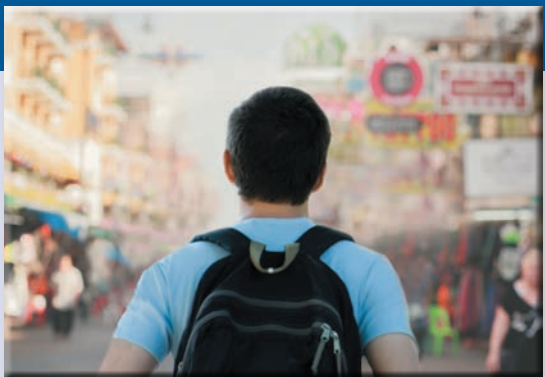




N. GREGORY MANKIW

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 —————
 - 6 Supply, Demand, and Government Policies ———
- How does the economy coordinate interdependent economic actors? Through the market forces of supply and demand.*
- 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 ———
 - 12 The Design of the Tax System —————
- Market outcomes are not always efficient, and governments can sometimes remedy market failure.*
- 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 | } | <i>The theory of the firm sheds light on the decisions that lie behind supply in competitive markets.</i> |
| 14 | Firms in Competitive Markets | | |
| 15 | Monopoly | } | <i>Firms with market power can cause market outcomes to be inefficient.</i> |
| 16 | Monopolistic Competition | | |
| 17 | Oligopoly | | |

THE ECONOMICS OF LABOR MARKETS

- | | | | |
|----|---|---|--|
| 18 | The Markets for the Factors of Production | } | <i>These chapters examine the special features of labor markets, in which most people earn most of their income.</i> |
| 19 | Earnings and Discrimination | | |
| 20 | Income Inequality and Poverty | | |

TOPICS FOR FURTHER STUDY

- | | | | |
|----|-------------------------------|---|--|
| 21 | The Theory of Consumer Choice | } | <i>Additional topics in microeconomics include household decision making, asymmetric information, political economy, and behavioral economics.</i> |
| 22 | Frontiers of Microeconomics | | |



PRINCIPLES OF
**MICRO
ECONOMICS**

NINTH EDITION

N. GREGORY MANKIW
HARVARD UNIVERSITY



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

Copyright 2021 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-203

Copyright 2021 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

This is an electronic version of the print textbook. Due to electronic rights restrictions, some third party content may be suppressed. Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. The publisher reserves the right to remove content from this title at any time if subsequent rights restrictions require it. For valuable information on pricing, previous editions, changes to current editions, and alternate formats, please visit www.cengage.com/highered to search by ISBN#, author, title, or keyword for materials in your areas of interest.

Important Notice: Media content referenced within the product description or the product text may not be available in the eBook version.

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

© 2021, 2018 Cengage Learning, Inc.

Unless otherwise noted, all content is © Cengage.

ALL RIGHTS RESERVED. No part of this work covered by the copyright herein may be reproduced or distributed in any form or by any means, except as permitted by U.S. copyright law, without the prior written permission of the copyright owner.

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.**

*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

<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.

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

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

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

PART I Introduction 1

- 1 Ten Principles of Economics 1
- 2 Thinking Like an Economist 17
- 3 Interdependence and the Gains from Trade 45

PART II How Markets Work 61

- 4 The Market Forces of Supply and Demand 61
- 5 Elasticity and Its Application 87
- 6 Supply, Demand, and Government Policies 109

PART III Markets and Welfare 131

- 7 Consumers, Producers, and the Efficiency of Markets 131
- 8 Application: The Costs of Taxation 151
- 9 Application: International Trade 167

PART IV The Economics of the Public Sector 187

- 10 Externalities 187
- 11 Public Goods and Common Resources 209
- 12 The Design of the Tax System 225

PART V Firm Behavior and the Organization of Industry 243

- 13 The Costs of Production 243
- 14 Firms in Competitive Markets 263
- 15 Monopoly 287
- 16 Monopolistic Competition 317
- 17 Oligopoly 335

PART VI The Economics of Labor Markets 357

- 18 The Markets for the Factors of Production 357
- 19 Earnings and Discrimination 379
- 20 Income Inequality and Poverty 397

PART VII Topics for Further Study 419

- 21 The Theory of Consumer Choice 419
- 22 Frontiers of Microeconomics 447

Contents



Preface: To the Instructor v

Preface: To the Student xxiii

PART I Introduction 1

CHAPTER 1

Ten Principles of Economics 1

1-1 How People Make Decisions 2

- 1-1a Principle 1: People Face Trade-Offs 2
- 1-1b Principle 2: The Cost of Something Is What You Give Up to Get It 3
- 1-1c Principle 3: Rational People Think at the Margin 4
- 1-1d Principle 4: People Respond to Incentives 5

1-2 How People Interact 6

- 1-2a Principle 5: Trade Can Make Everyone Better Off 7
- 1-2b Principle 6: Markets Are Usually a Good Way to Organize Economic Activity 7
 - FYI:** Adam Smith and the Invisible Hand 8
 - CASE STUDY:** Adam Smith Would Have Loved Uber 9
- 1-2c Principle 7: Governments Can Sometimes Improve Market Outcomes 9

1-3 How the Economy as a Whole Works 11

- 1-3a Principle 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services 11
- 1-3b Principle 9: Prices Rise When the Government Prints Too Much Money 11
- 1-3c Principle 10: Society Faces a Short-Run Trade-Off between Inflation and Unemployment 12

1-4 Conclusion 13

Chapter in a Nutshell 14

Key Concepts 14

Questions for Review 14

Problems and Applications 14

Quick Quiz Answers 15

CHAPTER 2

Thinking Like an Economist 17

2-1 The Economist as Scientist 18

- 2-1a The Scientific Method: Observation, Theory, and More Observation 18
- 2-1b The Role of Assumptions 19
- 2-1c Economic Models 19

2-1d Our First Model: The Circular-Flow Diagram 20

2-1e Our Second Model: The Production Possibilities Frontier 21

2-1f Microeconomics and Macroeconomics 24

2-2 The Economist as Policy Adviser 25

- 2-2a Positive versus Normative Analysis 25
 - IN THE NEWS:** Why Tech Companies Hire Economists 26
- 2-2b Economists in Washington 27
- 2-2c Why Economists' Advice Is Not Always Followed 28

2-3 Why Economists Disagree 29

- 2-3a Differences in Scientific Judgments 29
- 2-3b Differences in Values 30
- 2-3c Perception versus Reality 30
 - ASK THE EXPERTS:** Ticket Resale 32

2-4 Let's Get Going 32

Chapter in a Nutshell 33

Key Concepts 33

Questions for Review 33

Problems and Applications 34

Quick Quiz Answers 34

APPENDIX Graphing: A Brief Review 35

- Graphs of a Single Variable 35
- Graphs of Two Variables: The Coordinate System 36
- Curves in the Coordinate System 37
- Slope 39
- Cause and Effect 41

CHAPTER 3

Interdependence and the Gains from Trade 45

3-1 A Parable for the Modern Economy 46

- 3-1a Production Possibilities 46
- 3-1b Specialization and Trade 48

3-2 Comparative Advantage: The Driving Force of Specialization 50

- 3-2a Absolute Advantage 50
- 3-2b Opportunity Cost and Comparative Advantage 50
- 3-2c Comparative Advantage and Trade 52
- 3-2d The Price of the Trade 52

FYI: The Legacy of Adam Smith and David Ricardo 53

3-3 Applications of Comparative Advantage 54

- 3-3a Should LeBron James Mow His Own Lawn? 54
- 3-3b Should the United States Trade with Other Countries? 54

3-4 Conclusion	55
ASK THE EXPERTS: Trade between China and the United States	55
IN THE NEWS: Economics within a Marriage	56
Chapter in a Nutshell	56
Key Concepts	57
Questions for Review	57
Problems and Applications	58
Quick Quiz Answers	59

PART II How Markets Work 61

CHAPTER 4

The Market Forces of Supply and Demand 61

4-1 Markets and Competition	62
4-1a What Is a Market?	62
4-1b What Is Competition?	62
4-2 Demand	63
4-2a The Demand Curve: The Relationship between Price and Quantity Demanded	63
4-2b Market Demand versus Individual Demand	64
4-2c Shifts in the Demand Curve	65
CASE STUDY: Two Ways to Reduce Smoking	68
4-3 Supply	69
4-3a The Supply Curve: The Relationship between Price and Quantity Supplied	69
4-3b Market Supply versus Individual Supply	70
4-3c Shifts in the Supply Curve	71
4-4 Supply and Demand Together	73
4-4a Equilibrium	73
4-4b Three Steps to Analyzing Changes in Equilibrium	75
IN THE NEWS: Price Increases after Disasters	80
4-5 Conclusion: How Prices Allocate Resources	81
ASK THE EXPERTS: Price Gouging	82
Chapter in a Nutshell	82
Key Concepts	83
Questions for Review	83
Problems and Applications	84
Quick Quiz Answers	85

CHAPTER 5

Elasticity and Its Application 87

5-1 The Elasticity of Demand	88
5-1a The Price Elasticity of Demand and Its Determinants	88
5-1b Computing the Price Elasticity of Demand	89
5-1c The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities	90
5-1d The Variety of Demand Curves	91

FYI: A Few Elasticities from the Real World	91
5-1e Total Revenue and the Price Elasticity of Demand	93
5-1f Elasticity and Total Revenue along a Linear Demand Curve	94
5-1g Other Demand Elasticities	96

5-2 The Elasticity of Supply 97

5-2a The Price Elasticity of Supply and Its Determinants	97
5-2b Computing the Price Elasticity of Supply	98
5-2c The Variety of Supply Curves	98

5-3 Three Applications of Supply, Demand, and Elasticity 100

5-3a Can Good News for Farming Be Bad News for Farmers?	101
5-3b Why Did OPEC Fail to Keep the Price of Oil High?	103
5-3c Does Drug Interdiction Increase or Decrease Drug-Related Crime?	104

5-4 Conclusion 106

Chapter in a Nutshell	106
Key Concepts	107
Questions for Review	107
Problems and Applications	107
Quick Quiz Answers	108

CHAPTER 6

Supply, Demand, and Government Policies 109

6-1 Controls on Prices 110

6-1a How Price Ceilings Affect Market Outcomes	110
CASE STUDY: Lines at the Gas Pump	112
CASE STUDY: Rent Control in the Short Run and the Long Run	113
ASK THE EXPERTS: Rent Control	114
6-1b How Price Floors Affect Market Outcomes	114
CASE STUDY: The Minimum Wage	116
ASK THE EXPERTS: The Minimum Wage	117
6-1c Evaluating Price Controls	118

6-2 Taxes 119

6-2a How Taxes on Sellers Affect Market Outcomes	119
IN THE NEWS: Should the Minimum Wage Be \$15 an Hour?	120
6-2b How Taxes on Buyers Affect Market Outcomes	122
CASE STUDY: Can Congress Distribute the Burden of a Payroll Tax?	124
6-2c Elasticity and Tax Incidence	125
CASE STUDY: Who Pays the Luxury Tax?	126

6-3 Conclusion 127

Chapter in a Nutshell	127
Key Concepts	128
Questions for Review	128
Problems and Applications	128
Quick Quiz Answers	130

PART III Markets and Welfare 131

CHAPTER 7

Consumers, Producers, and the Efficiency of Markets 131

7-1 Consumer Surplus 132

- 7-1a Willingness to Pay 132
- 7-1b Using the Demand Curve to Measure Consumer Surplus 133
- 7-1c How a Lower Price Raises Consumer Surplus 134
- 7-1d What Does Consumer Surplus Measure? 135

7-2 Producer Surplus 137

- 7-2a Cost and the Willingness to Sell 137
- 7-2b Using the Supply Curve to Measure Producer Surplus 138
- 7-2c How a Higher Price Raises Producer Surplus 140

7-3 Market Efficiency 141

- 7-3a The Benevolent Social Planner 141
- 7-3b Evaluating the Market Equilibrium 142
- CASE STUDY:** Should There Be a Market for Organs? 145
- ASK THE EXPERTS:** Supplying Kidneys 145
- IN THE NEWS:** How Ticket Resellers Help Allocate Scarce Resources 146

7-4 Conclusion: Market Efficiency and Market Failure 147

Chapter in a Nutshell 148

Key Concepts 148

Questions for Review 149

Problems and Applications 149

Quick Quiz Answers 150

CHAPTER 8

Application: The Costs of Taxation 151

8-1 The Deadweight Loss of Taxation 152

- 8-1a How a Tax Affects Market Participants 152
- 8-1b Deadweight Losses and the Gains from Trade 155

8-2 The Determinants of the Deadweight Loss 157

- CASE STUDY:** The Deadweight Loss Debate 158

8-3 Deadweight Loss and Tax Revenue as Taxes Vary 160

- CASE STUDY:** The Laffer Curve and Supply-Side Economics 161
- ASK THE EXPERTS:** The Laffer Curve 162

8-4 Conclusion 163

Chapter in a Nutshell 163

Key Concept 164

Questions for Review 164

Problems and Applications 164

Quick Quiz Answers 165

CHAPTER 9

Application: International Trade 167

9-1 The Determinants of Trade 168

- 9-1a The Equilibrium without Trade 168
- 9-1b The World Price and Comparative Advantage 169

9-2 The Winners and Losers from Trade 170

- 9-2a The Gains and Losses of an Exporting Country 170
- 9-2b The Gains and Losses of an Importing Country 171
- 9-2c The Effects of a Tariff 173

FYI: Import Quotas: Another Way to Restrict Trade 175

9-2d The Lessons for Trade Policy 175

9-2e Other Benefits of International Trade 176

IN THE NEWS: Trade as a Tool for Economic Development 178

9-3 The Arguments for Restricting Trade 178

- 9-3a The Jobs Argument 178
- 9-3b The National-Security Argument 179
- 9-3c The Infant-Industry Argument 180
- 9-3d The Unfair-Competition Argument 180
- 9-3e The Protection-as-a-Bargaining-Chip Argument 180

CASE STUDY: Trade Agreements and the World Trade Organization 181

ASK THE EXPERTS: Tariffs and Trade Deals 181

IN THE NEWS: The Trade Policies of President Trump 182

9-4 Conclusion 183

Chapter in a Nutshell 184

Key Concepts 184

Questions for Review 185

Problems and Applications 185

Quick Quiz Answers 186

PART IV The Economics of the Public Sector 187

CHAPTER 10

Externalities 187

10-1 Externalities and Market Inefficiency 189

10-1a Welfare Economics: A Recap 189

10-1b Negative Externalities 190

10-1c Positive Externalities 191

CASE STUDY: Technology Spillovers, Industrial Policy, and Patent Protection 192

10-2 Public Policies toward Externalities 193

10-2a Command-and-Control Policies: Regulation 193

ASK THE EXPERTS: Vaccines 194

10-2b Market-Based Policy 1: Corrective Taxes and Subsidies 194

CASE STUDY: Why Is Gasoline Taxed So Heavily? 195

10-2c Market-Based Policy 2: Tradable Pollution Permits 197

IN THE NEWS: What Should We Do about Climate Change? 198

ASK THE EXPERTS: Carbon Taxes 200
10-2d Objections to the Economic Analysis of Pollution 200

10-3 Private Solutions to Externalities 201
10-3a The Types of Private Solutions 201
10-3b The Coase Theorem 202
10-3c Why Private Solutions Do Not Always Work 203
IN THE NEWS: The Coase Theorem in Action 204

10-4 Conclusion 204
Chapter in a Nutshell 205
Key Concepts 206
Questions for Review 206
Problems and Applications 206
Quick Quiz Answers 207

CHAPTER 11

Public Goods and Common Resources 209

11-1 The Different Kinds of Goods 210

11-2 Public Goods 212
11-2a The Free-Rider Problem 212
11-2b Some Important Public Goods 213
CASE STUDY: Are Lighthouses Public Goods? 214
11-2c The Difficult Job of Cost-Benefit Analysis 215
CASE STUDY: How Much Is a Life Worth? 215

11-3 Common Resources 217
11-3a The Tragedy of the Commons 217
11-3b Some Important Common Resources 218
ASK THE EXPERTS: Congestion Pricing 218
CASE STUDY: Why the Cow Is Not Extinct 219
IN THE NEWS: Social Media as a Common Resource 220

11-4 Conclusion: The Importance of Property Rights 221
Chapter in a Nutshell 222
Key Concepts 222
Questions for Review 222
Problems and Applications 223
Quick Quiz Answers 224

CHAPTER 12

The Design of the Tax System 225

12-1 An Overview of U.S. Taxation 226
12-1a Taxes Collected by the Federal Government 227
12-1b Taxes Collected by State and Local Governments 229

12-2 Taxes and Efficiency 230
12-2a Deadweight Losses 231
CASE STUDY: Should Income or Consumption Be Taxed? 231
12-2b Administrative Burden 232

12-2c Marginal Tax Rates versus Average Tax Rates 233
12-2d Lump-Sum Taxes 233

ASK THE EXPERTS: Top Marginal Tax Rates 233

12-3 Taxes and Equity 234

12-3a The Benefits Principle 235
12-3b The Ability-to-Pay Principle 235
CASE STUDY: How the Tax Burden Is Distributed 236
12-3c Tax Incidence and Tax Equity 238
CASE STUDY: Who Pays the Corporate Income Tax? 238

12-4 Conclusion: The Trade-Off between Equity and Efficiency 239

Chapter in a Nutshell 240
Key Concepts 240
Questions for Review 240
Problems and Applications 241
Quick Quiz Answers 241

PART V Firm Behavior and the Organization of Industry 243

CHAPTER 13

The Costs of Production 243

13-1 What Are Costs? 244
13-1a Total Revenue, Total Cost, and Profit 244
13-1b Costs as Opportunity Costs 244
13-1c The Cost of Capital as an Opportunity Cost 245
13-1d Economic Profit versus Accounting Profit 246

13-2 Production and Costs 247
13-2a The Production Function 247
13-2b From the Production Function to the Total-Cost Curve 249

13-3 The Various Measures of Cost 250
13-3a Fixed and Variable Costs 251
13-3b Average and Marginal Cost 251
13-3c Cost Curves and Their Shapes 252
13-3d Typical Cost Curves 254

13-4 Costs in the Short Run and in the Long Run 256
13-4a The Relationship between Short-Run and Long-Run Average Total Cost 256
13-4b Economies and Diseconomies of Scale 257
FYI: Lessons from a Pin Factory 258

13-5 Conclusion 258
Chapter in a Nutshell 259
Key Concepts 260
Questions for Review 260
Problems and Applications 260
Quick Quiz Answers 262

CHAPTER 14

Firms in Competitive Markets 263

14-1 What Is a Competitive Market? 264

- 14-1a The Meaning of Competition 264
- 14-1b The Revenue of a Competitive Firm 264

14-2 Profit Maximization and the Competitive Firm's Supply Curve 266

- 14-2a A Simple Example of Profit Maximization 266
- 14-2b The Marginal-Cost Curve and the Firm's Supply Decision 268
- 14-2c The Firm's Short-Run Decision to Shut Down 270
- 14-2d Spilt Milk and Other Sunk Costs 271
- CASE STUDY:** Near-Empty Restaurants and Off-Season Miniature Golf 272
- 14-2e The Firm's Long-Run Decision to Exit or Enter a Market 272
- 14-2f Measuring Profit in Our Graph for the Competitive Firm 274
- 14-2g A Brief Recap 275

14-3 The Supply Curve in a Competitive Market 276

- 14-3a The Short Run: Market Supply with a Fixed Number of Firms 276
- 14-3b The Long Run: Market Supply with Entry and Exit 276
- 14-3c Why Do Competitive Firms Stay in Business If They Make Zero Profit? 278
- 14-3d A Shift in Demand in the Short Run and Long Run 279
- 14-3e Why the Long-Run Supply Curve Might Slope Upward 279

14-4 Conclusion: Behind the Supply Curve 281

Chapter in a Nutshell 282

Key Concepts 282

Questions for Review 282

Problems and Applications 283

Quick Quiz Answers 285

CHAPTER 15

Monopoly 287

15-1 Why Monopolies Arise 288

- 15-1a Monopoly Resources 289
- 15-1b Government-Created Monopolies 289
- 15-1c Natural Monopolies 290

15-2 How Monopolies Make Production and Pricing Decisions 291

- 15-2a Monopoly versus Competition 291
- 15-2b A Monopoly's Revenue 292
- 15-2c Profit Maximization 294
- 15-2d A Monopoly's Profit 296
- FYI:** Why a Monopoly Does Not Have a Supply Curve 297
- CASE STUDY:** Monopoly Drugs versus Generic Drugs 297

15-3 The Welfare Cost of Monopolies 299

- 15-3a The Deadweight Loss 299
- 15-3b The Monopoly's Profit: A Social Cost? 301

15-4 Price Discrimination 302

- 15-4a A Parable about Pricing 302
- 15-4b The Moral of the Story 303
- 15-4c The Analytics of Price Discrimination 304
- 15-4d Examples of Price Discrimination 305
- IN THE NEWS:** Price Discrimination Reaches the Supreme Court 306

15-5 Public Policy toward Monopolies 308

- 15-5a Increasing Competition with Antitrust Laws 308
- 15-5b Regulation 309
- ASK THE EXPERTS:** Mergers 310
- 15-5c Public Ownership 310
- 15-5d Doing Nothing 311

15-6 Conclusion: The Prevalence of Monopolies 311

Chapter in a Nutshell 312

Key Concepts 313

Questions for Review 313

Problems and Applications 313

Quick Quiz Answers 316

CHAPTER 16

Monopolistic Competition 317

16-1 Between Monopoly and Perfect Competition 318

16-2 Competition with Differentiated Products 320

- 16-2a The Monopolistically Competitive Firm in the Short Run 320
- 16-2b The Long-Run Equilibrium 322
- 16-2c Monopolistic versus Perfect Competition 323
- 16-2d Monopolistic Competition and the Welfare of Society 324

16-3 Advertising 326

- 16-3a The Debate over Advertising 326
- CASE STUDY:** How Advertising Affects Prices 327
- 16-3b Advertising as a Signal of Quality 328
- 16-3c Brand Names 329

16-4 Conclusion 331

Chapter in a Nutshell 332

Key Concepts 332

Questions for Review 332

Problems and Applications 332

Quick Quiz Answers 333

CHAPTER 17

Oligopoly 335

17-1 Markets with Only a Few Sellers 336

- 17-1a A Duopoly Example 336
- 17-1b Competition, Monopolies, and Cartels 336
- 17-1c The Equilibrium for an Oligopoly 338
- 17-1d How the Size of an Oligopoly Affects the Market Outcome 339

ASK THE EXPERTS: Market Share and Market Power 340

17-2 The Economics of Cooperation	341
17-2a The Prisoners' Dilemma	341
17-2b Oligopolies as a Prisoners' Dilemma	342
CASE STUDY: OPEC and the World Oil Market	343
17-2c Other Examples of the Prisoners' Dilemma	344
17-2d The Prisoners' Dilemma and the Welfare of Society	345
17-2e Why People Sometimes Cooperate	346
CASE STUDY: The Prisoners' Dilemma Tournament	346
17-3 Public Policy toward Oligopolies	347
17-3a Restraint of Trade and the Antitrust Laws	347
CASE STUDY: An Illegal Phone Call	348
17-3b Controversies over Antitrust Policy	349
CASE STUDY: The Microsoft Case	351
IN THE NEWS: Is Amazon the Next Antitrust Target?	352
17-4 Conclusion	353
Chapter in a Nutshell	354
Key Concepts	354
Questions for Review	354
Problems and Applications	354
Quick Quiz Answers	356

PART VI The Economics of Labor Markets 357

CHAPTER 18

The Markets for the Factors of Production 357

18-1 The Demand for Labor	358
18-1a The Competitive Profit-Maximizing Firm	358
18-1b The Production Function and the Marginal Product of Labor	359
18-1c The Value of the Marginal Product and the Demand for Labor	361
18-1d What Causes the Labor-Demand Curve to Shift?	362
FYI: Input Demand and Output Supply: Two Sides of the Same Coin	363
18-2 The Supply of Labor	364
18-2a The Trade-Off between Work and Leisure	364
18-2b What Causes the Labor-Supply Curve to Shift?	365
18-3 Equilibrium in the Labor Market	366
ASK THE EXPERTS: Immigration	366
18-3a Shifts in Labor Supply	366
18-3b Shifts in Labor Demand	368
CASE STUDY: Productivity and Wages	369
FYI: Monopsony	370
18-4 The Other Factors of Production: Land and Capital	370
18-4a Equilibrium in the Markets for Land and Capital	371
FYI: What Is Capital Income?	372
18-4b Linkages among the Factors of Production	372
CASE STUDY: The Economics of the Black Death	373
IN THE NEWS: The Winners and Losers from Immigration	374

18-5 Conclusion	374
Chapter in a Nutshell	376
Key Concepts	376
Questions for Review	376
Problems and Applications	376
Quick Quiz Answers	378

CHAPTER 19

Earnings and Discrimination 379

19-1 Some Determinants of Equilibrium Wages	380
19-1a Compensating Differentials	380
19-1b Human Capital	380
CASE STUDY: The Increasing Value of Skills	381
ASK THE EXPERTS: Inequality and Skills	382
19-1c Ability, Effort, and Chance	382
CASE STUDY: The Benefits of Beauty	383
19-1d An Alternative View of Education: Signaling	383
19-1e The Superstar Phenomenon	384
19-1f Above-Equilibrium Wages: Minimum-Wage Laws, Unions, and Efficiency Wages	385
IN THE NEWS: Schooling as a Public Investment	386
19-2 The Economics of Discrimination	387
19-2a Measuring Labor-Market Discrimination	387
CASE STUDY: Is Emily More Employable than Lakisha?	389
19-2b Discrimination by Employers	389
CASE STUDY: Segregated Streetcars and the Profit Motive	390
19-2c Discrimination by Customers and Governments	391
CASE STUDY: Discrimination in Sports	391
19-2d Statistical Discrimination	392
19-3 Conclusion	393
Chapter in a Nutshell	394
Key Concepts	394
Questions for Review	394
Problems and Applications	395
Quick Quiz Answers	395

CHAPTER 20

Income Inequality and Poverty 397

20-1 Measuring Inequality	398
20-1a U.S. Income Inequality	398
20-1b Inequality Around the World	399
FYI: Incomes of the Super-Rich	400
20-1c The Poverty Rate	400
20-1d Problems in Measuring Inequality	403
IN THE NEWS: Are We Winning the War on Poverty?	404
CASE STUDY: Alternative Measures of Inequality	404
20-1e Economic Mobility	405
20-2 The Political Philosophy of Redistributing Income	406
20-2a Utilitarianism	407
20-2b Liberalism	408
20-2c Libertarianism	409

20-3 Policies to Reduce Poverty	410
20-3a Minimum-Wage Laws	410
20-3b Welfare	411
20-3c Negative Income Tax	411
20-3d In-Kind Transfers	412
20-3e Antipoverty Programs and Work Incentives	413
IN THE NEWS: International Differences in Income Redistribution	414
20-4 Conclusion	416
Chapter in a Nutshell	416
Key Concepts	416
Questions for Review	417
Problems and Applications	417
Quick Quiz Answers	418

PART VII Topics for Further Study 419

CHAPTER 21

The Theory of Consumer Choice 419

21-1 The Budget Constraint: What a Consumer Can Afford	420
21-1a Representing Consumption Opportunities in a Graph	420
21-1b Shifts in the Budget Constraint	421
21-2 Preferences: What a Consumer Wants	423
21-2a Representing Preferences with Indifference Curves	423
21-2b Four Properties of Indifference Curves	424
21-2c Two Extreme Examples of Indifference Curves	426
21-3 Optimization: What a Consumer Chooses	428
21-3a The Consumer's Optimal Choices	428
21-3b How Changes in Income Affect the Consumer's Choices	429
FYI: Utility: An Alternative Way to Describe Preferences and Optimization	430
21-3c How Changes in Prices Affect the Consumer's Choices	430
21-3d Income and Substitution Effects	432
21-3e Deriving the Demand Curve	433
21-4 Three Applications	435
21-4a Do All Demand Curves Slope Downward?	435

CASE STUDY: The Search for Giffen Goods	436
21-4b How Do Wages Affect Labor Supply?	436
CASE STUDY: Income Effects on Labor Supply: Historical Trends, Lottery Winners, and the Carnegie Conjecture	439
21-4c How Do Interest Rates Affect Household Saving?	440

21-5 Conclusion: Do People Really Think This Way?	443
Chapter in a Nutshell	443
Key Concepts	444
Questions for Review	444
Problems and Applications	444
Quick Quiz Answers	445

CHAPTER 22

Frontiers of Microeconomics 447

22-1 Asymmetric Information	448
22-1a Hidden Actions: Principals, Agents, and Moral Hazard	448
FYI: Corporate Management	449
22-1b Hidden Characteristics: Adverse Selection and the Lemons Problem	450
22-1c Signaling to Convey Private Information	450
CASE STUDY: Gifts as Signals	451
22-1d Screening to Uncover Private Information	452
22-1e Asymmetric Information and Public Policy	452
22-2 Political Economy	453
22-2a The Condorcet Voting Paradox	453
22-2b Arrow's Impossibility Theorem	454
22-2c The Median Voter Is King	455
22-2d Politicians Are People Too	457
22-3 Behavioral Economics	458
22-3a People Aren't Always Rational	458
22-3b People Care about Fairness	459
22-3c People Are Inconsistent over Time	460
ASK THE EXPERTS: Behavioral Economics	461
IN THE NEWS: Using Deviations from Rationality	462
22-4 Conclusion	464
Chapter in a Nutshell	464
Key Concepts	464
Questions for Review	465
Problems and Applications	465
Quick Quiz Answers	466



Preface: To the Student

“**E**conomics 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



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

opportunity cost

whatever must be given up to obtain some item

rational people

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

marginal change

a small incremental adjustment to a plan of action

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

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*.

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.

1-1d Principle 4: People Respond to Incentives

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

REDPIXEL.PH/Shutterstock.com



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

incentive
something that induces a person to act

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.

QuickQuiz

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.

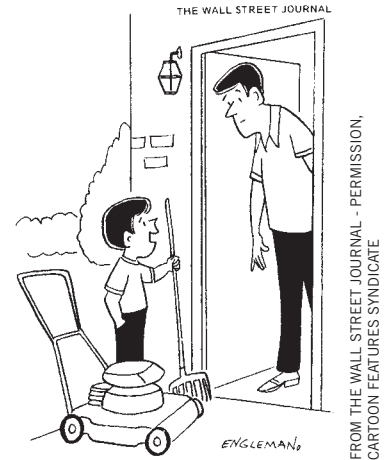
1-2b Principle 6: Markets Are Usually a Good Way to Organize Economic Activity

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.

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:



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

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

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:



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.

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.

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



RICHARD LEVINE/ALAMY STOCK PHOTO

Technology can improve this market.

property rights

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