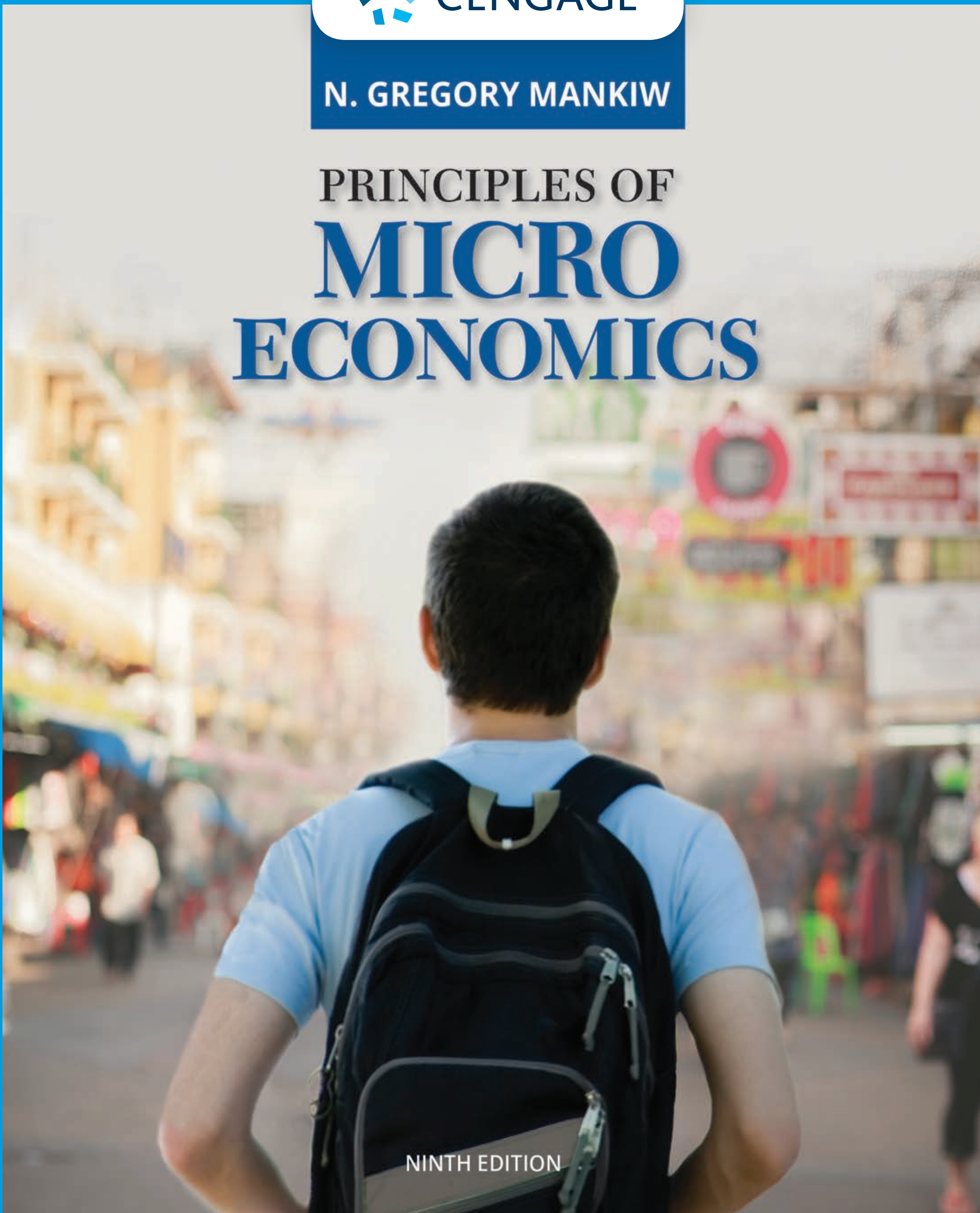
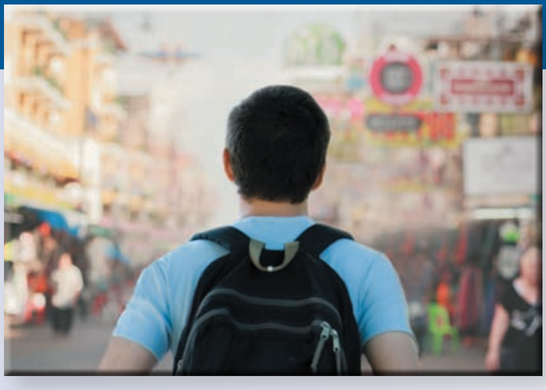
CENGAGE

N. GREGORY MANKIW

# PRINCIPLES OF MICRO ECONOMICS



NINTH EDITION



# *Principles of Microeconomics:* 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

5 Elasticity and Its Application

*How does the economy coordinate interdependent economic actors? Through the market forces of supply and demand.*

6 Supply, Demand, and Government Policies — *The tools of supply and demand are put to work to examine the effects of various government policies.*

## Markets and Welfare

7 Consumers, Producers, and the Efficiency of Markets

8 Application: The Costs of Taxation

9 Application: International Trade

*Why is the equilibrium of supply and demand desirable for society as a whole? The concepts of consumer and producer surplus explain the efficiency of markets, the costs of taxation, and the benefits of international trade.*

## The Economics of the Public Sector

10 Externalities

11 Public Goods and Common Resources

*Market outcomes are not always efficient, and governments can sometimes remedy market failure.*

12 The Design of the Tax System — *To fund programs, governments raise revenue through their tax systems, which are designed with an eye toward balancing efficiency and equity.*

## Firm Behavior and the Organization of Industry

13 The Costs of Production

14 Firms in Competitive Markets

*The theory of the firm sheds light on the decisions that lie behind supply in competitive markets.*

15 Monopoly

16 Monopolistic Competition

17 Oligopoly

*Firms with market power can cause market outcomes to be inefficient.*

## The Economics of Labor Markets

18 The Markets for the Factors of Production

19 Earnings and Discrimination

20 Income Inequality and Poverty

*These chapters examine the special features of labor markets, in which most people earn most of their income.*

## Topics for Further Study

21 The Theory of Consumer Choice

22 Frontiers of Microeconomics

*Additional topics in microeconomics include household decision making, asymmetric information, political economy, and behavioral economics.*

# PRINCIPLES OF MICRO ECONOMICS

NINTH EDITION

N. GREGORY MANKIW
HARVARD UNIVERSITY

CENGAGE

Australia • Brazil • Mexico • Singapore • United Kingdom • United States

CENGAGE

***Principles of Microeconomics,* Ninth Edition**
**N. Gregory Mankiw**

Senior Vice President, Higher Education & Skills Product: Erin Joyner

Product Director: Jason Fremder

Product Manager: Chris Rader

Senior Learning Designer: Sarah Keeling

Senior Content Manager: Anita Verma

In House Subject Matter Experts: Eugenia Belova, Kasie Jean, Shannon Aucoin

Product Assistant: Matt Schiesl

Digital Delivery Lead: Timothy Christy

Marketing Manager: John Carey

Intellectual Property Analysts: Ashley M. Maynard, Reba Frederics

Intellectual Property Project Managers: Betsy Hathaway, Erika Mugavin

Production Service: SPi Global US

Art Director: Bethany Bourgeois

Text Designer: Harasymczuk Design/Bethany Bourgeois

Design Images: iStock.com/lolostock; iStock.com/eurobanks; iStock.com/peeterv; George Rudy/Shutterstock.com; iStock.com/4x6

Cover Image: iStock.com/lolostock; iStock.com/eurobanks



For product information and technology assistance, contact us at **Cengage Customer & Sales Support, 1-800-354-9706** or **support.cengage.com.**

For permission to use material from this text or product, submit all requests online at **www.cengage.com/permissions.**

Library of Congress Control Number: 2019941004

ISBN: 978-0-357-13348-4

Loose-leaf Edition:
ISBN: 9780357133712

**Cengage**
200 Pier 4 Boulevard
Boston, MA 02210
USA

Cengage is a leading provider of customized learning solutions with employees residing in nearly 40 different countries and sales in more than 125 countries around the world. Find your local representative at **www.cengage.com.**

Cengage products are represented in Canada by Nelson Education, Ltd.

To learn more about Cengage platforms and services, register or access your online learning solution, or purchase materials for your course, visit **www.cengage.com.**

Printed in the United States of America
Print Number: 01 Print Year: 2019

*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

During 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 hit Broadway show *Hamilton* has brought renewed attention to the issue of ticket reselling. (Chapter 7)
- President Trump has taken a new and controversial approach to international trade. (Chapter 9)
- A carbon tax and dividend plan has become a focal policy in the debate about global climate change. (Chapter 10)
- Social media share many features, along with many of the problems, associated with common resources. (Chapter 11)
- The Supreme Court hears a case about international price discrimination. (Chapter 15)
- Amazon looks like it might be the next target for antitrust regulators. (Chapter 17)
- The winners and losers from immigration have become a major issue in the political debate. (Chapter 18)
- Research on tax data shows by how much the super-rich have gotten even richer. (Chapter 20)
- Some economists suggest that, despite little change in the official poverty rate, we are winning the war on poverty. (Chapter 20)

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.

## The Fundamental Tools of Supply and Demand

The next three chapters 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. Chapter 5, “Elasticity and Its Application,” introduces the concept of elasticity and uses it to analyze events in three different markets. Chapter 6, “Supply, Demand, and Government Policies,” uses these tools to examine price controls, such as rent-control and minimum-wage laws, and tax incidence.

Chapter 7, “Consumers, Producers, and the Efficiency of Markets,” extends the analysis of supply and demand using the concepts of consumer surplus and producer surplus. It begins by developing the link between consumers’ willingness to pay and the demand curve and the link between producers’ costs of production and the supply curve. It then shows that the market equilibrium maximizes the sum of the producer and consumer surplus. Thus, students learn early about the efficiency of market allocations.

The next two chapters apply the concepts of producer and consumer surplus to questions of policy. Chapter 8, “Application: The Costs of Taxation,” shows why taxation results in deadweight losses and what determines the size of those losses. Chapter 9, “Application: International Trade,” considers who wins and who loses from international trade and presents the debate over protectionist trade policies.

## More Microeconomics

Having examined why market allocations are often desirable, the book then considers how the government can sometimes improve on them. Chapter 10, “Externalities,” explains how external effects such as pollution can render market outcomes inefficient and discusses the possible public and private solutions to those inefficiencies. Chapter 11, “Public Goods and Common Resources,” considers the problems that arise when goods, such as national defense, have no market price. Chapter 12, “The Design of the Tax System,” describes how the government raises the revenue necessary to pay for public goods. It presents some institutional background about the U.S. tax system and then discusses how the goals of efficiency and equity come into play when designing a tax system.

The next five chapters examine firm behavior and industrial organization. Chapter 13, “The Costs of Production,” discusses what to include in a firm’s costs, and it introduces cost curves. Chapter 14, “Firms in Competitive Markets,” analyzes the behavior of price-taking firms and derives the market supply curve. Chapter 15, “Monopoly,” discusses the behavior of a firm that is the sole seller in its market. It examines the inefficiency of monopoly pricing, the possible policy responses, and the attempts by monopolies to price discriminate. Chapter 16, "Monopolistic Competition," looks at behavior in a market in which many sellers offer similar but differentiated products. It also discusses the debate over the effects of advertising. Chapter 17, "Oligopoly," covers markets in which there are only a few sellers, using the prisoners' dilemma as the model for examining strategic interaction.

The next three chapters present issues related to labor markets. Chapter 18, "The Markets for the Factors of Production," emphasizes the link between factor prices and marginal productivity. Chapter 19, "Earnings and Discrimination," discusses the determinants of equilibrium wages, including compensating differentials, human capital, and discrimination. Chapter 20, "Income Inequality and Poverty," examines the degree of inequality in U.S. society, alternative views about the government's role in changing the distribution of income, and various policies aimed at helping society's poorest members.

The next two chapters present optional material. Chapter 21, "The Theory of Consumer Choice," analyzes individual decision making using budget constraints and indifference curves. Chapter 22, "Frontiers of Microeconomics," introduces the topics of asymmetric information, political economy, and behavioral economics. Some instructors may skip all or some of this material, but these chapters are useful in motivating and preparing students for future courses in microeconomics. Instructors who cover these topics may assign these chapters earlier than they are presented in the book, and I have written them to facilitate this flexibility.

## 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**

| *Principles of Economics* | *Principles of Microeconomics* | *Principles of Macroeconomics* | *Brief Principles of Macroeconomics* | *Essentials of Economics* |
|---|---|---|---|---|
| **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.

Anil Aba, *University of Utah*
Mark Abajian, *San Diego Mesa College*
Dorian Abreu, *Hunter College*
Goncalo Alves Pina, *Santa Clara University*
Bob Barnes, *Loyola University Chicago*
James Bathgate, *Western Nevada College*
Nicole Bissessar, *Southern New Hampshire University*
Joseph Brignone, *Brigham Young University*
William Byrd, *Troy University*
Samantha Cakir, *Macalester College*
John Carter, *Modesto Junior College*
Avik Chakrabarti, *University of Wisconsin–Milwaukee*
Yong Chao, *University of Louisville*
David Chaplin, *Northwest Nazarene University*
Mitch Charkiewicz, *Central Connecticut State University*
LaPorchia Collins, *Tulane University*
Andrew Crawley, *University of Maine*
Maria DaCosta, *University of Wisconsin–Eau Claire*
Dennis Debrecht, *Carroll University*
Amrita Dhar, *University of Mary Washington*
Lynne Elkes, *Loyola University Maryland*
Elena Ermolenko, *Oakton Community College*
Sarah Estelle, *Hope College*
John Flanders, *Central Methodist University*
Gary Gray, *Umpqua Community College*
Jessica Hennessey, *Furman University*
Alexander Hill, *Arizona State University*
Miren Ivankovic, *Anderson University*
Justin Jarvis, *Truman State University*
Aaron Johnson, *Albany State University*
Bonnie Johnson, *Wayne State University*
Rutherford Johnson, *University of Minnesota Crookston*
Venoo Kakar, *San Francisco State University*
Jennifer Klein, *University of Colorado Boulder*
Audrey Kline, *University of Louisville*
Fred Kolb, *University of Wisconsin–Eau Claire*
Janet Koscianski, *Shippensburg University*
Mikhail Kouliavtsev, *Stephen F. Austin State University*
Nakul Kumar, *Bloomsburg University*
Jim Leggette, *Belhaven University*
David Lewis, *Oregon State University*
Hank Lewis, *Houston Community College*
Yan Li, *University of Wisconsin–Eau Claire*
Zhen Li, *Albion College*
Dan Marburger, *Arizona State University*
Jim McGibany, *Marquette University*
Steven McMullen, *Hope College*
Meghan Mihal, *St. Thomas Aquinas College*
Martin Milkman, *Murray State University*
Soonhong Min, *University at Albany*
Phillip Mixon, *Troy University*
Chau Nguyen, *Mesa Community College*
Scott Niederjohn, *Lakeland University*
Carla Nietfeld, *Francis Marion University*
John Nyhoff, *Oakton Community College*
Andrew Paizis, *New York University*
Jason Patalinghug, *Southern Connecticut State University*
Jodi Pelkowski, *Wichita State University*
Sougata Poddar, *Chapman University*
Lana Podolak, *Community College of Beaver County*
Gyan Pradhan, *Eastern Kentucky University*
Elena Prado, *San Diego State University*
John Reardon, *Hamline University*
Ty Robbins, *Manchester University*
Jason Rudbeck, *University of Georgia*
Anthony Scardino, *Felician University*
Helen Schneider, *University of Texas at Austin*
Alex Shiu, *McLennan Community College*
Harmeet Singh, *Texas A&M University–Kingsville*
Catherine Skura, *Sandhills Community College*
Gordon Smith, *Anderson University*
Nathan Smith, *University of Hartford*
Mario Solis-Garcia, *Macalester College*
Arjun Sondhi, *Wayne State University*
Derek Stimel, *University of California, Davis*

Paul Stock, *University of Mary Hardin Baylor*
Yang Su, *University of Washington*
Anna Terzyan, *Loyola Marymount University*
Elsy Thomas, *Bowling Green State University*
Kathryn Thwaites, *Sandhills Community College*
Phillip Tussing, *Houston Community College*
William Walsh, *University of Alabama*
Beth Wheaton, *Southern Methodist University*
Oxana Wieland, *University of Minnesota Crookston*
Christopher Wimer, *Heidelberg University*
Jim Wollscheid, *University of Arkansas–Fort Smith*
Doyoun Won, *University of Utah*
Kelvin Wong, *Arizona State University*
Fan Yang, *University of Washington*
Ying Yang, *University of Rhode Island*

The team of editors who worked on this book improved it tremendously. Jane Tufts, developmental editor, provided truly spectacular editing—as she always does. Jason Fremder, economics Product Director, and Christopher Rader, Product Manager, did a splendid job of overseeing the many people involved in such a large project. Sarah Keeling, Senior Learning Designer, was crucial in assembling an extensive and thoughtful group of reviewers to give me feedback on the previous edition and shape up the new edition. Anita Verma, Senior Content Manager, was crucial in putting together an excellent team to revise the supplements and with Beth Asselin and Phil Scott, project managers at SPi Global, had the patience and dedication necessary to turn my manuscript into this book. Bethany Bourgeois, Senior Designer, gave this book its clean, friendly look. Irwin Zucker, copyeditor, refined my prose, and Val Colligo, indexer, prepared a careful and thorough index. John Carey, Executive Marketing Manager, worked long hours getting the word out to potential users of this book. The rest of the Cengage team has, as always, been consistently professional, enthusiastic, and dedicated.

We have a top team of veterans who have worked across multiple editions producing the supplements that accompany this book. Working with those at Cengage, the following have been relentless in making sure that the suite of ancillary materials is unmatched in both quantity and quality. No other text comes close.

PowerPoint: Andreea Chiritescu (Eastern Illinois University)

Test Bank: Shannon Aucoin, Eugenia Belova, Ethan Crist, Kasie Jean, and Brian Rodriguez (in-house Subject Matter Experts)

Instructor manual: David Hakes (University of Northern Iowa)

I am grateful also to Rohan Shah and Rohit Goyal, two star undergraduates at Harvard and Yale, respectively, who helped me refine the manuscript and check the page proofs for this edition.

As always, I must thank my "in-house" editor Deborah Mankiw. As the first reader of most things I write, she continued to offer just the right mix of criticism and encouragement.

Finally, I should mention my three children Catherine, Nicholas, and Peter. Their contribution to this book was putting up with a father spending too many hours in his study. The four of us have much in common—not least of which is our love of ice cream (which becomes apparent in Chapter 4).

N. Gregory Mankiw
May 2019


# Brief Contents

# Contents


# 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.

N. Gregory Mankiw
May 2019

THE
RESTROOMS
BAÑOS
ATM

CHAPTER

1

# 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.

ISTOCK.COM/LOLOSTOCK

**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.

**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

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.

**opportunity cost**
whatever must be given up to obtain some item

The **opportunity cost** of an item is what you give up to get that item. When making any decision, decision makers should take into account the opportunity costs of each possible action. In fact, they usually do. College athletes who can earn millions dropping out of school and playing professional sports are well aware that their opportunity cost of attending college is very high. Not surprisingly, they often decide that the benefit of a college education is not worth the cost.

### 1-1c Principle 3: Rational People Think at the Margin

**rational people**
people who systematically and purposefully do the best they can to achieve their objectives

Economists normally assume that people are rational. **Rational people** systematically and purposefully do the best they can to achieve their objectives, given the available opportunities. As you study economics, you will encounter firms that decide how many workers to hire and how much product to make and sell to maximize profits. You will also encounter individuals who decide how much time to spend working and what goods and services to buy with the resulting income to achieve the highest possible level of satisfaction.

Rational people know that decisions in life are rarely black and white but often involve shades of gray. At dinnertime, you don't ask yourself "Should I fast or eat like a pig?" More likely, the question you face is "Should I take that extra spoonful of mashed potatoes?" When exams roll around, your decision is not between blowing them off and studying 24 hours a day but whether to spend an extra hour reviewing your notes instead of playing video games. Economists use the term **marginal change** to describe a small incremental adjustment to an existing plan of action. Keep in mind that *margin* means "edge," so marginal changes are adjustments around the edges of what you are doing. Rational people make decisions by comparing *marginal benefits* and *marginal costs*.

**marginal change**
a small incremental adjustment to a plan of action

For example, suppose you are considering watching a movie tonight. You pay $40 a month for a movie streaming service that gives you unlimited access to its film library, and you typically watch 8 movies a month. What cost should you take into account when deciding whether to stream another movie? You might at first think the answer is $40/8, or $5, which is the *average* cost of a movie. More relevant for your decision, however, is the *marginal* cost—the extra cost that you would incur by streaming another film. Here, the marginal cost is zero because you pay the same $40 for the service regardless of how many movies you stream. In other words, at the margin, streaming a movie is free. The only cost of watching a movie tonight is the time it takes away from other activities, such as working at a job or (better yet) reading this textbook.

Thinking at the margin also works for business decisions. Consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane across the United States costs the airline $100,000. The average cost of each seat is $500 ($100,000/200). One might be tempted to conclude that the airline should never sell a ticket for less than $500. But imagine that a plane is about to take off with 10 empty seats and a standby passenger waiting at the gate is willing to pay $300 for a seat. Should the airline sell the ticket? Of course it should. If the plane has empty seats, the cost of adding one more passenger is tiny. The *average* cost of flying a passenger is $500, but the *marginal* cost is merely the cost of the can of soda that the extra passenger will consume and the small bit of jet fuel needed to carry the extra passenger's weight. As long as the standby passenger pays more than the marginal cost, selling the ticket is profitable. Thus, a rational airline can increase profits by thinking at the margin.

Marginal decision making can explain some otherwise puzzling phenomena. Here is a classic question: Why is water so cheap, while diamonds are so expensive? Humans need water to survive, while diamonds are unnecessary. Yet people are willing to pay much more for a diamond than for a cup of water. The reason is that a person's willingness to pay for a good is based on the marginal benefit that an extra unit of the good would yield. The marginal benefit, in turn, depends on how many units a person already has. Water is essential, but the marginal benefit of an extra cup is small because water is plentiful. By contrast, no one needs diamonds to survive, but because diamonds are so rare, the marginal benefit of an extra diamond is large.

A rational decision maker takes an action if and only if the action's marginal benefit exceeds its marginal cost. This principle explains why people use their movie streaming services as much as they do, why airlines are willing to sell tickets below average cost, and why people pay more for diamonds than for water. It can take some time to get used to the logic of marginal thinking, but the study of economics will give you ample opportunity to practice.


REDPIXEL.PL/SHUTTERSTOCK.COM

*Many movie streaming services set the marginal cost of a movie equal to zero.*

## 1-1d Principle 4: People Respond to Incentives

**incentive**
something that induces a person to act

An **incentive** is something that induces a person to act, such as the prospect of a punishment or reward. Because rational people make decisions by comparing costs and benefits, they respond to incentives. You will see that incentives play a central role in the study of economics. One economist went so far as to suggest that the entire field could be summarized as simply "People respond to incentives. The rest is commentary."

Incentives are key to analyzing how markets work. For example, when the price of apples rises, people decide to eat fewer apples. At the same time, apple orchards decide to hire more workers and harvest more apples. In other words, a higher price in a market provides an incentive for buyers to consume less and an incentive for sellers to produce more. As we will see, the influence of prices on the behavior of consumers and producers is crucial to how a market economy allocates scarce resources.

Public policymakers should never forget about incentives: Many policies change the costs or benefits that people face and, as a result, alter their behavior. A tax on gasoline, for instance, encourages people to drive smaller, more fuel-efficient cars. That is one reason people drive smaller cars in Europe, where gasoline taxes are high, than in the United States, where gasoline taxes are low. A higher gasoline tax also encourages people to carpool, take public transportation, live closer to where they work, or switch to hybrid or electric cars.

When policymakers fail to consider how their policies affect incentives, they often face unintended consequences. For example, consider public policy regarding auto safety. Today, all cars have seat belts, but this was not true 60 years ago. In 1965, Ralph Nader's book *Unsafe at Any Speed* generated much public concern over auto safety. Congress responded with laws requiring seat belts as standard equipment on new cars.

How does a seat belt law affect auto safety? The direct effect is obvious: When a person wears a seat belt, the likelihood of surviving an auto accident rises. But that's not the end of the story. The law also affects behavior by altering incentives. The relevant behavior here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare, perhaps unconsciously, the marginal benefit from safer driving to the marginal cost. As a result, they drive more slowly and carefully when the benefit of increased safety is high. For example, when road conditions are icy, people drive more attentively and at lower speeds than they do when road conditions are clear.

Consider how a seat belt law alters a driver's cost–benefit calculation. Seat belts make accidents less costly by reducing the risk of injury or death. In other words, seat belts reduce the benefits of slow and careful driving. People respond to seat belts as they would to an improvement in road conditions—by driving faster and less carefully. The result of a seat belt law, therefore, is a larger number of accidents. The decline in safe driving has a clear, adverse impact on pedestrians, who are more likely to find themselves in an accident but (unlike the drivers) don't have the benefit of added protection.

At first, this discussion of incentives and seat belts might seem like idle speculation. Yet in a classic 1975 study, economist Sam Peltzman argued that auto-safety laws have had many of these effects. According to Peltzman's evidence, these laws give rise not only to fewer deaths per accident but also to more accidents. He concluded that the net result is little change in the number of driver deaths and an increase in the number of pedestrian deaths.

Peltzman's analysis of auto safety is an offbeat and controversial example of the general principle that people respond to incentives. When analyzing any policy, we must consider not only the direct effects but also the less obvious indirect effects that work through incentives. If the policy changes incentives, it will cause people to alter their behavior.

### Quick**Quiz**

1. Economics is best defined as the study of
   a. how society manages its scarce resources.
   b. how to run a business most profitably.
   c. how to predict inflation, unemployment, and stock prices.
   d. how the government can stop the harm from unchecked self-interest.

2. Your opportunity cost of going to a movie is
   a. the price of the ticket.
   b. the price of the ticket plus the cost of any soda and popcorn you buy at the theater.
   c. the total cash expenditure needed to go to the movie plus the value of your time.
   d. zero, as long as you enjoy the movie and consider it a worthwhile use of time and money.

3. A marginal change is one that
   a. is not important for public policy.
   b. incrementally alters an existing plan.
   c. makes an outcome inefficient.
   d. does not influence incentives.

4. Because people respond to incentives,
   a. policymakers can alter outcomes by changing punishments or rewards.
   b. policies can have unintended consequences.
   c. society faces a trade-off between efficiency and equality.
   d. All of the above.

*Answers at end of chapter.*

## 1-2 How People Interact

The first four principles discussed how individuals make decisions. As we go about our lives, many of our decisions affect not only ourselves but other people as well. The next three principles concern how people interact with one another.

## 1-2a Principle 5: Trade Can Make Everyone Better Off

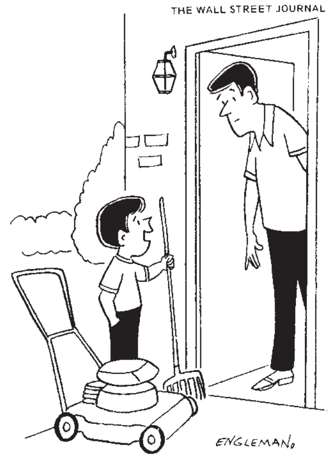
You may have heard on the news that the Chinese are our competitors in the world economy. In some ways, this is true because American firms and Chinese firms produce many of the same goods. Companies in the United States and China compete for the same customers in the markets for clothing, toys, solar panels, automobile tires, and many other items.

Yet it is easy to be misled when thinking about competition among countries. Trade between the United States and China is not like a sports contest in which one side wins and the other side loses. The opposite is true: Trade between two countries can make each country better off.

To see why, consider how trade affects your family. When a member of your family looks for a job, she competes against members of other families who are looking for jobs. Families also compete against one another when they go shopping because each family wants to buy the best goods at the lowest prices. In a sense, each family in an economy competes with all other families.

Despite this competition, your family would not be better off isolating itself from all other families. If it did, your family would need to grow its own food, sew its own clothes, and build its own home. Clearly, your family gains much from being able to trade with others. Trade allows each person to specialize in the activities she does best, whether it is farming, sewing, or home building. By trading with others, people can buy a greater variety of goods and services at lower cost.

Like families, countries also benefit from being able to trade with one another. Trade allows countries to specialize in what they do best and to enjoy a greater variety of goods and services. The Chinese, as well as the French, Egyptians, and Brazilians, are as much our partners in the world economy as they are our competitors.




FROM THE WALL STREET JOURNAL - PERMISSION, CARTOON FEATURES SYNDICATE

*"For $5 a week you can watch baseball without being nagged to cut the grass!"*

## 1-2b Principle 6: Markets Are Usually a Good Way to Organize Economic Activity

The collapse of communism in the Soviet Union and Eastern Europe in the late 1980s and early 1990s was one of the last century's most transformative events. Communist countries operated on the premise that government officials were in the best position to allocate the economy's scarce resources. These central planners decided what goods and services were produced, how much was produced, and who produced and consumed these goods and services. The theory behind central planning was that only the government could organize economic activity in a way that promoted well-being for the country as a whole.

Most countries that once had centrally planned economies have abandoned the system and instead have adopted market economies. In a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

**market economy**
an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services

At first glance, the success of market economies is puzzling. In a market economy, no one is looking out for the well-being of society as a whole. Free markets contain many buyers and sellers of numerous goods and services, and all of them are interested primarily in their own well-being. Yet despite decentralized decision making and self-interested decision makers, market economies have proven remarkably successful in organizing economic activity to promote overall prosperity.

In his 1776 book *An Inquiry into the Nature and Causes of the Wealth of Nations,* economist Adam Smith made the most famous observation in all of economics:

Households and firms interacting in markets act as if they are guided by an "invisible hand" that leads them to desirable market outcomes. One of our goals in this book is to understand how this invisible hand works its magic.

As you study economics, you will learn that prices are the instrument with which the invisible hand directs economic activity. In any market, buyers look at the price when deciding how much to demand, and sellers look at the price when deciding how much to supply. As a result of these decisions, market prices reflect both the value of a good to society and the cost to society of making the good. Smith's great insight was that prices adjust to guide buyers and sellers to reach outcomes that, in many cases, maximize the well-being of society as a whole.

Smith's insight has an important corollary: When a government prevents prices from adjusting naturally to supply and demand, it impedes the invisible hand's ability to coordinate the decisions of the households and firms that make up an economy. This corollary explains why taxes adversely affect the allocation of resources: They distort prices and thus the decisions of households and firms. It also explains the problems caused by policies that control prices, such as rent control. And it explains the failure of communism. In communist countries, prices were not determined in the marketplace but were dictated by central planners. These planners lacked the necessary information about consumers' tastes and producers' costs, which in a market economy is reflected in prices. Central planners failed because they tried to run the economy with one hand tied behind their backs—the invisible hand of the marketplace.

## FYI Adam Smith and the Invisible Hand

It may be only a coincidence that Adam Smith's great book *The Wealth of Nations* was published in 1776, the exact year in which American revolutionaries signed the Declaration of Independence. But the two documents share a point of view that was prevalent at the time: Individuals are usually best left to their own devices, without the heavy hand of government directing their actions. This political philosophy provides the intellectual foundation for the market economy and for a free society more generally.

Why do decentralized market economies work well? Is it because people can be counted on to treat one another with love and kindness? Not at all. Here is Adam Smith's description of how people interact in a market economy:

LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS DIVISION[ LC-USZ62-17407]

*Adam Smith.*

> *Man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. . . . Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that we obtain from one another the far greater part of those good offices which we stand in need of.*
>
> *It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow-citizens. . . .*
>
> *Every individual . . . neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.*

Smith is saying that participants in the economy are motivated by self-interest and that the "invisible hand" of the marketplace guides this self-interest into promoting general economic well-being.

Many of Smith's insights remain at the center of modern economics. Our analysis in the coming chapters will allow us to express Smith's conclusions more precisely and to analyze more fully the strengths and weaknesses of the market's invisible hand. ■

CASE STUDY

### ADAM SMITH WOULD HAVE LOVED UBER

You have probably never lived in a centrally planned economy, but if you have ever tried to hail a cab in a major city, you have likely experienced a highly regulated market. In many cities, the local government imposes strict controls in the market for taxis. The rules usually go well beyond regulation of insurance and safety. For example, the government may limit entry into the market by approving only a certain number of taxi medallions or permits. It may determine the prices that taxis are allowed to charge. The government uses its police powers—that is, the threat of fines or jail time—to keep unauthorized drivers off the streets and prevent drivers from charging unauthorized prices.

In 2009, however, this highly controlled market was invaded by a disruptive force: Uber, a company that provides a smartphone app to connect passengers and drivers. Because Uber cars do not roam the streets looking for taxi-hailing pedestrians, they are technically not taxis and so are not subject to the same regulations. But they offer much the same service. Indeed, rides from Uber cars are often more convenient. On a cold and rainy day, who wants to stand on the side of the road waiting for an empty cab to drive by? It is more pleasant to remain inside, use your smartphone to arrange a ride, and stay warm and dry until the car arrives.

RICHARD LEVINE/ALAMY STOCK PHOTO

*Technology can improve this market.*

Uber cars often charge less than taxis, but not always. Uber's prices rise significantly when there is a surge in demand, such as during a sudden rainstorm or late on New Year's Eve, when numerous tipsy partiers are looking for a safe way to get home. By contrast, regulated taxis are typically prevented from surge pricing.

Not everyone is fond of Uber. Drivers of traditional taxis complain that this new competition cuts into their source of income. This is hardly a surprise: Suppliers of goods and services often dislike new competitors. But vigorous competition among producers makes a market work well for consumers.

That is why economists love Uber. A 2014 survey of several dozen prominent economists asked whether car services such as Uber increased consumer well-being. Every single economist said "Yes." The economists were also asked whether surge pricing increased consumer well-being. "Yes," said 85 percent of them. Surge pricing makes consumers pay more at times, but because Uber drivers respond to incentives, it also increases the quantity of car services supplied when they are most needed. Surge pricing also helps allocate the services to those consumers who value them most highly and reduces the costs of searching and waiting for a car.

If Adam Smith were alive today, he would surely have the Uber app on his phone. ●

## 1-2c Principle 7: Governments Can Sometimes Improve Market Outcomes

If the invisible hand of the market is so great, why do we need government? One purpose of studying economics is to refine your view about the proper role and scope of government policy.

One reason we need government is that the invisible hand can work its magic only if the government enforces the rules and maintains the institutions that are key to a market economy. Most important, market economies need institutions to enforce **property rights** so individuals can own and control scarce resources. A farmer won't grow food if she expects her crop to be stolen; a restaurant won't serve meals unless it is assured that customers will pay before they leave; and a film company won't produce movies if too many potential customers avoid paying by making illegal copies. We all rely on government-provided police and courts to enforce our rights over the things we produce—and the invisible hand counts on our ability to enforce those rights.

**property rights** the ability of an individual to own and exercise control over scarce resources

Another reason we need government is that, although the invisible hand is powerful, it is not omnipotent. There are two broad rationales for a government to