

N. GREGORY MANKIW

# PRINCIPLES OF MACROECONOMICS

Eighth Edition



## THE REAL ECONOMY IN THE LONG RUN

- 12 Production and Growth
- 13 Saving, Investment, and the Financial System
- 14 The Basic Tools of Finance
- 15 Unemployment

*These chapters describe the forces that in the long run determine key real variables, including GDP growth, saving, investment, real interest rates, and unemployment.*

## MONEY AND PRICES IN THE LONG RUN

- 16 The Monetary System
- 17 Money Growth and Inflation

*The monetary system is crucial in determining the long-run behavior of the price level, the inflation rate, and other nominal variables.*

## THE MACROECONOMICS OF OPEN ECONOMIES

- 18 Open-Economy Macroeconomics: Basic Concepts
- 19 A Macroeconomic Theory of the Open Economy

*A nation's economic interactions with other nations are described by its trade balance, net foreign investment, and exchange rate.*

*A long-run model of the open economy explains the determinants of the trade balance, the real exchange rate, and other real variables.*

## SHORT-RUN ECONOMIC FLUCTUATIONS

- 20 Aggregate Demand and Aggregate Supply
- 21 The Influence of Monetary and Fiscal Policy on Aggregate Demand
- 22 The Short-Run Trade-off between Inflation and Unemployment

*The model of aggregate demand and aggregate supply explains short-run economic fluctuations, the short-run effects of monetary and fiscal policy, and the short-run linkage between real and nominal variables.*

## FINAL THOUGHTS

- 23 Six Debates over Macroeconomic Policy

*A capstone chapter presents both sides of six major debates over economic policy.*



# PRINCIPLES OF MACROECONOMICS

Eighth Edition

N. GREGORY MANKIW

HARVARD UNIVERSITY



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**N. Gregory Mankiw**

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





# About the Author



Jordi Cabré

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

Professor Mankiw is a prolific writer and a regular participant in academic and policy debates. His work has been published in scholarly journals, such as the *American Economic Review*, *Journal of Political Economy*, and *Quarterly Journal of Economics*, and in more popular forums, such as the *New York Times* and *The Wall Street Journal*. He is also author of the best-selling intermediate-level textbook *Macroeconomics* (Worth Publishers). In addition to his teaching, research, and writing, Professor Mankiw has been a research associate of the National Bureau of Economic Research, an adviser to the Congressional Budget Office and the Federal Reserve Banks of Boston and New York, 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.



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# 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 Robert Downey, Jr., 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  
December 2016

## Video Application

**V**ideo application features the book's author **introducing chapter content**. Author Greg Mankiw introduces the important themes in every chapter by delivering a highly relevant deposition on the real-world context to the economic principles that will be appearing in the upcoming chapter. These videos are intended to motivate students to better understand how economics relates to their day-to-day lives and in the world around them.

## ConceptClip Videos

**C**onceptClip videos help students master economics terms. These high-energy videos, embedded throughout the interactive book, address the known student challenge of understanding economics terminology when initially introduced to the subject matter. Developed by Professor Mike Brandl of The Ohio State University, these concept-based animations provide students with memorable context to the key terminology required for your introductory economics course.

*"I have always wanted supplemental material such as this to help me understand certain concepts in economics."*



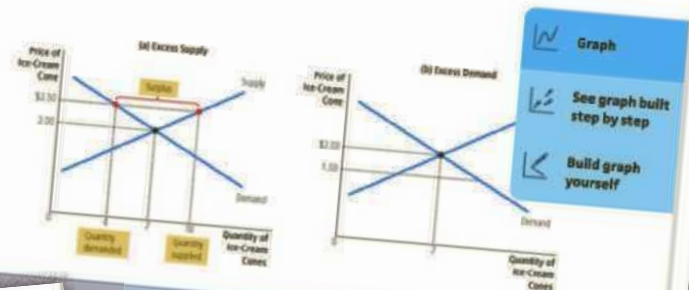


# Graph Builder

**G**raph Builder allows students to move step-by-step through complex graphical figures. Designed specifically for introductory economics students, Graph Builder interactive exercises help students first understand complex graphs by deconstructing a graph into finite steps that build upon one another, then practice graphing by drawing out a similar scenario from scratch. This drawing method supports the kinesthetic learning approach valued by instructors, like you— all within the context of the interactive book!

**Figure 9 Markets Not in Equilibrium**

Consider the market for ice-cream cones. Notice that the equilibrium quantity is 7 cones, and the equilibrium price is \$2.00 per cone. Suppose the market price is set at \$2.50 per cone. Because the market price of \$2.50 is above the equilibrium price, the quantity supplied (10 cones) exceeds the quantity demanded (4 cones), so there is a surplus in this market. Suppliers try to increase sales by cutting the price of a cone, and this moves the price toward its equilibrium level. **Instead of the market price being set too high, suppose it starts below the equilibrium price.**

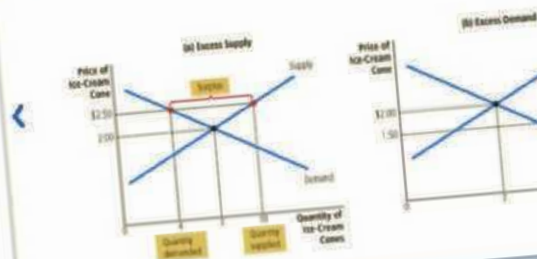


Graph  
See graph built step by step  
Build graph yourself

Steps: 1 2 3 4 5

**Figure 9 Markets Not in Equilibrium**

Consider the market for ice-cream cones. Notice that the equilibrium quantity is 7 cones, and the equilibrium price is \$2.00 per cone. Suppose the market price is set at \$2.50 per cone. Because the market price of \$2.50 is above the equilibrium price, the quantity supplied (10 cones) exceeds the quantity demanded (4 cones), so there is a surplus in this market. Suppliers try to increase sales by cutting the price of a cone, and this moves the price toward its equilibrium level. **Instead of the market price being set too high, suppose it starts below the equilibrium price.**



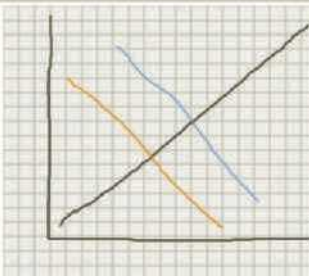
Steps: 1 2 3 4 5

## Now YOU build it!

Create the supply and demand curves that describe the following market for golf balls. The equilibrium quantity is 100 golf balls, and the equilibrium price is \$1.00 per ball. Suppose that the market price is set at \$1.50. At that price, the quantity demanded is 60 balls and the quantity supplied is 140 balls. Draw the effect of this market price, and label the shortage or surplus.

### Show Correct Graph

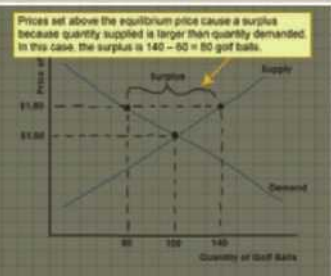
#### Your Graph



Try Again

#### Correct Graph

Hide Explanation



I'm Done, Submit!

*"I have not used anything like this before."*

*"The Graph Builder is amazing! This would help me a lot and the concept is great. I think all students should have access to this feature because it would better their knowledge of how to make graphs."*

# Study and Test Prep

## The Mankiw Study Guide is now a part of MindTap!

**T**he study guide by David Hakes for Mankiw's *Principles of Economics* has long been the standard of what a print study guide could be. Students like how it reinforces the text and improves understanding of the chapter content. Now for the eighth edition, the study guide is integrated right into the MindTap course at no additional charge!

For each chapter, students get the same great resources that users of the print Study Guide have always received:

- The Chapter Overview
- Problems and Short Answers
- Self-Test
- Advanced Critical Thinking
- Solutions for All Study Guide Questions



David Hakes and Greg Mankiw

# MindTap®

*"Additional practice with problems is extremely helpful, especially when combined with the immediate feedback that I received via the online server."*

*"The adaptive feedback system was incredibly useful, because by the time the test rolled around I didn't always remember what I had struggled with in previous weeks."*

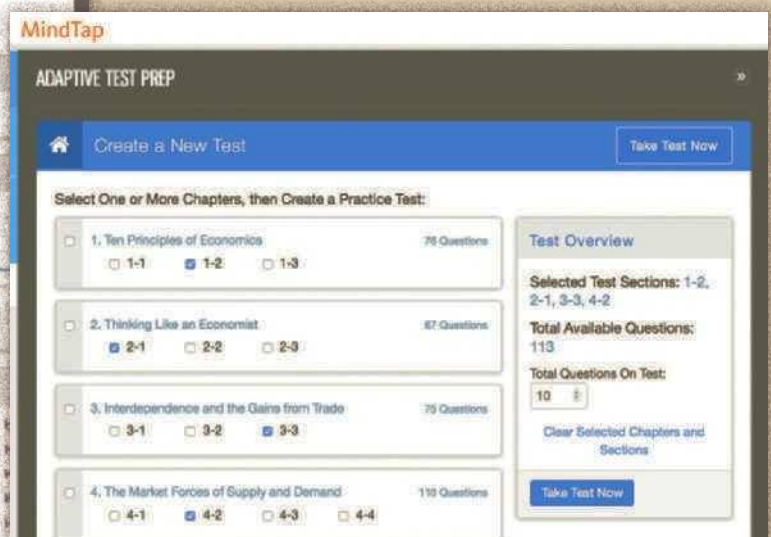
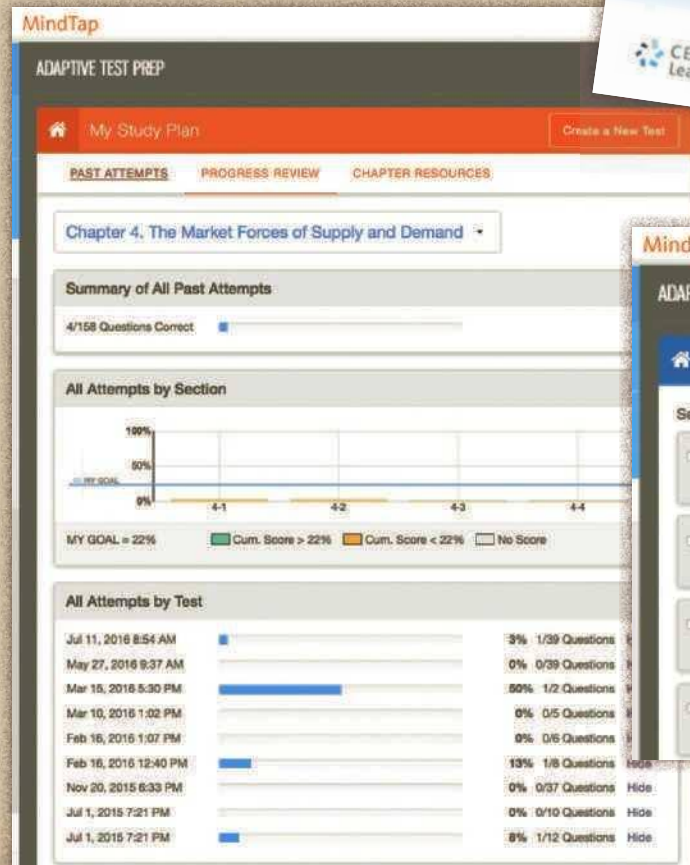
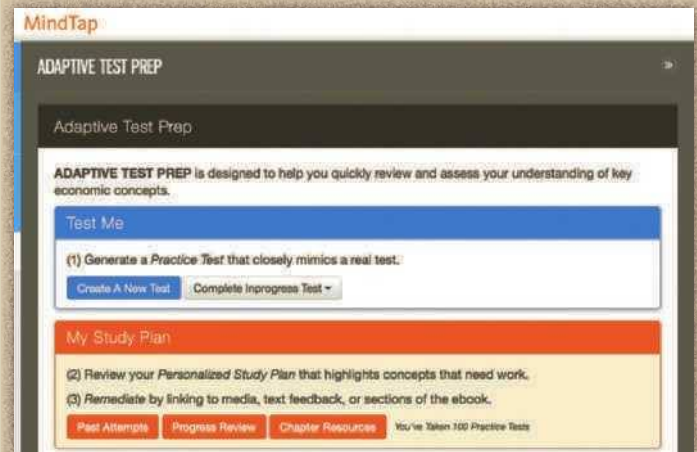


# Adaptive Test Prep Prepares Your Students for High-Stakes Testing

Are your students constantly asking you for more practice questions as exam time comes closer? Do your students complain because the test bank-type questions in the exam do not have the same look and feel as their homework assignments?

Adaptive Test Prep is a powerful tool that uses 4,000 new test bank-like questions to give students almost unlimited practice for each chapter and section. They can take as many tests as they like that are immediately graded for them. Students see how they did and the program gives them immediate remediation in the form of very robust feedback, a link right back into the text where the question topic resides, and for about 2,000 questions, they get a brief Quick Coach video with an instructor walking them through the exact question they missed!

Students can generate reports that show them which chapters and sections they need the most help on so they can tailor future practice tests just on the areas they are struggling with.







# 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, a dedicated teacher, has served as a reliable sounding board for ideas and is a hardworking partner with me in putting together the superb package of supplements. In addition, a special thanks to Ron Cronovich, an insightful instructor and trusted advisor, for his many years of consultation.

A special thanks to the team of teaching economists who worked on the test bank and ancillaries for this edition, many of whom have been working on the Mankiw ancillaries from the beginning. To Ken McCormick for vetting the entire test bank (with 17,000 questions) for correctness, and to Ken Brown, Sarah Cosgrove, Harold Elder, Michael Enz, Lisa Jepsen, Bryce Kanago, Daniel Marburger, Amanda Nguyen, Alicia Rosburg, Forrest Spence, and Kelvin Wong for authoring new questions and updating existing ones.

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

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 Wahhab Khandker, *University of Wisconsin–LaCrosse*  
 Jongsung Kim, *Bryant University*  
 Kihwan Kim, *Rutgers*  
 Elsy Kizhakethalackal, *Bowling Green State University*  
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 Fred Kolb, *University of Wisconsin–EauClaire*  
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 Janet Koscianski, *Shippensburg University*  
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 Maria Kula, *Roger Williams University*  
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 Daniel Lee, *Shippensburg University*  
 Jihoon Lee, *Northeastern University*  
 Jim Lee, *Texas A&M–Corpus Christi*  
 Junghoon Lee, *Emory University*  
 Ryan Lee, *Indiana University*  
 Sang Lee, *Southeastern Louisiana University*  
 James Leggette, *Belhaven University*  
 Bozena Leven, *The College of New Jersey*  
 Qing Li, *College of the Mainland*  
 Zhen Li, *Albion College*  
 Carlos Liard-Muriente, *Central Connecticut State University*  
 Larry Lichtenstein, *Canisius College*  
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 Xuepeng Liu, *Kennesaw State University*  
 Jie Ma, *Indiana University*  
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 Bruce Madariaga, *Montgomery College and Northwestern University*  
 Brinda Mahalingam, *University of Alabama-Huntsville*  
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 Paula Manns, *Atlantic Cape Community College*  
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 Dan Marburger, *Arizona State University*  
 Hardik Marfatia, *Northeastern Illinois University*  
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 Katherine McClain, *University of Georgia*  
 Michael McIlhon, *Century College*  
 Steven McMullen, *Hope College*  
 Jennifer McNiece, *Howard Payne University*  
 Robert Menafee, *Sinclair Community College*  
 Fabio Mendez, *Loyola University Maryland*  
 Charles Meyrick, *Housatonic Community College*  
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 Meghan Mihal, *St. Thomas Aquinas College*  
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 Evan Moore, *Auburn University–Montgomery*  
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 Charles Murray, *The College of Saint Rose*  
 James Murray, *University of Wisconsin–LaCrosse*  
 Christopher Mushrush, *Illinois State University*  
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 Scott Niederjohn, *Lakeland College*  
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 Michael Patton, *St. Louis Community College–Wildwood*  
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 Lana Podolak, *Community College of Beaver County*  
 Gyan Pradhan, *Eastern Kentucky University*  
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 Silvia Prina, *Case Western Reserve University*  
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 Mark Reavis, *Arkansas Tech University*  
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 Naveen Sarna, *Northern Virginia Community College–Alexandria*  
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 Irena Xhurxhi, *York College*  
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