



**N. GREGORY MANKIW**

**BRIEF PRINCIPLES OF**  
**MACRO**  
**ECONOMICS**

**NINTH EDITION**



# Brief Principles of Macroeconomics: a Guided Tour

## INTRODUCTION

- 1 Ten Principles of Economics ————— *The study of economics is guided by a few big ideas.*
- 2 Thinking Like an Economist ————— *Economists view the world as both scientists and policymakers.*
- 3 Interdependence and the Gains from Trade ——— *The theory of comparative advantage explains how people benefit from economic interdependence.*

## HOW MARKETS WORK

- 4 The Market Forces of Supply and Demand ——— *How does the economy coordinate interdependent economic actors? Through the market forces of supply and demand.*

## THE DATA OF MACROECONOMICS

- 5 Measuring a Nation's Income —————
  - 6 Measuring the Cost of Living —————
- The overall quantity of production and the overall price level are used to monitor developments in the economy as a whole.*

## THE REAL ECONOMY IN THE LONG RUN

- 7 Production and Growth —————
  - 8 Saving, Investment, and the Financial System ———
  - 9 The Basic Tools of Finance —————
  - 10 Unemployment —————
- These chapters describe the forces that in the long run determine key real variables, including GDP growth, saving, investment, real interest rates, and unemployment.*

## MONEY AND PRICES IN THE LONG RUN

- 11 The Monetary System —————
- 12 Money Growth and Inflation —————
- The monetary system is crucial in determining the long-run behavior of the price level, the inflation rate, and other nominal variables.*

## THE MACROECONOMICS OF OPEN ECONOMIES

- 13 Open-Economy Macroeconomics: Basic Concepts —————
- 14 A Macroeconomic Theory of the Open Economy —————
- A nation's economic interactions with other nations are described by its trade balance, net foreign investment, and exchange rate.*
- A long-run model of the open economy explains the determinants of the trade balance, the real exchange rate, and other real variables.*

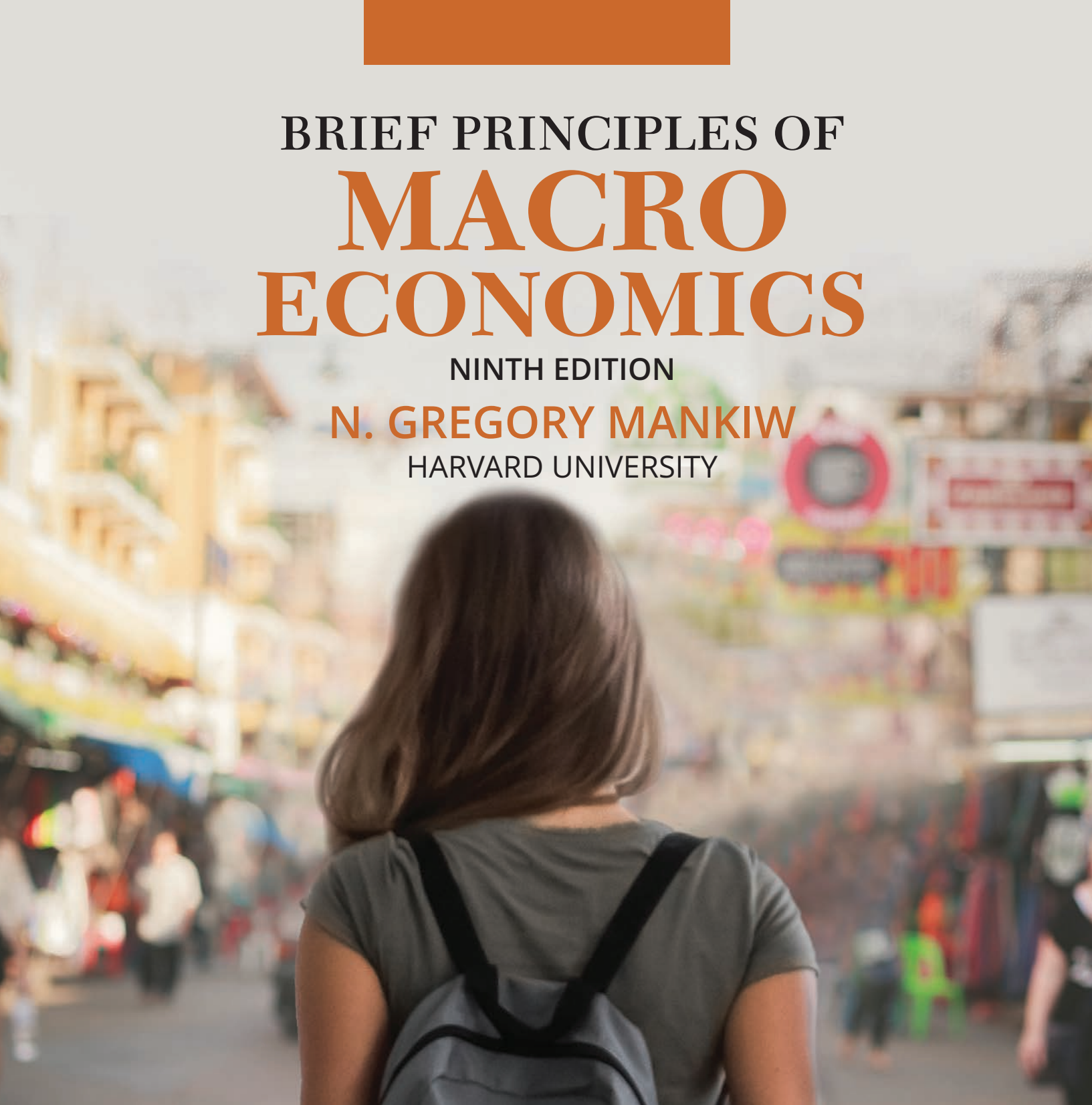
## SHORT-RUN ECONOMIC FLUCTUATIONS

- 15 Aggregate Demand and Aggregate Supply —————
- 16 The Influence of Monetary and Fiscal Policy on Aggregate Demand —————
- 17 The Short-Run Trade-Off between Inflation and Unemployment —————
- The model of aggregate demand and aggregate supply explains short-run economic fluctuations, the short-run effects of monetary and fiscal policy, and the short-run linkage between real and nominal variables.*

## FINAL THOUGHTS

- 18 Six Debates over Macroeconomic Policy —————
- A capstone chapter presents both sides of six major debates over economic policy.*





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HARVARD UNIVERSITY



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**N. Gregory Mankiw**

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*To Catherine, Nicholas, and Peter,  
my other contributions to the next generation*



# About the Author



JORDI CABRÉ

N. Gregory Mankiw is the Robert M. Beren Professor of Economics at Harvard University. As a student, he studied economics at Princeton University and MIT. As a teacher, he has taught macroeconomics, microeconomics, statistics, and principles of economics. He even spent one summer long ago as a sailing instructor on Long Beach Island.

Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals, such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums, such as the *New York Times* and *The Wall Street Journal*. He is also author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishers).

In addition to his teaching, research, and writing, Professor Mankiw has been a research associate of the National Bureau of Economic Research, an adviser to the Congressional Budget Office and the Federal Reserve Banks of Boston and New York, a trustee of the Urban Institute, and a member of the ETS test development committee for the Advanced Placement exam in economics. From 2003 to 2005, he served as chairman of the President's Council of Economic Advisers.



# Preface: To the Instructor

**D**uring my 20-year career as a student, the course that excited me most was the two-semester sequence on the principles of economics that I took during my freshman year in college. It is no exaggeration to say that it changed my life.

I had grown up in a family that often discussed politics over the dinner table. The pros and cons of various solutions to society's problems generated fervent debate. But in school, I had been drawn to the sciences. Whereas politics seemed vague, rambling, and subjective, science was analytic, systematic, and objective. While political debate continued without end, science made progress.

My freshman course on the principles of economics opened my eyes to a new way of thinking. Economics combines the virtues of politics and science. It is, truly, a social science. Its subject matter is society—how people choose to lead their lives and how they interact with one another—but it approaches the subject with the dispassion of a science. By bringing the methods of science to the questions of politics, economics tries to make progress on the challenges that all societies face.

I was drawn to write this book in the hope that I could convey some of the excitement about economics that I felt as a student in my first economics course. Economics is a subject in which a little knowledge goes a long way. (The same cannot be said, for instance, of the study of physics or the Chinese language.) Economists have a unique way of viewing the world, much of which can be taught in one or two semesters. My goal in this book is to transmit this way of thinking to the widest possible audience and to convince readers that it illuminates much about the world around them.

I believe that everyone should study the fundamental ideas that economics has to offer. One purpose of general education is to inform people about the world and thereby make them better citizens. The study of economics, as much as any discipline, serves this goal. Writing an economics textbook is, therefore, a great honor and a great responsibility. It is one way that economists can help promote better government and a more prosperous future. As the great economist Paul Samuelson put it, "I don't care who writes a nation's laws, or crafts its advanced treaties, if I can write its economics textbooks."

## What's New in the Ninth Edition?

Economics is fundamentally about understanding the world in which we live. Most chapters of this book include Case Studies illustrating how the principles of economics can be applied. In addition, In the News boxes offer excerpts from newspapers, magazines, and online news sources showing how economic ideas shed light on current issues facing society. After students finish their first course in economics, they should think about news stories from a new perspective and

with greater insight. To keep the study of economics fresh and relevant for each new cohort of students, I update each edition of this text to keep pace with the ever-changing world.

The new applications in this ninth edition are too numerous to list in their entirety, but here is a sample of the topics covered (and the chapters in which they appear):

- Technology companies are increasingly using economists to better run their businesses. (Chapter 2)
- The theory of economic growth can help explain why so many of the world's poorest nations are in sub-Saharan Africa. (Chapter 7)
- Economist Martin Feldstein explains why the United States is so prosperous. (Chapter 7)
- Cryptocurrencies may be the money of the future, or they may be a passing fad. (Chapter 11)
- Living during a hyperinflation, such as the recent situation in Venezuela, is a surreal experience. (Chapter 12)
- Recent discussion of trade deficits has included a lot of misinformation. (Chapter 14)
- The Federal Reserve has started to reassess what it means to target an inflation rate of 2 percent. (Chapter 18)

In addition to updating the book, I have refined its coverage and pedagogy with input from many users of the previous edition. There are numerous changes, large and small, aimed at making the book clearer and more student-friendly.

All the changes that I made, and the many others that I considered, were evaluated in light of the benefits of brevity. Like most things that we study in economics, a student's time is a scarce resource. I always keep in mind a dictum from the great novelist Robertson Davies: "One of the most important things about writing is to boil it down and not bore the hell out of everybody."

## How Is This Book Organized?

The organization of this book was designed to make economics as student-friendly as possible. What follows is a whirlwind tour of this text. The tour will, I hope, give instructors some sense of how the pieces fit together.

### Introductory Material

Chapter 1, "Ten Principles of Economics," introduces students to the economist's view of the world. It previews some of the big ideas that recur throughout economics, such as opportunity cost, marginal decision making, the role of incentives, the gains from trade, and the efficiency of market allocations. Throughout the book, I refer regularly to the *Ten Principles of Economics* introduced in Chapter 1 to remind students that these ideas are the foundation for all economics.

Chapter 2, "Thinking Like an Economist," examines how economists approach their field of study. It discusses the role of assumptions in developing a theory and introduces the concept of an economic model. It also explores the role of economists in making policy. This chapter's appendix offers a brief refresher course on how graphs are used, as well as how they can be abused.

Chapter 3, “Interdependence and the Gains from Trade,” presents the theory of comparative advantage. This theory explains why individuals trade with their neighbors, as well as why nations trade with other nations. Much of economics is about how market forces coordinate many individual production and consumption decisions. As a starting point for this analysis, students see in this chapter why specialization, interdependence, and trade can benefit everyone.

I next introduce the basic tools of supply and demand. Chapter 4, “The Market Forces of Supply and Demand,” develops the supply curve, the demand curve, and the notion of market equilibrium. This microeconomic model is the starting point for much of macroeconomic theory.

## Macroeconomics

My overall approach to teaching macroeconomics is to examine the economy in the long run (when prices are flexible) before examining the economy in the short run (when prices are sticky). I believe that this organization simplifies learning macroeconomics for several reasons. First, the classical assumption of price flexibility is more closely linked to the basic lessons of supply and demand, which students have already mastered. Second, the classical dichotomy allows the study of the long run to be broken up into several easily digested pieces. Third, because the business cycle represents a transitory deviation from the economy’s long-run growth path, studying the transitory deviations is more natural after the long-run equilibrium is understood. Fourth, the macroeconomic theory of the long run is less controversial among economists than is the macroeconomic theory of the short run. For these reasons, most upper-level courses in macroeconomics now follow this long-run-before-short-run approach; my goal is to offer introductory students the same advantage.

I start the coverage of macroeconomics with issues of measurement. Chapter 5, “Measuring a Nation’s Income,” discusses the meaning of gross domestic product and related statistics from the national income accounts. Chapter 6, “Measuring the Cost of Living,” examines the measurement and use of the consumer price index.

The next four chapters describe the behavior of the real economy in the long run. Chapter 7, “Production and Growth,” examines the determinants of the large variation in living standards over time and across countries. Chapter 8, “Saving, Investment, and the Financial System,” discusses the types of financial institutions in our economy and examines their role in allocating resources. Chapter 9, “The Basic Tools of Finance,” introduces present value, risk management, and asset pricing. Chapter 10, “Unemployment,” considers the long-run determinants of the unemployment rate, including job search, minimum-wage laws, the market power of unions, and efficiency wages.

Having described the long-run behavior of the real economy, the book then turns to the long-run behavior of money and prices. Chapter 11, “The Monetary System,” introduces the economist’s concept of money and the role of the central bank in controlling the quantity of money. Chapter 12, “Money Growth and Inflation,” develops the classical theory of inflation and discusses the costs that inflation imposes on a society.

The next two chapters present the macroeconomics of open economies, maintaining the long-run assumptions of price flexibility and full employment. Chapter 13, “Open-Economy Macroeconomics: Basic Concepts,” explains the relationship among saving, investment, and the trade balance, the distinction between

the nominal and real exchange rate, and the theory of purchasing-power parity. Chapter 14, “A Macroeconomic Theory of the Open Economy,” presents a classical model of the international flow of goods and capital. The model sheds light on various issues, including the link between budget deficits and trade deficits and the macroeconomic effects of trade policies. Because instructors differ in their emphasis on this material, these chapters are written so they can be used in different ways. Some may choose to cover Chapter 13 but not Chapter 14; others may skip both chapters; and still others may choose to defer the analysis of open-economy macroeconomics until the end of their courses.

After developing the long-run theory of the economy in Chapters 7 through 14, the book turns to explaining short-run fluctuations around the long-run trend. Chapter 15, “Aggregate Demand and Aggregate Supply,” begins with some facts about the business cycle and then introduces the model of aggregate demand and aggregate supply. Chapter 16, “The Influence of Monetary and Fiscal Policy on Aggregate Demand,” explains how policymakers can use the tools at their disposal to shift the aggregate-demand curve. Chapter 17, “The Short-Run Trade-Off between Inflation and Unemployment,” explains why policymakers who control aggregate demand face a trade-off between inflation and unemployment. It examines why this trade-off exists in the short run, why it shifts over time, and why it does not exist in the long run.

The book concludes with Chapter 18, “Six Debates over Macroeconomic Policy.” This capstone chapter considers six controversial issues facing policymakers: the proper degree of policy activism in response to the business cycle, the relative efficacy of government spending hikes and tax cuts to fight recessions, the choice between rules and discretion in the conduct of monetary policy, the desirability of reaching zero inflation, the importance of balancing the government’s budget, and the need for tax reform to encourage saving. For each issue, the chapter presents both sides of the debate and encourages students to make their own judgments.

## Learning Tools

The purpose of this book is to help students learn the fundamental lessons of economics and to show how they can apply these lessons to their lives and the world in which they live. Toward that end, I have used various learning tools that recur throughout the book.

### Case Studies

Economic theory is useful and interesting only if it can be applied to understanding actual events and policies. This book, therefore, contains numerous case studies that apply the theory that has just been developed.

### In the News Boxes

One benefit that students gain from studying economics is a new perspective and greater understanding about news from around the world. To highlight this benefit, I have included excerpts from many newspaper and magazine articles, some of which are opinion columns written by prominent economists. These articles, together with my brief introductions, show how basic economic theory can be applied. Most of these boxes are new to this edition. And for the first time in this

edition, each news article ends with “Questions to Discuss,” which can be used to start a dialogue in the classroom.

### **FYI Boxes**

These boxes provide additional material “for your information.” Some of them offer a glimpse into the history of economic thought. Others clarify technical issues. Still others discuss supplementary topics that instructors might choose either to discuss or skip in their lectures.

### **Ask the Experts Boxes**

This feature summarizes results from the IGM Economics Experts Panel, an ongoing survey of several dozen prominent economists. Every few weeks, these experts are offered a statement and then asked whether they agree with it, disagree with it, or are uncertain about it. The survey results appear in the chapters near the coverage of the relevant topic. They give students a sense of when economists are united, when they are divided, and when they just don’t know what to think.

### **Definitions of Key Concepts**

When key concepts are introduced in the chapter, they are presented in **bold** typeface. In addition, their definitions are placed in the margins. This treatment should aid students in learning and reviewing the material.

### **Quick Quizzes**

After each major section in a chapter, students are offered a brief multiple-choice Quick Quiz to check their comprehension of what they have just learned. If students cannot readily answer these quizzes, they should stop and review material before continuing. The answers to all Quick Quizzes are available at the end of each chapter.

### **Chapter in a Nutshell**

Each chapter concludes with a brief summary that reminds students of the most important lessons that they have learned. Later in their study, it offers an efficient way to review for exams.

### **List of Key Concepts**

A list of key concepts at the end of each chapter offers students a way to test their understanding of the new terms that have been introduced. Page references are included so that students can review the terms they do not understand.

### **Questions for Review**

Located at the end of each chapter, questions for review cover the chapter’s primary lessons. Students can use these questions to check their comprehension and prepare for exams.

### **Problems and Applications**

Each chapter also contains a variety of problems and applications asking students to apply the material that they have learned. Some instructors may use these questions for homework assignments. Others may use them as a starting point for classroom discussions.

## Alternative Versions of the Book

The book you are now holding is one of five versions of this text that are available for introducing students to economics. Cengage and I offer this menu of books because instructors differ in how much time they have and what topics they choose to cover. Here is a brief description of each:

- *Principles of Economics*. This complete version of the book contains all 36 chapters. It is designed for two-semester introductory courses that cover both microeconomics and macroeconomics.
- *Principles of Microeconomics*. This version contains 22 chapters and is designed for one-semester courses in introductory microeconomics.
- *Principles of Macroeconomics*. This version contains 23 chapters and is designed for one-semester courses in introductory macroeconomics. It contains a full development of the theory of supply and demand.
- *Brief Principles of Macroeconomics*. This shortened macro version of 18 chapters contains only one chapter on the basics of supply and demand. It is designed for instructors who want to jump to the core topics of macroeconomics more quickly.
- *Essentials of Economics*. This version of the book contains 24 chapters. It is designed for one-semester survey courses that cover the basics of both microeconomics and macroeconomics.

The accompanying table shows precisely which chapters are included in each book. Instructors who want more information about these alternative versions should contact their local Cengage representative.

**TABLE 1**

**The Five Versions of This Book**

<i>Principles of Economics</i>	<i>Principles of Microeconomics</i>	<i>Principles of Macroeconomics</i>	<i>Brief Principles of Macroeconomics</i>	<i>Essentials of Economics</i>
1 Ten Principles of Economics	X	X	X	X
2 Thinking Like an Economist	X	X	X	X
3 Interdependence and the Gains from Trade	X	X	X	X
4 The Market Forces of Supply and Demand	X	X	X	X
5 Elasticity and Its Application	X	X		X
6 Supply, Demand, and Government Policies	X	X		X
7 Consumers, Producers, and the Efficiency of Markets	X	X		X
8 Application: The Costs of Taxation	X	X		X
9 Application: International Trade	X	X		X
10 Externalities	X			X
11 Public Goods and Common Resources	X			X
12 The Design of the Tax System	X			
13 The Costs of Production	X			X
14 Firms in Competitive Markets	X			X
15 Monopoly	X			X
16 Monopolistic Competition	X			
17 Oligopoly	X			
18 The Markets for the Factors of Production	X			
19 Earnings and Discrimination	X			
20 Income Inequality and Poverty	X			
21 The Theory of Consumer Choice	X			
22 Frontiers of Microeconomics	X			
23 Measuring a Nation's Income		X	X	X
24 Measuring the Cost of Living		X	X	X
25 Production and Growth		X	X	X
26 Saving, Investment, and the Financial System		X	X	X
27 The Basic Tools of Finance		X	X	X
28 Unemployment		X	X	X
29 The Monetary System		X	X	X
30 Money Growth and Inflation		X	X	X
31 Open-Economy Macroeconomics: Basic Concepts		X	X	
32 A Macroeconomic Theory of the Open Economy		X	X	
33 Aggregate Demand and Aggregate Supply		X	X	X
34 The Influence of Monetary and Fiscal Policy on Aggregate Demand		X	X	X
35 The Short-Run Trade-Off between Inflation and Unemployment		X	X	
36 Six Debates over Macroeconomic Policy		X	X	



## Supplements

Cengage offers various supplements for instructors and students who use this book. These resources make teaching the principles of economics easy for the instructor and learning them easy for the student. David R. Hakes of the University of Northern Iowa, a dedicated teacher and economist, supervised the development of the supplements for this edition. A complete list of available supplements follows this Preface.

## Modules

I have written four modules, or mini-chapters, with optional material that instructors can include in their courses. For instructors using the digital version of the book, these modules can be added with a few mouse clicks. As of now, there are modules on The Economics of Healthcare, The European Union, The Keynesian Cross, and How Economists Use Data. I expect to add more modules to the library available to instructors in the years to come.

## Translations and Adaptations

I am delighted that versions of this book are (or will soon be) available in many of the world's languages. Currently scheduled translations include Azeri, Chinese (in both standard and simplified characters), Croatian, Czech, Dutch, French, Georgian, German, Greek, Indonesian, Italian, Japanese, Korean, Macedonian, Montenegrin, Portuguese, Romanian, Russian, Serbian, and Spanish. In addition, adaptations of the book for Australian, Canadian, European, and New Zealand students are also available. Instructors who would like more information about these books should contact Cengage.

## Acknowledgments

In writing this book, I benefited from the input of many talented people. Indeed, the list of people who have contributed to this project is so long, and their contributions so valuable, that it seems an injustice that only a single name appears on the cover.

Let me begin with my colleagues in the economics profession. The many editions of this text and its supplemental materials have benefited enormously from their input. In reviews and surveys, they have offered suggestions, identified challenges, and shared ideas from their own classroom experience. I am indebted to them for the perspectives they have brought to the text. Unfortunately, the list has become too long to thank those who contributed to previous editions, even though students reading the current edition are still benefiting from their insights.

Most important in this process has been David Hakes (University of Northern Iowa). David has served as a reliable sounding board for ideas and a hardworking partner with me in putting together the superb package of supplements. I am also grateful to Stephanie Thomas (Cornell University), who helped in the planning process for this new edition.

The following reviewers of the eighth edition provided suggestions for refining the content, organization, and approach in the ninth.

- |  |  |   |
|--|--|---|
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# Preface: To the Student



“Economics is a study of mankind in the ordinary business of life.” So wrote Alfred Marshall, the great 19th-century economist, in his textbook, *Principles of Economics*. We have learned much about the economy since Marshall’s time, but this definition of economics is as true today as it was in 1890, when the first edition of his text was published.

Why should you, as a student in the 21st century, embark on the study of economics? There are three reasons.

The first reason to study economics is that it will help you understand the world in which you live. There are many questions about the economy that might spark your curiosity. Why are apartments so hard to find in New York City? Why do airlines charge less for a round-trip ticket if the traveler stays over a Saturday night? Why is Emma Stone paid so much to star in movies? Why are living standards so meager in many African countries? Why do some countries have high rates of inflation while others have stable prices? Why are jobs easy to find in some years and hard to find in others? These are just a few of the questions that a course in economics will help you answer.

The second reason to study economics is that it will make you a more astute participant in the economy. As you go about your life, you make many economic decisions. While you are a student, you decide how many years to stay in school. Once you take a job, you decide how much of your income to spend, how much to save, and how to invest your savings. Someday you may find yourself running a small business or a large corporation, and you will decide what prices to charge for your products. The insights developed in the coming chapters will give you a new perspective on how best to make these decisions. Studying economics will not by itself make you rich, but it will give you some tools that may help in that endeavor.

The third reason to study economics is that it will give you a better understanding of both the potential and the limits of economic policy. Economic questions are always on the minds of policymakers in mayors’ offices, governors’ mansions, and the White House. What are the burdens associated with alternative forms of taxation? What are the effects of free trade with other countries? What is the best way to protect the environment? How does a government budget deficit affect the economy? As a voter, you help choose the policies that guide the allocation of society’s resources. An understanding of economics will help you carry out that responsibility. And who knows: Perhaps someday you will end up as one of those policymakers yourself.

Thus, the principles of economics can be applied in many of life’s situations. Whether the future finds you following the news, running a business, or sitting in the Oval Office, you will be glad that you studied economics.

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# Ten Principles of Economics

The word *economy* comes from the Greek word *oikonomos*, which means “one who manages a household.” At first, this origin might seem peculiar. But in fact, households and economies have much in common.

A household faces many decisions. It must decide which household members do which tasks and what each member receives in return: Who cooks dinner? Who does the laundry? Who gets the extra dessert at dinner? Who gets to drive the car? In short, a household must allocate its scarce resources (time, dessert, car mileage) among its various members, taking into account each member’s abilities, efforts, and desires.

Like a household, a society faces many decisions. It must find some way to decide what jobs will be done and who will do them. It needs some people to grow food, other people to make clothing, and still others to design computer software. Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must also allocate the goods and services they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Ferrari and who will take the bus.



**scarcity**

the limited nature of society's resources

**economics**

the study of how society manages its scarce resources

The management of society's resources is important because resources are scarce. **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything she wants, each individual in a society cannot attain the highest standard of living to which she might aspire.

**Economics** is the study of how society manages its scarce resources. In most societies, resources are allocated not by an all-powerful dictator but through the combined choices of millions of households and firms. Economists therefore study how people make decisions: how much they work, what they buy, how much they save, and how they invest their savings. Economists also study how people interact with one another. For instance, they examine how the many buyers and sellers of a good together determine the price at which the good is sold and the quantity that is sold. Finally, economists analyze the forces and trends that affect the economy as a whole, including the growth in average income, the fraction of the population that cannot find work, and the rate at which prices are rising.

The study of economics has many facets, but it is unified by several central ideas. In this chapter, we look at *Ten Principles of Economics*. Don't worry if you don't understand them all at first or if you aren't completely convinced. We explore these ideas more fully in later chapters. The ten principles are introduced here to give you a sense of what economics is all about. Consider this chapter a "preview of coming attractions."

## 1-1 How People Make Decisions

There is no mystery to what an economy is. Whether we are talking about the economy of Los Angeles, the United States, or the whole world, an economy is just a group of people dealing with one another as they go about their lives. Because the behavior of an economy reflects the behavior of the individuals who make up the economy, our first four principles concern individual decision making.

### 1-1a Principle 1: People Face Trade-Offs

You may have heard the old saying, "There ain't no such thing as a free lunch." Grammar aside, there is much truth to this adage. To get something that we like, we usually have to give up something else that we also like. Making decisions requires trading off one goal against another.

Consider a student who must decide how to allocate her most valuable resource—her time. She can spend all of her time studying economics, spend all of it studying psychology, or divide it between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour she could have spent napping, bike riding, playing video games, or working at her part-time job for some extra spending money.

Consider parents deciding how to spend their family income. They can buy food, clothing, or a family vacation. Or they can save some of their income for retirement or their children's college education. When they choose to spend an extra dollar on one of these goods, they have one less dollar to spend on some other good.

When people are grouped into societies, they face different kinds of trade-offs. One classic trade-off is between "guns and butter." The more a society spends on national defense (guns) to protect itself from foreign aggressors, the less it can spend on consumer goods (butter) to raise its standard of living. Also important

in modern society is the trade-off between a clean environment and a high level of income. Laws that require firms to reduce pollution raise the cost of producing goods and services. Because of these higher costs, the firms end up earning smaller profits, paying lower wages, charging higher prices, or doing some combination of these three. Thus, while pollution regulations yield a cleaner environment and the improved health that comes with it, this benefit comes at the cost of reducing the well-being of the regulated firms' owners, workers, and customers.

Another trade-off society faces is between efficiency and equality. **Efficiency** means that society is getting the maximum benefits from its scarce resources. **Equality** means that those benefits are distributed uniformly among society's members. In other words, efficiency refers to the size of the economic pie, and equality refers to how the pie is divided into individual slices.

When government policies are designed, these two goals often conflict. Consider, for instance, policies aimed at equalizing the distribution of economic well-being. Some of these policies, such as the welfare system or unemployment insurance, try to help the members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Though these policies achieve greater equality, they reduce efficiency. When the government redistributes income from the rich to the poor, it reduces the reward for working hard; as a result, people work less and produce fewer goods and services. In other words, when the government tries to cut the economic pie into more equal slices, the pie shrinks.

Recognizing that people face trade-offs does not by itself tell us what decisions they will or should make. A student should not abandon the study of psychology just because doing so would increase the time available for the study of economics. Society should not stop protecting the environment just because environmental regulations would reduce our material standard of living. The government should not ignore the poor just because helping them would distort work incentives. Nonetheless, people are likely to make good decisions only if they understand the options available to them. Our study of economics, therefore, starts by acknowledging life's trade-offs.

### 1-1b Principle 2: The Cost of Something Is What You Give Up to Get It

Because people face trade-offs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of an action is not as obvious as it might first appear.

Consider the decision to go to college. The main benefits are intellectual enrichment and a lifetime of better job opportunities. But what are the costs? To answer this question, you might be tempted to add up the money you spend on tuition, books, room, and board. Yet this total does not truly represent what you give up to spend a year in college.

This calculation has two problems. First, it includes some things that are not really costs of going to college. Even if you quit school, you need a place to sleep and food to eat. Room and board are costs of going to college only to the extent that they exceed the cost of living and eating at home or in your own apartment. Second, this calculation ignores the largest cost of going to college—your time. When you spend a year listening to lectures, reading textbooks, and writing papers, you cannot spend that time working at a job and earning money. For most students, the earnings they give up to attend school are the largest cost of their education.

#### efficiency

the property of society getting the most it can from its scarce resources

#### equality

the property of distributing economic prosperity uniformly among the members of society