essentials of economics

5e

Stanley L. Brue
Campbell R. McConnell
Sean M. Flynn

Mc Graw Hill

Essentials of Economics

The McGraw Hill Series Economics

SURVEY OF ECONOMICS

Brue, McConnell, and Flynn
Essentials of Economics
Fifth Edition

Guell
Issues in Economics Today
Ninth Edition

Mandel
M: Economics: The Basics
Fourth Edition

Schiller and Gebhardt
Essentials of Economics
Twelfth Edition

PRINCIPLES OF ECONOMICS

Asarta and Butters
Connect Master Principles of Economics
Third Edition

Colander
Economics, Microeconomics, and Macroeconomics
Eleventh Edition

Frank, Bernanke, Antonovics, and Heffetz
Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics
Eighth Edition

Frank, Bernanke, Antonovics, and Heffetz
Streamlined Editions: Principles of Economics, Principles of Microeconomics, Principles of Macroeconomics
Fourth Edition

Karlan and Morduch
Economics, Microeconomics, and Macroeconomics
Third Edition

McConnell, Brue, and Flynn
Economics, Microeconomics, and Macroeconomics
Twenty-second Edition

McConnell, Brue, and Flynn
Brief Editions: Microeconomics and Macroeconomics
Third Edition

Samuelson and Nordhaus
Economics, Microeconomics, and Macroeconomics
Nineteenth Edition

Schiller and Gebhardt
The Economy Today, The Micro Economy Today, and The Macro Economy Today
Sixteenth Edition

Slavin
Economics, Microeconomics, and Macroeconomics
Twelfth Edition

ECONOMICS OF SOCIAL ISSUES

Guell
Issues in Economics Today
Ninth Edition

Register, and Grimes
Economics of Social Issues
Twenty-First Edition

DATA AND ANALYTICS FOR ECONOMICS

Prince
Predicative Analytics for Business Strategy
First Edition

MANAGERIAL ECONOMICS

Baye and Prince
Managerial Economics and Business Strategy
Tenth Edition

Brickley, Smith, and Zimmerman
Managerial Economics and Organizational Architecture
Seventh Edition

Thomas and Maurice
Managerial Economics
Thirteenth Edition

INTERMEDIATE ECONOMICS

Bernheim and Whinston
Microeconomics
Second Edition

Dornbusch, Fischer, and Startz
Macroeconomics
Thirteenth Edition

Frank
Microeconomics and Behavior
Tenth Edition

ADVANCED ECONOMICS

Romer
Advanced Macroeconomics
Fifth Edition

MONEY AND BANKING

Cecchetti and Schoenholtz
Money, Banking, and Financial Markets
Sixth Edition

URBAN ECONOMICS

O'Sullivan
Urban Economics
Ninth Edition

LABOR ECONOMICS

Borjas
Labor Economics
Eighth Edition

McConnell, Brue, and Macpherson
Contemporary Labor Economics
Twelfth Edition

PUBLIC FINANCE

Rosen and Gayer
Public Finance
Tenth Edition

ENVIRONMENTAL ECONOMICS

Field and Field
Environmental Economics: An Introduction
Eighth Edition

INTERNATIONAL ECONOMICS

Appleyard and Field
International Economics
Ninth Edition

Pugel
International Economics
Seventeenth Edition

Essentials of Economics

5th edition

Stanley L. Brue
Pacific Lutheran University

Campbell R. McConnell
University of Nebraska at Lincoln

Sean M. Flynn
Scripps College

With the special assistance of

Randy R. Grant
Linfield University

Mc Graw Hill

ESSENTIALS OF ECONOMICS, FIFTH EDITION

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LWI 27 26 25 24 23 22

ISBN 978-1-265-35064-2 (bound edition)
MHID 1-265-35064-7 (bound edition)
ISBN 978-1-265-58606-5 (loose-leaf edition)
MHID 1-265-58606-3 (loose-leaf edition)

Portfolio Manager: *Adam Huenecke*
Lead Product Developer: *Kelly I. Pekelder*
Marketing Manager: *Bobby Pearson*
Content Project Managers: *Melissa Leick*, *Emily Windelborn*
Buyers: *Rachel Hirschfield/Sue Culbertson*
Designer: *Matt Diamond*
Content Licensing Specialist: *Melissa Homer*
Cover Image: *tantishock/Shutterstock*
Compositor: *Straive*

Library of Congress Cataloging-in-Publication Data

Names: Brue, Stanley L., 1945- author.
Title: Essentials of economics / Stanley L. Brue, Pacific Lutheran University, Campbell R. McConnell, Sean M. Flynn.
Description: 5th Edition. | New York, NY : McGraw Hill LLC, 2022. | Revised edition of Essentials of economics, [2019]
Identifiers: LCCN 2021049788 (print) | LCCN 2021049789 (ebook) | ISBN 9781265350642 (paperback) | ISBN 9781265587352 (ebook)
Subjects: LCSH: Economics.
Classification: LCC HB171 .B778 2022 (print) | LCC HB171 (ebook) | DDC 330–dc23
LC record available at https://lccn.loc.gov/2021049788
LC ebook record available at https://lccn.loc.gov/2021049789

mheducation.com/highered

About the Authors

Stanley L. Brue

Stanley L. Brue did his undergraduate work at Augustana College (South Dakota) and received its Distinguished Achievement Award in 1991. He received his Ph.D. from the University of Nebraska–Lincoln. He is retired from a long career at Pacific Lutheran University, where he was honored as a recipient of the Burlington Northern Faculty Achievement Award. Professor Brue has also received the national Leavey Award for excellence in economic education. He has served as national president and chair of the Board of Trustees of Omicron Delta Epsilon International Economics Honorary. He is coauthor of *Economics,* Twenty-second Edition; *Economic Scenes,* Fifth Edition (Prentice-Hall); *Contemporary Labor Economics,* Eleventh Edition; and *The Evolution of Economic Thought,* Eighth Edition (Cengage). For relaxation, he enjoys international travel, attending sporting events, and going on fishing trips.

Campbell R. McConnell

Campbell R. McConnell earned his Ph.D. from the University of Iowa after receiving degrees from Cornell College and the University of Illinois. He taught at the University of Nebraska–Lincoln from 1953 until his retirement in 1990. He was also coauthor of *Economics,* Twenty-second Edition, *Contemporary Labor Economics*, and *Economics, Brief Edition*. He was a recipient of both the University of Nebraska Distinguished Teaching Award and the James A. Lake Academic Freedom Award and served as president of the Midwest Economics Association. Professor McConnell was awarded an honorary Doctor of Laws degree from Cornell College in 1973 and received its Distinguished Achievement Award in 1994. He was also a jazz expert and aficionado until his passing in 2019.

Sean M. Flynn

Sean M. Flynn did his undergraduate work at the University of Southern California before completing his Ph.D. at U.C. Berkeley, where he served as the Head Graduate Student Instructor for the Department of Economics after receiving the Outstanding Graduate Student Instructor Award. He teaches at Scripps College in Claremont, California, and is also the author of *Economics for Dummies*, Third Edition (Wiley); coauthor of *Economics,* Twenty-second Edition; and *The Cure That Works: How to Have the World's Best Healthcare–at a Quarter of the Price* (Regnery). His research interests include behavioral finance, behavioral economics, and health care economics. An accomplished martial artist, Sean has coached five of his students to national championships and is the author of *Understanding Shodokan Aikido* (Shodokan Press). Other hobbies include running, traveling, and cooking.

IN MEMORIAM

CAMPBELL R. McCONNELL (1928–2019)

We have lost a gracious friend, superb mentor, and legendary coauthor. In 2019 Professor Campbell R. "Mac" McConnell passed away at age 90 in Lincoln, Nebraska. Mac was one of the most significant and influential American economic educators of his generation. Through his best-selling principles textbook, he made introductory economics accessible to millions of students. By way of numerous adaptations and translations of his textbook, he influenced students throughout the world.

Mac was born in Harvey, Illinois, graduated from Cornell College (Iowa), and obtained his Ph.D. from the University of Iowa. He had a long and successful career as a researcher and teacher at the University of Nebraska, publishing peer-reviewed research articles and serving in leadership positions such as President of the Midwest Economic Association. His gift of explaining complex economics simply and thoroughly led him to explore opportunities to extend his educational reach beyond his own classroom. McGraw Hill understood the great potential in his textbook proposal and the first edition of *Economics: Principles, Problems, and Policies* made its debut in 1960. It was an instant hit and by the late 1970s it became the leading seller in the United States, supplanting Paul Samuelson's textbook as the market leader. *Economics* remains the top seller today.

In 1986, Mac and his former student, Stanley Brue, coauthored *Contemporary Labor Economics* and 2 years later Professor Brue joined Mac as a coauthor of *Economics*. Stan, Mac, and McGraw Hill added Sean Flynn as the third coauthor on the authorship team in 2008. The authorship transitions have been planned in advance, with authors working side by side for several editions. These smooth transitions have greatly contributed to the progress of the book and its continuing success.

We (Stan and Sean) are humbled and proud to have worked with Mac and McGraw Hill over these many years. We pledge to instructors and students that we will continue to stress clarity of presentation—in each new chapter, revised paragraph, rephrased explanation, and edited sentence. We believe that our dedication to preserving and improving the quality of the book is absolutely the best way for us to honor and extend Mac's amazing legacy. Mac liked to say that, "*Brevity at the expense of clarity is false economy.*" We will honor him, and his legacy, by always putting clarity first.

We greatly miss our coauthor and long-time friend Campbell R. McConnell.

Stanley L. Brue

Sean M. Flynn

Brief Contents

Mc Graw Hill
501-1333

Contents

Preface

Welcome to the fifth edition of *Essentials of Economics,* a one-semester principles of economics text derived from McConnell-Brue-Flynn *Economics,* the best-selling two-semester economics textbook. Over the years, numerous instructors have requested a short, one-semester version of *Economics* that would cover both microeconomics and macroeconomics. While some other two-semester books simply eliminate chapters, renumber those that remain, and offer the "cut and splice" version as a customized book, this methodology does not fit with our vision of a tightly focused, highly integrated book. We built this text from scratch, incorporating the core content from *Economics* in a format designed specifically for the one-semester course. This book has the clear and careful language and the balanced approach that has made its two-semester counterpart a best-seller, but the pedagogy and topic discussion are much better suited to the needs of the one-semester course.

We think *Essentials of Economics* will fit nicely in various one-term courses. It is sufficiently lively and focused for use in principles courses populated primarily by non-business majors. Also, it is suitably analytical and comprehensive for use in combined micro and macro principles courses for business and potential economics majors. Finally, we think this book—if supplemented with appropriate lecture and reading assignments—will work well in refresher courses for students returning to MBA programs.

However the book is used, our goals remain the same:

- Help the student master the principles essential for understanding the economic problem, specific economic issues, and policy alternatives.
- Help the student understand and apply the economic perspective and reason accurately and objectively about economic matters.
- Promote a lasting student interest in economics and the economy.

What's New and Improved?

One of the benefits of writing a successful text is the opportunity to revise—to delete the outdated and install the new, to rewrite misleading or ambiguous statements, to introduce more relevant illustrations, to improve the organizational structure, and to enhance the learning aids. We trust that you will agree that we have used this opportunity wisely and fully.

Improved Efficiency for Instructors

Faculty time is precious. To preserve as much of it as possible for the faculty adopting *Essentials of Economics*, we went sentence by sentence and section by section, pulling out extraneous examples, eliminating unnecessary graphs, and—in some cases—removing entire sections that faculty reported they don't have time to teach. It is our hope that this streamlined presentation frees up faculty time for more advanced classroom activities, including experiments, debates, simulations, and various forms of peer instruction and team-based learning.

Improved Readability for Students

Student time is also precious. The current crop of college students are digital natives and social media pioneers. They are used to Googling for answers, reading things that tend to be no longer than a Tweet, and receiving instant feedback. We have revised our presentation to accommodate their fast-paced, nonlinear learning style. You will find a greater economy of language and an increased focus on key examples, changes that will appeal to the heavy digital consumers as well as traditional students who study the old-fashioned way.

Examples and Illustrations That Resonate with Students

Students absorb economic theory most easily when it resonates with their experiences and is explained with current examples.

Disruptions from the COVID-19 pandemic have been felt throughout the economy, felt as much by our students as anyone. While it has not changed underlying principles, it has provided numerous examples to which students can relate, particularly at the microeconomic level. These have been integrated into topics such as production possibilities, consumer sovereignty, and market failure. In later chapters, the massive shock to the macroeconomy and subsequent policy response is woven into the discussions of business cycle movements and fiscal and monetary policy.

The pandemic isn't the only issue of interest to students, so we include other timely topics such as green-energy subsidies, universal basic income, the $15 minimum wage debate, soaring tuition costs, congestion pricing, and Bitcoin.

Updated End-of-Chapter Questions and Problems

We have updated the end-of-chapter questions, adding new problems to reflect revised and enhanced content, and removing a few that are outdated. The questions are analytic and often ask for free responses, whereas the problems are mainly quantitative. We have aligned the questions and problems with the learning objectives presented at the beginning of the chapters. All of the questions and problems are assignable through McGraw Hill's *Connect,* and many contain additional algorithmic variations and can be automatically graded within the system.

Chapter Changes

Individual chapters contain data updates, revised Learning Objectives, and new examples. In addition to the changes and features listed above, some chapter-specific revisions include:

Chapter 1: Limits, Alternatives, and Choices features a new Applying the Analysis titled, "Is Facebook Free?", another focusing on the pandemic and production possibilities, and a Global Snapshot comparing investment levels in selected countries.

Chapter 2: The Market System and the Circular Flow includes three new Applying the Analysis pieces—on Bitcoin mining, the Korean peninsula at night, and consumer sovereignty in a pandemic.

Chapter 3: Demand, Supply, and Market Equilibrium provides a new Applying the Analysis on market equilibrium, as well as a new Global Snapshot on the price of a loaf of bread in various countries. The Applying the Analysis piece on Uber and dynamic pricing has been moved to the **Chapter Three Appendix: Additional Examples of Supply and Demand**.

Chapter 4: **Elasticity of Demand and Supply** includes a new Applying the Analysis on "The Southwest Effect," as well as two new Global Snapshots, the first giving income elasticities of the demand for gasoline in selected countries, and the second reporting on cross elasticities between food prices and education spending in various countries.

Chapter 5: Market Failures: Public Goods and Externalities features updated information on the U.S. tax structure, and a new Applying the Analysis on congestion pricing.

Chapter 6: Businesses and Their Costs includes a new Global Snapshot on international differences in manufacturing costs. The presentation has been streamlined by removing the discussion of the business population and the principal-agent problem.

Chapter 7: Pure Competition offers a new Applying the Analysis on the life expectancy of a business to illustrate the frequency of entry and exit of firms.

Chapter 8: Pure Monopoly presents a new Applying the Analysis on France's long history of government salt monopolies.

Chapter 9: Monopolistic Competition and Oligopoly features a new Global Snapshot on restaurants per 100,000 residents in various cities around the world, as well as a new Applying the Analysis piece on product differentiation.

Chapter 10: GDP and Economic Growth contains numerous updates of both domestic and international data.

Chapter 11: Business Cycles, Unemployment, and Inflation incorporates discussion of the pandemic-induced recession that began in February 2020.

Chapter 12: Aggregate Demand and Aggregate Supply features a new Global Snapshot on the size of various countries' GDP gaps.

Chapter 13: Fiscal Policy, Deficits, and Debt includes important updates related to the pandemic recession and the subsequent policy responses, including the CARES Act and the American Rescue Plan.

Chapter 14: Money, Banking, and Financial Institutions is significantly more concise thanks to a shortened discussion of securitization, a streamlined history of the financial crisis, and the elimination of the section on the structure of the post-crisis financial services industry.

Chapter 15: Interest Rates and Monetary Policy features updated coverage of recent U.S. monetary policy, including a new discussion of the Fed's dual mandate to set and pursue targets for both the unemployment rate and inflation rate.

Chapter 16: International Trade and Exchange Rates contains extensive data updates, a streamlined presentation of the arguments in favor of protectionism, and an updated and consolidated discussion of trade pacts, including the USMCA revisions to NAFTA.

Chapter 17: Wage Determination includes an updated presentation of the minimum wage debate, the addition of the demand-enhancement union model, and updated data on occupational employment trends.

Chapter 18: Income Inequality and Poverty features a new discussion of the debate over Universal Basic Income (UBI).

Acknowledgments

We give special thanks to Randy R. Grant of Linfield University who served as the content coordinator for *Essentials of Economics*. Professor Grant modified and seamlessly incorporated appropriate new content and revisions that the authors made in the twenty-second edition of *Economics* into *Essentials.* He also updated the tables and other information in *Essentials of Economics* and made various improvements that he deemed helpful or were suggested to him by the authors, reviewers, and publisher.

We wish to acknowledge William Walstad and Tom Barbiero (the coauthor of the Canadian edition of *Economics*) for their ongoing ideas and insights.

We are greatly indebted to an all-star group of professionals at McGraw Hill–in particular Adam Huenecke, Kelly Pekelder, Melissa Leick, Emily Windelborn, Mark Christianson, and Bobby Pearson for their publishing and marketing expertise. Matt Diamond provided the vibrant interior design and cover.

The fifth edition has benefited from a number of perceptive formal reviews. The reviewers, listed at the end of the preface, were a rich source of suggestions for this revision. To each of you, and others we may have inadvertently overlooked, thank you for your considerable help in improving *Essentials of Economics.*

Stanley L. Brue
Sean M. Flynn
Campbell R. McConnell

Reviewers

Mark Abajian, *San Diego City College*
Rebecca Arnold, *San Diego Mesa College*
Benjamin Artz, *University of Wisconsin, Milwaukee*
Clare Battista, *California Polytechnic State University*
Derek Berry, *Calhoun Community College*
Laura Jean Bhadra, *Northern Virginia Community College, Manassas*
Philip Bohan, *Ventura College*
Kalyan Chakraborty, *Emporia State University*
Jan Christopher, *Delaware State University*
Donald Coffin, *Indiana University Northwest*
Diana Denison, *Red Rocks Community College*
John Allen Deskins, *Creighton University, Omaha*
Caf Dowlah, *Queensborough Community College*
Mariano Escobedo, *Columbus State Community College*
Charles Fairchild, *Northern Virginia Community College, Manassas*
Charles Fraley, *Cincinnati State Tech and Community College*
Amy Gibson, *Christopher Newport University*
John Gibson, *Indiana University Northwest*
Robert Harris, *IUPUI, Indianapolis*
Mark Healy, *William Rainey Harper College*
Melinda Hickman, *Doane College*
Glenn Hsu, *Kishwaukee College*
Scott Hunt, *Columbus State Community College*
John Ifcher, *Santa Clara University*
Vani Kotcherlakota, *University of Nebraska, Kearney*
Marie Kratochvil, *Nassau Community College*
Teresa Laughlin, *Palomar College*
Melissa Lind, *University of Texas, Arlington*
Keith Malone, *University of North Alabama*
Khalid Mehtabdin, *College of Saint Rose*
Jennifer Kelleher Michaels, *Emmanuel College*
Babu Nahata, *University of Louisville*
Jim Payne, *Calhoun Community College*
Michael Petrowsky, *Glendale Community College*
Mitchell Redlo, *Monroe Community College*
Belinda Roman, *Palo Alto College*
Dave St. Clair, *California State University, East Bay*
Courtenay Stone, *Ball State University*
Gary Stone, *Winthrop University*
Anh Le Tran, *Lasell College*
Miao Wang, *Marquette University*
Timothy Wunder, *University of Texas, Arlington*

Connect Tools for Customizing Classes

Our Connect learning platform contains several tools that allow faculty to create and deliver custom content to their students.

Instructor-Authored Homework Problems

McGraw Hill is committed to empowering faculty. One way we do that is by ensuring that instructors can write their own auto-gradable homework questions within our Connect learning platform. These can then be assigned in exactly the same way as our test bank questions and our end-of-chapter questions and problems.

Custom Publishing

Another option for personalization is our "custom pub" program through which we can deliver small print runs of McConnell that include material that faculty have prepared themselves—anything from bullet-pointed lecture notes to privately authored worksheets or reading materials. Those materials can be integrated with McConnell content in any order, thereby allowing faculty total control over course content and reading materials.

Test Builder in Connect

Available within Connect, Test Builder is a cloud-based tool that enables instructors to format tests that can be printed or administered within an LMS. Test Builder offers a modern, streamlined interface for easy content configuration that matches course needs, without requiring a download.

Test Builder allows you to:

- Access all test bank content from a particular title.
- Easily pinpoint the most relevant content through robust filtering options.
- Manipulate the order of questions or scramble questions and/or answers.
- Pin questions to a specific location within a test.
- Determine your preferred treatment of algorithmic questions.
- Choose the layout and spacing.
- Add instructions and configure default settings.

Test Builder provides a secure interface for better protection of content and allows for just-in-time updates to flow directly into assessments.

Mc Graw Hill connect® + proctorio

Remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control students' assessment experience by restricting browser activity, recording students' activity, and verifying students are doing their own work.

Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

Assurance of Learning Ready

Many educational institutions today are focused on the notion of assurance of learning, an important element of many accreditation standards. *Essentials of Economics 5e* is designed specifically to support your assurance of learning initiatives with a simple yet powerful solution.

Each chapter in the book begins with a list of numbered learning objectives, which appear throughout the chapter as well as in the end-of-chapter assignments. Every Test Bank question for *Essentials of Economics 5e* maps to a specific chapter learning objective in the textbook as well as topic area, Bloom's Taxonomy level, and AACSB skill area. You can use our Test Bank software, EZ Test, or Connect Economics to easily search for learning objectives that directly relate to the learning objectives for your course. You can then use the reporting features of EZ Test to aggregate student results in similar fashion, making the collection and presentation of assurance of learning data simple and easy.

AACSB Statement

McGraw Hill is a proud corporate member of AACSB International. Understanding the importance and value of AACSB accreditation, *Essentials of Economics 5e* recognizes the curricula guidelines detailed in the AACSB standards for business accreditation by connecting selected questions in the Test Bank and end-of-chapter material to the general knowledge and skill guidelines in the AACSB standards.

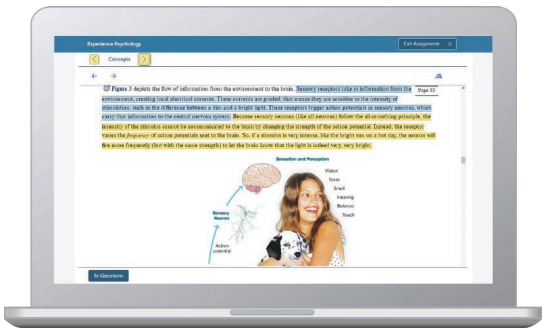
The statements contained in *Essentials of Economics 5e* are provided only as a guide for the users of this textbook. The AACSB leaves content coverage and assessment within the purview of individual schools, the mission of the school, and the faculty. While *Essentials of Economics 5e* and the teaching package make no claim of any specific AACSB qualification or evaluation, we have, within *Essentials of Economics 5e*, labeled selected questions according to the six general knowledge and skills areas.

Instructors: Student Success Starts with You

Tools to enhance your unique voice

Want to build your own course? No problem. Prefer to use an OLC-aligned, prebuilt course? Easy. Want to make changes throughout the semester? Sure. And you'll save time with Connect's auto-grading too.

65%
Less Time Grading



Laptop: McGraw Hill; Woman/dog: George Doyle/Getty Images

Study made personal

Incorporate adaptive study resources like SmartBook® 2.0 into your course and help your students be better prepared in less time. Learn more about the powerful personalized learning experience available in SmartBook 2.0 at **www.mheducation.com/highered/connect/smartbook**

Affordable solutions, added value

Make technology work for you with LMS integration for single sign-on access, mobile access to the digital textbook, and reports to quickly show you how each of your students is doing. And with our Inclusive Access program you can provide all these tools at a discount to your students. Ask your McGraw Hill representative for more information.

Padlock: Jobalou/Getty Images

Solutions for your challenges

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Visit **www.supportateverystep.com** for videos and resources both you and your students can use throughout the semester.

Checkmark: Jobalou/Getty Images

SUPPORT AT every step

Students: Get Learning that Fits You

Effective tools for efficient studying

Connect is designed to help you be more productive with simple, flexible, intuitive tools that maximize your study time and meet your individual learning needs. Get learning that works for you with Connect.

Study anytime, anywhere

Download the free ReadAnywhere app and access your online eBook, SmartBook 2.0, or Adaptive Learning Assignments when it's convenient, even if you're offline. And since the app automatically syncs with your Connect account, all of your work is available every time you open it. Find out more at **www.mheducation.com/readanywhere**

> ***"I really liked this app—it made it easy to study when you don't have your textbook in front of you."***
>
> - Jordan Cunningham, Eastern Washington University

Calendar: owattaphotos/Getty Images

Everything you need in one place

Your Connect course has everything you need—whether reading on your digital eBook or completing assignments for class, Connect makes it easy to get your work done.

Learning for everyone

McGraw Hill works directly with Accessibility Services Departments and faculty to meet the learning needs of all students. Please contact your Accessibility Services Office and ask them to email accessibility@mheducation.com, or visit **www.mheducation.com/about/accessibility** for more information.

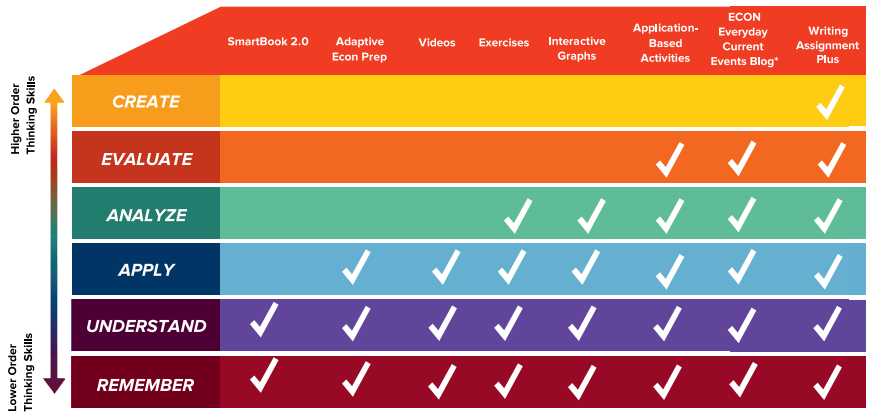
Top: Jenner Images/Getty Images, Left: Hero Images/Getty Images, Right: Hero Images/Getty Images

Connect Economics Asset Alignment with Bloom's Taxonomy

We Take Students Higher

As a learning science company we create content that supports higher order thinking skills. Within Connect®, we tag assessments accordingly so you can filter your search, assign it, and receive reporting on it. These content asset types can be associated with one or more levels of Bloom's Taxonomy.

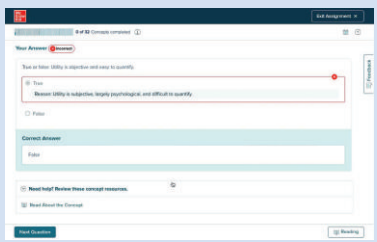
The chart below shows a few of the key assignable economics assets with *McGraw Hill Connect* aligned with Bloom's Taxonomy. Take your students higher by assigning a variety of applications, moving them from simple memorization to concept application.

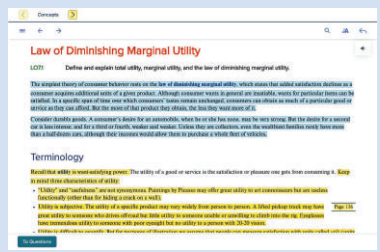


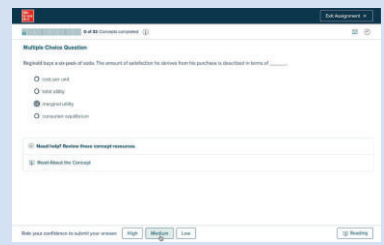
* Outside of Connect.

SmartBook 2.0

SmartBook 2.0 provides personalized learning to each student's needs, continually adapts to pinpoint knowledge gaps and focuses learning on concepts requiring additional study. It fosters more productive learning and helps students better prepare for class.

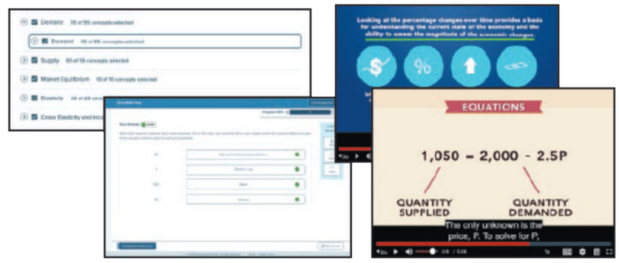






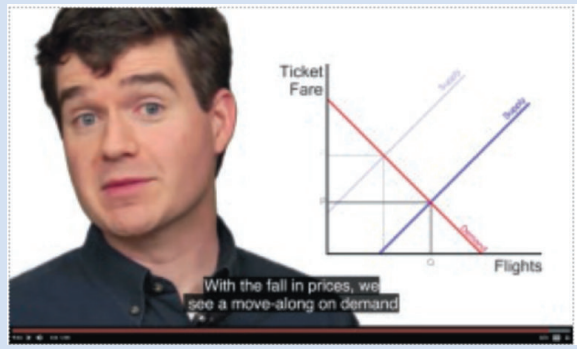
Adaptive Econ Prep

Math and graphing preparedness assignments help students refresh important prerequisite topics necessary to be successful in economics. New Adaptive Econ Prep Tool provides students just-in-time math and graphing remediation that are prerequisite to success in Principles of Economics courses and adapt to each student.



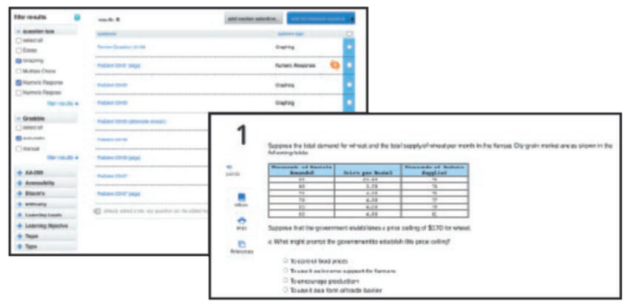
Videos

Tutorial videos provide engaging explanations to help students grasp challenging concepts. Application videos bring economics to life with relevant, real world examples. All videos include closed captioning for accessibility and are assignable with assessment questions for improved retention.



Exercises

Exercises with algorithmic variations provide ample opportunities for students to practice and hone quantitative skills. Graphing Exercises provide opportunities for students to draw, interact with, manipulate, and analyze graphs.



Interactive Graphs

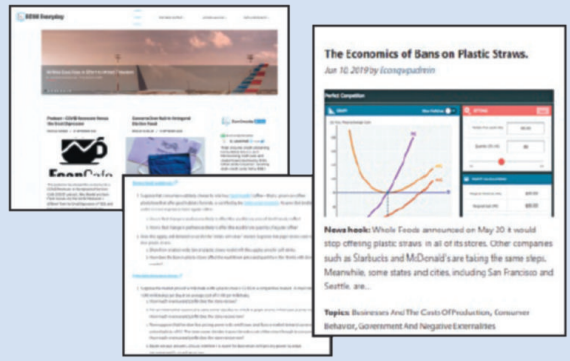
Interactive Graphs provide visual displays of real data and economic concepts for students to manipulate. All graphs are accompanied by assignable assessment questions and feedback to guide students through the experience of learning to read and interpret graphs and data.

Application-Based Activities

Immersive real-life scenarios engage students and put them in the role of everyday economists. Students practice their economic thinking and problem-solving skills as they apply course concepts and see the implications of their decisions as they go. Each activity is designed as a 15-minute experience, unless students eagerly replay for a better outcome.

ECON Everyday Current Events Blog

Our ECON Everyday blog saves instructors time bringing current, student-centered content into their course all semester long. Short articles, written for principles-level students, is tagged by topic to bring currency into your course. We also provide discussion questions to help you drive the conversation forward. Visit www.econeveryday.com and subscribe for updates.



Writing Assignment Plus

Writing Assignment Plus delivers a learning experience that helps students improve their written communication skills and conceptual understanding. Faculty can assign, monitor, grade, and provide feedback on writing projects efficiently. Built-in grammar and writing review helps students improve writing quality while an originality check helps students correct central plagiarism before submission. End result? Improved workplace skills of writing in critical thinking.

For more information, please visit: www.mheducation.com/highered/economics

PART ONE

Introduction

To the Student

This book and its ancillaries contain several features designed to help you learn economics:

- ***Appendix on graphs*** To understand the content in this book, you will need to be comfortable with basic graphical analysis and a few quantitative concepts. The web appendix for Chapter 1 reviews graphing and slopes of curves. Be sure not to skip it.
- ***Key terms*** Key terms are set in boldface type within the chapters, defined in the margins, listed at the end of each chapter, and again defined in the Glossary toward the end of the book.
- ***"Illustrating the Idea" and "Applying the Analysis"*** These sections flow logically and smoothly from the content that precedes them. They are part and parcel of the development of the ideas and cannot be skipped. Each "Illustrating the Idea" and "Applying the Analysis" section is followed by a question.
- ***Questions and Problems*** The end of each chapter features separate sections of Questions and Problems. The Questions are analytic and often ask for free responses, while the Problems are more computational. Each is keyed to a particular learning objective (LO) in the list of LOs at the beginning of the chapter. At the Online Learning Center, there are multiple-choice quizzes and one or more web-based questions for each chapter.

Our two main goals are to help you understand and apply economics and help you improve your analytical skills. An understanding of economics will enable you to comprehend a whole range of economic, social, and political problems that otherwise would seem puzzling and perplexing. Also, your study will enhance reasoning skills that are highly prized in the workplace.

Good luck with your study. We think it will be well worth your time and effort.

CHAPTER ONE

Limits, Alternatives, and Choices

Learning Objectives

LO1.1 Define economics and the features of the economic perspective.
LO1.2 Describe the role of economic theory in economics.
LO1.3 Distinguish microeconomics from macroeconomics.
LO1.4 Explain the individual's economizing problem and illustrate trade-offs, opportunity costs, and attainable combinations with budget lines.
LO1.5 List the categories of scarce resources and explain society's economizing problem.
LO1.6 Apply production possibilities analysis.
LO1.7 (Chapter appendix) Understand graphs, curves, and slopes as they relate to economics.

(An appendix on understanding graphs can be found at the end of this chapter. If you need a quick review of this mathematical tool, you might benefit by reading the appendix first.)

People's wants are numerous and varied. Biologically, people need only air, water, food, clothing, and shelter. But in modern society, people also desire goods and services that provide a more comfortable or affluent standard of living. We want bottled water, soft drinks, and fruit juices, not just water from the creek. We want salads, burgers, and pizzas, not just berries and nuts. We also want flat-panel TVs, Internet service, education, national defense, smartphones, health care, and much more.

Fortunately, society possesses productive resources such as labor and managerial talent, tools and machinery, and land and mineral deposits. These resources, employed in the economic system (or simply the economy), help us produce goods and services that satisfy many of our economic wants. But in reality our economic wants far exceed the productive capacity of our scarce (limited) resources. We are forced to make choices. This unyielding truth underlies the definition of **economics** as the social science concerned with how individuals, institutions, and society make choices under conditions of scarcity.

The Economic Perspective

economics
The study of how people, institutions, and society make economic choices under conditions of scarcity.

economic perspective
A viewpoint that envisions individuals and institutions making rational decisions by comparing the marginal benefits and marginal costs associated with their actions.

Economists view things through a particular perspective. This **economic perspective** has several critical and closely interrelated features.

Scarcity and Choice

scarcity
The limits placed on the amounts and types of *goods* and *services* available for consumption as the result of there being only limited *economic resources* from which to produce output; the fundamental economic constraint that creates *opportunity costs* and that necessitates the use of *marginal analysis (cost-benefit analysis)* to make optimal choices.

opportunity cost
The value of the good, service, or time forgone to obtain something else.

The economic resources needed to make goods are services are in limited supply. This **scarcity** restricts options and demands choices. Because we "can't have it all," we must decide what we will have and what we must forgo.

At the core of economics is the idea that "there is no free lunch." You may be treated to lunch, making it "free" to you, but someone bears a cost (as in the nearby story about Facebook). Scarce inputs involved in creating the lunch include land, equipment, and farm labor. Because society could have used these to produce other things, it sacrifices those other goods and services in making the lunch available. Economists call such sacrifices **opportunity costs:** To obtain more of one thing, society forgoes the opportunity of getting the next best thing that could have been created with those resources.

APPLYING THE ANALYSIS

Is Facebook Free?

Facebook spends over $20 billion every year updating its platform, running server farms, and paying its employees. It also gives away its product for free to more than 2 billion users. Has Facebook figured out a way to overcome scarcity?

Rvlsoft/Shutterstock

No, it hasn't. Scarcity is permanent. But Facebook *has* figured out a way to more than cover its costs without charging its users a penny. Facebook's trick is to charge advertisers instead. They pay Facebook nearly $40 billion per year to boost content and target ads to specific individuals.

Lesson One: If you are consuming a good or service and not paying for it, the cost is being borne by someone else.

Lesson Two: Companies don't usually give freebies to be nice; they do it as part of their business model. Facebook grants users free access to its platform to make sure that it has as many "eyeballs" as possible to sell to advertisers.

Purposeful Behavior

utility
The want-satisfying power of a good or service; the satisfaction or pleasure a consumer obtains from the consumption of a good or service (or from the consumption of a collection of goods and services).

Economics assumes that human behavior reflects "rational self-interest." Individuals look for and pursue opportunities to increase their **utility:** pleasure, happiness, or satisfaction. They allocate their time, energy, and money to maximize their satisfaction. Because they weigh costs and benefits, their decisions are "purposeful" or "rational," not "random" or "chaotic."

ILLUSTRATING THE IDEA

Did Zuckerberg, Seacrest, and Grande Make Bad Choices?

The importance of opportunity costs in decision making is illustrated by different choices people make with respect to college. Average salaries of college graduates are nearly twice as high as those earned by persons with high school diplomas as their last education completed. For students with both the access to and aptitude for college, "Go to college, stay in college, and earn a degree" is very sound advice.

Yet Facebook founder Mark Zuckerberg and media personality Ryan Seacrest both dropped out of college, while pop singer Ariana Grande never even bothered to start classes. What were they thinking? Unlike most students, Zuckerberg faced enormous opportunity costs for staying in college. He had a vision for his company, and dropping out helped to ensure Facebook's success. Similarly, Seacrest landed a professional DJ job at his local radio station when he was in high school before moving to Hollywood and eventually becoming America's top radio and TV personality. Finishing his college degree might have interrupted the string of successes that made his career possible. And Grande knew that staying on top in the world of pop takes unceasing work. So after her first album became a massive hit, it made sense for her to skip college in order to relentlessly pursue continuing success.

So Zuckerberg, Seacrest, and Grande understood opportunity costs and made their choices accordingly. The size of opportunity costs greatly matters in making individual decisions.

QUESTION:

Professional athletes sometimes return to college after they retire from professional sports. How does that college decision relate to opportunity costs?

"Purposeful behavior" does not assume that people and institutions are immune from faulty logic and therefore are perfect decision makers. They sometimes make mistakes. Nor does it mean that people's decisions are unaffected by emotion or the decisions of those around them. People sometimes are impulsive or emulative. "Purposeful behavior" simply means that people make decisions with some desired outcome in mind.

Nor is rational self-interest the same as selfishness. Increasing one's own wage, rent, interest, or profit normally requires identifying and satisfying somebody else's want. Also, many people make personal sacrifices to others without expecting any monetary reward. They contribute time and money to charities because they derive pleasure from doing so. Parents help pay for their children's education for the same reason. These self-interested, but unselfish, acts help maximize the givers' satisfaction as much as any personal purchase of goods or services.

Marginal Analysis: Comparing Benefits and Costs

The economic perspective focuses largely on **marginal analysis**—comparisons of marginal benefits and marginal costs. To economists, "marginal" means "extra," "additional," or "a change in." Most choices or decisions involve changes in the existing state of affairs.

marginal analysis
The comparison of marginal ("extra" or "additional") benefits and marginal costs, usually for decision making.

Should you attend school for another year? Should you study an extra hour for an exam? Should a business expand or reduce its output? Should government increase or decrease its funding for a missile defense system?

Each option involves marginal benefits and marginal costs. In making choices rationally, the decision maker must compare those two amounts. Example: You and your partner are shopping for a diamond ring. Should you buy a $\frac{1}{2}$-carat diamond or a 1-carat diamond? The marginal cost of a larger diamond is the added expense beyond the cost of the smaller diamond. The marginal benefit is the perceived greater lifetime pleasure (utility) from the larger stone. If the marginal benefit of the larger diamond exceeds its marginal cost (and you can afford it), buy the larger stone. But if the marginal cost is more than the marginal benefit, you should buy the smaller diamond instead—even if you can afford the larger stone!

In a world of scarcity, the decision to obtain the marginal benefit associated with some specific option always includes the marginal cost of giving up something else. The money spent on the larger diamond means forgoing some other product. An opportunity cost—the value of the next best thing given up—is always present whenever a choice is made.

APPLYING THE ANALYSIS

Fast-Food Lines

The economic perspective is useful in analyzing all sorts of behaviors. Consider an everyday example: the behavior of fast-food customers. When customers enter the restaurant, they go to the shortest line, believing that line will minimize their time cost of obtaining food. They are acting purposefully; time is limited, and people prefer using it in some way other than standing in a long line.

If one fast-food line is temporarily shorter than other lines, some people will move to that line. These movers apparently view the time saving from the shorter line (marginal benefit) as exceeding the cost of moving from their present line (marginal cost). The line switching tends to equalize line lengths. No further movement of customers between lines occurs once all lines are about equal.

Fast-food customers face another cost-benefit decision when a clerk opens a new station at the counter. Should they move to the new station or stay put? Those who shift to the new line decide that the time saving from the move exceeds the extra cost of physically moving. In so deciding, customers must also consider just how quickly they can get to the new station compared with others who may be contemplating the same move. (Those who hesitate are lost!)

Customers at the fast-food establishment do not have perfect information when they select lines. Thus, not all decisions turn out as expected. For example, you might enter a short line and find someone in front of you is ordering hamburgers and fries for 40 people in the Greyhound bus parked out back (and the employee is a trainee)! Nevertheless, at the time you made your decision, you thought it was optimal.

Finally, customers must decide what food to order when they arrive at the counter. In making their choices, they again compare marginal costs and marginal benefits in attempting to obtain the greatest personal satisfaction for their expenditure.

Economists believe that what is true for the behavior of customers at fast-food restaurants is true for economic behavior in general. Faced with an array of choices, consumers, workers, and businesses rationally compare marginal costs and marginal benefits in making decisions.

QUESTION:

Have you ever gone to a fast-food restaurant only to observe long lines and then leave? Use the economic perspective to explain your behavior.

Theories, Principles, and Models

Like the other sciences, economics relies on the **scientific method.** That procedure consists of several elements:

scientific method
The procedure for the systematic pursuit of knowledge involving the observation of facts and the formulation and testing of hypotheses to obtain theories, principles, and laws.

- Observing real-world behavior and outcomes.
- Based on those observations, formulating a possible explanation of cause and effect (hypothesis).
- Testing this explanation by comparing the outcomes of specific events to the outcome predicted by the hypothesis.
- Accepting, rejecting, or modifying the hypothesis, based on these comparisons.
- Continuing to test the hypothesis against the facts. As favorable results accumulate, the hypothesis evolves into a *theory.* A very well-tested and widely accepted theory is referred to as a *law* or *principle.* Combinations of such laws or principles are incorporated into *models,* which are simplified representations of how something works, such as a market or segment of the economy.

Theories, principles, and models are "purposeful simplifications." The full scope of economic reality itself is too complex to be understood as a whole. In developing theories, principles, and models, economists remove the clutter and simplify. Despite their simplifications, good theories do a good job of explaining and predicting how individuals and institutions actually behave in producing, exchanging, and consuming goods and services.

There are some other things you should know about economic principles:

- ***Generalizations*** Economic principles are *generalizations* relating to economic behavior or to the economy itself. Economic principles are expressed as the tendencies of typical or average consumers, workers, or business firms. For example, economists say that consumers buy more of a particular product when its price falls. Economists recognize that some consumers may increase their purchases by a large amount, others by a small amount, and a few not at all. This "price-quantity" principle, however, holds for the typical consumer and for consumers as a group.
- ***Other-things-equal assumption*** Like other scientists, economists use the *ceteris paribus* or **other-things-equal assumption** to construct their theories. They assume that all variables except those under immediate consideration are held constant for a particular analysis. For example, when considering the relationship between the price of Pepsi and the amount of Pepsi that is purchased, economists do not take into account all the other factors that might influence the amount of Pepsi purchased (e.g., the price of Coca-Cola, and consumer incomes and preferences). Holding other things equal is helpful because the economist can then focus on the relationship between the price of Pepsi and purchases of Pepsi without being confused by changes in other variables.

other-things-equal assumption
The assumption that factors other than those being considered are held constant; *ceteris paribus* assumption.

- ***Graphical expression*** Many economic models are expressed graphically. Be sure to read the special appendix for this chapter as a review of graphs.

Microeconomics and Macroeconomics

Economists develop economic principles and models at two levels.

Microeconomics

microeconomics
The part of economics concerned with such individual units as a household, a firm, or an industry and with individual markets, specific goods and services, and product and resource prices.

Microeconomics is concerned with decision making by individual consumers, workers, households, and business firms. At this level of analysis, we observe the details of their behavior under a figurative microscope. We measure the price of a specific product, the revenue or income of a particular firm or household, or the expenditures of a specific firm, government entity, or family.

Macroeconomics

macroeconomics
The part of economics concerned with the economy as a whole; with such major aggregates as the household, business, and government sectors; and with measures of the total economy.

aggregate
A collection of specific economic units treated as if they were one. For example, all prices of individual goods and services are combined into a price level, or all the units of output are aggregated into gross domestic product.

Macroeconomics examines the performance and behavior of the economy as a whole. It focuses on economic growth, the business cycle, interest rates, inflation, and the behavior of major economic or aggregates, such as the government, household, and business sectors. An **aggregate** is a collection of specific economic units treated as if they were one unit. Therefore, we might lump together the millions of consumers in the U.S. economy and treat them as if they were one huge unit called "consumers."

In using aggregates, macroeconomics seeks to obtain an overview, or general outline, of the economy and the relationships of its major aggregates. Macroeconomics speaks of such economic measures as total output, total employment, total income, aggregate expenditures, and the general level of prices. Very little attention is given to specific units making up the various aggregates.

PHOTO OP

Micro versus Macro

Figuratively, microeconomics examines the sand, rock, and shells, not the beach; in contrast, macroeconomics examines the beach, not the sand, rocks, and shells.

NPS Photo

Holbox/Shutterstock RF

Individuals' Economic Problem

It is clear from our previous discussion that both individuals and society face an **economic problem**: The need to make choices because economic wants exceed economic means. Let's first build a microeconomic model of the economizing problem faced by an individual.

economic problem
The need for individuals and society to make choices because wants exceed means.

Limited Income

We all have a finite amount of income, even the wealthiest among us. Even Bill Gates must decide how to spend his money! Our income comes in the form of wages, interest, rent, and profit, although we may also receive money from government programs or family members. As **Global Snapshot 1.1** shows, the average income of Americans in 2017 was $58,270. In the poorest nations, it was less than $500.

GLOBAL SNAPSHOT 1.1

Average Income, Selected Nations

Average income (total income/population) and therefore typical budget constraints vary greatly among nations.

Country	Per Capita Income, 2017*
Switzerland	$80,560
Qatar	61,070
United States	58,270
Singapore	54,530
France	37,970
South Korea	28,380
China	8,690
Mexico	8,610
Iraq	4,770
India	1,820
Madagascar	400
Malawi	320

*U.S. dollars, based on exchange rates.

Source: Organization for Economic Co-operation and Development (OECD), www.compareyourcountry.org.

Unlimited Wants

Most people have virtually unlimited wants. Our wants extend over a wide range of products that provide utility, from *necessities* (food, shelter, clothing) to *luxuries* (perfumes, yachts, sports cars).

PHOTO OP

Necessities versus Luxuries

Economic wants include both necessities and luxuries. Each type of item provides utility to the buyer.

David Sachs/Getty Images

Ingram Publishing/Superstock RF

Over time, as new and improved products are introduced, economic wants tend to change and multiply. Only recently have people wanted Wi-Fi connections, tablet computers, or flying drones because those products did not exist a few decades ago. Also, the satisfaction of certain wants may trigger others: The acquisition of a Ford Focus or a Honda Civic has been known to whet the appetite for a Lexus or a Mercedes.

Like goods, services also satisfy our wants. Car repair work, legal and accounting advice, and haircuts all satisfy human wants. Actually, we buy many goods, such as automobiles and washing machines, for the services they render.

Most people's desires for goods and services cannot be fully satisfied, though our desires for a particular good or service can be satisfied; over a short period of time, we can surely obtain enough toothpaste or pasta. But our broader desire for more goods and services and higher-quality goods and services seems to be another story.

Because we have only limited income but seemingly insatiable wants, it is in our self-interest to economize: to pick and choose goods and services that maximize our satisfaction, given the limitations we face.

A Budget Line

budget line
A line that shows the different combinations of two products a consumer can purchase with a specific money income, given the products' prices.

We can clarify the economic problem facing consumers by visualizing a **budget line** or *budget constraint,* which is a schedule or curve that shows various combinations of two products a consumer can purchase with a specific money income.

To understand this idea, suppose you received an Amazon gift card as a birthday present. The $120 card is soon to expire. You go online to Amazon.com and confine your purchase decisions to two alternatives: movies and paperback books. Movies are $20 each, and paperback books are $10 each. The table in **Figure 1.1** shows your purchase options.

At one extreme, you might spend all of your $120 "income" on 6 movies at $20 each and have nothing left to spend on books. Or, by giving up 6 movies and thereby gaining $40, you can have 4 movies at $20 each and 4 books at $10 each. And so on to the other extreme, at which you could buy 12 books at $10 each, spending your entire gift card on books with nothing left to spend on movies.

The graph in **Figure 1.1** shows the budget line. Every point on the line represents a possible combination of movies and books, including fractional quantities. The slope of the graphed budget line measures the ratio of the price of books (P_b) to the price of movies (P_m); more precisely, the slope is $P_b/P_m = \$ - 10/\$ + 20 = \frac{1}{2}$. So you must forgo 1 movie (measured on the vertical axis) to buy 2 books (measured on the horizontal axis). This yields a slope of $\frac{1}{2}$ or −0.5.

The budget line illustrates several ideas.

Attainable and Unattainable Combinations All the combinations of movies and books on or inside the budget line are *attainable* from the $120 of money income. You can afford to buy, for example, 3 movies at $20 each and 6 books at $10 each. You also can obviously afford to buy 2 movies and 5 books, thereby using up only $90 of the $120 available on your gift card. But to achieve maximum utility, you will want to spend the full $120. The budget line shows all combinations that cost exactly the full $120.

In contrast, all combinations beyond the budget line are *unattainable*. The $120 limit simply does not allow you to purchase, for example, 5 movies at $20 each and 5 books at $10 each. That $150 expenditure would clearly exceed the $120 limit.

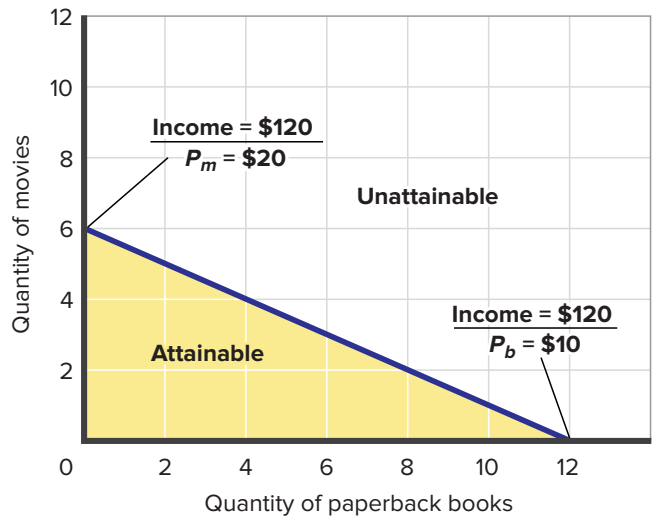
Trade-offs and Opportunity Costs The budget line in **Figure 1.1** illustrates the idea of trade-offs arising from limited income. To obtain more movies, you have to give up some books. For example, to acquire the first movie, you trade off 2 books. So the opportunity cost of the first movie is 2 books. To obtain the second movie, the opportunity cost is also 2 books. The straight-line budget constraint, with its constant slope, indicates **constant opportunity cost.** That is, the opportunity cost of 1 extra movie remains the same (=2 books) as you purchase more movies. Likewise, the opportunity cost of 1 extra book does not change $\left(= \frac{1}{2} \text{ movie} \right)$ as you purchase more books.

constant opportunity cost
An opportunity cost that remains the same for each additional unit as a consumer (or society) shifts purchases (production) from one product to another along a straight-line budget line (production possibilities curve).

FIGURE 1.1
A consumer's budget line. The budget line (or budget constraint) shows all the combinations of any two products that can be purchased, given the prices of the products and the consumer's money income.

The Budget Line: Whole-Unit Combinations of Movies and Paperback Books Attainable with an Income of $120

Units of Movies (Price = $20)	Units of Books (Price = $10)	Total Expenditure
6	0	$120 = ($120 + $0)
5	2	$120 = ($100 + $20)
4	4	$120 = ($80 + $40)
3	6	$120 = ($60 + $60)
2	8	$120 = ($40 + $80)
1	10	$120 = ($20 + $100)
0	12	$120 = ($0 + $120)



Choice Limited income forces people to choose what to buy and what to forgo. You will select the combination of movies and paperback books that you think is "best." That is, you will evaluate your marginal benefits and your marginal costs (here, product price) to make choices that maximize your satisfaction. Other people, with the same $120 gift card, would undoubtedly make different choices.

Income Changes The budget line varies with income. An increase in income shifts the budget line to the right; a decrease in income shifts it to the left. To verify this, recalculate the table in **Figure 1.1**, assuming the card value (income) is (a) $240 and (b) $60, and plot the new budget lines in the graph. No wonder people like to have more income: It shifts their budget lines outward and enables them to buy more goods and services. But even with more income, people will still face spending trade-offs, choices, and opportunity costs.

Society's Economic Problem

Society also faces an economizing problem. Should it devote more of its limited resources to the criminal justice system (police, courts, and prisons) or to education (teachers, books, and schools)? If it decides to devote more resources to both, what other goods and services does it forgo?

Scarce Resources

economic resources
The land, labor, capital, and entrepreneurial ability that are used in the production of goods and services; productive agents; factors of production.

Society has limited or scarce **economic resources,** meaning all natural, human, and manufactured resources that go into the production of goods and services.

Resource Categories

Economists classify economic resources into four general categories.

land
Natural resources ("free gifts of nature") used to produce goods and services.

Land **Land** includes all natural resources used in the production process. These include forests, mineral and oil deposits, arable land, wind power, sunlight, and water resources.

labor
People's physical and mental talents and efforts that are used to help produce goods and services.

Labor The **labor** resource consists of the physical actions and mental activities that people contribute to the production of goods and services. The work-related activities of a retail clerk, teacher, professional football player, and nuclear physicist all fall under the general heading "labor."

capital
Human-made resources (buildings, machinery, and equipment) used to produce goods and services; goods that do not directly satisfy human wants; also called *capital goods* and *investment goods.*

Capital For economists, **capital** (or *capital goods*) includes all manufactured aids used in producing consumer goods and services. Capital includes all factory, storage, transportation, and distribution facilities, as well as tools and machinery. Economists use the term **investment** to describe spending that pays for the production and accumulation of capital goods.

investment
Spending for the production and accumulation of capital and additions to inventories.

While consumer goods satisfy wants directly, capital goods do so indirectly by aiding the production of consumer goods. For example, large commercial baking ovens (capital goods) help make loaves of bread (consumer goods). Note that the term "capital" as used by economists does not refer to money. Because money produces nothing, economists do not include it as an economic resource.

PHOTO OP

Economic Resources

Land, labor, capital, and entrepreneurial ability all contribute to producing goods and services.




Monty Rakusen/Cultura/Getty Images; Asiseeit/Getty Images; artiomp/Shutterstock; Helga Esteb/Shutterstock RF

Entrepreneurial Ability Finally, there is the special human resource, distinct from labor, called **entrepreneurial ability.** It is supplied by entrepreneurs, who perform several important economic functions:

entrepreneurial ability
The human resource that combines the other resources to produce a product, makes nonroutine decisions, innovates, and bears risks.

- Entrepreneurs take the initiative in combining resources to produce a good or a service. They are the driving force behind production.
- Entrepreneurs make the strategic business decisions that set the course of an enterprise.
- Entrepreneurs innovate. They commercialize new products, new production techniques, or even new forms of business organization.
- Entrepreneurs bear risk. Because innovation is risky, progress would cease without entrepreneurs who are willing to take on risk by devoting their time, effort, and ability—as well as their own money and the money of others—to commercialize new products and ideas.

Because land, labor, capital, and entrepreneurial ability are combined to produce goods and services, they are called the **factors of production** or simply "inputs."

factors of production
Economic resources: land, capital, labor, and entrepreneurial ability.

Production Possibilities Model

Society uses its scarce resources to produce goods and services. The alternatives it faces can best be understood through a macroeconomic model of production possibilities. To keep things simple, we assume:

- ***Full employment*** The economy is employing all of its available resources.
- ***Fixed resources*** The quantity and quality of the factors of production are fixed.
- ***Fixed technology*** The state of technology (the methods used to produce output) is constant.
- ***Two goods*** The economy is producing only two goods: pizzas and industrial robots. Pizzas symbolize **consumer goods,** products that satisfy our wants directly; industrial robots symbolize **capital goods,** products that satisfy our wants indirectly by making possible more efficient production of consumer goods.

consumer goods
Products and services that satisfy human wants directly.

capital goods
Items that are used to produce other goods and therefore do not directly satisfy consumer wants.

Production Possibilities Table

A production possibilities table lists the different combinations of two products that can be produced with a specific set of resources, assuming full employment. **Figure 1.2** contains such a table for a simple economy that is producing pizzas and industrial robots. At alternative *A*, this economy would be devoting all its resources to the production of industrial robots (capital goods); at alternative *E*, all resources would go to pizza production (consumer goods). Those alternatives are unrealistic extremes; an economy typically produces both capital goods and consumer goods, as in *B, C*, and *D*. As we move from alternative *A* to *E*, we increase the production of pizzas at the expense of the production of industrial robots.

Because consumer goods satisfy our wants directly, any movement toward *E* looks tempting. In producing more pizzas, society increases the satisfaction of its current wants. But there is a cost: More pizzas mean fewer industrial robots. This shift of resources to consumer goods catches up with society over time because the stock of capital goods expands more slowly, thereby reducing potential future production. By moving toward alternative *E*, society chooses "more now" at the expense of "much more later."

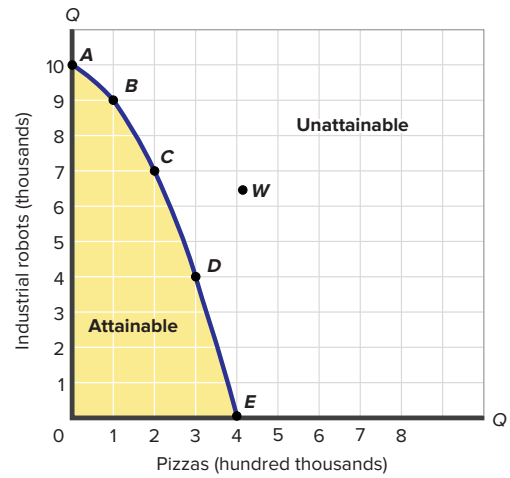
By moving toward *A*, society chooses to forgo current consumption, thereby freeing up resources that can be used to increase the production of capital goods. By building up its stock of capital this way, society will have greater future production and, therefore, greater future consumption. By moving toward *A*, society is choosing "more later" at the cost of "less now."

Generalization: At any point in time, a fully employed economy must sacrifice some of one good to obtain more of another good. Scarce resources prohibit such an economy from having more of both goods. Having more of one thing means having less of something else.

FIGURE 1.2

The production possibilities curve. Each point on the production possibilities curve represents some maximum combination of two products that can be produced if resources are fully and efficiently employed. When an economy operates on the curve, more industrial robots means fewer pizzas, and vice versa. Limited resources and fixed technology make any combination of industrial robots and pizza lying outside the curve (such as at *W*) unattainable. Points inside the curve are attainable, but they indicate that full employment is not being realized.

	Production Alternatives				
Type of Product	**A**	**C**	**B**	**E**	**D**
Pizzas (in hundred thousands)	0	1	2	3	4
Industrial robots (in thousands)	10	9	7	4	0



Production Possibilities Curve

production possibilities curve
A curve showing the different combinations of two goods or services that can be produced in a full-employment, full-production economy where the available supplies of resources and technology are fixed.

The data presented in a production possibilities table can also be shown graphically as a **production possibilities curve.** This curve displays the different combinations of goods and services that society can produce in a fully employed economy, assuming a fixed availability of supplies of resources and fixed technology.

In **Figure 1.2**, each point on the production possibilities curve represents some maximum output of the two products. The curve is a "constraint" because it shows the limit of attainable outputs. Points on the curve are attainable as long as the economy uses all its available resources. Points lying inside the curve are also attainable, but they reflect less total output and therefore are not as desirable as points on the curve. Points lying beyond the production possibilities curve, like *W*, represent a greater output than the output at any point on the curve. Such points, however, are unattainable with the current resources and technology.

Law of Increasing Opportunity Costs

Figure 1.2 clearly shows that more pizzas mean fewer industrial robots. The number of units of industrial robots that must be given up to obtain another pizza is the opportunity cost of that unit of pizzas.

In moving from alternative *A* to alternative *B* in the table in **Figure 1.2**, the cost of one additional unit of pizzas is one fewer robot. But when additional units are considered—*B* to *C, C* to *D*, and *D* to *E*—an important economic principle is revealed: For society, the opportunity cost of each additional unit of pizzas is greater than the opportunity cost of the preceding one. When we move from *A* to *B*, just one industrial robot is sacrificed for one more pizza, but in going from *B* to *C*, we sacrifice two industrial robots for one more pizza, then three industrial robots for one more pizza, and finally four for one. Conversely, confirm that as we move from *E* to *A*, the cost of an additional industrial robot (on average) is $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, and 1 pizzas, respectively, for the four successive moves.

law of increasing opportunity costs
The principle that as the production of a good increases, the opportunity cost of producing an additional unit rises.

Our example illustrates the **law of increasing opportunity costs**: As we increase the production of a particular good, the opportunity cost of producing an additional unit rises.

Shape of the Curve The law of increasing opportunity costs is reflected in the shape of the production possibilities curve: The curve is bowed out from the origin of the graph. As **Figure 1.2** shows, when the economy moves from *A* to *E*, it must give up successively larger amounts of industrial robots (1, 2, 3, and 4) to acquire equal increments of pizzas (1, 1, 1, and 1). Thus, the slope of the production possibilities curve becomes steeper as we move from *A* to *E*.

Economic Rationale The law of increasing opportunity costs results from the fact that economic resources are not completely adaptable to alternative uses. Many resources are better at producing one type of good than at producing others. Consider land. Some land is highly suited to growing the ingredients necessary for pizza production. But as pizza production expands, society has to start using land that is less suitable for farming. That land is rich in mineral deposits and therefore well suited to producing the materials needed to make industrial robots. That land will be the first land devoted to the production of industrial robots. But as society steps up the production of industrial robots, it must use land that is less and less suited to making robot components.

This lack of perfect flexibility, or interchangeability, of resources causes society's increasing opportunity costs.

Optimal Allocation

Of all the attainable combinations of pizzas and industrial robots on the curve in **Figure 1.2**, which is optimal (best)? That is, which quantities of pizzas and robots will maximize satisfaction?

Recall that economic decisions center on comparisons of marginal benefits (MB) and marginal costs (MC). Any economic activity should be expanded as long as marginal benefit exceeds marginal cost and should be reduced if marginal cost exceeds marginal benefit. The optimal amount of the activity occurs where MB = MC. Society uses the same logic to make its production decision.

Consider pizzas. We already know from the law of increasing opportunity costs that the marginal cost of additional pizzas will rise as more pizzas are produced. At the same time, we need to recognize that the extra or marginal benefits that come from producing and consuming pizzas decline with each additional pizza. Consequently, each additional pizza brings both increasing marginal costs and decreasing marginal benefits.

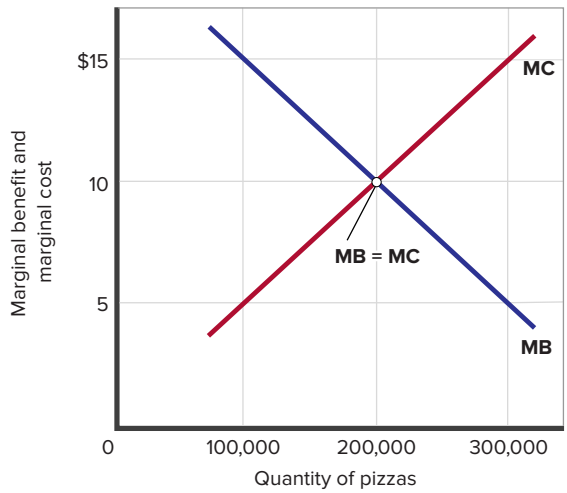
The optimal quantity of pizza production is indicated in **Figure 1.3** by the intersection of the MB and MC curves: 200,000 units. Why is this amount the optimal quantity? If only 100,000 units of pizzas were produced, the marginal benefit of an extra unit of them would exceed its marginal cost. In money terms, MB is $15, while MC is only $5. When society gains something worth $15 at a marginal cost of only $5, it is better off. In **Figure 1.3**, net gains continue until pizza production has been increased to 200,000.

In contrast, the production of 300,000 pizzas is excessive. There, the MC of an added pizza is $15 and its MB is only $5. This means that one pizza is worth only $5 to society but costs $15 to obtain. This is a losing proposition for society!

So resources are being efficiently allocated to any product when the marginal benefit and marginal cost of its output are equal (MB = MC). Suppose that by applying the above analysis to industrial robots, we find its optimal (MB = MC) quantity is 7,000. This would mean that alternative *C* (200,000 units of pizzas and 7,000 units of industrial robots) on the production possibilities curve in **Figure 1.2** would be optimal for this economy.

FIGURE 1.3

Optimal output: MB = MC. Achieving the optimal output requires the expansion of a good's output until its marginal benefit (MB) and marginal cost (MC) are equal. No resources beyond that point should be allocated to the product. Here, optimal output occurs when 200,000 units of pizzas are produced.



Unemployment, Growth, and the Future

In the depths of the Great Depression of the 1930s, one-quarter of U.S. workers were unemployed and one-third of U.S. production capacity was idle. Subsequent downturns have been much less severe. During the deep 2007–2009 recession, for instance, production fell by a comparably smaller 3.7 percent, and 1 in 10 workers was without a job. The pandemic recession that began in 2020 saw output fall by 33.1 percent and unemployment rise to 14.7 percent in the second quarter, but the third quarter saw output rebound by 31.4 percent and unemployment fall to 7.9 percent.

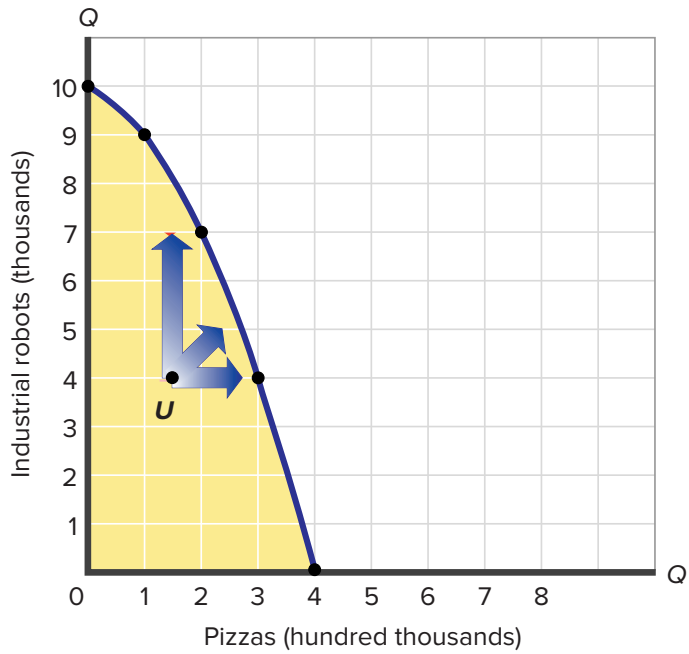
Almost all nations have experienced widespread unemployment and unused production capacity from business downturns at one time or another. Since the COVID-19 outbreak, most nations around the world have had economic downturns and elevated unemployment.

How do these realities relate to the production possibilities model? Our analysis and conclusions change if we relax the assumption that all available resources are fully employed. The five alternatives in the table of **Figure 1.2** represent maximum outputs; they illustrate the combinations of pizzas and industrial robots that can be produced when the economy is operating at full employment. With unemployment, this economy would produce less than each alternative shown in the table.

Graphically, we represent situations of unemployment by points inside the original production possibilities curve. Point *U* in **Figure 1.4** is one such point. Here the economy is falling short of the various maximum combinations of pizzas and industrial robots represented by the points on the production possibilities curve. Movement toward full employment would yield a greater output of one or both products.

FIGURE 1.4

Unemployment and the production possibilities curve. Any point inside the production possibilities curve, such as *U*, represents unemployment or a failure to achieve full employment. The arrows indicate that, by realizing full employment, the economy could operate on the curve. This means it could produce more of one or both products than it is producing at point *U*.



A Growing Economy

When we drop the assumptions that the quantity and quality of resources and technology are fixed, the production possibilities curve shifts positions, and the economy's potential maximum output changes.

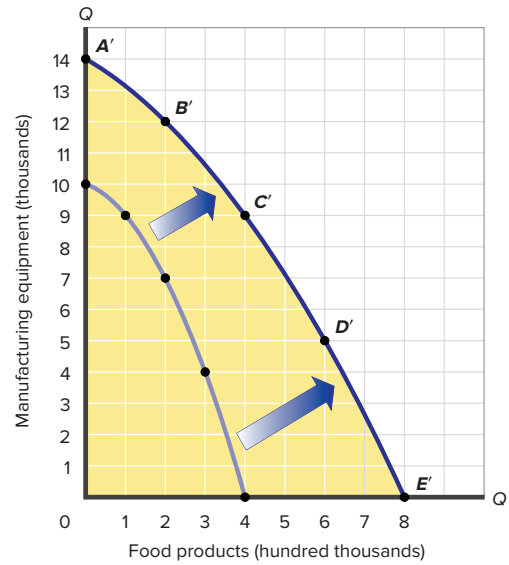
Increases in Resource Supplies Although resource supplies are fixed at any specific moment, they change over time. For example, a nation's growing population brings about increases in the supplies of labor and entrepreneurial ability. Also, labor quality usually improves over time. The economy's stock of capital generally increases at a significant, though unsteady, rate. And although some of our energy and mineral resources are being depleted, new sources are also being discovered. The development of irrigation systems, for example, adds to the supply of arable land.

economic growth
(1) An outward shift in the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology; (2) an increase of real output (gross domestic product) or real output per capita.

The net result of these increased supplies of the factors of production is society's ability to produce more consumer goods and more capital goods. The new production possibilities might look like those in the table in **Figure 1.5**. The greater abundance of resources will result in a greater potential output of one or both products. The economy will have achieved economic growth in the form of expanded potential output. Graphically, the production possibilities curve shifts outward and to the right, as illustrated by the move from the inner curve to curve A' B' C' D' E' in **Figure 1.5**. This sort of shift represents growth of economic capacity, which, when used, means **economic growth**: a larger total output.

FIGURE 1.5
Economic growth and the production possibilities curve. The increase in supplies of resources, the improvements in resource quality, and the technological advances that occur in a dynamic economy move the production possibilities curve outward and to the right, allowing the economy to have larger quantities of both types of goods.

	Production Alternatives				
Type of Product	**A′**	**B′**	**C′**	**D′**	**E′**
Pizzas (hundred thousands)	0	2	4	6	8
Industrial robots (thousands)	14	12	9	5	0



APPLYING THE ANALYSIS

The Economics of Pandemics

Production possibilities analysis is helpful in assessing the costs and benefits of battling a pandemic, including the COVID-19 outbreak that spread globally and brought physical and economic devastation in 2020.

If we categorize all of U.S. production as either "pandemic goods" (such as PPE—personal protective equipment—and research and development of vaccines) or "other goods," we can measure them on the axes of a production possibilities diagram such as that shown in **Figure 1.2**. The opportunity cost of using more resources for pandemic goods is the other goods sacrificed. In a fully employed economy, more pandemic goods are achieved at the opportunity cost of fewer other goods—education, pollution control, personal computers, houses, and so on. The cost of battling the pandemic is the other goods forgone. The benefits of these activities are numerous and diverse, but clearly include the gains from saving lives, minimizing long-term health damage, and reducing economic disruption.

Society must assess the marginal benefit (MB) and marginal cost (MC) of additional pandemic goods to determine their optimal amounts—where to locate on the pandemic goods–other goods production possibilities curve. Although estimating marginal benefits and marginal costs is an imprecise art, the MB-MC framework is a useful way of approaching choices. An optimal allocation of resources requires that society expand the production of pandemic goods until MB = MC.

The experience with COVID-19 increased the perceived marginal benefits of pandemic goods. If we label the horizontal axis in **Figure 1.3** "pandemic goods" and draw in a rightward shift of the MB curve, we see that the optimal quantity of pandemic goods rises. In response to COVID-19, the United States allocated more of its resources to pandemic goods. But the MB-MC analysis also reminds us we can spend too much on pandemics, as well as too little. The United States should not expand pandemic goods beyond the point where MB = MC. If it does, it will be sacrificing other goods of greater value than the pandemic goods obtained.

Pandemics not only force difficult choices, they also reduce the ability of an economy to produce. COVID-19 prompted some communities to impose "shut down orders," closing businesses and causing millions to become unemployed. Even places without shutdown orders saw closures and mass unemployment as concerns over the pandemic kept consumers away from nonessential businesses. This would be represented in **Figure 1.4** by the economy moving from a point on the curve to point *U* inside the curve. Reflecting this, U.S. unemployment rose from 3.5 percent in February 2020, to 14.7 percent in April 2020.

COVID-19 also adversely affected production possibilities through the death or disability of millions of people. **Figure 1.5** represents a growing economy with an outward shifting curve. The loss of labor due to death or disability caused an inward shift of production possibilities. The International Monetary Fund (IMF) estimates that globally the cumulative loss of output from COVID-19 may reach $28 trillion by 2025.

QUESTION:

How might the unemployment effects and inward shift of the production possibilities curve have differed if society had made different choices about the allocation of resources to pandemic versus other goods?

Advances in Technology Improving technology brings both new and better goods and improved ways of producing them. For now, let's focus on one type of technological advance: improvements in the methods of production–for example, the introduction of computerized systems to manage inventories and schedule production. These advances allow society to produce more goods with available resources. They make possible the production of more industrial robots *and* more pizzas.

APPLYING THE ANALYSIS

Information Technology and Biotechnology

A real-world example of improved technology is the recent surge of new technologies relating to computers, communications, and biotechnology. Technological advances have dropped the prices of computers and greatly increased their speed. Improved software has greatly increased the everyday usefulness of computers. Cellular phones and the Internet have increased communications capacity, enhancing production and improving the efficiency of markets. Advances in biotechnology have resulted in important agricultural and medical discoveries. These and other new and improved technologies have contributed to U.S. economic growth (outward shifts of the nation's production possibilities curve).

QUESTION:

How have technological advances in medicine helped expand production possibilities in the United States?

Conclusion: Economic growth is the result of (1) increases in supplies of resources, (2) improvements in resource quality, and (3) technological advances. Whereas static, no-growth economies must sacrifice some of one good to obtain more of another, dynamic, growing economies can produce larger quantities of both goods.

Present Choices and Future Possibilities

An economy's current choice of positions on its production possibilities curve helps determine the curve's future location. Let's designate the two axes of the production possibilities curve as "goods for the future" and "goods for the present," as in **Figure 1.6**. Goods for the future are such things as capital goods, research and education, and preventive medicine; they are the ingredients of economic growth. Goods for the present are consumer goods such as food, clothing, and entertainment.

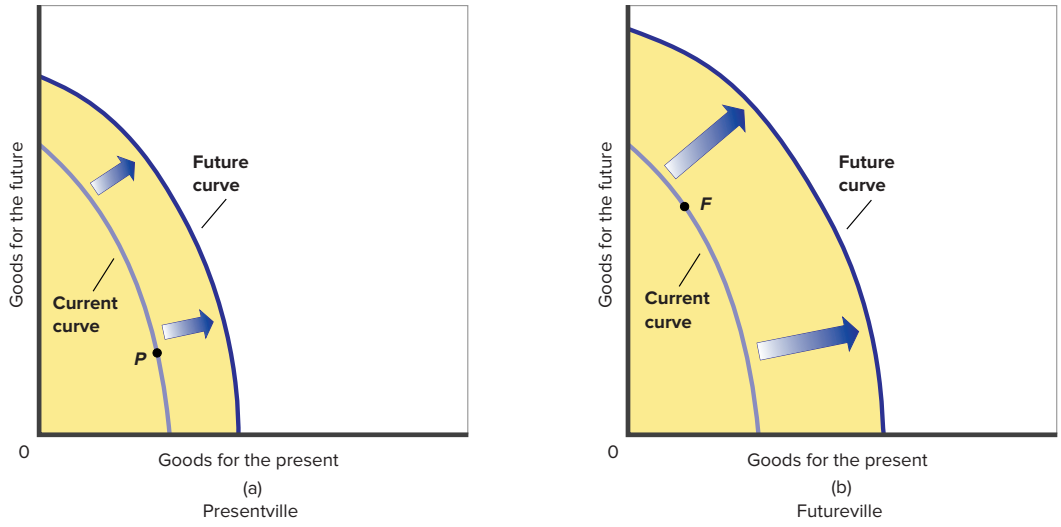
Now suppose there are two hypothetical economies, Presentville and Futureville, that are initially identical in every respect except one: Presentville's current choice of positions on its production possibilities curve (point *P* in **Figure 1.6a**) strongly favors present goods over future goods. Futureville, in contrast, makes a current choice that stresses larger amounts of future goods and smaller amounts of present goods, as shown by point *F* in **Figure 1.6b**.

Now, other things equal, we can expect Futureville's future production possibilities curve to be farther to the right than Presentville's. By currently choosing an output more favorable to technological advances and to increases in the quantity and quality of resources, Futureville will achieve greater economic growth than Presentville. In terms of capital goods, Futureville is choosing to make larger current additions to its "national factory" by devoting more of its current output to capital than does Presentville. The payoff from this choice for Futureville is greater future production capacity and economic growth. The opportunity cost is fewer consumer goods in the present.

Is Futureville's choice thus necessarily "better" than Presentville's? We cannot say. The different outcomes simply reflect different preferences and priorities in the two countries. **Global Snapshot 1.2** indicates that nations differ substantially in how large a fraction of their respective national incomes they choose to devote to purchasing capital goods for the future as opposed to consumption goods for the present.

FIGURE 1.6

Present choices and future locations of production possibilities curves. (a) Presentville's current choice to produce more "present goods" and fewer "future goods," as represented by point *P*, will cause a modest outward shift of the production possibilities curve in the future. (b) Futureville's current choice favoring "future goods," as depicted by point *F*, will result in a greater outward shift of the curve in the future.



GLOBAL SNAPSHOT 1.2

Gross Fixed Capital Formation as a Percentage of National Income, Selected Nations, 2017

Countries vary widely in the percentage of their respective national incomes that they devote to investments in productive capital ("goods for the future") rather than current consumption. Only the former generates increases in future production capacity and economic growth.

Source: The World Bank, www.worldbank.org.

Summary

LO1.1 Define economics and the features of the economic perspective.

Economics is the social science that studies how people, institutions, and society make choices under conditions of scarcity. Central to economics is the idea of opportunity cost: the value of the next-best good or service forgone to obtain something.

The economic perspective includes three elements: scarcity and choice, purposeful behavior, and marginal analysis. It sees individuals and institutions making rational decisions based on comparisons of marginal costs and marginal benefits.

LO1.2 Describe the role of economic theory in economics.

Economists employ the scientific method, in which they form and test hypotheses of cause-and-effect relationships to generate theories, laws, and principles. Economists often combine theories into representations called models.

LO1.3 Distinguish microeconomics from macroeconomics.

Microeconomics examines the decision making of specific economic units or institutions. Macroeconomics looks at the economy as a whole or its major aggregates.

LO1.4 Explain the individual's economizing problem and illustrate trade-offs, opportunity costs, and attainable combinations with budget lines.

Individuals face an economizing problem. Because their wants exceed their incomes, they must decide what to purchase and what to forgo. Society also faces an economic problem. Societal wants exceed the available resources necessary to fulfill them. Society therefore must decide what to produce and what to forgo.

Graphically, a budget line (or budget constraint) illustrates the economizing problem for individuals. The line shows the various combinations of two products that a consumer can purchase with a specific money income, given the prices of the two products.

LO1.5 List the categories of scarce resources and explain society's economizing problem.

Economic resources are inputs into the production process and can be classified as land, labor, capital, and entrepreneurial ability. Economic resources are also known as factors of production or inputs.

Society's economic problem can be illustrated through production possibilities analysis. Production possibilities tables and curves show the different combinations of goods and services that can be produced in a fully employed economy, assuming that resource quantity, resource quality, and technology are fixed.

LO1.6 Apply production possibilities analysis.

An economy that is fully employed and thus operating on its production possibilities curve must sacrifice the output of some types of goods and services to increase the production of others. The gain of one type of good or service is always accompanied by an opportunity cost in the form of loss of some of the other type.

Because resources are not equally productive in all possible uses, shifting resources from one use to another creates increasing opportunity costs. The production of additional units of one product requires the sacrifice of increasing amounts of the other product.

The optimal point on the production possibilities curve represents the most desirable mix of goods. It requires expanding the production of each good until its marginal benefit (MB) equals its marginal cost (MC).

Over time, technological advances and increases in the quantity and quality of resources enable the economy to produce more of all goods and services—that is, to experience economic growth. Society's choice regarding the mix of consumer goods and capital goods determines the future location of the production possibilities curve and the extent of economic growth.

Terms and Concepts

economics
economic perspective
scarcity
opportunity cost
utility
marginal analysis
scientific method
other-things-equal assumption
microeconomics
macroeconomics
aggregate
economic problem
budget line
constant opportunity cost
economic resources
land
labor
capital
investment
entrepreneurial ability
factors of production
consumer goods
capital goods
production possibilities curve
law of increasing opportunity costs
economic growth

Questions

1. Ralph Waldo Emerson once wrote: "Want is a growing giant whom the coat of Have was never large enough to cover." How does this statement relate to the definition of economics? **(LO1)**
2. "Buy 2, get 1 free." Explain why the "1 free" is free to the buyer but not to society. **(LO1)**
3. What is an opportunity cost? How does the idea relate to the definition of economics? Which of the following decisions would entail the greater opportunity cost: allocating a square block in the heart of New York City for a surface parking lot or allocating a square block at the edge of a typical suburb for such a lot? Explain. **(LO1)**
4. What is "utility" and how does it relate to purposeful behavior? **(LO1)**
5. Cite three examples of recent decisions you made in which you, at least implicitly, weighed marginal cost and marginal benefit. **(LO1)**
6. What are the key elements of the scientific method, and how does this method relate to economic principles and laws? **(LO2)**
7. Indicate whether each of the following statements applies to microeconomics or macroeconomics: **(LO3)**
   a. The unemployment rate in the United States was 3.7 percent in December 2018.
   b. A U.S. software firm laid off 15 workers last month and transferred the work to India.
   c. An unexpected freeze in central Florida reduced the citrus crop and caused the price of oranges to rise.
   d. U.S. output, adjusted for inflation, increased by 2.3 percent in 2017.
   e. Last week, Wells Fargo Bank lowered its interest rate on business loans by one-half of 1 percentage point.
   f. The consumer price index rose by 2.2 percent from November 2017 to November 2018.
8. What are economic resources? What categories do economists use to classify them? Why are resources also called factors of production? Why are they called inputs? **(LO5)**
9. Why is money not considered a capital resource in economics? Why is entrepreneurial ability considered a category of economic resource, distinct from labor? What roles do entrepreneurs play in the economy? **(LO5)**
10. Explain the typical shapes of marginal-benefit and marginal-cost curves. How are these curves used to determine the optimal allocation of resources to a particular product? If current output is such that marginal cost exceeds marginal benefit, should more or fewer resources be allocated to this product? Explain. **(LO6)**
11. Explain how (if at all) each of the following events affects the location of a country's production possibilities curve: **(LO6)**
    a. The quality of education increases.
    b. The number of unemployed workers increases.
    c. A new technique improves the efficiency of extracting copper from ore.
    d. A devastating earthquake destroys numerous production facilities.

Problems

1. Potatoes cost Janice $1 per pound, and she has $5.00 that she could possibly spend on potatoes or other items. If she feels that the first pound of potatoes is worth $1.50, the second pound is worth $1.14, the third pound is worth $1.05, and all subsequent pounds are worth $0.30 per pound, how many pounds of potatoes will she purchase? What if she only had $2 to spend? **(LO1)**
2. Pham can work as many or as few hours as she wants at the college bookstore for $12 per hour. But due to her hectic schedule, she has just 15 hours per week that she can spend working at either the bookstore or at other potential jobs. One potential job, at a café, will pay her $15 per hour for up to 6 hours per week. She has another job offer at a garage that will pay her $13 an hour for up to 5 hours per week. And she has a potential job at a day care center that will pay her $11.50 per hour for as many hours as she can work. If her goal is to maximize the amount of money she can make each week, how many hours will she work at the bookstore? **(LO1)**
3. Suppose you won $15 on a lotto ticket at the local 7-Eleven and decided to spend all the winnings on candy bars and bags of peanuts. Candy bars cost $0.75 each while bags of peanuts cost $1.50 each. **(LO4)**
   a. Construct a table showing the alternative combinations of the two products that are available.
   b. Plot the data in your table as a budget line in a graph. What is the slope of the budget line? What is the opportunity cost of one

more candy bar? Of one more bag of peanuts? Do these opportunity costs rise, fall, or remain constant as each additional unit of the product is purchased?

c. Does the budget line tell you which of the available combinations of candy bars and bags of peanuts to buy?

d. Suppose you had won $30 on your ticket, not $15. Show the $30 budget line in your diagram. Has the number of available combinations increased or decreased?

4. Suppose you are on a desert island and possess exactly 20 coconuts. Your neighbor, Friday, is a fisherman, and he is willing to trade 2 fish for every 1 coconut you are willing to give him. Another neighbor, Kwame, is also a fisherman, and he is willing to trade 3 fish for every 1 coconut. **(LO4)**

a. On a single figure, draw budget lines for trading with Friday and for trading with Kwame. (Put coconuts on the vertical axis.)

b. What is the slope of the budget line from trading with Friday?

c. What is the slope of the budget line from trading with Kwame?

d. Which budget line features a larger set of attainable combinations of coconuts and fish?

e. If you are going to trade coconuts for fish, would you rather trade with Friday or Kwame? Why?

5. Below is a production possibilities table for consumer goods (automobiles) and capital goods (forklifts): **(LO5)**

	Production Alternatives				
Type of Production	**A**	**B**	**C**	**D**	**E**
Automobiles	0	2	4	6	8
Forklifts	30	27	21	12	0

a. Show these data graphically. Upon what specific assumptions is this production possibilities curve based?

b. If the economy is at point *C*, what is the cost of one more automobile? Of one more forklift? Which characteristic of the production possibilities curve reflects the law of increasing opportunity costs: its shape or its length?

c. If the economy characterized by this production possibilities table and curve were producing 3 automobiles and 20 forklifts, what could you conclude about its use of its available resources?

d. Is production at a point outside the production possibilities curve currently possible? Could a future advance in technology allow production beyond the current production possibilities curve?

6. Referring to the table in problem 5, suppose improvement occurs in the technology of producing forklifts but not in the technology of producing automobiles. Draw the new production possibilities curve. Now assume that a technological advance occurs in producing automobiles but not in producing forklifts. Draw the new production possibilities curve. Now draw a production possibilities curve that reflects technological improvement in the production of both goods. **(LO6)**

7. On average, households in China save 40 percent of their annual income each year, whereas households in the United States save less than 5 percent. Production possibilities are growing at roughly 7 percent annually in China but only 3 percent in the United States. Use graphical analysis of “present goods” versus “future goods” to explain the difference between China’s growth rate and the U.S. growth rate. **(LO6)**

CHAPTER ONE APPENDIX

Graphs and Their Meaning

Economists often use graphs to illustrate economic models. By understanding these "pictures," you will more readily comprehend economic relationships.

Construction of a Graph

A graph is a visual representation of the relationship between two variables. The table in **Figure 1** is a hypothetical illustration showing the relationship between income and consumption for the economy as a whole. Because people tend to buy more goods and services when their incomes go up, it is not surprising to find in the table that total consumption in the economy increases as total income increases.

The information in the table is expressed graphically in **Figure 1**. Here is how it is done: We want to show visually how consumption changes as income changes. We therefore represent income on the horizontal axis of the graph and consumption on the vertical axis.

The vertical and horizontal scales of the graph reflect the ranges of values of consumption and income, marked in convenient increments. As you can see, the values on the scales cover all the values in the table.

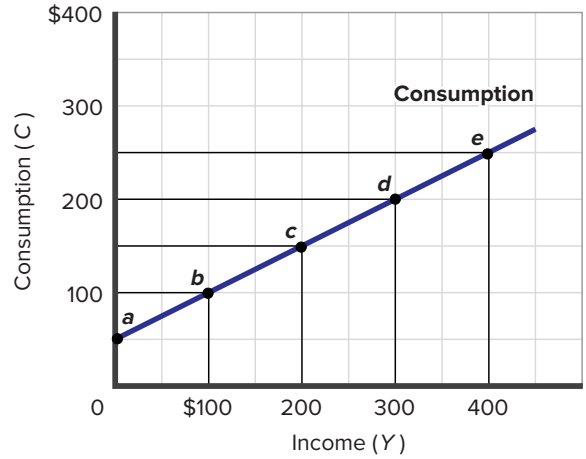
Because the graph has two dimensions, each point within it represents an income value and its associated consumption value. To find a point that represents one of the five income-consumption combinations in the table, we draw straight lines from the appropriate values on the vertical and horizontal axes. For example, to plot point *c* (the \$200 income–\$150 consumption point), we draw straight lines up from the horizontal (income) axis at \$200 and across from the vertical (consumption) axis at \$150. These lines intersect at point *c*, which represents this particular income-consumption combination. You should verify that the other income-consumption combinations shown in the table are properly located in the graph in **Figure 1**.

Finally, by assuming that the same general relationship between income and consumption prevails for all other incomes, we draw a line or smooth curve to connect these points. That line or curve represents the income-consumption relationship.

FIGURE 1

Graphing the direct relationship between consumption and income. Two sets of data that are positively or directly related, such as consumption and income, graph as an upward sloping line.

Income per Week	Consumption per Week	Point
\$ 0	\$ 50	*a*
100	100	*b*
200	150	*c*
300	150	*d*
400	250	*e*



If the curve is a straight line, as in **Figure 1**, we say the relationship is *linear.* (It is permissible, and even customary, to refer to straight lines in graphs as "curves.")

Direct and Inverse Relationships

direct relationship
The relationship between two variables that change in the same direction, for example, product price and quantity supplied.

The line in **Figure 1** slopes upward to the right, so it depicts a **direct relationship** between income and consumption. When two variables have a direct relationship (or positive relationship), they change in the same direction. An increase in consumption is associated with an increase in income; a decrease in consumption accompanies a decrease in income. When two sets of data are positively or directly related, they always graph as an upward sloping line, as in **Figure 1**.

inverse relationship
The relationship between two variables that change in opposite directions, for example, product price and quantity demanded.

In contrast, two sets of data may be inversely related. Consider the table in **Figure 2**, which shows the relationship between the price of basketball tickets and game attendance for Big Time University (BTU). Here we have an **inverse relationship** (or negative relationship) because the two variables change in opposite directions. When ticket prices decrease, attendance increases. When ticket prices increase, attendance decreases. The six data points in the table are plotted in the graph in **Figure 2**. An inverse relationship always graphs as a downward sloping line.

Dependent and Independent Variables

independent variable
The variable causing a change in some other (dependent) variable.

dependent variable
A variable that changes as a consequence of a change in some other (independent) variable; the "effect" or outcome.

Economists seek to determine which variable is the "cause" and which is the "effect." The **independent variable** is the cause or source; it is the variable that changes first. The **dependent variable** is the effect or outcome; it is the variable that changes because of the change in the independent variable. In our income-consumption example, income is the independent variable and consumption the dependent variable. Income causes consumption to be what it is rather than the other way around. Similarly, ticket prices (set in advance of the season and printed on the ticket) determine attendance at BTU basketball games; attendance at games does not determine the printed ticket prices for those games. Ticket price is the independent variable and the quantity of tickets purchased is the dependent variable.

FIGURE 2
Graphing the inverse relationship between ticket prices and game attendance. Two sets of data that are negatively or inversely related, such as ticket price and the attendance at basketball games, graph as a downward sloping line.

Ticket Price	Attendance, Thousands	Point
$50	0	*a*
40	4	*b*
30	8	*c*
20	12	*d*
10	16	*e*
0	20	*f*