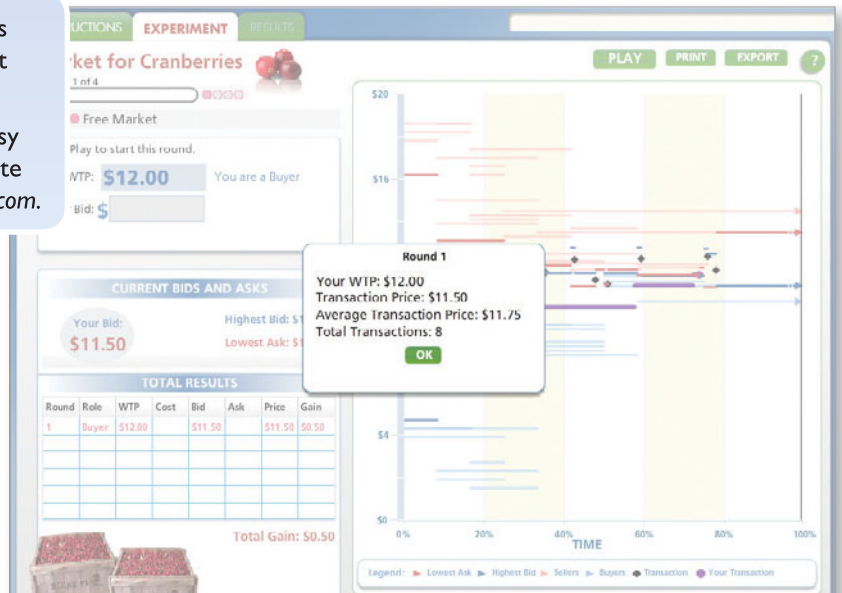
1. A higher bond rating translates to a(n) _____ interest rate.

A. lower
 B. erratic
 C. stable
 D. higher

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Pearson's experiments program is flexible and easy for instructors and students to use. For a complete list of available experiments, visit www.myeconlab.com.



ACTIONS EXPERIMENT REFLECT
Market for Cranberries
1 of 4
Free Market
Play to start this round.
WTP: \$12.00 You are a Buyer
Bid: \$

CURRENT BIDS AND ASKS
Your Bid: \$11.50 Highest Bid: \$11.50 Lowest Ask: \$11.50

TOTAL RESULTS

Round	Role	WTP	Cost	Bid	Ask	Price	Gain
1	Buyer	\$12.00		\$11.50	\$11.50	\$11.50	\$0.50

Total Gain: \$0.50

Round 1
Your WTP: \$12.00
Transaction Price: \$11.50
Average Transaction Price: \$11.75
Total Transactions: 8
OK

Legend: Lowest Ask Highest Bid Sellers Buyers Transaction Your Transaction

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Macroeconomics

PRINCIPLES, APPLICATIONS, AND TOOLS

EIGHTH EDITION

Arthur O'Sullivan

Lewis and Clark College

Steven M. Sheffrin

Tulane University

Stephen J. Perez

California State University, Sacramento

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ALTERNATIVE COURSE SEQUENCE

Alternative Macroeconomics Sequence

		Standard Course	Long-Run Focus	Short-Run Focus	Challenging Course
1	Introduction: What Is Economics?	X	X	X	X
2	The Key Principles of Economics	X	X	X	X
3	Exchange and Markets	X	X	X	X
4	Demand, Supply, and Market Equilibrium				X
5	Measuring a Nation's Production and Income	X	X	X	X
6	Unemployment and Inflation	X	X	X	X
7	The Economy at Full Employment		X		X
8	Why Do Economies Grow?	X	X	X	X
9	Aggregate Demand and Aggregate Supply	X	X	X	X
10	Fiscal Policy	X	X	X	X
11	The Income-Expenditure Model	X		X	X
12	Investment and Financial Markets	X		X	
13	Money and the Banking System	X	X	X	X
14	The Federal Reserve and Monetary Policy	X	X	X	X
15	Modern Macroeconomics: From the Short Run to the Long Run	X	X	X	X
16	The Dynamics of Inflation and Unemployment		X		X
17	Macroeconomic Policy Debates				
18	International Trade and Public Policy				X
19	The World of International Finance	X	X	X	X

Preface

In preparing this eighth edition, we had three primary goals. First, we wanted to incorporate the sweeping changes in the U.S. and world economies we have all witnessed in the last several years, and the difficulties that the world economies have experienced in recovering from the severe economic downturn. Second, we strived to update this edition to reflect the latest exciting developments in economic thinking and make these accessible to new students of economics. Finally, we wanted to stay true to the philosophy of the textbook—using basic concepts of economics to explain a wide variety of timely and interesting economic applications.

► WHAT'S NEW TO THIS EDITION

In addition to updating all the figures and data, we made a number of other key changes in this edition. They include the following:

- At the beginning of each chapter, we introduced a set of *Learning Objectives*. These give the students a preview of what they will learn in each section of the chapter, facilitating their learning.
- We revised and updated our discussion of fiscal policy in Chapter 10 to reflect our continuing difficulties in attempting to restore the economy to full unemployment and the changing views of the effectiveness of fiscal stimulus.
- We revised and updated our treatment of monetary policy in Chapter 14, as the Federal Reserve has continued to experiment with quantitative easing and other new monetary policies.

- We discuss in Chapter 15 how the thinking of Fed Chairman Ben Bernanke evolved during this past decade as he faced unprecedented challenges.
- We discuss in Chapter 5 the length of economic recoveries and the slow pace of the current recovery.
- We revised and expanded our discussion of the euro in Chapter 19, reflecting the serious challenges now facing the European Monetary Union.
- We highlight in Chapter 18 how rapid increases in imports can affect employment in local labor markets.

We also incorporated a total of 18 exciting new applications into this edition of macroeconomics. In addition, we incorporated a total of 12 new chapter-opening stories. These fresh applications and chapter openers show the widespread relevance of economic analysis.


In the opening four chapters, the new applications include incentives to purchase hybrid cars (Chapter 1), choosing how fast to sail a container ship (Chapter 2), the markets for meteorites (Chapter 3), and the economic forces behind the proposal to include sheep shearing as an Olympic sport (Chapter 4).

In the core macroeconomics chapters, the new applications include understanding changes in labor force participation (Chapter 6), taxes and the mobility of international soccer stars (Chapter 7), the “broken window fallacy” and Keynesian economics (Chapter 11), whether debt forgiveness for “underwater” homeowners is a good policy (Chapter 12), how hyperinflations end (Chapter 16), and how the federal government has handled the financial difficulties of the states in U.S. history (Chapter 17).

▶ APPLYING THE CONCEPTS

This is an Applications-driven textbook. We carefully selected over 120 real-world Applications that help students develop and master essential economic concepts. Here is an example of our approach from Chapter 4, “Demand, Supply, and Market Equilibrium.”

application 2



LAW OF SUPPLY AND WOOLYMPICS

APPLYING THE CONCEPTS #2: What is the law of supply?

In the 1990s, the world price of wool decreased by about 30 percent, and prices have remained relatively low since then. Based on the law of supply, we would expect the quantity of wool supplied from New Zealand and other exporters to decrease, and that's what happened. Land formerly used to grow grass for wool-producing sheep has been converted into other uses, including dairy products, forestry, and the domestication of deer.

There have been several attempts to revive the wool industry by boosting the demand for wool and thus increasing its price. The United Nations General Assembly declared 2009 as the International Year of Natural Fibres, with the objective "to raise awareness and stimulate demand for natural fibres." In 2012, the Federated Farmers of New Zealand proposed that sheep shearing be added to the Commonwealth Games and Olympics as a demonstration sport. The favorites for Olympic titles are the current world record holders Ivan Scott (744 sheep in 24 hours) and Kerry-Jo Te Huia (507 sheep in 24 hours). Of course, it's not obvious that Olympic shearing would increase the demand for wool, and then there is the problem of what to do with all the sheared wool. Speed knitting? **Related to Exercises 2.6 and 2.10.**

SOURCE: Based on "Wan Wan Don't Tell Me," National Public Radio (January 21, 2012).

Each chapter includes three to five thought-provoking Applying the Concepts questions that convey important economic concepts, paired with and illustrated by an Application that discusses the concept and conveys its real-world use.

For each Application and Applying the Concepts question, we provide end-of-chapter exercises that test students' understanding of the concepts.

ECONOMIC EXPERIMENT

MARKET EQUILIBRIUM

This simple experiment takes about 20 minutes. We start by dividing the class into two equal groups: consumers and producers.

- The instructor provides each consumer with a number indicating the maximum amount he or she is willing to pay (WTP) for a bushel of apples. The WTP is a number between \$1 and \$100. Each consumer has the opportunity to buy one bushel of apples per trading period. The consumer's score for a single trading period equals the gap between the WTP and the price actually paid for apples. For example, if the consumer's WTP is \$80 and he or she pays only \$30 for apples, the consumer's score is \$50. Each consumer has the option of not buying apples. This will be sensible if the best price the consumer can get exceeds the WTP. If the consumer does not buy apples, his or her score will be zero.
- The instructor provides each producer with a number indicating the cost of producing a bushel of apples (a number between \$1 and \$100). Each producer has the opportunity to sell one bushel per trading period. The producer's score for a single trading period equals the gap between the selling prices and the cost of producing apples. So if a producer sells apples for \$20, and the cost is only \$15, the producer's score is \$5. Producers have the option of not selling apples, which is sensible if the best price the producer can get is less than the cost. If the producer does not sell apples, his or her score is zero.

Once everyone understands the rules, consumers and producers meet in a trading area to arrange transactions. A consumer may announce how much he or she is willing to pay for apples and wait for a producer to agree to sell apples at that price. Alternatively, a producer may announce how much he or she is willing to accept for apples and wait for a consumer to agree to buy apples at that price. Once a transaction has been arranged, the consumer and producer inform the instructor of the trade, record the transaction, and leave the trading area.

Several trading periods are conducted, each of which lasts a few minutes. After the end of each trading period, the instructor lists the prices at which apples sold during the period. Then another trading period starts, providing consumers and producers another opportunity to buy or sell apples. After all the trading periods have been completed, each participant computes his or her score by adding the scores from the trading periods.

MyEconLab
For additional economic experiments, please visit www.myeconlab.com.

- 1.4 The market demand curve is the (horizontal/vertical) sum of the individual demand curves.
- 1.5 A change in price causes movement along a demand curve and a change in _____.
- 1.6 When several provinces in eastern Canada cut their cigarette taxes, the price of cigarettes decreased by roughly 50 percent, and the youth smoking rate increased by roughly _____ (1, 17, 50, 90) percent. (Related to Application 1 on page 71.)
- 1.7 **Draw a Demand Curve.** Your state has decided to offer its citizens vanity license plates for their cars and wants to predict how many vanity plates it will sell at different prices. The price of the state's regular license plates is \$20 per year, and the state's per-capita income is \$30,000. A recent survey of other states with approximately the same population (3 million people) generated the following data on incomes, prices, and vanity plates:

State	B	C	D	E
Price of vanity plate	\$ 60	\$ 55	\$ 50	\$ 40
Price of regular plates	20	20	35	20
Income	30,000	25,000	30,000	30,000
Quantity of vanity plates	6,000	6,000	16,000	16,000

 - a. Use the available data to identify some points on the demand curve for vanity plates and connect the points to draw a demand curve. Don't forget *ceteris paribus*.
 - b. Suppose the demand curve is linear. If your state sets a price of \$50, how many vanity plates would be purchased?
- 1.8 **Youth Smoking.** Use a demand and supply graph of the youth smoking market to show the effects of the tax cut in eastern Canada. Assume that the initial price is \$6.00, the initial quantity is 100 units, and each youth smoker smokes 5 cigarettes per day. (Related to Application 1 on page 71.)
- 2.1 The minimum supply price is the _____ price at which a product is supplied.
- 2.2 From the following list, choose the variables that are held fixed when drawing a market supply curve:
 - The price of the product
 - Wages paid to workers
 - The price of materials used in production
 - Taxes paid by producers
 - The quantity of the product purchased
- 2.3 The market supply curve is the (horizontal/vertical) sum of the individual supply curves.
- 2.4 A change in price causes movement along a supply curve and a change in _____.
- 2.5 Arrows up or down: In the 1990s, the world price of wool _____ and the quantity of wool supplied _____ (Related to Application 2 on page 76.)
- 2.6 **Marginal Cost of Housing.** When the price of a standard three-bedroom house increases from \$150,000 to \$160,000, a building company increases its output from 20 houses per year to 21 houses per year. What does the increase in the quantity of housing reveal about the cost of producing housing?
- 2.7 **Imports and Market Supply.** Two nations supply sugar to the world market. Lowland has a minimum supply price of 10 cents per pound, while Highland has a minimum supply price of 24 cents per pound. For each nation, the slope of the supply curve is 1 cent per million pounds.
 - a. Draw the individual supply curves and the market supply curve. At what price and quantity is the supply curve kinked?
 - b. The market quantity supplied at a price of 15 cents is _____ million pounds. The market quantity supplied at a price of 30 cents is _____ million pounds.
- 2.8 **Responses to Higher Soybean Prices.** Suppose that in initial equilibrium in the soybean market, each of the 1,000 farmers produces 50 units, for a total of 50,000 units of soybeans. Suppose the price of soybeans increases, and everyone expects the price to stay at the higher level for many years.
 - a. Arrows up or down: Over a period of several years, we expect the quantity of soybeans supplied to _____ as the number of soybean farmers _____ and the output per farmer _____.
 - b. A farmer who enters the market is likely to have a (higher/lower) marginal cost of production than an original firm.
- 2.10 **Response to Lower Wool Price.** Use a demand and supply graph of the wool market to show the effects of the decrease in the price of wool on the quantity supplied in New Zealand. Assume that the initial price is \$20 per unit and the initial quantity is 100 units. Also assume that for each 1 percent decrease in price, the quantity supplied decreases by 1 percent. (Related to Application 2 on page 76.)

In addition, some chapters contain an Economic Experiment section that gives students the opportunity to do their own economic analysis.

► WHY FIVE KEY PRINCIPLES?

In Chapter 2, “The Key Principles of Economics,” we introduce the following five key principles and then apply them throughout the book:

1. **The Principle of Opportunity Cost.** The opportunity cost of something is what you sacrifice to get it.
2. **The Marginal Principle.** Increase the level of an activity as long as its marginal benefit exceeds its marginal cost. Choose the level at which the marginal benefit equals the marginal cost.
3. **The Principle of Voluntary Exchange.** A voluntary exchange between two people makes both people better off.
4. **The Principle of Diminishing Returns.** If we increase one input while holding the other inputs fixed, output will increase, but at a decreasing rate.
5. **The Real-Nominal Principle.** What matters to people is the real value of money or income—its purchasing power—not the face value of money or income.

This approach of repeating five key principles gives students the big picture—the framework of economic reasoning. We make the key concepts unforgettable by using them repeatedly, illustrating them with intriguing examples, and giving students many opportunities to practice what they’ve learned. Throughout the text, economic concepts are connected to the five key principles when the following callout is provided for each principle:

PRINCIPLE OF OPPORTUNITY COST
The opportunity cost of something is what you sacrifice to get it.



► HOW IS THE BOOK ORGANIZED?

Chapter 1, “Introduction: What Is Economics?” uses three current policy issues—traffic congestion, poverty in Africa, and Japan’s prolonged recession—to explain the economic way of thinking. Chapter 2, “The Key Principles of Economics,” introduces the five principles we return to throughout the book. Chapter 3, “Exchange and Markets,” is devoted entirely to exchange and trade. We discuss the fundamental rationale for exchange and introduce some of the institutions modern societies developed to facilitate trade.

Students need to have a solid understanding of demand and supply to be successful in the course. Many students have difficulty understanding movement along a curve versus shifts of a curve. To address this difficulty, we developed an innovative way to organize topics in Chapter 4, “Demand, Supply, and Market Equilibrium.” We examine the law of demand and changes in quantity demanded, the law of supply and changes in quantity supplied, and then the notion of market equilibrium. After students have a firm grasp of equilibrium concepts, we explore the effects of changes in demand and supply on equilibrium prices and

quantities. For organization options, please see the alternative course sequence chart on page xiii.

Summary of the Macroeconomics Chapters

Part 2, “The Basic Concepts of Macroeconomics” (Chapters 5 and 6), introduces students to the key concepts—GDP, inflation, unemployment—that are used throughout the text and in everyday economic discussion. The two chapters in this section provide the building blocks for the rest of the book. Part 3, “The Economy in the Long Run” (Chapters 7 and 8), analyzes how the economy operates at full employment and explores the causes and consequences of economic growth.

Next we turn to the short run. We begin the discussion of business cycles, economic fluctuations, and the role of government in Part 4, “Economic Fluctuations and Fiscal Policy” (Chapters 9 through 12). We devote an entire chapter to the structure of government spending and revenues and the role of fiscal policy. In Part 5, “Money, Banking, and Monetary Policy” (Chapters 13 and 14), we introduce the key elements of both monetary theory and policy into our economic models. Part 6, “Inflation, Unemployment, and Economic Policy” (Chapters 15 through 17), brings the important questions of the dynamics of inflation and unemployment into our analysis. Finally, the last two chapters in Part 7, “The International Economy” (Chapters 18 and 19), provide an in-depth analysis of both international trade and finance.

A Few Features of Our Macroeconomics Chapters

The following are a few features of our macroeconomics chapters:

- **Flexibility.** A key dilemma confronting economics professors has always been how much time to devote to long-run topics, such as growth and production, versus short-run topics, such as economic fluctuations and business cycles. Our book is designed to let professors choose. It works like this: To pursue a long-run approach, professors should initially concentrate on Chapters 1 through 4, followed by Chapters 5 through 8.
- To focus on economic fluctuations, start with Chapters 1 through 4, present Chapter 5, “Measuring a Nation’s Production and Income,” and Chapter 6, “Unemployment and Inflation,” and then turn to Chapter 9, “Aggregate Demand and Aggregate Supply.”
- Chapter 11, “The Income-Expenditure Model,” is self-contained, so instructors can either skip it completely or cover it as a foundation for aggregate demand.
- **Long Run.** Throughout most of the 1990s, the U.S. economy performed very well—low inflation, low unemployment, and rapid economic growth. This robust performance led to economists’ increasing interest in trying to understand the processes of economic growth. Our discussion of economic growth in Chapter 8, “Why Do Economies Grow?” addresses

the fundamental question of how long-term living standards are determined and why some countries prosper while others do not. This is the essence of economic growth. As Nobel Laureate Robert E. Lucas, Jr., once wrote, “Once you start thinking about growth, it is hard to think of anything else.”

- **Short Run.** The great economic expansion of the 1990s came to an end in 2001, as the economy started to contract. The recession beginning in 2007 was the worst downturn since World War II. Difficult economic times remind us that macroeconomics is also concerned with understanding the causes and consequences of economic fluctuations. Why do economies experience recessions and depressions, and what steps can policymakers take to stabilize the economy and ease the devastation people suffer from them? This has been a constant theme of macroeconomics throughout its entire history and is covered extensively in the text.
- **Policy.** Macroeconomics is a policy-oriented subject, and we treat economic policy in virtually every chapter. We discuss both important historical and more recent macroeconomic events in conjunction with the theory. In addition, we devote Chapter 17, “Macroeconomic Policy Debates,” to three important policy topics that recur frequently in macroeconomic debates: the role of government deficits, whether the Federal Reserve should target inflation or other objectives, and whether income or consumption should be taxed.

► MyEconLab

Both the text and supplement package provide ways for instructors and students to assess their knowledge and progress through the course. MyEconLab, the new standard in personalized online learning, is a key part of O’Sullivan, Sheffrin, and Perez’s integrated learning package for the eighth edition.

For the Instructor

MyEconLab is an online course management, testing, and tutorial resource. Instructors can choose how much or how little time to spend setting up and using MyEconLab. Each chapter contains two Sample Tests, Study Plan Exercises, and Tutorial Resources. The online Gradebook records each student’s performance and time spent on the Tests and Study Plan and generates reports by student or by chapter. Instructors can assign tests, quizzes, and homework in MyEconLab using four resources:

- Preloaded Sample Test questions
- Problems similar to the end-of-chapter exercises
- Test Bank questions
- Self-authored questions using the Econ Exercise Builder

Exercises use 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 each of these problem types, even those with graphs. When working homework exercises, students receive immediate feedback with links to additional learning tools.

For the Student

MyEconLab puts students in control of their learning through a collection of tests, practice, and study tools tied to the online, interactive version of the textbook, and other media resources. Within 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 tests set by their instructors. At the core of MyEconLab are the following features:

- Sample Tests, two per chapter
- Personal Study Plan
- Tutorial Instruction
- Graphing Tool

Sample Tests Two Sample Tests for each chapter are preloaded in MyEconLab, enabling students to practice what they have learned, test their understanding, and identify areas in which they need further work. Students can study on their own, or they can complete assignments created by their instructor.

Personal Study Plan Based on a student’s performance on tests, MyEconLab generates a personal Study Plan that shows where the student needs further study. The Study Plan consists of a series of additional practice exercises with detailed feedback and guided solutions that are keyed to other tutorial resources.

Tutorial Instruction Launched from many of the exercises in the Study Plan, MyEconLab provides tutorial instruction in the form of step-by-step solutions and other media-based explanations.

Graphing Tool A graphing tool is integrated into the Tests and Study Plan exercises to enable students to make and manipulate graphs. This feature helps students understand how concepts, numbers, and graphs connect.


Additional MyEconLab Tools MyEconLab includes the following additional features:

1. **Weekly News Update**—This feature provides weekly updates during the school year of news items with links to sources for further reading and discussion questions.
2. **eText**—While students are working in the Study Plan or completing homework assignments, part of the tutorial resources available is a direct link to the

relevant page of the text so that students can review the appropriate material to help them complete the exercise.

3. **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.


Real-Time Data Analysis

 *New real-time data exercises that students can complete on MyEconLab.*



Real-Time Data Analysis

Exercises allow instructors to assign problems which use up-to-the-minute data. Each RTDA exercise loads the appropriate and most currently available data from FRED®, a comprehensive and up-to-date data set maintained by the Federal Reserve Bank of St. Louis. Exercises are graded based on that instance of data, and feedback is provided.

In the eText available in MyEconLab, select figures labeled MyEconLab Real-Time Data  can upon student direction display a popup graph updated with real-time data from FRED®.

MyEconLab content has been created over the years through the efforts of Charles Baum, Middle Tennessee State University; Peggy Dalton, Frostburg State University; Sarah Ghosh, University of Scranton; Russell Kellogg, University of Colorado, Denver; Bert G. Wheeler, Cedarville University; and Douglas A. Ruby, Noel Lotz, and Courtney Kamauf, Pearson Education.

▶ WHAT INSTRUCTOR'S SUPPLEMENTS DID WE DEVELOP?

A fully integrated teaching and learning package is necessary for today's classroom. Our supplement package helps you provide new and interesting real-world Applications and assess student understanding of economics. The supplements are coordinated with the main text through the numbering system of the headings in each section. The major sections of the chapters are numbered (1.1, 1.2, 1.3, and so on), and that numbering system is used consistently in the supplements to make it convenient and flexible for instructors to develop assignments.

Two Test Banks

There are two test banks for *Macroeconomics*. Each test bank offers multiple-choice, true/false, and short-answer questions. The questions are referenced by topic and are presented in sequential order. Each question is keyed by degree of difficulty, with questions ranging on a scale of one to three. Easy questions involve straightforward recall of information in the text. Moderate questions require some analysis on the student's part. Difficult questions usually entail more complex analysis and may require

the student to go one step further than the material presented in the text. Questions are also classified as *fact*, *definition*, *conceptual*, and *analytical*. Fact questions test the student's knowledge of factual information presented in the text. Definition questions ask the student to define an economic concept. Conceptual questions test the student's understanding of a concept. Analytical questions require the student to apply an analytical procedure to answer the question.

The test banks include tables and a series of questions asking students to solve for numeric values, such as profit or equilibrium output. There are also numerous questions based on graphs: Several questions ask students to interpret data presented in a graph, draw a graph on their own, and answer related questions.

In each chapter there are several questions that support the Applications in the main book. There are also new questions to support the updated and new content in the main book.

The Association to Advance Collegiate Schools of Business (AACSB) The authors of the test banks have connected 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 quality of the curricula. Although no specific courses are required, the AACSB expects a curriculum to include learning experiences in the following areas:

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

Questions that test skills relevant to these guidelines are appropriately tagged. 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. In addition, the tagged questions may help instructors identify potential applications of these skills. This in turn may suggest enrichment activities or other educational experiences to help students achieve these skills.

For Macroeconomics... Test Bank 1, prepared by Randy Methenitis of Richland College, includes approximately 3,000 multiple-choice, true/false, short-answer, and graphing questions. Test Bank 2, prepared by Brian Rosario of California State University, Sacramento, contains over 3,000 multiple-choice, true/false, and short-answer questions. Both test banks are available in a computerized format using TestGen, test-generating software.

TestGen

Macroeconomics banks 1 and 2 appear in print and as computer files that may be used with TestGen test-generating software. This test-generating program permits instructors to edit, add, or delete questions from the test bank; analyze test results; and organize a database of tests and student results. This software allows for flexibility and ease of use. It provides many options for organizing and displaying tests, along with a search and sort feature.

Instructor's Resource Manual

The instructor's resource manual, revised by Jeff Phillips of Colby-Sawyer College, follows the textbook's organization, incorporating extra Applications questions. The manual also provides detailed outlines (suitable for use as lecture notes) and solutions to all questions in the textbook. The instructor's resource manual is also designed to help the instructor incorporate applicable elements of the supplement package. The instructor's resource manual contains the following for each chapter:

- Summary: a bulleted list of key topics in the chapter
- Approaching the Material: student-friendly examples to introduce the chapter
- Chapter Outline: summary of definitions and concepts
- Teaching Tips on how to encourage class participation
- Summary and discussion points for the Applications in the main text
- New Applications and discussion questions
- Solutions to all end-of-chapter exercises

The instructor's resource manual is also available for download from the Instructor's Resource Center.

PowerPoint® Presentations

Three sets of PowerPoint slides are available for download from the Instructor's Resource Center at www.pearsonshighered.com/irc.

1. A comprehensive set of PowerPoint slides that can be used by instructors for class presentations. These PowerPoints, prepared by Brock Williams of Metropolitan Community College, include all the graphs, tables, and equations in the textbook, as well as lecture notes that outline the chapter.
2. A comprehensive set of PowerPoint slides with Classroom Response Systems (CRS) questions built in so that instructors can incorporate CRS "clickers" into their classroom lectures. This presentation is also prepared by Brock Williams of Metropolitan Community College. For more information on Pearson's partnership with CRS, see the following description. Instructors may download these PowerPoint presentations from the Instructor's Resource Center (www.pearsonshighered.com/irc).
3. A PDF version of the PowerPoint slides is also available as PDF files from the Instructor's Resource Center. This version of the PowerPoint slides can be printed and used in class.

Instructor's Resource Center on CD-ROM

The test banks, TestGen files, instructor's resource manuals, and PowerPoint slides are also available on this CD-ROM. Faculty can pick and choose from the various supplements and export them to their hard drive.

CourseSmart

The CourseSmart eTextbook for the text is available through www.coursesmart.com. CourseSmart goes beyond traditional expectations, providing instant, online access to the textbooks and course materials you need at a lower cost to students. And, even as students save money, you can save time and hassle with a digital textbook that allows you to search the most relevant content at the very moment you need it. Whether it's evaluating textbooks or creating lecture notes to help students with difficult concepts, CourseSmart can make life a little easier. See how when you visit www.coursesmart.com/instructors.

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This password-protected site is accessible from www.pearsonshighered.com/irc and hosts all of the resources previously listed: test banks, TestGen files, instructor's resource manuals, and PowerPoint slides. Instructors can click on the "Help downloading Instructor Resources" link for easy-to-follow instructions on getting access or contact their sales representative for further information.

Classroom Response Systems

Classroom Response Systems (CRS) is an exciting new wireless polling technology that makes large and small classrooms even more interactive because it enables instructors

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► WHAT STUDENT SUPPLEMENTS DID WE DEVELOP?

To accommodate different learning styles and busy student lifestyles, we provide a variety of print and online supplements.

Study Guide

The study guide, created by David Eaton of Murray State University, reinforces economic concepts and Applications from the main book and helps students assess their learning. Each chapter of the study guide includes the following features:

- **Chapter Summary:** Provides a summary of the chapter, key term definitions, and review of the Applications from the main book.
- **Study Tip:** Provides students with tips on understanding key concepts.
- **Key Equations:** Alerts students to equations they are likely to see throughout the class.
- **Caution!:** Alerts students to potential pitfalls and key figures or tables that deserve special attention.
- **Activity:** Encourages students to think creatively about an economic problem. An answer is provided so students can check their work.
- **Practice Test:** Includes approximately 25 multiple-choice and short-answer questions that help students test their knowledge. Select questions include a graph or table for students to analyze. Some of these questions support the Applications in the main book.
- **Solutions to the practice test.**

The student study guide is available as an additional resource in the MyEconLab course discussed earlier.

► REVIEWERS

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Introduction: What Is Economics?

Economics is the science of choice, exploring the choices made by individuals and organizations.

Over the last few centuries, these choices have led to substantial gains in the standard of living around the globe. In the United States, the typical person today has roughly seven times the income and purchasing power of a person 100 years ago. Our prosperity is the result of choices made by all sorts of people, including inventors, workers, entrepreneurs, and the people who saved money and loaned it to others to invest in machines and other tools of production. One reason we have prospered is greater efficiency: We have discovered better ways to use our resources—raw materials, time, and energy—to produce the goods and services we value.

As an illustration of changes in the standard of living and our growing prosperity, let's compare the way people listened to music in 1891 with how we listen today. You can buy an iPod shuffle® for \$49 and fill it with 500 songs at \$0.99 each. If you earn a wage of \$15 per hour, it would take you about 36 hours of work to purchase and then fill an iPod. Back in 1891, the latest technological marvel was Thomas Edison's cylinder phonograph, which played music recorded on 4-inch cylinders. Imagine that you lived back then and wanted to get just as much music as you could fit on an iPod. Given the wages and prices in 1891, it would take you roughly 800 hours of work to earn enough money to buy the phonograph and all the cylinders. And if you wanted to keep your music with you, you would need 14 backpacks to carry the cylinders.

Although prosperity and efficiency are widespread, they are not universal. In some parts of the world, many people live in poverty. For example, in sub-Saharan Africa 388 million people—about half the population—live on less than \$1.25 per day. And in all nations of the world, inefficiencies still exist, with valuable resources being wasted. For example, each year the typical urban commuter in the United States wastes more than 47 hours and \$84 worth of gasoline trapped in rush hour traffic.



LEARNING OBJECTIVES

- List the three key economic questions.
- Discuss the insights from economics for a real-world problem such as congestion.
- List the four elements of the economic way of thinking.
- List three ways to use macroeconomics.
- List three ways to use microeconomics.

MyEconLab

MyEconLab helps you master each objective and study more efficiently.

economics provides a framework to diagnose all sorts of problems faced by society and then helps create and evaluate various proposals to solve them. Economics can help us develop strategies to replace poverty with prosperity, and to replace waste with efficiency. In this chapter, we explain what economics is and how we all can use economic analysis to think about practical problems and solutions.

1.1 What Is Economics?

Economists use the word **scarcity** to convey the idea that resources—the things we use to produce goods and services—are limited, while human wants are unlimited. Therefore, we cannot produce everything that everyone wants. As the old saying goes, you can't always get what you want. **Economics** studies the choices we make when there is scarcity; it is all about trade-offs. Here are some examples of scarcity and the trade-offs associated with making choices:

- You have a limited amount of time. If you take a part-time job, each hour on the job means one fewer hour for study or play.
- A city has a limited amount of land. If the city uses an acre of land for a park, it has one fewer acre for housing, retailers, or industry.
- You have limited income this year. If you spend \$17 on a music CD, that's \$17 fewer you have to spend on other products or to save.

People produce goods (music CDs, houses, and parks) and services (the advice of physicians and lawyers) by using one or more of the following five **factors of production**, also called *production inputs* or simply *resources*:

- **Natural resources** are provided by nature. Some examples are fertile land, mineral deposits, oil and gas deposits, and water. Some economists refer to all types of natural resources as *land*.
- **Labor** is the physical and mental effort people use to produce goods and services.
- **Physical capital** is the stock of equipment, machines, structures, and infrastructure that is used to produce goods and services. Some examples are forklifts, machine tools, computers, factories, airports, roads, and fiber-optic cables.
- **Human capital** is the knowledge and skills acquired by a worker through education and experience. Every job requires some human capital: To be a surgeon, you must learn anatomy and acquire surgical skills. To be an accountant, you must learn the rules of accounting and acquire computer skills. To be a musician, you must learn to play an instrument.
- **Entrepreneurship** is the effort used to coordinate the factors of production—natural resources, labor, physical capital, and human capital—to produce and sell products. An entrepreneur comes up with an idea for a product, decides how to produce it, and raises the funds to bring it to the market. Some examples of entrepreneurs are Bill Gates of Microsoft, Steve Jobs of Apple Computer, Howard Schultz of Starbucks, and Ray Kroc of McDonald's.

Given our limited resources, we make our choices in a variety of ways. Sometimes we make our decisions as individuals, and other times we participate in collective decision making, allowing the government and other organizations to choose for us. Many of our choices happen within *markets*, institutions or arrangements that enable us to buy and sell things. For example, most of us participate in the labor market, exchanging our time for money, and we all participate in consumer markets, exchanging money for food and clothing. But we make other choices outside

scarcity

The resources we use to produce goods and services are limited.

economics

The study of choices when there is scarcity.

factors of production

The resources used to produce goods and services; also known as *production inputs* or *resources*.

natural resources

Resources provided by nature and used to produce goods and services.

labor

Human effort, including both physical and mental effort, used to produce goods and services.

physical capital

The stock of equipment, machines, structures, and infrastructure that is used to produce goods and services.

human capital

The knowledge and skills acquired by a worker through education and experience and used to produce goods and services.

entrepreneurship

The effort used to coordinate the factors of production—natural resources, labor, physical capital, and human capital—to produce and sell products.

markets—from our personal decisions about everyday life to our political choices about matters that concern society as a whole. What unites all these decisions is the notion of scarcity: We can't have it all; there are trade-offs.

Economists are always reminding us that there is scarcity—there are trade-offs in everything we do. Suppose that in a conversation with your economics instructor you share your enthusiasm about an upcoming launch of the space shuttle. The economist may tell you that the resources used for the shuttle could have been used instead for an unmanned mission to Mars.

By introducing the notion of scarcity into your conversation, your instructor is simply reminding you that there are trade-offs, that one thing (a Mars mission) is sacrificed for another (a shuttle mission). Talking about alternatives is the first step in a process that can help us make better choices about how to use our resources. For example, we could compare the scientific benefits of a shuttle mission to the benefits of a Mars mission and choose the mission with the greater benefit.

Positive versus Normative Analysis

Economics doesn't tell us what to choose—shuttle mission or Mars mission—but simply helps us to understand the trade-offs. President Harry S. Truman once remarked,

All my economists say, “On the one hand, . . . ; On the other hand, . . .” Give me a one-handed economist!

An economist might say, “On the one hand, we could use a shuttle mission to do more experiments in the gravity-free environment of Earth's orbit; on the other hand, we could use a Mars mission to explore the possibility of life on other planets.” In using both hands, the economist is not being evasive, but simply doing economics, discussing the alternative uses of our resources. The ultimate decision about how to use our resources—shuttle mission or Mars exploration—is the responsibility of citizens or their elected officials.

Most modern economics is based on **positive analysis**, which predicts the consequences of alternative actions by answering the question “What *is*?” or “What *will be*?” A second type of economic reasoning is normative in nature. **Normative analysis** answers the question “What *ought to be*?”

In Table 1.1, we compare positive questions to normative questions. Normative questions lie at the heart of policy debates. Economists contribute to policy debates by conducting positive analyses of the consequences of alternative actions. For example, an economist could predict the effects of an increase in the minimum wage on the number of people employed nationwide, the income of families with minimum-wage workers, and consumer prices. Armed with the conclusions of the economist's positive analysis, citizens and policymakers could then make a

positive analysis

Answers the question “What *is*?” or “What *will be*?”

normative analysis

Answers the question “What *ought to be*?”

TABLE 1.1 Comparing Positive and Normative Questions

Positive Questions	Normative Questions
<ul style="list-style-type: none"> • If the government increases the minimum wage, how many workers will lose their jobs? • If two office-supply firms merge, will the price of office supplies increase? • How does a college education affect a person's productivity and earnings? • How do consumers respond to a cut in income taxes? • If a nation restricts shoe imports, who benefits and who bears the cost? 	<ul style="list-style-type: none"> • Should the government increase the minimum wage? • Should the government block the merger of two office-supply firms? • Should the government subsidize a college education? • Should the government cut taxes to stimulate the economy? • Should the government restrict imports?

normative decision about whether to increase the minimum wage. Similarly, an economist could study the projects that could be funded with \$1 billion in foreign aid, predicting the effects of each project on the income per person in an African country. Armed with this positive analysis, policymakers could then decide which projects to support.

Economists don't always reach the same conclusions in their positive analyses. The disagreements often concern the magnitude of a particular effect. For example, most economists agree that an increase in the minimum wage will cause unemployment, but disagree about how many people would lose their jobs. Similarly, economists agree that spending money to improve the education system in Africa will increase productivity and income, but disagree about the size of the increase in income.

The Three Key Economic Questions: What, How, and Who?

We make economic decisions at every level in society. Individuals decide what products to buy, what occupations to pursue, and how much money to save. Firms decide what goods and services to produce and how to produce them. Governments decide what projects and programs to complete and how to pay for them. The choices of individuals, firms, and governments answer three questions:

- 1 *What products do we produce?* Trade-offs exist: If a hospital uses its resources to perform more heart transplants, it has fewer resources to care for premature infants.
- 2 *How do we produce the products?* Alternative means of production are available: Power companies can produce electricity with coal, natural gas, or wind power. Professors can teach in large lecture halls or small classrooms.
- 3 *Who consumes the products?* We must decide how to distribute the products of society. If some people earn more money than others, should they consume more goods? How much money should the government take from the rich and give to the poor?

As we'll see later in the book, most of these decisions are made in markets, where prices play a key role in determining what products we produce, how we produce them, and who gets the products. In Chapter 3, we'll examine the role of markets in modern economies and the role of government in market-based economies.

Economic Models

Economists use *economic models* to explore the choices people make and the consequences of those choices. An economic model is a simplified representation of an economic environment, with all but the essential features of the environment eliminated. An **economic model** is an abstraction from reality that enables us to focus our attention on what really matters. As we'll see throughout the book, most economic models use graphs to represent the economic environment.

To see the rationale for economic modeling, consider an architectural model. An architect builds a scale model of a new building and uses the model to show how the building will fit on a plot of land and blend with nearby buildings. The model shows the exterior features of the building, but not the interior features. We can ignore the interior features because they are unimportant for the task at hand—seeing how the building will fit into the local environment.

Economists build models to explore decision making by individuals, firms, and other organizations. For example, we can use a model of a profit-maximizing firm to predict how a firm will respond to increased competition. If a new car stereo

economic model

A simplified representation of an economic environment, often employing a graph.

store opens up in your town, will the old firms be passive and simply accept smaller market shares, or will they aggressively cut their prices to try to drive the new rival out of business? The model of the firm includes the monetary benefits and costs of doing business, and assumes that firms want to make as much money as possible. Although there may be other motives in the business world—to have fun or to help the world—the economic model ignores these other motives. The model focuses our attention on the profit motive and how it affects a firm’s response to increased competition.

1.2 Economic Analysis and Modern Problems

Economic analysis provides important insights into real-world problems. To explain how we can use economic analysis in problem solving, we provide three examples. You’ll see these examples again in more detail later in the book.

Economic View of Traffic Congestion

Consider first the problem of traffic congestion. According to the Texas Transportation Institute, the typical U.S. commuter wastes about 47 hours per year because of traffic congestion.¹ In some cities, the time wasted is much greater: 93 hours in Los Angeles, 72 hours in San Francisco, and 63 hours in Houston. In addition to time lost, we also waste 2.3 billion gallons of gasoline and diesel fuel each year.

To an economist, the diagnosis of the congestion problem is straightforward. When you drive onto a busy highway during rush hour, your car takes up space and decreases the distance between the vehicles on the highway. A driver’s normal reaction to a shorter distance between moving cars is to slow down. So when you enter the highway, you force other commuters to slow down and thus spend more time on the highway. If each of your 900 fellow commuters spends just two extra seconds on the highway, you will increase the total travel time by 30 minutes. In deciding whether to use the highway, you will presumably ignore these costs you impose on others. Similarly, your fellow commuters ignore the cost they impose on you and others when they enter the highway. Because no single commuter pays the full cost (30 minutes), too many people use the highway, and everyone wastes time.

One possible solution to the congestion problem is to force people to pay for using the road, just as they pay for gasoline and tires. The government could impose a congestion tax of \$8 per trip on rush-hour commuters and use a debit card system to collect the tax: Every time a car passes a checkpoint, a transponder would charge the commuter’s card. Traffic volume during rush hours would then decrease as travelers (a) shift their travel to off-peak times, (b) switch to ride sharing and mass transit, and (c) shift their travel to less congested routes. The job for the economist is to compute the appropriate congestion tax and predict the consequences of imposing it.

Economic View of Poverty in Africa

Consider next the issue of poverty in Africa. In the final two decades of the twentieth century, the world economy grew rapidly, and the average per capita income (income per person) increased by about 35 percent. In contrast, the economies of poverty-stricken sub-Saharan Africa shrank, and per capita income *decreased* by about 6 percent. Africa is the world’s second-largest continent in both area and population and accounts for more than 12 percent of the world’s human population. Figure 1.1 shows a map of Africa. The countries of sub-Saharan Africa are highlighted in orange.



▲ FIGURE 1.1

Map of Africa

Africa is the world's second-largest continent in both area and population, and accounts for more than 12 percent of the world's human population. The countries of sub-Saharan Africa are highlighted in orange.

SOURCE: web.worldbank.org/WEBSITE/EXTERNAL/COUNTRIES/AFRICA

Economists have found that as a nation's economy grows, its poorest households share in the general prosperity.² Therefore, one way to reduce poverty in sub-Saharan Africa is to increase economic growth. Economic growth occurs when a country expands its production facilities (machinery and factories), improves its public infrastructure (highways and water systems), widens educational opportunities, and adopts new technology.

The recent experience of sub-Saharan Africa is somewhat puzzling because in the last few decades the region has expanded educational opportunities and received large amounts of foreign aid. Some recent work by economists on the sources of growth suggests that institutions such as the legal system and the regulatory environment also play key roles in economic growth.³ In sub-Saharan Africa, a simple legal dispute about a small debt takes about 30 months to resolve, compared to 5 months in the United States. In Mozambique, it takes 174 days to complete the procedures required to set up a business, compared to just 2 days in Canada. In many cases, institutions impede rather than encourage the sort of investment and risk taking—called entrepreneurship—that causes economic growth and reduces poverty. As a consequence, economists and policymakers are exploring ways to reform the region's institutions. They are also challenged with choosing among development projects that will generate the biggest economic boost per dollar spent—the biggest bang per buck.

Economic View of the Current World Recession

Over the last several decades, the U.S. economy has performed well and has raised our standard of living. The general consensus was that our policymakers had learned to manage the economy effectively. Although the economy faltered at times, policymakers seemed to know how to restore growth and prosperity.

That is why the financial crisis and the recession that began in late 2007 has so shaken the confidence of people in the United States and around the world. The problems started innocently enough, with a booming market for homes that was fueled by easy credit from financial institutions. But we later discovered that many

purchasers of homes and properties could not really afford them, and when many homeowners had trouble making their mortgage payments, the trouble spread to banks and other financial institutions. As a result, businesses found it increasingly difficult to borrow money for everyday use and investment, and economic activity around the world began to contract.

The major countries of the world have implemented aggressive policies to try to halt this downturn. Policymakers want to avoid the catastrophes that hit the global economy in the 1930s. Fortunately, they can draw on many years of experience in economic policy to guide the economy during this difficult time.

1.3 The Economic Way of Thinking

How do economists think about problems and decision making? The economic way of thinking is best summarized by British economist John Maynard Keynes (1883–1946):⁴

The theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps its possessor draw correct conclusions.

Let's look at the four elements of the economic way of thinking.

Use Assumptions to Simplify

Economists use assumptions to make things simpler and focus attention on what really matters. If you use a road map to plan a car trip from Seattle to San Francisco, you make two unrealistic assumptions to simplify your planning:

- The earth is flat: The flat road map doesn't show the curvature of the earth.
- The roads are flat: The standard road map doesn't show hills and valleys.

Instead of a map, you could use a globe that shows all the topographical features between Seattle and San Francisco, but you don't need those details to plan your trip. A map, with its unrealistic assumptions, will suffice because the curvature of the earth and the topography of the highways are irrelevant to your trip. Although your analysis is based on two unrealistic assumptions, that does not mean your analysis is invalid. Similarly, if economic analysis is based on unrealistic assumptions, that doesn't mean the analysis is faulty.

What if you decide to travel by bike instead of by automobile? Now the assumption of flat roads really matters, unless of course you are eager to pedal up and down mountains. If you use a standard map, and thus assume there are no mountains between the two cities, you may inadvertently pick a mountainous route instead of a flat one. In this case, the simplifying assumption makes a difference. The lesson is that we must think carefully about whether a simplifying assumption is truly harmless.

Isolate Variables — *Ceteris Paribus*

Economic analysis often involves *variables* and how they affect one another. A **variable** is a measure of something that can take on different values, for example, your grade point average. Economists are interested in exploring relationships between two variables—like the relationship between the price of apples and the quantity of apples consumers purchase. Of course, the quantity of apples purchased depends on many other variables, including the consumer's income. To explore the relationship between the quantity and price of apples, we must assume that the consumer's income—and anything else that influences apple purchases—doesn't change during the time period we're considering.

variable

A measure of something that can take on different values.

Alfred Marshall (1842–1924) was a British economist who refined the economic model of supply and demand and provided a label for this process.⁵ He picked one variable that affected apple purchases (price) and threw the other variable (income) into what he called the “pound” (in Marshall’s time, the “pound” was an enclosure for holding stray cattle; nowadays, a pound is for stray dogs). That variable waited in the pound while Marshall examined the influence of the first variable. Marshall labeled the pound *ceteris paribus*, the Latin expression meaning that other variables are held fixed:

ceteris paribus

The Latin expression meaning that other variables are held fixed.

. . . the existence of other tendencies is not denied, but their disturbing effect is neglected for a time. The more the issue is narrowed, the more exactly can it be handled.

This book contains many statements about the relationship between two variables. For example, the quantity of computers produced by Dell depends on the price of computers, the wage of computer workers, and the cost of microchips. When we say, “An increase in the price of computers increases the quantity of computers produced,” we are assuming that the other two variables—the wage and the cost of microchips—do not change. That is, we apply the *ceteris paribus* assumption.

Think at the Margin

Economists often consider how a small change in one variable affects another variable and what impact that has on people’s decision making. In other words, if circumstances change only slightly, how will people respond? A small, one-unit change in value is called a **marginal change**. The key feature of marginal change is that the first variable changes by only one unit. For example, you might ask, “If I study just one more hour, by how much will my exam score increase?” Economists call this process “thinking at the margin.” Thinking at the margin is like thinking on the edge. You will encounter marginal thinking throughout this book. Here are some other marginal questions:

marginal change

A small, one-unit change in value.

- If I keep my barber shop open one more hour, by how much will my revenue increase?
- If I stay in school and earn another degree, by how much will my lifetime earnings increase?
- If a car dealer hires one more sales associate, how many more cars will the dealer sell?

As we’ll see in the next chapter, economists use the answer to a marginal question as a first step in deciding whether to do more or less of something, for example, whether to keep your barber shop open one more hour.

Rational People Respond to Incentives

A key assumption of most economic analysis is that people act rationally, meaning they act in their own self-interest. Scottish philosopher Adam Smith (1723–1790), who is also considered the founder of economics, wrote that he discovered within humankind⁶

a desire of bettering our condition, a desire which, though generally calm and dispassionate, comes with us from the womb, and never leaves us until we go to the grave.

Smith didn’t say people are motivated exclusively by self-interest, but rather that self-interest is more powerful than kindness or altruism. In this book, we will assume that people act in their own self-interest. Rational people respond to incentives. When the payoff, or benefit, from doing something changes, people change their behavior to get the benefit.

application 1

INCENTIVES TO BUY HYBRID VEHICLES

APPLYING THE CONCEPTS #1: How do people respond to incentives?

Consider the incentives to buy a hybrid vehicle, which is more fuel efficient but more expensive than a gas-powered vehicle. Between 2000 and 2007, the number of hybrid vehicles increased from fewer than 10,000 vehicles to more than 340,000 vehicles. Over this period, the price of gasoline increased significantly, and the higher price of gasoline was responsible for roughly one third of the hybrid vehicles purchased in 2007. An additional factor in hybrid purchases was a federal subsidy of up to \$3,400 per hybrid vehicle. The subsidy was responsible for roughly one fifth of the hybrid vehicles purchased in 2007. The increase in the number of hybrid vehicles decreased the emission of the greenhouse gas carbon dioxide (CO₂).

How efficient is the hybrid subsidy in reducing CO₂? On average, the cost of abating one ton of CO₂ through the hybrid subsidy is \$177. There are less costly ways to reduce CO₂ emissions, including building insulation, energy-efficient lighting, reforestation, and switching to electric power systems that use fuels that generate less CO₂. For example, a switch from coal to natural gas in power plants reduces CO₂ emissions at less than one third the cost associated with the hybrid subsidy. **Related to Exercise 3.4.**

SOURCE: Based on Arie Beresteanu and Shanjun Li, “Gasoline Prices, Government Support, and the Demand for Hybrid Vehicles in the United States,” *International Economic Review* 52 (2011), pp. 161–182.



Example: London Addresses Its Congestion Problem

To illustrate the economic way of thinking, let's consider again how an economist would approach the problem of traffic congestion. Recall that each driver on the highway slows down other drivers but ignores these time costs when deciding whether to use the highway. If the government imposes a congestion tax to reduce traffic during rush hour, the economist is faced with a question: How high should the tax be?

To determine the appropriate congestion tax, an economist would assume that people respond to incentives and use the three other elements of the economic way of thinking:

- **Use assumptions to simplify.** To simplify the problem, we would assume that every car has the same effect on the travel time of other cars. Of course, this is unrealistic because people drive cars of different sizes in different ways. But the alternative—looking at the effects of each car on travel speeds—would needlessly complicate the analysis.
- **Isolate variables—use *ceteris paribus*.** To focus attention on the effects of a congestion tax on the number of cars using the highway, we would make the *ceteris paribus* assumption that everything else that affects travel behavior—the price of gasoline, bus fares, and consumer income—remains fixed.
- **Think at the margin.** To think at the margin, we would estimate the effects of adding one more car to the highway. Now consider the marginal question: If we add one more car to the highway, by how much does the total travel time for commuters increase? Once we answer this question, we can determine the cost imposed by the marginal driver. If the marginal driver forces each of