Seventh Edition

# Principles of Microeconomics

N. Gregory Mankiw

## Firm Behavior and the Organization of Industry

13 The Costs of Production
14 Firms in Competitive Markets

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

15 Monopoly
16 Monopolistic Competition
17 Oligopoly

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

## The Economics of Labor Markets

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

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

## Topics for Further Study

21 The Theory of Consumer Choice
22 Frontiers of Microeconomics

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

*Seventh Edition*

# Principles of Microeconomics

## N. Gregory Mankiw

CENGAGE Learning

Australia • Brazil • Japan • Korea • Mexico • Singapore • Spain • United Kingdom • United States

**Principles of Microeconomics, 7e**
N. Gregory Mankiw

Senior Vice President, Global Product Manager, Higher Education: Jack W. Calhoun

Vice President, General Manager, Social Science & Qualitative Business: Erin Joyner

Product Director: Mike Worls

Developmental Editor: Jane Tufts

Product Development Manager: Jennifer E. Thomas

Content Developers: Clara Goosman and Elizabeth A. Beiting-Lipps

Product Assistant: Anne Merrill

Sr. Content Project Manager: Colleen A. Farmer

Sr. Market Development Manager: John Carey

Sr. Marketing Manager: Robin LeFevre

Marketing Coordinator: Christopher Walz

Media Developer: Anita Verma

Digital Content Designer: Kasie Jean

Sr. Content Digitization Project Manager: Jaclyn Hermesmeyer

Manufacturing Planner: Kevin Kluck

Sr. Marketing Communications Manager: Sarah Greber

Production Service: PreMediaGlobal

Sr. Art Director: Michelle Kunkler

Cover and Internal Designer: Beckmeyer Design

Internal Illustrations by: Greg LaFever

Cover Painting by: Wojciech Gerson (1831–1901)

Rights Acquisitions Specialist (Text and Photo): John Hill



Library of Congress Control Number: 2013944586

ISBN-13: 978-1-285-16590-5

ISBN-10: 1-285-16590-X

**Cengage Learning**
200 First Stamford Place, 4th Floor
Stamford, CT 06902
USA



Printed in the United States of America
1 2 3 4 5 6 7 17 16 15 14 13

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

# About the Author


Jordi Cabre

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, 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.

Professor Mankiw lives in Wellesley, Massachusetts, with his wife Deborah, three children, Catherine, Nicholas, and Peter, and their border terrier, Tobin.

# Brief Contents

# Preface to the Student

"Economics is a study of mankind in the ordinary business of life." So wrote Alfred Marshall, the great 19th-century economist, in his textbook, *Principles of Economics*. Although we have learned much about the economy since Marshall's time, 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 at the beginning of 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 Leonardo DiCaprio 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 reading the newspaper, running a business, or sitting in the Oval Office, you will be glad that you studied economics.

N. Gregory Mankiw
December 2013

# 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 seven 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 have been Ron Cronovich (Carthage College) and David Hakes (University of Northern Iowa). Ron and David, both dedicated teachers, have served as reliable sounding boards for ideas and hardworking partners with me in putting together the superb package of supplements.

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

Mark Abajian, *San Diego Mesa College*
Rahi Abouk, *University of Wisconsin Milwaukee*
Nathanael Adams, *Cardinal Stritch University*
Seemi Ahmad, *Dutchess Community College*
May Akabogu-Collins, *Mira Costa College–Oceanside*
Ercument Aksoy, *Los Angeles Valley College*
William Aldridge, *University of Alabama–Tuscaloosa*
Donald L. Alexander, *Western Michigan University*
Basil Al-Hashimi, *Mesa Community College*
Rashid Al-Hmoud, *Texas Tech University*
Hassan Aly, *Ohio State University*
Michelle Amaral, *University of the Pacific*
Shahina Amin, *University of Northern Iowa*
Catalina Amuedo, *San Diego State University*
Vivette Ancona, *Hunter College–CUNY*
Diane Anstine, *North Central College*
Carolyn Arcand, *University of Massachusetts Boston*
Ali Ataiifar, *Delaware County Community College*
Shannon Aucoin, *University of Louisiana Lafayette*
Lisa Augustyniak, *Lake Michigan College*
Wesley Austin, *University of Louisiana Lafayette*
Sang Hoo Bae, *Clark University*
Karen Baehler, *Hutchinson Community College*
Mohsen Bahmani-Oskooee, *University of Wisconsin Milwaukee*
Stephen Baker, *Capital University*
Tannista Banerjee, *Auburn University*
Bob Barnes, *DePaul University*
Hamid Bastin, *Shippensburg University*
Leon Battista, *Albertus Magnus College*
Gerald Baumgardner, *Susquehanna University*

Christoph Bauner, *University of Massachusetts–Amherst*
Elizabeth Bayley, *University of Delaware*
Mike Belleman, *St Clair County Community College*
Cynthia Benelli, *University of California Santa Barbara*
Charles Bennett, *Gannon University*
Bettina Berch, *Borough of Manhattan Community College*
Stacey Bertke, *Owensboro Community & Technical College*
Tibor Besedes, *Georgia Institute of Technology*
Abhijeet Bhattacharya, *Illinois Valley Community College*
Ronald Bishop, *Lake Michigan College*
Janet Blackburn, *San Jacinto South College*
Natalia Boliari, *Manhattan College*
Antonio Bos, *Tusculum College*
Jennifer Bossard, *Doane College*
James Boudreau, *University of Texas–Pan American*
Mike Bowyer, *Montgomery Community College*
William Brennan, *Minnesota State University–Mankato*
Scott Broadbent, *Western Kentucky University*
Greg Brock, *Georgia Southern University*
Stacey Brook, *University of Iowa*
Keith Brouhle, *Grinnell College*
Byron Brown, *Michigan State University*
Christopher Brunt, *Lake Superior State University*
Laura Bucila, *Texas Christian University*
Donna Bueckman, *University of Tennessee–Knoxville*
Joe Bunting, *St. Andrews University*
Rob Burrus, *University of North Carolina–Wilmington*
James Butkiewicz, *University of Delaware*
Anna Cai, *University of Alabama–Tuscaloosa*
Michael Carew, *Baruch College*
William Carner, *Westminster College*
Onur Celik, *Quinnipiac University*
Kalyan Chakraborty, *Emporia State University*
Suparna Chakraborty, *Baruch College–CUNY*
Dustin Chambers, *Salisbury University*
Silvana Chambers, *Salisbury University*
Krishnamurti Chandrasekar, *New York Institute of Technology*
Yong Chao, *University of Louisville*
David Chaplin, *Northwest Nazarene University*
Xudong Chen, *Baldwin-Wallace College*
Yi-An Chen, *University of Washington*, *Seattle*
Ron Cheung, *Oberlin College*
Dmitriy Chulkov, *Indiana University Kokomo*
Lawrence Cima, *John Carroll University*
Cindy Clement, *University of Maryland*
Matthew Clements, *Saint Edward's University*
Tina Collins, *San Joaquin Valley College*
Scott Comparato, *Southern Illinois University*
Stephen Cotten, *University of Houston Clear Lake*
Jim Cox, *Georgia Perimeter College*
Michael Craig, *University of Tennessee–Knoxville*
Matt Critcher, *University of Arkansas Community College at Batesville*
George Crowley, *Troy University*, *Troy*
David Cullipher, *Arkansas State University-Mountain Home*
Dusan Curcic, *University of Virginia*
Maria DaCosta, *University of Wisconsin–EauClaire*
Bruce Dalgaard, *St. Olaf College*
Anusua Datta, *Philadelphia University*
Amanda Dawsey, *University of Montana*
William DeFrance, *University of Michigan-Flint*
Paramita Dhar, *Central Connecticut State University*
Ahrash Dianat, *George Mason University*
Stephanie Dieringer, *University of South Florida St. Petersburg*

Parks Dodd, *Georgia Institute of Technology*
Veronika Dolar, *Long Island University*
Kirk Doran, *University of Notre Dame*
Caf Dowlah, *Queensborough Community College–CUNY*
Tanya Downing, *Cuesta College*
Michael J. Driscoll, *Adelphi University*
Ding Du, *Northern Arizona University*
Kevin Dunagan, *Oakton Community College*
Nazif Durmaz, *University of Houston–Victoria*
Tomas Dvorak, *Union College*
Eva Dziadula, *Lake Forest College*
Dirk Early, *Southwestern University*
Ann Eike, *University of Kentucky*
Harold Elder, *University of Alabama–Tuscaloosa*
Lynne Elkes, *Loyola University Maryland*
Diantha Ellis, *Abraham Baldwin College*
Noha Emara, *Columbia University*
Michael Enz, *Framingham State University*
Lee Erickson, *Taylor University*
Pat Euzent, *University of Central Florida–Orlando*
Timothy Ewest, *Wartburg College*
Amir Farmanesh, *University of Maryland*
Donna Fisher, *Georgia Southern University*
Nikki Follis, *Chadron State College*
Joseph Franklin, *Newberry College*
Ted Fu, *Shenandoah University*
Winnie Fung, *Wheaton College*
Marc Fusaro, *Arkansas Tech University*
Todd Gabe, *University of Maine*
Mary Gade, *Oklahoma State University*
Jonathan Gafford, *Columbia State Community College*
Iris Geisler, *Austin Community College*
Jacob Gelber, *University of Alabama at Birmingham*
Robert Gentenaar, *Pima Downtown Community College*
Soma Ghosh, *Albright College*
Edgar Ghossoub, *University of Texas at San Antonio*
Alex Gialanella, *Manhattanville College*
Bill Gibson, *University of Vermont*
Kenneth Gillingham, *Yale University*
Gregory Gilpin, *Montana State University*
Jayendra Gokhale, *Oregon State University*
Joel Goldhar, *IIT/Stuart School of Business*
Michael Goode, *Central Piedmont Community College*
Michael J Gootzeit, *University of Memphis*
Jackson Grant, *US Air Force Academy*
Jeremy Groves, *Northern Illinois University*
Ilhami Gunduz, *Brooklyn College–CUNY*
Michele Hampton, *Cuyahoga Community College Eastern*
James Hartley, *Mount Holyoke College*
Mike Haupert, *University of Wisconsin LaCrosse*
David Hedrick, *Central Washington University*
Sara Helms, *Samford University*
Jessica Hennessey, *Furman University*
Thomas Henry, *Mississippi State University*
Bob Holland, *Purdue University*
Glenn Hsu, *University of Central Oklahoma*
Jim Hubert, *Seattle Central Community College*
Christopher Hyer, *University of New Mexico*
Kent Hymel, *California State University–Northridge*
Miren Ivankovic, *Anderson University*
Eric Jacobson, *University of Delaware*
Ricot Jean, *Valencia College*
Michal Jerzmanowski, *Clemson University*
Bonnie Johnson, *California Lutheran University*
Bruce Johnson, *Centre College*
Paul Johnson, *University of Alaska Anchorage*
Philipp Jonas, *KV Community College*
Adam Jones, *University of North Carolina–Wilmington*

Jason Jones, *Furman University*
Roger Jordan, *Baker College*
James Jozefowicz, *Indiana University of Pennsylvania*
Simran Kahai, *John Carroll University*
David Kalist, *Shippensburg University*
David Karemera, *St. Cloud State University*
Wahhab Khandker, *University of Wisconsin–LaCrosse*
Jongsung Kim, *Bryant University*
Kihwan Kim, *Rutgers*
Todd Knoop, *Cornell College*
Fred Kolb, *University of Wisconsin–EauClaire*
Oleg Korenok, *Virginia Commonwealth University*
Mikhail Kouliavtsev, *Stephen F. Austin State University*
Ben Kyer, *Francis Marion University*
Daniel Lawson, *Oakland Community College*
Elena Lazzari, *Marygrove College*
Chun Lee, *Loyola Marymount University*
Daniel Lee, *Shippensburg University*
Jihoon Lee, *Northeastern University*
Jim Lee, *Texas A&M–Corpus Christi*
Sang Lee, *Southeastern Louisiana University*
Qing Li, *College of the Mainland*
Carlos Liard-Muriente, *Central Connecticut State University*
Larry Lichtenstein, *Canisius College*
Jenny Liu, *Portland State University*
Jialu Liu, *Allegheny College*
Michael Machiorlatti, *Oklahoma City Community College*
Bruce Madariaga, *Montgomery College and Northwestern University*
C. Lucy Malakar, *Lorain County Community College*
Gabriel Manrique, *Winona State University*
Katherine McClain, *University of Georgia*
Michael McIlhon, *Century College*
Jennifer McNiece, *Howard Payne University*
Charles Meyrick, *Housatonic Community College*
Heather Micelli, *Mira Costa College*
Laura Middlesworth, *University of Wisconsin–Eau Claire*
Phillip Mixon, *Troy University–Troy*
Evan Moore, *Auburn University–Montgomery*
Francis Mummery, *California State University–Fullerton*
John Mundy, *St. Johns River State University*
James Murray, *University of Wisconsin–LaCrosse*
Christopher Mushrush, *Illinois State University*
John Nader, *Davenport University*
Max Grunbaum Nagiel, *Daytona State College*
Scott Niederjohn, *Lakeland College*
George Norman, *Tufts University*
Yanira Ogrodnik, *Post University*
David O'Hara, *Metro State College of Denver*
Wafa Orman, *University of Alabama in Huntsville*
Brian O'Roark, *Robert Morris University*
Glenda Orosco, *Oklahoma State University Institute of Technology*
Orgul Ozturk, *University of South Carolina*
Maria Papapavlou, *San Jacinto Central College*
Nitin Paranjpe, *Wayne State University*
Irene Parietti, *Felician College*
Jooyoun Park, *Kent State University*
Michael Patton, *St. Louis Community College–Wildwood*
Wesley Pech, *Wofford College*
Germain Pichop, *Oklahoma City Community College*
Florenz Plassmann, *Binghamton University*
Lana Podolak, *Community College of Beaver County*
Gyan Pradhan, *Eastern Kentucky University*
Silvia Prina, *Case Western Reserve University*
Thomas Prusa, *Rutgers University*

Robert Rebelein, *Vassar College*
Matt Rendleman, *Southern Illinois University*
Kristen Roche, *Mount Mary College*
Antonio Rodriguez, *Texas A&M International University*
Debasis Rooj, *Kishwaukee College*
Larry Ross, *University of Alaska*
Jeff Rubin, *Rutgers University–New Brunswick*
Jason C. Rudbeck, *University of Georgia*
Jeff Ruggiero, *University of Dayton*
Robert Rycroft, *University of Mary Washington*
Allen Sanderson, *University of Chicago*
Nese Sara, *University of Cincinnati*
Naveen Sarna, *Northern Virginia Community College–Alexandria*
Eric Sartell, *Whitworth University*
Martin Schonger, *Princeton University*
Michael Schultz, *Menlo College*
Gerald Scott, *Florida Atlantic University*
Reshmi Sengupta, *Northern Illinois University*
David Shankle, *Blue Mountain College*
Robert Shoffner, *Central Piedmont Community College*
Johnny Shull, *Wake Tech Community College*
Suann Shumaker, *Las Positas College*
Nicholas Shunda, *University of Redlands*
Milan Sigetich, *Southern Oregon University*
Jonathan Silberman, *Oakland University*
Joe Silverman, *Mira Costa College–Oceanside*
Catherine Skura, *Sandhills Community College*
Gary Smith, *Canisius College*
Richard Smith, *University of South Florida–St. Petersburg*
Joe Sobieralski, *Southwestern Illinois College–Belleville*
Soren Soumbatiants, *Franklin University*
Dean Stansel, *Florida Gulf Coast University*
Sylwia Starnawska, *D'Youville College*
Keva Steadman, *Augustana College*
Rebecca Stein, *University of Pennsylvania*
Michael Stroup, *Stephen F. Austin State University*
Edward Stuart, *Northeastern Illinois University*
Yu-hsuan Su, *University of Washington*
Abdul Sukar, *Cameron University*
John Susenburger, *Utica College*
James Swofford, *University of South Alabama*
Vera Tabakova, *East Carolina University*
Eric Taylor, *Central Piedmont Community College*
Erdal Tekin, *Georgia State University*
Noreen Templin, *Butler Community College*
Thomas Tenerelli, *Central Washington University*
Charles Thompson, *Brunswick Community College*
Flint Thompson, *Chippewa Valley Technical College*
Deborah Thorsen, *Palm Beach State College–Central*
James Tierney, *University of California Irvine*
Julie Trivitt, *Arkansas Tech University*
Ross vanWassenhove, *University of Houston*
Ben Vaughan, *Trinity University*
Rubina Vohra, *St. Peter's College*
Will Walsh, *Samford University*
Chih-Wei Wang, *Pacific Lutheran University*
Chad Wassell, *Central Washington University*
Christine Wathen, *Middlesex Community College*
Oxana Wieland, *University of Minnesota, Crookston*
Christopher Wimer, *Bowling Green State University–Firelands College*
Ken Woodward, *Saddleback College*
Eric Zemljic, *Kent State University*
Zhen Zhu, *University of Central Oklahoma*
Kent Zirlott, *University of Alabama–Tuscaloosa*

The team of editors who worked on this book improved it tremendously. Jane Tufts, developmental editor, provided truly spectacular editing—as she always does. Mike Worls, economics product director, did a splendid job of overseeing the many people involved in such a large project. Jennifer Thomas, product development manager; Clara Goosman, content developer; and Elizabeth Beiting-Lipps, associate content developer, were crucial in assembling an extensive and thoughtful group of reviewers to give me feedback on the previous edition while putting together an excellent team to revise the supplements. Colleen Farmer, senior content project manager, and Katy Gabel, project manager, had the patience and dedication necessary to turn my manuscript into this book. Michelle Kunkler, senior art director, gave this book its clean, friendly look. Greg LaFever, the illustrator, helped make the book more visually appealing and the economics in it less abstract. Pamela Rockwell, copyeditor, refined my prose, and PreMediaGlobal prepared a careful and thorough index. John Carey, senior market development manager, and Robin LeFevre, senior brand manager, worked long hours getting the word out to potential users of this book. The rest of the Cengage team was also consistently professional, enthusiastic, and dedicated.

I am grateful also to Lisa Mogilanski and Alex Sareyan, two star Harvard undergraduates, 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 would like to 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). I am grateful to Nicholas in particular for helping me check the page proofs for this edition. In case you didn’t notice, Nick, it was just my way of tricking you into learning a bit of economics.

N. Gregory Mankiw
December 2013

# Contents



# Part I Introduction 1

## CHAPTER 1



## CHAPTER 2

## CHAPTER 3

### Interdependence and the Gains from Trade 47




# Part II How Markets Work 63

## CHAPTER 4

### The Market Forces of Supply and Demand 65



## CHAPTER 5

### Elasticity and Its Application 89

## CHAPTER 6

### Supply, Demand, and Government Policies 111




# Part III Markets and Welfare 133

## CHAPTER 7

### Consumers, Producers, and the Efficiency of Markets 135



## CHAPTER 8

### Application: The Costs of Taxation 155



## CHAPTER 9

### Application: International Trade 171


# Part V Firm Behavior and the Organization of Industry 257

## CHAPTER 16

### Monopolistic Competition 329



## CHAPTER 17

### Oligopoly 347




# Part VI The Economics of Labor Markets 371

## CHAPTER 18

### The Markets for the Factors of Production 373

LOTTO
CARS
PIZZA
PIZZA


PART

# I

# Introduction

Illustration by Greg LaFever; Easel © Dragana Brankovic/istockphoto; Paint Brushes © Bart Coenders/istockphoto

CHAPTER

# 1

# Ten Principles of Economics

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

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

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

they produce. It must decide who will eat caviar and who will eat potatoes. It must decide who will drive a Ferrari and who will take the bus.

**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 multitude of 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 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 an overview 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, we begin our study of economics with four principles about 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 that she could have spent napping, bike riding, watching TV, or working at her part-time job for some extra spending money.

Or consider parents deciding how to spend their family income. They can buy food, clothing, or a family vacation. Or they can save some of the family income for retirement or for 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 its shores from foreign aggressors, the less it can spend on consumer goods (butter) to raise the standard of living at home. 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 some combination of these three. Thus, while pollution regulations yield the benefit of a cleaner environment and the improved health that comes with it, the regulations come at the cost of reducing the incomes of the regulated firms' owners, workers, and customers.

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

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

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

When government policies are designed, these two goals often conflict. Consider, for instance, policies aimed at equalizing the distribution of economic well-being. Some of these policies, such as the welfare system or unemployment insurance, try to help the members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Though they achieve greater equality, these policies 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 gets smaller.

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 reduce our material standard of living. The poor should not be ignored just because helping them distorts work incentives. Nonetheless, people are likely to make good decisions only if they understand the options that are 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.

There are two problems with this calculation. 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 are more expensive at college than elsewhere. 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. For most students, the earnings they give up to attend school are the single largest cost of their education.

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

The **opportunity cost** of an item is what you give up to get that item. When making any decision, decision makers should be aware of the opportunity costs that accompany each possible action. In fact, they usually are. College athletes who can earn millions if they drop out of school and play professional sports are well aware that the opportunity cost of their attending college is very high. It is not surprising that they often decide that the benefit of a college education is not worth the cost.

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

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

Economists normally assume that people are rational. **Rational people** systematically and purposefully do the best they can to achieve their objectives, given the available opportunities. As you study economics, you will encounter firms that decide how many workers to hire and how much of their product to manufacture 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.

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

Rational people know that decisions in life are rarely black and white but usually involve shades of gray. At dinnertime, the question you face is not "Should I fast or eat like a pig?" More likely, you will be asking yourself "Should I take that extra spoonful of mashed potatoes?" When exams roll around, your decision is not between blowing them off and studying twenty-four hours a day but whether to spend an extra hour reviewing your notes instead of watching TV. 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 often make decisions by comparing *marginal benefits* and *marginal costs*.

For example, suppose you are considering calling a friend on your cell phone. You decide that talking with her for 10 minutes would give you a benefit that you value at about $7. Your cell phone service costs you $40 per month plus $0.50 per minute for whatever calls you make. You usually talk for 100 minutes a month, so your total monthly bill is $90 ($0.50 per minute times 100 minutes, plus the $40 fixed fee). Under these circumstances, should you make the call? You might be tempted to reason as follows: "Because I pay $90 for 100 minutes of calling each month, the average minute on the phone costs me $0.90. So a 10-minute call costs $9. Because that $9 cost is greater than the $7 benefit, I am going to skip the call." That conclusion is wrong, however. Although the *average* cost of a 10-minute call is $9, the *marginal* cost—the amount your bill increases if you make the extra call—is only $5. You will make the right decision only by comparing the marginal benefit and the marginal cost. Because the marginal benefit of $7 is greater than the marginal cost of $5, you should make the call. This is a principle that people innately understand: Cell phone users with unlimited minutes (that is, minutes that are free at the margin) are often prone to make long and frivolous calls.

Thinking at the margin works for business decisions as well. 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. In this case, the average cost of each seat is $100,000/200, which is $500. One might be tempted to conclude that the airline should never sell a ticket for less than $500. But a rational airline can increase its profits by thinking at the margin. 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 bag of peanuts and can of soda that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling the ticket is profitable.

Marginal decision making can help explain some otherwise puzzling economic 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; but for some reason, 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, people consider the marginal benefit of an extra diamond to be large.

A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost. This principle explains why people use their cell phones as much as they do, why airlines are willing to sell tickets below average cost, and why people are willing to 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.


© David Davis Photoproductions RF / Alamy

*"Is the marginal benefit of this call greater than the marginal cost?"*

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

An **incentive** is something (such as a prospect of a punishment or reward) that induces a person to act. 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."

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

Incentives are crucial to analyzing how markets work. For example, when the price of an apple 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 for 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, and live closer to where they work. If the tax were larger, more people would be driving hybrid cars, and if it were large enough, they would switch to electric cars.

When policymakers fail to consider how their policies affect incentives, they often end up with unintended consequences. For example, consider public policy regarding auto safety. Today, all cars have seat belts, but this was not true fifty years ago. In the 1960s, 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 probability of surviving an auto accident rises. But that's not the end of the story because the law also affects behavior by altering incentives. The relevant behavior here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare, perhaps unconsciously, the marginal benefit from safer driving to the marginal cost. As a result, they drive more slowly and carefully when the benefit of increased safety is high. For example, when road conditions are icy, people drive more attentively and at lower speeds than they do when road conditions are clear.

Consider how a seat belt law alters a driver's cost–benefit calculation. Seat belts make accidents less costly because they reduce the likelihood 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 produce both fewer deaths per accident and 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.

case study

### The Incentive Effects of Gasoline Prices

From 2005 to 2008 the price of oil in world oil markets skyrocketed, the result of limited supplies together with surging demand from robust world growth, especially in China. The price of gasoline in the United States rose from about $2 to about $4 a gallon. At the time, the news was filled with stories about how people responded to the increased incentive to conserve—sometimes in obvious ways, sometimes in less obvious ways.

Here is a sampling of various stories:

- "As Gas Prices Soar, Buyers Are Flocking to Small Cars"
- "As Gas Prices Climb, So Do Scooter Sales"
- "Gas Prices Knock Bicycles Sales, Repairs into Higher Gear"
- "Gas Prices Send Surge of Riders to Mass Transit"
- "Camel Demand Up as Oil Price Soars": Farmers in the Indian state of Rajasthan are rediscovering the humble camel. As the cost of running gas-guzzling tractors soars, even-toed ungulates are making a comeback.
- "The Airlines Are Suffering, but the Order Books of Boeing and Airbus Are Bulging": Demand for new, more fuel-efficient aircraft has never been greater.

The latest versions of the Airbus A320 and Boeing 737, the single-aisle workhorses for which demand is strongest, are up to 40 percent cheaper to run than the vintage planes some American airlines still use.

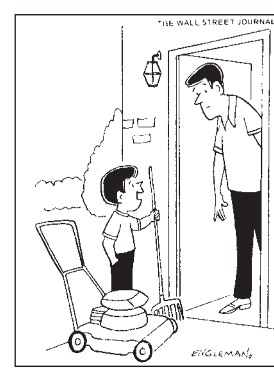
- "Home Buying Practices Adjust to High Gas Prices": In his hunt for a new home, Demetrius Stroud crunched the numbers to find out that, with gas prices climbing, moving near an Amtrak station is the best thing for his wallet.
- "Gas Prices Drive Students to Online Courses": For Christy LaBadie, a sophomore at Northampton Community College, the 30-minute drive from her home to the Bethlehem, Pa., campus has become a financial hardship now that gasoline prices have soared to more than $4 a gallon. So this semester she decided to take an online course to save herself the trip—and the money.
- "Diddy Halts Private Jet Flights Over Fuel Prices": Fuel prices have grounded an unexpected frequent-flyer: Sean "Diddy" Combs. . . . The hip-hop mogul said he is now flying on commercial airlines instead of in private jets, which Combs said had previously cost him $200,000 and up for a roundtrip between New York and Los Angeles. "I'm actually flying commercial," Diddy said before walking onto an airplane, sitting in a first-class seat and flashing his boarding pass to the camera. "That's how high gas prices are."

Many of these developments proved transitory. The economic downturn that began in 2008 and continued into 2009 reduced the world demand for oil, and the price of gasoline declined substantially. No word yet on whether Mr. Combs has returned to his private jet.

**Quick Quiz** *Describe an important trade-off you recently faced. • Give an example of some action that has both a monetary and nonmonetary opportunity cost. • Describe an incentive your parents offered to you in an effort to influence your behavior.*

# 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.



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

From The Wall Street Journal - Permission, Cartoon Features Syndicate

## 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 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. In fact, 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.