

Student Edition Sample Chapter: Macroeconomics

AP<sup>®</sup>  
EDITION

23rd Edition

# economics

McConnell | Brue | Flynn



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Graw  
Hill

23rd Edition

# economics

McConnell | Brue | Flynn



# **Economics**

**AP<sup>®</sup> Edition**

**Twenty-Third Edition**

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ECONOMICS, TWENTY-THIRD EDITION

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# Brief Contents

## Microeconomics

### Unit 1: Basic Economic Concepts

- Chapter 1: Scarcity, Resource Allocation, and Economic Systems 2
- Chapter 2: Production Possibilities and Trade 43
- Chapter 3: Cost-Benefit Analysis and Choice 76

### Unit 2: Supply and Demand

- Chapter 4: Demand and Supply 103
- Chapter 5: Market Equilibrium 151
- Chapter 6: Intervention, International Trade, and Public Policy 179

### Unit 3: Production, Cost, and the Perfect Competition Model

- Chapter 7: Businesses and the Costs of Production 215
- Chapter 8: Profit and Perfect Competition 254

### Unit 4: Imperfect Competition

- Chapter 9: Monopoly and Price Discrimination 310
- Chapter 10: Monopolistic Competition, Oligopoly, and Game Theory 344

### Unit 5: Factor Markets

- Chapter 11: Factor Markets 382

### Unit 6: Market Failure and the Role of Government

- Chapter 12: Market Failures, Externalities, and Public Goods 425
- Chapter 13: Government Intervention and Inequalities 460

## Macroeconomics

### Unit 1: Basic Economic Concepts

- Chapter 1: Scarcity, Production Possibilities, and Trade 495
- Chapter 2: Demand, Supply, and Market Equilibrium 535

### Unit 2: Economic Indicators and the Business Cycle

- Chapter 3: Circular Flow, GDP, and Unemployment 576
- Chapter 4: Inflation and Business Cycles 617

### Unit 3: National Income and Price Determination

- Chapter 5: Aggregate Demand and Aggregate Supply 649
- Chapter 6: Fiscal Policy, Deficits, and Debts 703

#### **Unit 4: Financial Sector**

- Chapter 7: Money and Interest Rates 738
- Chapter 8: Money Markets and Monetary Policy 758

#### **Unit 5: Long-Run Consequences of Stabilization Processes**

- Chapter 9: Short-Run Policy and the Phillips Curve 820
- Chapter 10: Economic Growth 847

#### **Unit 6: Open Economy – International Trade and Finance**

- Chapter 11: The Balance of Payments and Exchange Rates 890
- Chapter 12: International Trade 910

# ABOUT THE AUTHORS

To Mac and Mem, Terri and Craig, and past instructors.



Campbell R. McConnell/  
McGraw Hill

**CAMPBELL R. MCCONNELL** earned his Ph.D. at 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 *Contemporary Labor Economics* and *Essentials of Economics*. 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.



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**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 economics 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 *Economic Scenes*, fifth edition (Prentice-Hall); *Contemporary Labor Economics*, twelfth edition; *Essentials of Economics*, fourth edition; and *The Evolution of Economic Thought*, eighth edition (Cengage Learning). For relaxation, he enjoys international travel, attending sporting events, and going on fishing trips.



Sean M. Flynn/McGraw Hill

**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 (of the Claremont Colleges) and is the author of *Economics for Dummies*, third edition (Wiley); *Essentials of Economics*, fourth 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*. Other hobbies include running, traveling, and cooking.

## AP Contributor: Student Edition

**ERIC DODGE** holds the Zeddies Chair in Economics and is a professor of economics at Hanover College in Hanover, Indiana. At Hanover College, Indiana's oldest private college, he teaches courses in Principles and Intermediate Microeconomics, Environmental Economics, Labor Economics, Introduction to Sustainability, and Econometrics. He is the author of *5 Steps to a 5: Microeconomics* and *5 Steps to a 5: Macroeconomics* and co-author with Melanie Fox of *Economics Demystified*. For over twenty years, he has served as a faculty consultant for the AP Economics program, and as an AP Reader, Table Leader, and Question Leader for the AP Economics reading. A native of Portland, Oregon, he received his bachelor's degree in Business Administration from the University of Puget Sound and his master's and doctoral degrees in Economics from the University of Oregon. He enjoys the outdoors, growing tomatoes, and dropping dad jokes on his unsuspecting kids. He splits his time between Madison and West Lafayette, Indiana and is married to Melanie Fox, with sons Eli, Max, and Theo.



Eric Dodge/Eric Dodge

## AP Contributors: Teacher Manual

**JULIE MEEK** holds a Master's Degree in Economics Education from the University of Delaware and a Master's Degree in Secondary Education from the University of North Texas. She has taught at Plano East Senior High school since 1997. Plano East Senior High school is a large suburban school located in Plano just north of Dallas, Texas. Julie started teaching AP Economics in 2003 and has been an AP Macroeconomics grader as well as a table leader and question leader at the AP Reading. In 2016, Julie became an AP workshop consultant presenting at seminars and Advanced Placement Summer Institutes for new and experienced teachers. As a grader of the AP Macroeconomics exam, she has had the opportunity for exceptional professional development. Using this experience, she has developed pedagogical strategies for skill and knowledge acquisition to share by writing the AP Skills Practice features in the student edition and updating the AP Teacher Manual.

**MARTHA SEVETSON RUSH** has been teaching AP Macroeconomics and AP Microeconomics since 1997. She has been an AP Reader in both Macroeconomics (2007–2014) and Macroeconomics (2015–Present), and has served on the College Board's AP Microeconomics Curriculum Design and Assessment Committee and Economics Instructional Design Committee, as well as serving as a College Board consultant since 2015.



# PREFACE

Welcome to the 23rd edition of *Economics*, AP Edition, America’s most innovative—and popular—economics learning resource.

We are pleased to present teachers and students with comprehensive revisions, insightful new content, and additions to both our digital resources and our industry-leading ancillary materials.

From real-life examples to cutting-edge learning resources, our modern approach makes learning and applying economics easier for both students and teachers.

- For students, *Economics* offers a student-centered learning environment that presents the subject matter in new and engaging ways.
- For teachers, a full and supportive instructional support package does the heavy lifting regarding basic concepts and ideas so teachers can focus their attention on helping students achieve the knowledge and skills needed for success in their AP Micro- or Macroeconomics course.

It is our sincere hope that our 23rd edition will continue to promote rapid learning and deep understanding. We have worked hard to ensure that *Economics* is comprehensive, analytical, and challenging—yet fully accessible to a wide range of students. Where needed, an extra sentence of explanation is provided. Brevity at the expense of clarity is false economy.

**Sean M. Flynn**

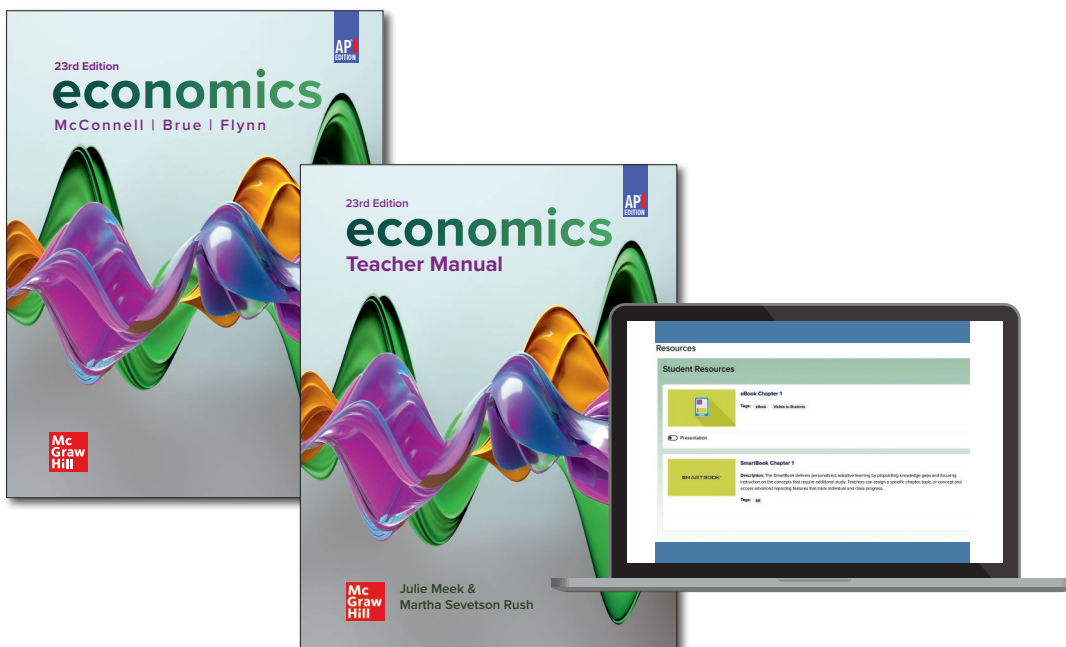
**Stanley L. Brue**

# The Most Trusted Source for AP Success

## A Student-Centered Approach

McConnell has always put students at the center of every revision and the new edition of *Economics* is no exception. Extensive market feedback and a keen focus on optimizing student outcomes drove this revision. Nearly every element—from the work itself to the digital tools and resources—has been updated and optimized for today’s AP students.

- **Unit and chapter content is laser-focused** on AP topics and learning objectives to ensure full coverage of both the AP Micro- and Macroeconomics frameworks.
- **The new, student-friendly design** makes the core text more accessible to high school students.
- **A complete split between AP Microeconomics and AP Macroeconomics** ensures the precise coverage of introductory topics based on the Course and Exam Descriptions.
- **New AP-style multiple choice and free response questions** are available at the end of each chapter and unit to give students even more practice.
- **SmartBook® has been updated and enhanced**, making our adaptive reading experience more personal, more accessible, and more productive for students anytime, anywhere, and on any device.
- **We have extended our ongoing efforts to accommodate the fast-paced, nonlinear learning style of contemporary students** by streamlining paragraphs, highlighting key examples, and introducing additional Key Graphs. These changes will help digital natives quickly scan for key concepts and core material. Scores of newly added headers, Quick Review boxes, and bullet points will assist them in rapidly identifying the most important ideas and information.



## Complete Alignment to the AP Frameworks

Decades of work by dedicated practitioners continues to enhance the user experience through the clear treatment of economic concepts, balanced coverage, patient explanations, and currency of information. Our new AP Edition builds on past strengths by keeping the tried-and-true core content while reorganizing the sequence to match the Micro- and Macroeconomics Course and Exam descriptions and adding a robust selection of AP-focused practice and activities to support student success.

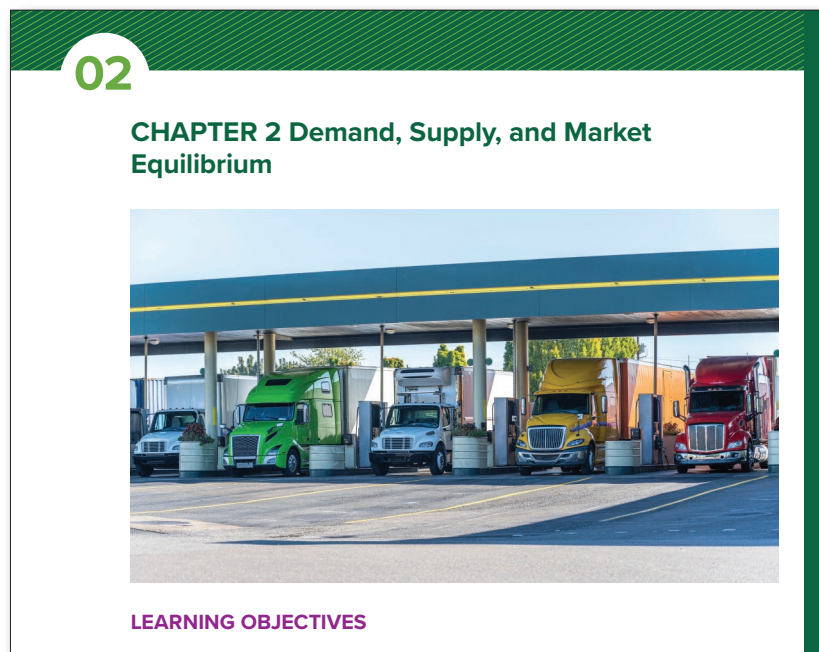
## Easy visual cues distinguish the content specific to each course

We've made it simple for teachers and students to find the course content they need by creating a complete micro/macro split. Each course is color coded for ease of use. Guidance on content overlap is provided in the AP Teacher Manual for those teaching both courses.



◀ **Microeconomics** chapters are indicated by the purple border and shading.

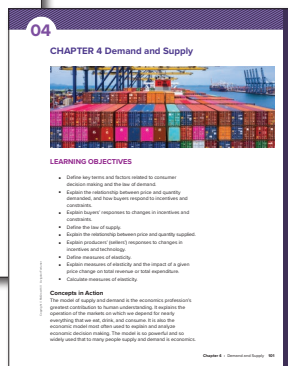
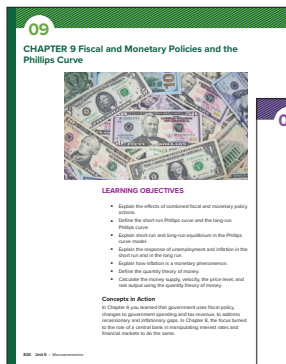
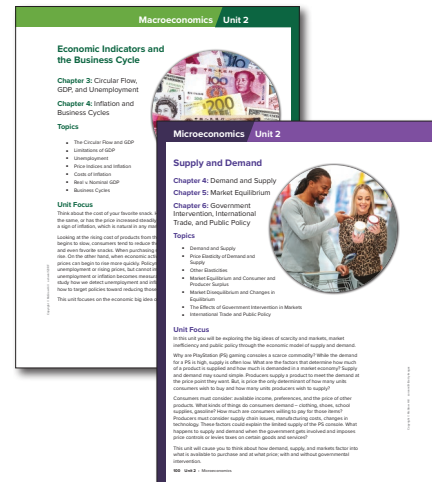
**Macroeconomics** chapters are indicated by the green border and shading. ▶



## Intuitive Organization

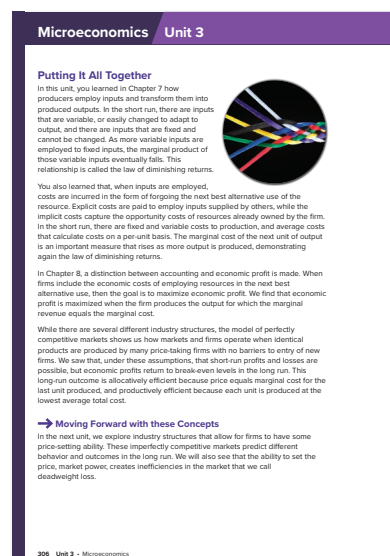
Course content is divided into units and chapters, matching the organization and structure of the AP Micro- and Macroeconomics frameworks. Features ensure instruction, practice, and mastery are discretely focused on the expectations of the AP course outcomes and, ultimately, exam success.

Each unit opens with the list of **AP Topics** and a **Unit Focus** that hooks students' attention and sets the stage for content to gain student buy-in right away.



Chapters list the **AP Learning Objectives** and begin with a **Concepts in Action** introduction to help students connect with the practical application of economic concepts.

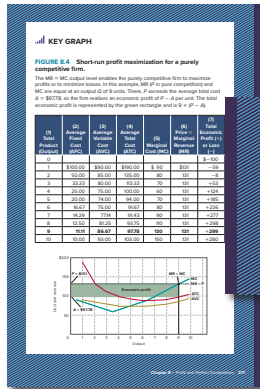
**Putting It All Together** features at the end of each unit show students how the content works together to extend their understanding.



**Moving Forward with These Concepts** sections inform students about other places in their study of economics where these concepts will reappear – perhaps with a different focus.

## Comprehensive Explanations at an Appropriate Level

Teachers can assign topics with the confidence that their students can independently read and comprehend the thorough-yet-accessible narrative. Multiple check points and learning aids support understanding and application, especially for the most challenging concepts.



**QUICK QUIZ FOR FIGURE 8.4**

- Curve MR is horizontal because:
  - product price falls as output increases.
  - the law of diminishing marginal utility is at work.
  - the market demand for this product is perfectly elastic.
  - the firm is a price taker.
- At a price of \$10 and 7 units of output:
  - MR exceeds MC, and the firm should expand its output.
  - total revenue is less than total cost.
  - AVC exceeds ATC.
  - the firm would earn only a normal profit.

► **Detailed Graphs** throughout the book help students visually grasp economic concepts and models. **Key Graphs** have self-contained Quick Quizzes to help students comprehend and apply essential models.

► **Quick Review** sections reexamine concepts in a clear and concise manner, providing the perfect study tool for chapter quizzes, tests, and the AP Exam.

**QUICK REVIEW 8.2**

- ✓ A firm will choose to produce if it can at least break even and then generate a normal profit.
- ✓ Profit is maximized, or loss minimized, at the output at which marginal revenue (or price in pure competition) equals marginal cost, provided that price exceeds variable cost at that output level.
- ✓ If the market price is below the minimum average variable cost, the firm will minimize its losses by shutting down.

**AP Economics Skills Practice**

**Skill 4.A:** Draw an accurately labeled graph or visual to represent an economic model or situation.

You have already practiced Skill 2.A earlier in this chapter. Now you will extend your understanding of how to show your knowledge on an accurately labeled graph. You are often asked to graph an economic concept or principle and asked to explain the cause of the situation, using two skills in the one free response.

**On the AP Exam**

For example, answer this sample free response question. Begin by identifying the model or market that is required. Remember the correct labeling system for that model or market, in this case labeling the graphs.

Assume that the market for greeting cards is perfectly competitive. Currently the greeting card firms are in long-run equilibrium.

- Draw a correctly labeled graph of the greeting card market and graph of a typical greeting card firm.
- On your graphs in part a, indicate the following:
  - The market equilibrium price,  $P$ , and quantity,  $Q$ .
  - The firm's quantity,  $Q_{firm}$ .
  - Shade the firm's area of economic profit.

Remember that perfect competition requires side-by-side graphs. Be careful to label which is the market graph and which is the firm graph. You MUST connect the two graphs by the market price creating the firm's MR (MR =  $D = AR = P$ ) in a way that is necessary for the firm's profit maximization. MR is marginal revenue,  $D$  is demand,  $AR$  is average revenue, and  $P$  is price.

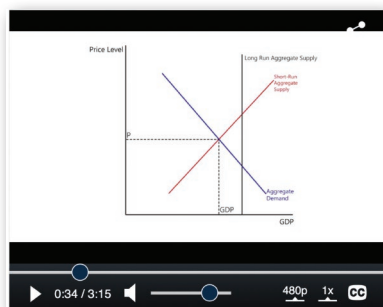
Correctly labeled graph:

Remember that the area of profit is price minus ATC times the quantity. So, both the price and ATC are found along the quantity of output line.

► **New AP Skills Practice** features include explanation and practical application of the AP Economics Skills, including graphing and explaining concept chains. Students will benefit from these reminders of the skills that will be assessed on the AP Exam.

## Extend Student Learning with Digital Resources

The new **Adaptive Econ Prep: Math and Graphing** tool gives students math remediation and experience with the graphing fundamentals that are prerequisites to success.



► **Connect the Dots** videos help students with challenging concepts such as externalities, exchange rates, and the loanable funds market.

**Chapters / Modules**

- Select All (7 Chapters / Modules)
- Trade
- Production Possibilities
- Law of Demand and the Demand Curve
- Law of Supply and the Supply Curve
- Equilibrium Price and Quantity
- Price Elasticity Coefficient and Formula
- Cross Elasticity and Income Elasticity of Demand

## Connecting to Students' Everyday Lives

Students absorb economic theory most easily when it directly relates to their experiences and is exemplified with current examples. To that end, the 23rd edition covers many topics and events that reflect the issues of the day.

**CONSIDER THIS ...**  
**Is Facebook Free?**  
 Facebook spends over \$50 billion every year on platform, running server farms, and paying its employees. Facebook found a way to overcome scarcity?  
 No, it hasn't. Scarcity is permanent. But Facebook found a way to more than cover its costs without charging a penny. Facebook's solution is to charge advertisers to pay Facebook over \$100 billion per year to be targeted to specific individuals.

**LAST WORD**  
**Pitfalls to Sound Economic Reasoning**  
 Because they affect us so personally, we often have trouble thinking accurately and objectively about economic issues.

**GLOBAL PERSPECTIVE 4.1**  
**CROSS ELASTICITY OF DEMAND BETWEEN EDUCATION SPENDING AND INCREASES IN THE PRICE OF FOOD, SELECTED NATIONS**  
 The amount by which education spending falls when food prices go up is higher in lower-income countries like Tanzania and Vietnam, where family budgets are tighter and any increase in food costs is more likely to mean cutbacks on education spending. The decline in education spending is noticeably smaller in high-income countries like Japan and the United States, where family budgets are less constrained.

Country	Cross Elasticity
Tanzania	-0.28
Benin	-0.25
Vietnam	-0.22
Ecuador	-0.18
Zimbabwe	-0.15
Russia	-0.12
Argentina	-0.08
South Korea	-0.05
Japan	-0.02
United States	-0.01

**SOURCE** Economic Research Service, United States Department of Agriculture.

◀ The **Consider This...**, **Last Word**, and **Global Perspective** features drive home key ideas in an accessible, student-friendly manner.

## Extend Student Learning with Digital Resources

**ECON Everyday**  
 Econ Everyday for Everyone

◀ The **ECON Everyday Blog** saves teachers time by bringing current, student-centered content into their courses. Short articles written for AP-level students are available in the digital resources, and tagged by topic to make them easily searchable. Discussion questions help teachers drive the conversation forward.

**Application-Based Activities (ABAs)** are immersive decision-making simulations that put students into the role of everyday economists. Students practice their economics thinking and problem-solving skills as they apply course concepts to interactive digital scenarios.

**NEWS FLASH**  
 LIVE  
 Real and Nominal GDP

**McGraw Hill**

The wages of Mexican factory workers are about five times less per hour than those of U.S. factory workers.

What is the primary reason that all the remaining U.S. manufacturing jobs have not yet been off-shored to Mexico and other low-wage countries?

- Mexico and other low-wage countries can't accumulate enough capital.
- Overall (total) production costs matter more than just labor costs by themselves.
- U.S. companies don't have enough people who speak foreign languages.
- U.S. consumers are biased against foreign goods.

◀ **Guided Peer Instruction** activities are student-led and allow students to apply their own learning to teach others in a way that more than doubles understanding relative to lecture-based formats.

## Focused AP Test Practice and Prep

2. Refer to the graph depicting U.S. domestic market for corn. How many bushels of corn, if any, will the United States export or import at a world price of \$1, \$2, \$3, \$4, and \$5? Use this information to construct the U.S. export supply curve and import demand curve for corn. Suppose that the only other corn-producing nation is France, where the domestic price is \$4. Which country will export corn, and which country will import it?

**AP Exam Practice**

**Multiple Choice**

Directions: Each of the questions or incomplete statements below is followed by five answers or completions. Select the one that is best in each case.

1. When an excise tax is imposed on a competitive market with no externalities, deadweight loss occurs because

- consumers pay a higher price per unit than they did before the tax.
- the quantity exchanged is less than the quantity where the marginal benefit equals the marginal cost to society.
- producers receive a lower price per unit than they did before the tax.
- the government collects tax revenue.
- the total net benefit to society remains unchanged.

2. When a price floor is created in competitive markets, we expect to see

- a transfer of producer surplus to consumer surplus.
- the collection of government revenue.
- an increase in total surplus to society.
- a persistent surplus of goods or service.
- lower prices for consumers.

208 Unit 2 - Microeconomics

**AP Exam Practice**

Question 10 refers to the following graph.

10. If an excise tax of  $(P_2 - P_1)$  dollars is placed on the production of each unit, government tax revenue is equal to:

- $\frac{1}{2} \times (P_2 - P_1) \times Q_1$
- $\frac{1}{2} \times (P_2 - P_1) \times Q_2$
- $\frac{1}{2} \times (P_2 - P_1) \times (Q_2 - Q_1)$
- $\frac{1}{2} \times (P_2 - P_1) \times Q_1 \times Q_2$
- $P_2 \times Q_1$

**Free Response**

Directions: Respond to all parts of the question. Use correctly-labeled diagrams, if useful or required, in explaining your answers. A correctly-labeled diagram must have all axes and curves clearly labeled and must show directional changes.

1. The market for poppsicles in Sauna City is competitive and in equilibrium.

- Draw a correctly-labeled graph of the market for poppsicles, labeling the equilibrium price  $P_m$  and equilibrium quantity  $Q_m$ .
- At the equilibrium price and quantity, the price elasticity of demand is equal to 2.0 and the price elasticity of supply is equal to 0.50. If the price of poppsicles fell by 7%, would total spending on poppsicles rise, fall, or remain the same? Explain.

Chapter 6 - Government Intervention, International Trade, and Public Policy 213

AP Exam Practice includes multiple-choice and free-response questions matching the style and rigor of the AP Exams. Including the complete Practice Exams at the end of the book, these question sets provide students with ample practice.

## Extend Assessment Opportunities with Digital Resources

Digital Test Banks include AP-style multiple-choice and free-response questions and content review questions for mastery.

**Question 26**

Short Free-Response Question

Directions: Respond to all parts of the question. Include correctly-labeled diagrams, if useful or required, in explaining your answers. A correctly-labeled diagram must show all axes and curves clearly labeled and must show directional changes.

Assume a closed economic system in which there is neither foreign trade nor a government sector.

- Construct a correctly-labeled circular flow diagram that illustrates each of the following:
  - money flow and exchange of goods and services between households and businesses
  - money flow and exchange of factors of production between households and businesses
- Label each market in the model.

Instructions

1000 of 1000 words remaining

**Microeconomics Unit 1 Basic Economic Concepts**

**Unit 1 Overview**

Unit 1 introduces the fundamental economic problem: Resources are scarce, while human needs and wants are unlimited. Therefore, individuals and societies must make choices. The unit starts with a focus on scarcity and the opportunity costs of decisions. The production possibilities curve model is introduced and used to illustrate opportunity cost, productive efficiency, inefficiency, and growth. Next, the theory of comparative advantage is described, with a focus on calculating how trading partners should specialize and trade to maximize total production, as well as determining mutually beneficial terms of trade. The unit concludes with an exploration of economic decision making, focusing on a cost-benefit analysis. Some economic decisions are undertaken by comparing total benefits with total costs, and other decisions permit decision makers to compare marginal benefits with marginal costs. An introduction to the key assumptions associated with consumer choice theory, such as diminishing marginal utility and budget constraints, culminates in this section with the concept of marginal utility per dollar, which allows consumers to allocate their limited income according to the utility-maximizing rule.

AP Unit Reviews provide a concise overview of each unit's content for quick review.

Complete Digital and Printable Practice Exams (two for each course) allow teachers to assign in their preferred mode and set AP Exam-like parameters for a realistic testing experience.

**SECTION I MULTIPLE-CHOICE QUESTIONS**  
60 QUESTIONS TIME: 70 MINUTES

Directions: Each of the questions or incomplete statements below is followed by five answers or completions. Select the one that is best in each case.

1. The graph shows the production possibilities curve for an economy in which both pizzas and industrial robots are produced. Given this graph, which of the following must be true?

- Point D is allocatively efficient.
- Point W is productively inefficient.
- Point C is productively efficient.
- Point B is preferable to Point D.
- Opportunity costs are constant.

## Power Up the Test Prep with 5 Steps to a 5

The number-one choice for AP teachers, 5 Steps to a 5 test prep guides are now available as an add-on for your AP Micro- or Macroeconomics course.



Both **5 Steps to a 5: AP Macroeconomics** and **5 Steps to a 5: AP Microeconomics** are robust in-class resources that reinforce critical concepts, offer extensive AP Exam practice, and help students walk into test day feeling prepared and confident.

Each workbook includes:

- Full-length practice tests that align with the latest College Board requirements,
- hundreds of practice exercises with answer explanations,
- an overview of all the most important AP Micro- and Macroeconomics topics,
- and proven test-taking strategies from veteran AP teachers.

### Review and Test Prep You Can Trust

5 Steps guides are useful tools throughout the school year, and each begins with a diagnostic test to determine students' strengths and challenges.

Take the Diagnostic Exam < 23

**Diagnostic Exam: AP Macroeconomics**

**SECTION I**  
Time—70 Minutes  
60 Questions

For the following multiple-choice questions, select the best answer choice and record your choice on the answer sheet provided.

1. Which of the following is an example of capital as an economic resource?  
(A) A cement mixer  
(B) A barrel of crude oil  
(C) A registered nurse  
(D) A share of corporate stock  
(E) A bachelor's degree

Figure D.1 shows a production possibilities curve for two nations, X and Y, that can produce both crepes and paper. The curve is concave to the origin. Point W is on the curve, point X is on the curve, and point Z is on the curve.

Question 2 is based on the production possibilities of two nations that can produce both crepes and paper.

NATION X		NATION Y	
Crepes	Paper	Crepes	Paper
0	3	0	5
9	0	5	0

3. Using Figure D.1, which of the following movements would be described as economic growth?  
(A) W to X  
(B) X to Y  
(C) W to Y  
(D) Z to W  
(E) X to Z

Day 64

**NAME THAT CURVE!**

The following short-run cost curves are unrammed. Your job is to correctly identify them, without the use of your books and/or class notes.

295

### Bellringers for Every Day of the Year

5 Minutes to a 5 is a group of 180 five-minute activities that reinforce the most vital course material and give students the edge they need.

### Time-saving Teacher Resources

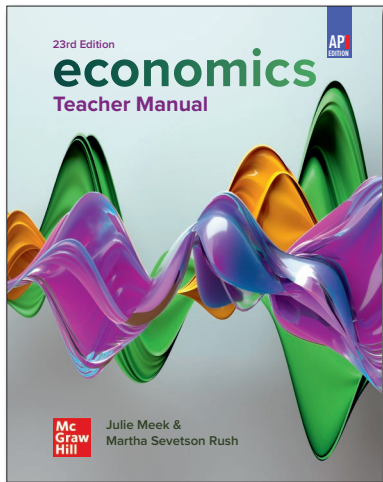
A teacher manual is included with each guide to help maximize classroom time, give tips on curriculum management, and help build a strategy for the entire school year.

Semester Pacing Schedule			
TOPICS	% OF EXAM	PACING	5 STEPS TO A 5
Unit 1: Basic Economic Concepts	15–10%	8–10 Class Periods	Chapter 5 pp. 51–64
Unit 2: Economic Indicators and the Business Cycle	12–17%	9–11 Class Periods	Chapters 6 & 7 pp. 65–100
Unit 3: National Income and Price Determination	17–27%	10–12 Class Periods	Chapters 8 & 9 pp. 101–133
Unit 4: Financial Sector	18–23%	11–13 Class Periods	Chapter 9 pp. 114–133
Unit 5: Long Run Consequences and Stabilization Policies	20–30%	8–10 Class Periods	Chapter 10 pp. 134–148
Unit 6: Open Economy—International Trade and Finance	10–13%	5–7 Class Periods	Chapter 11 pp. 149–168
Year-Long Pacing Schedule			
TOPICS	% OF EXAM	PACING	5 STEPS TO A 5
Unit 1: Basic Economic Concepts	15–10%	16–20 Class Periods	Chapter 5 pp. 51–64
Unit 2: Economic Indicators and the Business Cycle	12–17%	18–22 Class Periods	Chapters 6 & 7 pp. 65–100
Unit 3: National Income and Price Determination	17–27%	20–24 Class Periods	Chapters 8 & 9 pp. 101–133
Unit 4: Financial Sector	18–23%	22–26 Class Periods	Chapter 9 pp. 114–133
Unit 5: Long Run Consequences and Stabilization Policies	20–30%	16–20 Class Periods	Chapter 10 pp. 134–148
Unit 6: Open Economy—International Trade and Finance	10–13%	10–14 Class Periods	Chapter 11 pp. 149–168

Visit [mheonline.com/5Steps](http://mheonline.com/5Steps) for more information.



## Robust AP Teacher Manual



The updated AP Teacher Manual by Julie Meek builds upon the work of Martha Sevetson Rush and includes additional features and a new organization that matches the reorganized Student Edition. The manual is available in print and an online version is included with the digital resources.

### Key features include:

- **Sample syllabi** and **pacing guides** for each course
- **Unit and chapter overviews** featuring advice for teaching the content of each course and guidance if teaching both Micro- and Macroeconomics
- **Chapter-level** features, such as:
  - **Addressing the AP Framework** highlighting the Topics and Skills
  - **Exam Focus** explaining where chapter content commonly appears on the AP Economics Exams
  - **Teaching Suggestions** that contain both **Strategies** and **Stumbling Blocks** to help students gain mastery
  - Leveled **English Learner** support
  - Complete **answers and explanations** for all discussion questions, problems, and AP Exam Practice in the Student Edition
  - See page xviii for a full list of teacher resources.

## A NOTE ON ACCESSIBILITY

We are proud that our publisher, McGraw Hill, is fully committed to accessibility, as is made clear by McGraw Hill's Accessibility Statement:

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One aspect of accessibility is the ability of students from all backgrounds to instantly and immediately open, use, and benefit from every learning tool available to them no matter what device they are using to access the Internet and our content.

- We are consequently very happy to announce that *Economics* takes full advantage of McGraw Hill's free K-12 Portal app. Available for both iOS and Android devices, the app gives students access to all of the McGraw Hill learning tools, including SmartBook, Recharge, and our Adaptive Learning Assignments. Students using the K-12 Portal app can even take notes, highlight key material, and complete assignments *offline* knowing that all their work will sync the next time they connect to the Internet.

# Personalized, Dynamic Digital Resources

## Your Online Course on my.mheducation.com

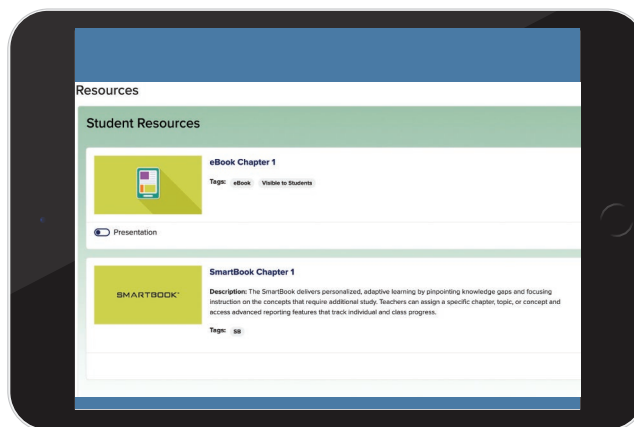
*Economics* is enriched with digital resources including videos illustrating concepts and processes, interactivities, discussion ideas, and adaptive learning tools that provide students with an opportunity to contextualize and apply their understanding.

### For Students

#### More Practice. More Interactivity. More Opportunities.

Resources for students include:

- Interactive eBook and adaptive SmartBook
- Guided Peer Instruction
- Math Prep
- Economics Everyday Blog
- Application-Based Activities
- Adaptive Econ Prep – Math and Graphing
- Connect the Dots Videos
- Economics and Ethics
- AP Practice and Test Prep
- Two Full Practice Exams for Each Course

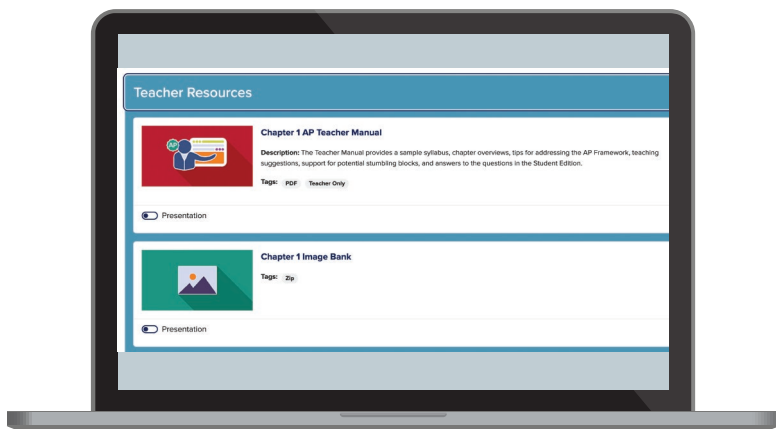


### For Teachers

#### More Support. More Data. More Enhancements.

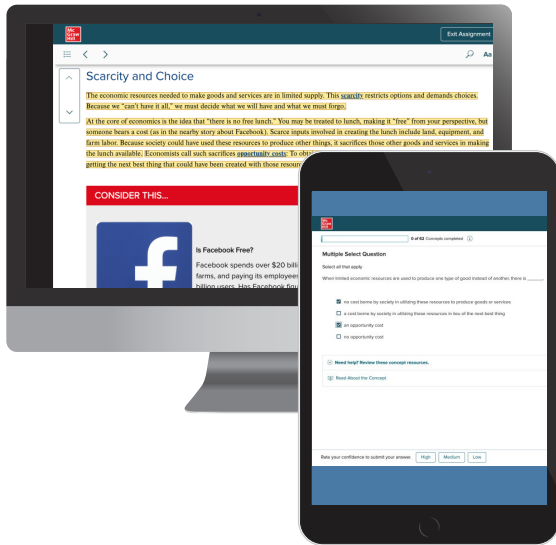
Resources for teachers include:

- Complete AP Teacher Manual for Micro- and Macroeconomics
- Benchmarks and Pacing
- AP Suggested Assignments
- Micro- and Macroeconomics complete correlations
- Accessible PowerPoint Presentations
- Chapter-level Content Quizzes and Assessments
- Chapter-level AP Exam-style Practice Questions
- English Learner Activities
- Digital Image Library
- Complete Answer Keys



## Adaptive Learning with SmartBook®

SmartBook® delivers personalized, adaptive learning tailored to each student's individual needs by pinpointing knowledge gaps and focusing instruction on the concepts that require additional study. Teachers can assign a specific chapter, topic, or concept and access advanced reporting features that track individual and class progress with actionable insights to inform in-class instruction.



### For Students

#### More Personalized. More Productive. More Accessible.

As students move through the material, multiple data points are captured to sequence and pace learning for each student's unique needs.

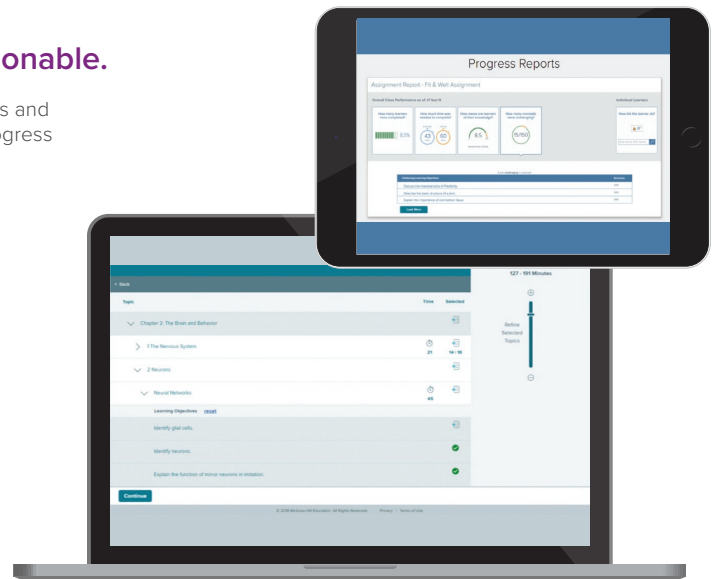
- **Focused Instruction:** Yellow highlights help students easily identify their assigned learning concepts.
- **Targeted Remediation:** Blue highlights bring focus to the contents and concepts that require additional study.
- **Meaningful Practice:** Practice sets with instant feedback allow students to ask for guidance and rate their confidence level.
- **Recharged Learning:** Students can recharge their learning by accessing previously completed assignments with personalized recommendations.
- **Mobile Ready:** Assignments are accessible both online and offline with the *ReadAnywhere* app.

### For Teachers

#### More Control. More Prepared. More Actionable.

Teachers can organize assignments to suit their students' needs and align to their course outcomes while easily tracking student progress at the individual and/or class level.

- **Flexible Assignments:** Assign homework down to the sub-topic level and time-on-task.
- **Manageable Content:** Assign content across multiple chapters to establish the context for the learning ahead and make connections between chapters, topics, and concepts.
- **Results-based Support:** Provide personalized review assignments that target each student's areas of weakness, better preparing them for upcoming assessments.
- **Actionable Reports:** Advanced reporting features track individual and class progress with data-driven insights.



## Truly Aligned to the Course and Exam Descriptions

### AP Edition Chapter-by-Chapter Changes

Each chapter of *Economics*, AP Edition, contains data updates and numerous revised examples that will be fresh and relevant for today's students. Chapter-specific updates include new boxed features additional Key Graphs, and substantial revisions to the core content.

As mentioned earlier, we have reorganized the content to match the scope and sequence of the Microeconomics and Macroeconomics Course and Exam Descriptions and a complete micro/macro split. We have also added new material to keep the book current and hone the focus on AP content. Specific changes include:

**Microeconomics Chapter 1: Scarcity, Resource Allocation, and Economic Systems** features updated examples, a revised presentation of capital (and, thus, investment) that highlights the fact that “capital” includes intangible intellectual capital as well as physical capital, and a streamlined presentation of the circular flow model. By popular demand, we have also brought back the Last Word about faulty economic reasoning that appeared in several earlier editions.

**Microeconomics Chapter 2: Production Possibilities and Trade** contains extensive data updates, a new Key Word (*trade*), and a highly revised and substantially more intuitive presentation of absolute and comparative advantage.

**Microeconomics Chapter 3: Cost-Benefit Analysis and Choice** contains significant new material on cost-benefit analysis including detailed scenarios.

**Microeconomics Chapter 4: Demand and Supply** includes several new examples and new material on how network and congestion effects shift demand curves.

**Microeconomics Chapter 5: Market Equilibrium** contains new material on how changes in supply and demand affect consumer and producer surplus and the role that elasticity plays in the changes. Also, a new Last Word on how rapid shifts in supply and demand prompted dramatic price changes and shortages during the COVID-19 pandemic.

**Microeconomics Chapter 6: Intervention, International Trade, and Public Policy** includes new material on subsidies and the deadweight loss created with interventions made on efficient market outcomes.

**Microeconomics Chapter 7: Businesses and the Costs of Production** includes an improved definition of explicit costs, several updated examples, a more intuitive explanation of sunk costs, and a new Last Word on cloud computing and economies of scale.

**Microeconomics Chapter 8: Profit and Perfect Competition** features several new examples, a clarified explanation of the  $P = MC$  rule for competitive profit maximization, and a new Consider This about the decreasing-cost characteristics of the lithium-ion battery industry on which electric cars depend. There is also a new

Last Word on how firms in various industries implemented the short-run shutdown condition during the COVID-19 pandemic.

***Microeconomics Chapter 9: Monopoly and Price Discrimination*** has several new examples and an expanded treatment of network effects as a cause of monopoly power.

***Microeconomics Chapter 10: Monopolistic Competition, Oligopoly, and Game Theory*** contains several new examples, revised Key Word definitions, a new Last Word on how the worldwide credit-card oligopoly engages in nonprice competition via credit-card rewards programs, and brief clarifications of the role of advertising in shifting and tilting the demand curves of monopolistically competitive firms.

***Microeconomics Chapter 11: Factor Markets*** contains data updates, new examples, and wording improvements to enhance clarity.

***Microeconomics Chapter 12: Market Failures, Externalities, and Public Goods*** contains a new introduction of the concepts of how marginal social benefits and costs differ from marginal private benefits and costs and includes coverage of how negative externalities can come from consumption, and positive externalities can come from production. Several updates in both the text and in figures emphasize the concepts of maximum willingness to pay (demand curve) and minimum willingness to accept (supply curve), thereby enhancing student understanding of both consumer and producer surplus as well as the efficiency losses that result from over- and under-production.

***Microeconomics Chapter 13: Government Intervention and Inequalities*** contains new material on how price controls can improve efficiency in monopoly product markets or monopsony labor markets. The distinction is made between per-unit taxes and lump-sum taxes and demonstrates that lump-sum taxes do not affect a firm's output decision, while a per-unit tax does. This chapter's Last Word on Universal Basic Income has also been heavily revised due to the natural experiment provided by those enhanced and extended unemployment benefits.

***Macroeconomics Chapter 1: Scarcity, Production Possibilities, and Trade*** features updated examples, a revised presentation of capital (and, thus, investment) that highlights the fact that "capital" includes intangible intellectual capital as well as physical capital, and contains extensive data updates, and a highly revised and substantially more intuitive presentation of absolute and comparative advantage.

***Macroeconomics Chapter 2: Demand, Supply, and Market Equilibrium*** contains a new Last Word on how rapid shifts in supply and demand prompted dramatic price changes and shortages during the COVID-19 pandemic.

***Macroeconomics Chapter 3: Circular Flow, GDP, and Unemployment*** benefits from data updates, revisions to our presentation of the income and allocation approaches to totaling up GDP, and a revised presentation of why financial transactions are excluded from GDP and a streamlined presentation of the circular flow model.

**Macroeconomics Chapter 4: Inflation and Business Cycles** has extensive data updates and new material that relates the chapter's key concepts to the COVID-19 recession.

**Macroeconomics Chapter 5: Aggregate Demand and Aggregate Supply** contains additional explanation of the equilibrium in the AD-AS model, improved definitions of two Key Words (*short-run aggregate supply* and *long-run aggregate supply*) as well as substantial new material relating the AD-AS model to the COVID-19 recession.

**Macroeconomics Chapter 6: Fiscal Policy, Deficits, and Debts** incorporates several discussions of fiscal policy before and during the COVID-19 pandemic, especially with respect to the sheer magnitude of the stimulus but also with respect to other things, like how unusual the stimulus was in not having any recognition lag and, compared with typical recessions, hardly any administrative or operational lag, either.

**Macroeconomics Chapter 7: Money and Interest Rates** combines and streamlines coverage of money and other financial assets, including how interest rates serve as the opportunity cost of holding money. We have added discussions of debit cards as a means of accessing checkable deposits, electronic cash-transfer systems like PayPal and Venmo, and a new Last Word about cryptocurrencies, including Bitcoin and central-bank digital currencies. Please also note the subtle but profound revisions that were necessitated by the Fed's changing the definitions of the *M1* and *M2* measures of the money supply such that noncheckable savings deposits are now part of *M1* rather than *M2*. That definitional adjustment has produced the strange result that *M2* is now only about 5 percent larger than *M1* (whereas, previously, *M2* had always been at least triple the size of *M1*).

**Macroeconomics Chapter 8: Money Markets and Monetary Policy** is presented in both the traditional and current frameworks to better match the AP curriculum. The traditional treatment of monetary policy begins with a fractional reserve banking system in which the central bank prescribes a reserve requirement. In such a "limited reserves" system, the central bank can expand or contract the money supply, most often by buying or selling government securities to commercial banks. The chapter then describes how central banks, like the Federal Reserve, devised new monetary tools to combat the immense challenges posed by the 2008 Great Recession. The result of these new tools is a banking system described as having "ample reserves" and the elimination of the reserve requirement. In this system the central bank uses administrated interest rates to move the "policy rate," the federal funds rate in the U.S., higher or lower. When the policy rate increases, it acts as an incentive to reduce the amount of money circulating in the economy. When the policy rate decreases, it incentivizes a greater amount of money in circulation. The coverage of both limited reserves and ample reserves banking systems is a way of allowing teachers and students to adapt to the transition of the curriculum between monetary policy before and after the upheaval of 2008–2010.

**Macroeconomics Chapter 9: Short-Run Policy and the Phillips Curve** contains new material that stresses the short-run impact of fiscal and monetary policy and the tradeoff between higher unemployment rates and lower inflation rates, before introducing the Phillips Curve.

**Macroeconomics Chapter 10: Economic Growth** contains numerous data updates and several wording improvements for clarity. The chapter is organized so that students understand the connection between the macroeconomy and budget deficits or surpluses and the debate over whether a growing national debt affects long-run economic growth through changes to the market for loanable funds.

**Macroeconomics Chapter 11: The Balance of Payments and Exchange Rates** offers extensive data updates, various edits for concision and clarity, and a new Last Word describing the Exchange Rate Trilemma. The chapter introduces foreign exchange and markets for currency, demonstrating how a currency can increase in price (appreciate) or decrease (depreciate) due to changes to either the demand or supply of that currency.

**Macroeconomics Chapter 12: International Trade** contains significant new content to address how the College Board presents the connection between fiscal and monetary policies, currency markets, and balance of payment accounts. Through additional examples and graphs, more clarification is provided for the relationship between two currency markets. It is shown that when the demand for one currency rises (it appreciates), there must be an increased supply of the other currency (it depreciates), causing a reciprocal change in value of each.



## REVIEWERS

The 23rd edition has also greatly benefited from a number of perceptive faculty reviews. The reviewers, listed in the next section, were a rich source of suggestions for this revision. To each of you, and to any others we may have inadvertently overlooked, thank you for your considerable help in improving *Economics*.

### Reviewers supporting the 23rd Edition:

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## Key Graphs: Microeconomics

1.3	The Circular Flow Diagram	22
2.1	The Production Possibilities Curve	46
2.7	Trading Possibilities lines and the Gains from Trade	66
3.2	Total and Marginal Utility	85
5.1	Equilibrium Price and Quantity	151
6.6	Efficiency Loss (or Deadweight Loss) of an Excise Tax Paid by Producers	187
6.12	The Economic Effects of Protective Tariffs and Import Quotas	200
7.1	The Law of Diminishing Returns	221
7.4	The Relationship of the Marginal-Cost Curve to the Average-Total-Cost and Average-Variable-Cost Curves	232
7.7	The Long-Run Average-Total-Cost Curve: Unlimited Number of Plant Sizes	239
8.4	Short-Run Profit Maximization for a Purely Competitive Firm	271
8.7	The $P = MC$ Rule and the Competitive Firm's Short-Run Supply Curve	278
8.14	Long-Run Equilibrium: A Competitive Firm and Market	295
9.4	Profit Maximization by a Pure Monopolist	323
9.6	Inefficiency of Pure Monopoly Relative to a Purely Competitive Industry	330
10.1	A Monopolistically Competitive Firm: Short Run and Long Run	352
11.2	Labor Supply and Labor Demand in	390
	(a) a Purely Competitive Labor Market and	
	(b) a Single Competitive Firm	
12.5	Negative and Positive Externalities	432
13.9	Rate Regulation of a Natural Monopoly	469
13.10	The Lorez Curve and Gini Ratio	476

## Key Graphs: Macroeconomics

1.1	The Production Possibilities Curve	505
1.7	Trading Possibilities Lines and the Gains from Trade	524
2.6	Equilibrium Price and Quantity	555
3.1	The Circular Flow Diagram	578
5.3	The Multiplier Process ( $MPC = 0.75$ )	658

<b>5.9</b>	The Equilibrium Price Level and Equilibrium Real GDP	680
<b>5.11</b>	A Recession Resulting from a Leftward Shift of Aggregate Demand When the Price Level is Downwardly Inflexible	684
<b>6.1</b>	Expansionary Fiscal Policy with the Multiplier Effect	705
<b>8.2</b>	The Demand for Money, the Supply of Money, and the Equilibrium Interest Rate in the Market for Money	777
<b>11.1</b>	The Market for Foreign Currency (Pounds)	900

# Table of Contents

Brief Contents	iv
About the Authors	vi
Preface	viii
Key Graphs	xxv

## Microeconomics

### Unit 1: Basic Economic Concepts 1

#### Chapter 1

##### Scarcity, Resource Allocation, and Economic Systems 2

##### Concepts, Principles, and Models 3

##### The Economic Perspective 4

Scarcity and Choice

**AP Economics Skills Practice Skill 1.A** 5

**Consider This:** *Is Facebook Free?* 6

##### Society's Economizing Problem 6

Scarce Resources / Resource Categories

##### Microeconomics and Macroeconomics 8

Micronomics / Macroeconomics / Positive and Normative Economics / Economic Systems / Laissez-Faire Capitalism / The Command System / The Market System

##### Characteristics of the Market System 12

Private Property / Self-Interest / Competition / Markets and Prices / Specialization / Active, but Limited, Government

##### Five Fundamental Questions 16

What Will Be Produced? / How Will the Goods and Services Be Produced? / Who Will Get the Output? / How Will the System Accommodate Change? / How Will the System Promote Technological Progress?

**Consider This:** *Bitcoin and Cheap Electrons* 17

##### The Circular Flow Model 22

Households / Businesses / Product Market / Resource Market

**Last Word:** *Pitfalls to Sound Economic Reasoning* 26

##### End-of-Chapter Material 28

<b>Chapter 2</b>	
<b>Production Possibilities and Trade</b>	44
<b>Production Possibilities Model</b>	44
Production Possibilities Table / Production Possibilities Curve / Law of Increasing Opportunity Costs / Optimal Allocation	
<b>AP Economics Skills Practice Skill 1.C</b>	50
<b>Unemployment, Growth, and the Future</b>	51
A Growing Economy / Present Choices and Future Possibilities	
<b>AP Economics Skills Practice Skill 4.A</b>	55
<b>Comparative Advantage and Trade</b>	56
<b>The Economic Basis for Trade</b>	56
Comparative Advantage / Two Isolated Nations / Specializing Based on Comparative Advantage / Terms of Trade / Gains from Trade / Trade with Increasing Opportunity Costs	
<b>Consider This: A CPA and a House Painter</b>	59
<b>Chapter 3</b>	
<b>Cost-Benefit Analysis and Choice</b>	75
<b>Cost-Benefit Analysis</b>	76
<b>AP Economics Skills Practice Skill 3.C</b>	78
<b>Consider This: Did Zuckerberg, Durant, and Grande Make Good or Bad Choices?</b>	79
<b>Marginal Analysis and Consumer Choice</b>	79
Individual's Economizing Problem / Limited Income / Unlimited Wants / A Budget Line	
<b>Law of Diminishing Marginal Utility</b>	83
Terminology / Total Utility and Marginal Utility	
<b>Theory of Consumer Behavior</b>	87
Consumer Choice and the Budget Constraint / Utility-Maximizing Rule / Numerical Example	
<b>End-of-Chapter Material</b>	91
<b>End-of-Unit Material</b>	96
<b>Unit 2: Supply and Demand</b>	100
<b>Chapter 4</b>	
<b>Demand and Supply</b>	101
<b>Markets</b>	102
<b>Demand</b>	102
Law of Demand / The Demand Curve / Market Demand / Changes in Demand / Changes in Quantity Demanded	

<b>Supply</b>	112
Law of Supply / The Supply Curve / Market Supply / Determinants of Supply / Changes in Supply / Changes in Quantity Supplied	
<b>AP Economics Skills Practice Skill 1.B</b>	118
<b>Price Elasticity of Demand</b>	119
The Price-Elasticity Coefficient and Formula / Interpretations of Ed	
<b>The Total-Revenue Test</b>	123
Elastic Demand / Inelastic Demand / Unit Elasticity / Price Elasticity Along a Linear Demand Curve / Price Elasticity and the Total-Revenue Curve	
<b>Determinants of Price Elasticity of Demand</b>	128
Applications of Price Elasticity of Demand	
<b>Consider This: The Southwest Effect</b>	131
<b>Price Elasticity of Supply</b>	132
Price Elasticity of Supply: The Immediate Market Period / Price Elasticity of Supply: The Short Run / Price Elasticity of Supply: The Long Run / Applications of Price Elasticity of Supply	
<b>Cross Elasticity and Income Elasticity of Demand</b>	136
Cross Elasticity of Demand / Income Elasticity of Demand	
<b>Global Perspective: Cross Elasticity of Demand Between Education     Spending and Increases in the Price of Food, Selected Nations</b>	138
<b>AP Economics Skills Practice Skill 2.C</b>	140
<b>Global Perspective: Income Elasticity of Demand for Gasoline, Selected Nations</b>	141
<b>Last Word: Elasticity and Pricing Power: Why different consumers pay     different prices</b>	142
<b>End-of-Chapter Material</b>	144
<b>Chapter 5</b>	
<b>Market Equilibrium</b>	149
<b>Market Equilibrium</b>	150
Equilibrium Price and Quantity / Rationing Function of Prices / Total Surplus / Consumer Surplus / Producer Surplus / Total Surplus and Efficiency /	
<b>Consider This: Emergent Equilibria</b>	154
<b>AP Economics Skills Practice Skill 4.B</b>	162
<b>Changes in Supply, Demand, and Equilibrium</b>	164
Changes in Demand / Changes in Supply / Complex Cases / Market Shifts and Changes to Total Surplus / Increase in Demand	
<b>Consider This: Salsa and Coffee Beans</b>	169
<b>AP Economics Skills Practice Skill 3.A</b>	170
<b>Last Word: Pandemic Prices</b>	171
<b>End-of-Chapter Material</b>	173

## Chapter 6

<b>Government Intervention, International Trade, and Public Policy</b>	177
<b>Government-set Prices</b>	178
<b>Price Ceilings on Gasoline</b>	178
<b>Price Floors on Wheat</b>	180
<b>Excise Taxes, Tax Incidence, and Efficiency Loss</b>	181
Elasticity and Tax Incidence / Efficiency Loss of a Tax	
<b>AP Economics Skills Practice Skill 3.A</b>	182
<b>Subsidies, Incidence, and Efficiency Loss</b>	190
Efficiency Loss	
<b>Supply and Demand Analysis of Exports and Imports</b>	193
Supply and Demand in the United States / Supply and Demand in Canada / Equilibrium World Price, Exports, and Imports	
<b>Trade Barriers and Export Subsidies</b>	199
Economic Impact on Tariffs / Economic Impact of Quotas	
<b>Last Word: <i>Petition of the Candlemakers, 1845</i></b>	204
<b>End-of-Chapter Material</b>	206
<b>End-of-Unit Material</b>	210

## Unit 3: Production, Cost, and the Perfect Competition Model

214

## Chapter 7

<b>Businesses and the Costs of Production</b>	215
<b>Short Run and Long Run</b>	216
<b>Short-Run Production Relationships</b>	217
Law of Diminishing Returns	
<b>AP Economics Skills Practice Skill 4.A</b>	223
<b>Economic Costs</b>	225
Explicit and Implicit Costs	
<b>Short-Run Production Costs</b>	226
Fixed, Variable, and Total Costs / Per-Unit, or Average, Costs / Marginal Cost / Shifts of the Cost Curves	
<b>Consider This: <i>Ignoring Sunk Costs</i></b>	231
<b>Global Perspective: <i>Relative Manufacturing Costs, Selected Nations</i></b>	236

<b>Long-Run Production Costs</b>	236
Firm Size and Costs / The Long-Run Cost Curve / Economies and Diseconomies of Scale / Minimum Efficient Scale and Industry Structure	
<b>AP Economics Skills Practice Skill 1.B</b>	246
<b>Last Word: <i>Living in a Cloud</i></b>	247
<b>End-of-Chapter Material</b>	249
<b>Chapter 8</b>	
<b>Profit and Perfect Competition</b>	254
<b>Accounting Profit and Normal Profit</b>	255
Economic Profit	
<b>AP Economics Skills Practice Skill 2.A</b>	259
<b>Four Market Models</b>	260
<b>Pure Competition: Characteristics and Occurrence</b>	261
<b>Demand as Seen by a Purely Competitive Seller</b>	262
Perfectly Elastic Demand / Average, Total, and Marginal Revenue	
<b>Profit Maximization in the Short Run: Total-Revenue – Total-Cost Approach</b>	265
<b>Profit Maximization in the Short Run: Marginal-Revenue – Marginal-Cost Approach</b>	268
Profit-Maximizing Case / Loss-Minimizing Case / Shutdown Case	
<b>AP Economics Skills Practice Skill 4.A</b>	276
<b>Marginal Cost and Short-Run Supply</b>	277
Generalized Depiction / Firm and Industry: Equilibrium Price	
<b>Profit Maximization in the Long Run</b>	284
Assumptions / The Goal of Our Analysis / Long-Run Equilibrium	
<b>Long-Run Supply Curves</b>	287
Long-Run Supply for a Constant-Cost Industry / Long-Run Supply for an Increasing-Cost Industry / Long-Run Supply for a Decreasing-Cost Industry	
<b>AP Economics Skills Practice Skill 3.A</b>	288
<b>Pure Competition and Efficiency</b>	293
Productive Efficiency: $P = \text{Minimum ATC}$ / Allocative Efficiency: $P = MC$ / Maximum Consumer and Producer Surplus	
<b>Last Word: <i>The Pandemic Pause</i></b>	299
<b>End-of-Chapter Material</b>	301
<b>End-of-Unit Material</b>	306



<b>Unit 4: Imperfect Competition</b>	309
<b>Chapter 9</b>	
<b>Monopoly and Price Discrimination</b>	310
<b>An Introduction to Pure Monopoly</b>	311
Examples of Monopoly	
<b>Barriers to Entry</b>	312
Economies of Scale / Network Effects / Legal Barriers to Entry: Patents and Licenses / Ownership or Control of Essential Resources / Pricing and Other Strategic Barriers to Entry	
<b>Monopoly Demand</b>	316
The Monopolist is a Pricemaker / The Monopolist Sets Prices in the Elastic Region of Demand	
<b>AP Economics Skills Practice</b> <i>Skill 3.C</i>	321
<b>Output and Price Determination</b>	322
Cost Data / $MR = MC$ Rule / No Monopoly Supply Curve / Misconceptions Concerning Monopoly Pricing / Possibility of Losses by Monopolist	
<b>AP Economics Skills Practice</b> <i>Skill 4.B</i>	327
<b>Consider This:</b> <i>Salt Monopolies</i>	328
<b>Economic Effects of Monopoly</b>	329
Price, Output, and Efficiency / Income Transfer / Assessment and Policy Options	
<b>Global Perspective:</b> <i>Competition from Foreign Multinational Corporations</i>	333
<b>Price Discrimination</b>	334
Conditions / Examples of Price Discrimination / Graphical Analysis	
<b>AP Economic Skills Practice:</b> <i>Skill 2.A</i>	338
<b>End-of-Chapter Material</b>	339
<b>Chapter 10</b>	
<b>Monopolistic Competition, Oligopoly, and Game Theory</b>	344
<b>Monopolistic Competition</b>	345
Relatively Large Number of Sellers / Differentiated Products / Easy Entry and Exit / Advertising / Monopolistically Competitive Industries	
<b>Global Perspective:</b> <i>Number of Restaurants Per 100,000 Residents, Selected Cities</i>	350
<b>Price and Output in Monopolistic Competition</b>	350
The Firm's Demand Curve / The Short Run: Profit or Loss / The Long Run: Only a Normal Profit	
<b>AP Economics Skills Practice:</b> <i>Skill 4.A</i>	355

<b>Monopolistic Competition and Efficiency</b>	356
Neither Productive nor Allocative Efficiency / Excess Capacity / Product Variety	
<b>Oligopoly</b>	358
A Few Large Producers / Homogeneous or Differentiated products / Control over Price, but Mutual Interdependence / Entry Barriers / Mergers / Oligopolistic Industries	
<b>Oligopoly Behavior: A Game-Theory Overview</b>	362
Mutual Interdependence Revisited / Collusion / Incentive to Cheat	
<b>Game Theory and Strategic Behavior</b>	366
A One-Time Game: Strategies and Equilibrium	
<b>AP Economics Skills Practice: Skill 2.C</b>	369
<b>AP Economics Skills Practice: Skill 3.C</b>	370
<b>Last Word: The Rewards of Oligopoly Are...Sky Miles?</b>	371
<b>End-of-Chapter Material</b>	373
<b>End-of-Unit Material</b>	378
<b>Unit 5: Factor Markets</b>	381
<b>Chapter 11</b>	
<b>Factor Markets</b>	382
<b>Significance of Resource Pricing</b>	383
<b>Marginal Productivity Theory of Resource Demand</b>	384
Resource Demand as a Derived Demand / Marginal Revenue Product / Rule for Employing Resources: $MRP = MRC$ / $MRP$ as Resource Demand Schedule	
<b>A Purely Competitive Labor Market</b>	388
Market Demand for Labor / Market Supply of Labor / Labor Market Equilibrium	
<b>Changes to Labor Market Equilibrium</b>	392
<b>Determinants of Resource Demand</b>	392
Changes in Product Demand / Changes in Productivity / Changes in the Prices of Other Resources	
<b>AP Economics Skills Practice Skill 4.B</b>	393
<b>Consider This: Fringe Benefits vs. Take-Home Pay</b>	394
<b>AP Economics Skills Practice Skill 3.A</b>	396
<b>Determinants of Resource Supply</b>	400
Changes in Population and Age Distribution / Changes in Preferences and Cultural Norms / Changes in Wealth or Non-labor Income	
<b>Changes to Equilibrium in Factor Markets</b>	400
<b>Optimal Combination of Resources</b>	401
The Least-Cost Rule / The Profit-Maximizing Rule / Numerical Illustration	

<b>Monopsony Model</b>	407
Upward Sloping Labor Supply to Firm / MRC Higher than the Wage Rate / Equilibrium Wage and Employment / Examples of Monopsony Power	
<b>AP Economics Skills Practice Skill 3.C</b>	408
<b>Last Word:</b> <i>Labor and Capital: Substitutes or Complements?</i>	412
<b>End-of-Chapter Material</b>	414
<b>End-of-Unit Material</b>	420
<b>Unit 6: Market Failure and the Role of Government</b>	424
<b>Chapter 12</b>	
<b>Market Failure, Externalities, and Public Goods</b>	425
<b>Efficiently Functioning Markets</b>	426
Marginal Private Benefit and Marginal Social Benefit / Marginal Private Cost and Marginal Social Cost	
<b>Externalities and Efficiency Losses</b>	429
Deadweight Losses from Underproduction / Deadweight Losses from Overproduction / Externalities / Another Way to Model Externalities / Negative Externalities in Consumption / Positive Externalities in Production / Government Intervention in Negative Externalities / Government Intervention in Positive Externalities	
<b>AP Economics Skills Practice Skill 2.A</b>	434
<b>Global Perspective:</b> <i>Percentage of CO<sub>2</sub> Emission Taxed, Selected Nations, 2018</i>	440
<b>AP Economics Skills Practice Skill 4.B</b>	441
<b>Consider This:</b> <i>The Fable of the Bees</i>	442
<b>AP Economics Skills Practice Skill 3.A</b>	445
<b>Public Goods</b>	445
Characteristics of Private Goods / Public Goods Characteristics / Optimal Quantity of a Public Good / Demand for Public Goods / Comparing MB and MC	
<b>Last Word:</b> <i>Visible Pollution, Hidden Costs</i>	452
<b>End-of-Chapter Material</b>	455
<b>Chapter 13</b>	
<b>Government Intervention and Inequalities</b>	460
<b>Government Intervention in Imperfectly Competitive Markets</b>	461
Inefficiency of Price Controls in Competitive Markets / Price Controls in Imperfectly Competitive Markets / A Price Ceiling in a Monopoly Market / A Price Floor in a Monopsony Market / Per-unit vs. Lump-sum Taxes and Subsidies	
<b>AP Economics Skills Practice Skill 1D and 4C</b>	467

<b>Regulated Monopoly</b>	468
Socially Optimal Price: $P = MC$ / Fair-Return Price: $P = ATC$ / Dilemma of Regulation	
<b>AP Economics Skills Practice Skill 3.B</b>	473
<b>Income Inequality</b>	473
Facts About Income Inequality / Distribution by Income Category / Distribution by Quintiles (Fifths) / The Lorenz Curve and Gini Ratio / Effect of Government Redistribution	
<b>Causes of Income Inequality</b>	479
Education and Training / Discrimination / Preferences and Risks / Unequal Distribution of Wealth	
<b>AP Economics Skills Practice Skill 2.B</b>	482
<b>Last Word: Debating Universal Basic Income</b>	483
<b>End-of-Chapter Material</b>	485
<b>End-of-Unit Material</b>	490
<b>Macroeconomics</b>	
<b>Unit 1: Basic Economic Concepts</b>	494
<b>Chapter 1</b>	
<b>Scarcity, Production Possibilities, and Trade</b>	495
<b>Concepts, Principles, and Models</b>	496
<b>The Economic Perspective</b>	497
Scarcity and Choice	
<b>Consider This: Is Facebook Free?</b>	498
<b>AP Economics Skills Practice Skill 1.A</b>	499
<b>Society's Economizing Problem</b>	499
Scarce Resources / Resource Categories	
<b>Microeconomics and Macroeconomics</b>	501
Microeconomics / Macroeconomics / Positive and Normative Economics	
<b>Production Possibilities Model</b>	503
Production Possibilities Table / Production Possibilities Curve / Law of Increasing Opportunity Costs / Optimal Allocation	
<b>AP Economics Skills Practice Skill 1.C</b>	506
<b>Unemployment, Growth, and the Future</b>	510
A Growing Economy / Present Choices and Future Possibilities	
<b>Comparative Advantage and Trade</b>	514

<b>The Economic Basis for Trade</b>	514
Comparative Advantage / Two Isolated Nations / Specializing Based Comparative Advantage	
<b>Consider This:</b> <i>The CPA and a House Painter</i>	517
<b>Terms of Trade</b>	522
Gains from Trade / Trade with Increasing Opportunity Costs	
<b>AP Economics Skills Practice Skill 4.A</b>	528
<b>End-of-Chapter Material</b>	530
<b>Chapter 2</b>	
<b>Demand, Supply, and Market Equilibrium</b>	535
<b>Markets</b>	536
<b>Demand</b>	537
Law of Demand / The Demand Curve / Market Demand / Changes in Demand / Changes in Quantity Demanded	
<b>AP Economics Skills Practice Skill 1.B</b>	546
<b>Supply</b>	547
Law of Supply / The Supply Curve / Market Supply / Determinants of Supply / Changes in Supply / Changes in Quantity Supplied	
<b>AP Economics Skills Practice Skill 1.B</b>	553
<b>Market Equilibrium</b>	554
Equilibrium Price and Quantity / Rationing Function of Prices	
<b>Consider This:</b> <i>Emergent Equilibria</i>	557
<b>Changes in Supply, Demand, and Equilibrium</b>	558
Changes in Demand / Changes in Supply / Complex Cases	
<b>Consider This:</b> <i>Salsa and Coffee Beans</i>	561
<b>Last Word:</b> <i>Pandemic Prices</i>	562
<b>AP Economics Skills Practice Skill 4.A</b>	564
<b>End-of-Chapter Material</b>	565
<b>End-of-Unit Material</b>	571
<b>Unit 2: Economics Indicators and the Business Cycle</b>	575
<b>Chapter 3</b>	
<b>Circular Flow, GDP, and Unemployment</b>	576
<b>The Circular Flow Model</b>	577
Households / Businesses / Product Market / Resource Market	

<b>Assessing the Economy's Performance</b>	580
Gross Domestic Product / Value Added / Gross Output and Multiple Counting / GDP Excludes Nonproduction Transactions / Two Ways of Looking at GDP: Spending and Income	
<b>AP Economics Skills Practice Skill 1.D</b>	581
<b>The Expenditures Approach</b>	587
Personal Consumption Expenditures / Gross Private Domestic Investment ( <i>I<sub>g</sub></i> ) / Government Purchases ( <i>G</i> ) / Net Exports ( <i>X<sub>n</sub></i> ) / Putting It All Together: $GDP = C + I_g + G + X_n$	
<b>The Income Approach</b>	593
Compensation of Employees / Rents / Interest / Proprietors' Income / Corporate Profits / Taxes on Production and Imports / From National Income to GDP	
<b>Shortcomings of GDP</b>	598
Nonmarket Activities / Leisure and Psychic Income / Improved Product Quality / The Underground Economy / GDP and the Environment / Composition and Distribution of Output / Noneconomic Sources of Well-Being / The Importance of Intermediate Output	
<b>Global Perspective: The Underground Economy as a Percentage of GDP, Selected Nations</b>	600
<b>Unemployment</b>	601
Measurement of Unemployment / Types of Unemployment / Definition of Full Employment / Economics Cost of Unemployment / Noneconomic Costs	
<b>AP Economics Skills Practice Skill 1.C</b>	605
<b>Consider This: Downwardly Sticky Wages and Unemployment</b>	606
<b>End-of-Chapter Material</b>	613
<b>Chapter 4</b>	
<b>Inflation and Business Cycles</b>	617
<b>Inflation</b>	618
Measurement of Inflation / Facts of Inflation / Types of Inflation / Core Inflation	
<b>AP Economics Skills Practice Skill 3.C</b>	620
<b>Global Perspective: Inflation Rates In Five Industrial Nations, 2010-2021</b>	621
<b>Redistribution Effects of Inflation</b>	624
Nominal and Real Income / Anticipations / Who is Hurt by Inflation? / Who is Unaffected or Helped by Inflation? / Anticipated Inflation / Other Redistribution Issues	
<b>Nominal GDP versus Real GDP</b>	628
Adjustment Process in a One-Product Economy / An Alternative Method / Real-World Considerations and Data	
<b>AP Economics Skills Practice Skill 3.A</b>	629

<b>The Business Cycle</b>	634
Phases of the Business Cycle / Causation: A First Glance / Cyclical Impact: Durables and Nondurables	
<b>AP Economics Skills Practice Skill 2.C</b>	635
<b>End-of-Chapter Material</b>	641
<b>End-of-Unit Material</b>	645
 <b>Unit 3: National Income and Price Determination</b>	 648
 <b>Chapter 5</b>	
<b>Aggregate Demand and Aggregate Supply</b>	649
<b>Aggregate Demand</b>	650
Aggregate Demand Curve	
<b>Changes in Aggregate Demand</b>	654
<b>The Multiplier Effect</b>	655
Rationale / Changes in Consumer Spending / Investment Spending / Government Spending / Net Export Spending / The Multiplier and the Marginal Propensities	
<b>AP Economics Skills Practice Skill 2.A</b>	664
<b>Aggregate Supply</b>	666
Aggregate Supply in the Immediate Short Run / Aggregate Supply in the Short Run / Aggregate Supply in the Long Run / Focusing on the Short Run	
<b>Changes in Aggregate Supply</b>	673
Changes in Input Prices / Productivity / Legal-Institutional Environment	
<b>AP Economics Skills Practice Skill 2.B</b>	678
<b>Equilibrium in the AD-AS Model</b>	679
<b>Changes in Equilibrium</b>	682
Increases in AD: Demand-Pull Inflation / Decreases in AD: Recession and Cyclical Unemployment / Decreases in AS: Cost-Push Inflation / Increases in AS: Full Employment with Price-Level Stability	
<b>Global Perspective: Size of GDP Gaps, Selected Countries, 2020</b>	686
<b>From Short Run to Long Run</b>	690
Short-Run Aggregate Supply / Long-Run Aggregate Supply / Long-Run Equilibrium in the AD-AS Model	
<b>Applying the Extended AD-AS Model</b>	694
Demand-Pull Inflation in the Extended AD-AS Model	
<b>AP Economics Skills Practice Skill 4.B, 4.C</b>	696
<b>End-of-Chapter Material</b>	698

<b>Chapter 6</b>	
<b>Fiscal Policy, Deficits, and Debt</b>	703
<b>Fiscal Policy and the AD-AS Model</b>	704
Expansionary Fiscal Policy / Contractionary Fiscal Policy	
<b>AP Economics Skills Practice Skill 3.C</b>	712
<b>Built-In Stability</b>	713
Tax Collections and the Business Cycle / Automatic or Built-In Stabilizers	
<b>Evaluating How Expansionary or Contractionary Fiscal Policy Is Determined</b>	716
Cyclically Adjusted Budget	
<b>Recent and Projected U.S. Fiscal Policy</b>	719
Fiscal Policy during and after the Pandemic Recession of 2020	
<b>Problems, Criticisms, and Complications of Implementing Fiscal Policy</b>	721
Problems of Timing / Political Considerations / Future Policy Reversals / Offsetting State and Local Finance / Crowding-Out Effect	
<b>AP Economics Skills Practice Skill 4.B, 4.C, 2.C</b>	725
<b>Last Word: The Social Security and Medicare Time Bombs</b>	727
<b>End-of-Chapter Material</b>	729
<b>End-of-Unit Material</b>	733
<b>Unit 4: Financial Sector</b>	737
<b>Chapter 7</b>	
<b>Money and Interest Rates</b>	738
<b>The Functions of Money</b>	739
<b>The Components of the Money Supply</b>	741
Money Definition <i>M1</i> / Money Definition <i>M2</i>	
<b>Financial Investment</b>	745
<b>Some Popular Investments</b>	746
Stocks / Bonds	
<b>Calculating Investment Returns</b>	749
Percentage Rates of Return / Interest Rates and Bond Prices / Nominal and Real Interest Rates	
<b>AP Economics Skills Practice Skill 3.A</b>	751
<b>AP Economics Skills Practice Skill 3.C</b>	752
<b>Last Word: Cryptocurrencies</b>	754
<b>End-of-Chapter Material</b>	755



## Chapter 8

**Money Markets and Monetary Policy** 758

**Fractional Reserve Banking and the Money Supply** 760

The Fractional Reserve Banking System / Fed Influence over Lending and the Money Supply

**The Balance Sheet of a Commercial Bank with Fractional Reserves** 764

**AP Economics Skills Practice Skill 2.C** 767

**The Banking System: Multiple-Deposit Expansion** 768

**The Money Multiplier** 771

Reversibility: The Multiple Destruction of Money

**Interest Rates** 775

The Demand for Money / The Equilibrium Interest Rate

**Traditional Tools of Monetary Policy** 779

The Reserve Ratio / The Discount Rate

**AP Economics Skills Practice Skill 3.B** 787

**Traditional Monetary Policy with Limited Reserves, Real GDP, and the Price Level** 788

Cause-Effect Chain / Effects of an Expansionary Monetary Policy

**Tools of Monetary Policy** 794

From Conventional to Unconventional / Administered Rates / Monetary Policy with Ample Reserves

**AP Economics Skills Practice Skill 4.B and Skill 4.C** 805

**Loanable Funds Theory of Interest Rates** 807

Supply of Loanable Funds / Demand for Loanable Funds / Extending the Model

**End-of-Chapter Material** 811

**End-of-Unit Material** 816

**Unit 5: Long-Run Consequences of Stabilization Policies** 819

## Chapter 9

**Fiscal and Monetary Policies and the Phillips Curve** 820

**Fiscal and Monetary Policy in the Short run** 821

Recessionary Gaps / Inflationary Gaps / Are Fiscal and Monetary Policy Necessary?

**The Inflation-Unemployment Relationship** 823

The Phillips Curve / Aggregate Supply Shocks Contradict the Phillips Curve / Post-Great Recession Evidence Against a Stable Phillips Curve

<b>The Long-Run Phillips Curve</b>	829
Short-Run Phillips Curve / Long-Run Vertical Phillips Curve / Disinflation	
<b>Global Perspective:</b> <i>The Misery Index, Selected nations, 2010-2021</i>	830
<b>What Causes Macro Instability?</b>	834
Mainstream View / Monetarist View / Real-Business-Cycle View	
<b>AP Economics Skills Practice</b> <i>Skills 2.A, 2.C, 3.A, 3.C 4.A, 4.B, 4.C</i>	840
<b>End-of-Chapter Material</b>	843
<b>Chapter 10</b>	
<b>Economic Growth</b>	847
<b>The U.S. Public Debt</b>	848
Ownership / International Comparisons / Interest Charges / Public Concerns / Bankruptcy / Burdening Future Generations / Substantive Issues / Income Distribution / Incentives / Foreign-owned Public Debt / Crowding-Out Effect Revisited	
<b>Global Perspective:</b> <i>Public Debt: International Comparisons</i>	852
<b>AP Economics Skills Practice</b> <i>Skills 3.A</i>	856
<b>AP Economics Skills Practice</b> <i>Skills 2.A</i>	857
<b>Economic Growth</b>	859
Growth as a Goal / Arithmetic of Growth	
<b>Modern Economic Growth</b>	862
The Uneven Distribution of Growth / Catching Up Is Possible / Institutional Structures That Promote Modern Economic Growth	
<b>Consider This:</b> <i>Patents and Innovation</i>	868
<b>Determinants of Growth</b>	869
Supply Factors / Demand Factor / Efficiency Factor / Production Possibilities Analysis	
<b>Accounting for Growth</b>	875
Labor Inputs versus Labor Productivity / Technological Advance / Quantity of Capital per Worker / Education and Training / Economies of Scale and Resource Allocation / Fiscal Policy Targeting Aggregate Supply / Taxes and Incentives to Work, Save, and Invest	
<b>Global Perspective:</b> <i>Average Test Scores of Eighth-Grade Students in Math     and Science, Top 12 Test-Taking Countries</i>	879
<b>End-of-Chapter Material</b>	882
<b>End-of-Unit Material</b>	886

<b>Unit 6: Open Economy – International Trade and Finance</b>	889
<b>Chapter 11</b>	
<b>The Balance of Payments and Exchange Rates</b>	890
<b>International Financial Transactions</b>	891
<b>The Balance of Payments</b>	892
Current Account / Capital and Financial Account / Why the Balance?	
<b>Global Perspective:</b> <i>U.S. Trade Balances In Goods And Services, Selected Nations, 2021</i>	895
<b>AP Economics Skills Practice</b> <i>Skill 1.C</i>	898
<b>Exchange Rates</b>	899
Depreciation and Appreciation	
<b>AP Economics Skills Practice</b> <i>Skill 3.C, 4.A, 4.C</i>	902
<b>End-of-Chapter Material</b>	906
<b>Chapter 12</b>	
<b>International Trade</b>	910
<b>Determinants of Flexible Exchange Rates</b>	911
Disadvantages of Flexible Exchange Rates	
<b>AP Economics Skills Practice</b> <i>Skill 3.B</i>	915
<b>Government Policy and Flexible Exchange Rates</b>	917
Fiscal Policy and the Exchange Rate / Monetary Policy and the Exchange Rate	
<b>AP Economics Skills Practice</b> <i>Skill 3.B</i>	920
<b>Fixed Exchange Rates</b>	921
Foreign Exchange Market Replaced by Government Peg / Official Reserves / Defending a Peg by Altering Demand or Supply	
<b>The Current Exchange Rate System: The Managed Float</b>	925
<b>AP Economics Skills Practice</b> <i>Skill 4.A, 4.B, 2.A, 3.A, 3.B</i>	928
<b>Last Word:</b> <i>The Exchange Rate Trilemma</i>	930
<b>End-of-Chapter Material</b>	932
<b>End-of-Unit Material</b>	936

<b>Glossary</b>	G-1
<b>Microeconomics Index</b>	MICI-1
<b>Macroeconomics Index</b>	MACI-1
<b>AP Microeconomics Practice Exam</b>	AP-1
<b>AP Macroeconomics Practice Exam</b>	AP-22

## About the AP Micro- and Macroeconomics Courses and Exams

### Course Structure

The Advanced Placement (AP) program was created by the College Board. The AP Microeconomics and AP Macroeconomics courses each have a separate AP Exam. The exams are written by Test Development Committees, which consist of university Economics professors and high school teachers with experience teaching AP Economics courses. Test questions are written to measure understanding of the content and skills included in the Course and Exam Descriptions published by the College Board. The College Board audits high school courses with the AP designation to ensure the high school curriculum meets standards equivalent to introductory college Economics courses.

Microeconomics and Macroeconomics are typically two, one-semester courses that explore different aspects of economic reasoning and applications. Microeconomics focuses on economic decisions made by individual households—as consumers and as suppliers of inputs like labor—and by firms—as suppliers of output and demanders of inputs. Macroeconomics considers behavior in the aggregate economy and economic performance. Particular attention is paid to macroeconomic challenges with unemployment, inflation, and economic growth. International finance is addressed in the Macroeconomics course, while international trade is included in both the Microeconomics and Macroeconomics courses.

### Understanding by Design©

The AP Microeconomics and Macroeconomics courses are organized using the Understanding by Design© Framework. In each course, the content is designed to spiral Big Ideas about economics—such as “Competitive markets bring together buyers and sellers to exchange goods and services for mutual gain”—throughout the semester. Each course is divided into six units with specific topics, learning objectives, and essential knowledge items. In addition, each course has the same four categories of economics skills:

- Principles and Models: Define economic principles and models.
- Interpretation: Explain given economic outcomes.
- Manipulation: Determine outcomes of specific economic situations.
- Graphing and Visuals: Model economic situations using graphs or visual representations.

Each question on the AP Exams will measure one of these skills as well as content knowledge. Graphing skills are assessed only in the free-response section of the exams.

### About the AP Micro- and Macroeconomics Exams

The AP Microeconomics Exam and AP Macroeconomics Exam are entirely separate exams. Each exam is scheduled for two hours and ten minutes, on separate test days. Students are given 70 minutes to answer 60 multiple-choice questions. Then,

after a 10-minute reading period, students have 50 minutes to write answers to three free-response questions, one worth 10 points and two worth 5 points each. The multiple-choice section accounts for two-thirds of the score (66.65 percent), and the free-response section provides the other one-third of the score (33.35 percent).

Summary of AP Exam Format		
Section 1	<b>Multiple Choice</b> 60 Questions Time: 70 Minutes Weight: 66.65% of Exam	<ul style="list-style-type: none"> <li>• Four-function calculators are allowed in this section.</li> <li>• Use a #2 pencil with a very good eraser for this section.</li> </ul>
	10 minute required reading period	
Section 2	<b>Free Response</b> Question 1: Long (10 points) Question 2: Short (5 points) Question 3: Short (5 points) Time: 50 minutes Weight: 33.35% of Exam	<ul style="list-style-type: none"> <li>• There is a 10-minute required reading period before writing the answers to the 3 FRQs. This time can also be used to begin outlining answers.</li> <li>• Four-function calculators are allowed in this section. Use blue or black ink in this section.</li> <li>• The long FRQ represents 50% of the FRQ score, each of the two short FRQs represent 25% of the score.</li> </ul>

### Breakdown of AP Exam Questions by Unit

Percentage of Questions	Units in AP Microeconomics
12–15%	Basic Economic Concepts
20–25%	Supply and Demand
22–25%	Production, Cost, and the Perfect Competition Model
15–22%	Imperfect Competition
10–13%	Factor Markets
8–13%	Market Failure and the Role of Government

Percentage of Questions	Units in AP Macroeconomics
5–10%	Basic Economic Concepts
12–17%	Economic Indicators and the Business Cycle
17–27%	National Income and Price Determination
18–23%	Financial Sector
20–30%	Long-Run Consequences of Stabilization Policy
10–13%	Open Economy – International trade and Finance

## Grading the AP Exam

The multiple-choice section of the AP Exam is scored electronically, whereas readers grade the FRQs. The College Board then applies a weighted formula and combines the raw multiple-choice and free-response scores to create a composite score out of 90 points. Finally, a conversion factor is used to award the student one of five final scores, with a 5 being extremely well qualified and a 1 being no recommendation. The score required to achieve a 5, 4, or 3 varies with each test administration.

A passing score on either exam can provide college credit for institutions that accept AP credit, but colleges and universities differ markedly in requirements and credits offered. Some schools accept a score of 3 for credit, whereas other schools may require a 4 or a 5 in order to receive credit. Some schools require passing scores on both AP Exams to receive credit for either course.

## Answering Multiple-Choice Questions

The multiple-choice questions can include a wide range of information, including definitions and applications of principles, calculations, interpretations of graphs, explanations of the causes or results of an economic action, and choosing an appropriate economic policy to deal with an economic event.

Four-function calculators can be used during the AP Economics Exams. Generally, the math involved in multiple-choice questions is simple enough that if you understand the formulas, the answer will be clear. For example, reserve requirement ratios tend to be 5%, 10%, 20%, or 25% to make it easy for you to calculate money multipliers. The opportunity costs involved in calculating comparative advantage will reduce to numbers that are easy to compare.

**Answer every question.** Each question has five potential answers labeled A-E. Each correct answer is worth one point, while questions left blank earn no points.

The College Board will assess no penalty for wrong answers. Although you will earn no credit for a wrong answer, you will not face any additional penalty for guessing. So, it is in your best interest to answer every question on the AP Exam. It is also best to answer questions in the order they appear, rather than skipping questions throughout the test. You do not want to risk skipping a line and mismarking subsequent answers.

Make a note of answers you want to go back and re-view after you've finished, but do not skip a question entirely. Carefully erase corrections completely.

**Don't second-guess yourself.** Be careful not to overanalyze questions. In many cases, the answer may seem to be too obvious when it is correct. The AP Exam questions are designed to test information you should have learned in the course, not reach for the most obscure concepts. Although some questions will test your ability to discern concepts (for example, the difference between a change in demand and a change in quantity demanded), they are not designed to trick you if you understand those concepts.

With that in mind, also remember that several of the test questions will be written at a high level in order to identify students deserving scores of 4 and 5. You may face

test questions about concepts you have not studied or do not remember, but it is still important to answer every question. If you can eliminate a couple of obviously wrong answers, you are that much closer to a correct answer.

**Look for clues in key terms.** Watch carefully for key terms in a question that can help you rule out incorrect answers. For example, “long run” and “short run” result in different graphs for firms entering and exiting the industry in Microeconomics, and a different slope for aggregate supply and Phillips Curves in Macroeconomics. The terms nominal and real can help you differentiate the effects of inflation. If you pay careful attention to the terms, you may be able to rule out two or more potential answers.

**Sketch graphs.** For questions regarding graphical analysis, quickly draw a graph to visualize the answer— even on the multiple-choice section. Do not rely just on your memory; seeing the graph can help you remember or determine, for example, the relative locations of the average total cost and average variable cost curves, or how a change in aggregate demand affects real output and price levels. It is important to use these visual aids to avoid simple mistakes.

**Pace yourself.** It is important to watch your pace as you move through the questions. You have just over one minute to answer each question. Some questions, such as definitions, can be answered quickly, whereas others may require deeper analysis or time to draw a graph to find the answer. The key is to keep moving and keep an eye on the time. If you finish early, double check that you have answered every question on your answer sheet, and then review the questions you noted to review one last time.

## Answering Free-Response Questions

The free-response questions (FRQs) include a wide range of information; however, this section will always include some questions that test graphing skills. You should expect to draw, manipulate, and interpret a variety of graphs. Any questions requiring calculations in the free-response section will require you to show your work. That means starting from the formula or equation and performing the arithmetic required to obtain your answer.

**Format of AP Economics FRQs.** AP Economics responses are quite different from the formal essays written for some other AP subjects requiring thesis statements and five-paragraph development structures. AP Economics FRQs generally consist of a series of questions and sub-questions that can be answered in several sentences, or in some cases simply a word or number. Responses should directly answer the questions asked.

Both AP Economics Exams use the same five task verbs to guide student responses:

- **Identify** (or an interrogatory word like What? Which? or Will?) requires a specific, brief response with no elaboration or explanation.
- **Explain** requires additional information about how or why an outcome occurs using evidence or reasoning. Graphs and symbols are acceptable as part of the explanation.



- **Calculate** requires you to perform mathematical steps to arrive at a response and show your work.
- **Draw** a correctly labeled graph requires a graph to answer the question. Clear, accurate labels are required. Draw a large graph, and then make it easy for a reader to interpret it.
- **Show/Label/Plot/Indicate** requires you to visually represent an economic situation using your correctly labeled graph. Label equilibrium points by extending dotted lines to the axes (not internal labels). Clearly show directional changes when relevant.

Keep in mind the economic concept of efficiency and apply it to your free-response writing. Be complete—but be efficient about it. Directly answer the question asked and explain why that answer is correct. The best answers use the appropriate terms and the clearest language to explain the situation, causes and effects, and reasoning. The readers (scorers) want to see a clear analysis and your understanding. Remember that the readers want to award you points for every correct portion of your responses. To that end, use your best handwriting to make it easy for the reader to find and read your answers, so you can earn all the points you deserve.

**Ten-minute Reading Period.** At the beginning of the free-response portion of the AP Exam, you will have a ten-minute reading period. Use that time to very carefully review each of the three FRQs. Focus on the verbs in the FRQs, explained above. Start to sketch graphs and write notes right on the question page, so you can outline your answers. (Be sure you copy final graphs onto the designated answer pages, or they will not be counted.)

**Stay organized.** Organization is essential for a good free-response answer. Be sure to answer the questions in the order they are asked, and directly answer the question that was asked. For example, if the question asks you what will happen to employment, do not explain what you think will happen to the unemployment rate; answer about employment.

As with the multiple-choice section, in the free-response section readers give you points for correct answers, rather than subtract points for incorrect answers. If necessary, guess on such questions as: What will happen to the price? What will happen to exports? What will happen to the number of workers hired? The only possible answers are “increase,” “decrease,” or “no change,” so make your best guess even if you are not entirely sure of the answer.

However, if the question asks about a specific policy solution such as an open-market operation, and you answer by discussing changes in the discount rate, even if your answer pertaining to the discount rate is correct, you will not earn the point because you did not answer the question that was asked.

**Link concepts.** In writing your answers, it is critical to make linkages between concepts. This is one issue readers have consistently identified as a weakness in the responses they score. In Microeconomics, for example, why does an increase in the price of strawberries lead to an increase in the demand for grapes? In Macroeconomics, why does an increase in the money supply cause an increase

in new home sales? Be sure to explain how a change in one factor affects other factors, and then include the step-by-step mechanisms that cause those changes to happen.

**Draw graphs carefully.** It is important to look for details in the FRQ that will help you draw your graphs correctly. Be careful to label every axis and curve and show any curve shifts and equilibrium. Look for terms such as short run and long run. A Micro question may ask you to draw a graph showing a firm making an initial short-run profit. Drawing a graph in long-run equilibrium instead will cost you easy points. In the same way, a Macro question may ask you to draw a graph illustrating an economy in short-run equilibrium at less than full-employment output. In order to illustrate that lower output, you will have to draw a vertical long-run aggregate supply curve to the right of current equilibrium.

**Pace yourself.** You should try to complete the long FRQ in 25 minutes, leaving 25 minutes to finish the two short FRQs. When you have finished all three FRQs, re-read each question and sub-question to be sure you have answered every single part of the question.

## Practice Questions

General information about the course and exam is available at AP Central, as are links to the most recent FRQs and scoring guidelines.

Link to AP Microeconomics Exam:

<https://apcentral.collegeboard.org/courses/ap-micro-economics/exam>

Link to AP Macroeconomics Exam:

<https://apcentral.collegeboard.org/courses/ap-macro-economics/exam>

If you scroll down either site, you will find an arrow linking to FRQs from earlier years. A great way to test your knowledge of AP Microeconomics and AP Macroeconomics is to take these past tests. They are excellent preparation for taking the AP Economics Exams. In addition, your teacher can provide access to AP Classroom, which has additional practice multiple-choice questions. Your teacher must select and assign the questions; students are not able to access AP Classroom on their own.

There are also complete micro- and macroeconomics practice exams at the end of this book and two additional complete practice exams for both courses in your digital resources.



## Economic Indicators and the Business Cycle

**Chapter 3:** Circular Flow, GDP, and Unemployment

**Chapter 4:** Inflation and Business Cycles

### Topics

- The Circular Flow and GDP
- Limitations of GDP
- Unemployment
- Price Indices and Inflation
- Costs of Inflation
- Real v. Nominal GDP
- Business Cycles



### Unit Focus

Think about the cost of your favorite snack. Has the price of this snack remained the same, or has the price increased steadily over time? A steady price increase is a sign of inflation, which is natural in any market economy.

Looking at the rising cost of products from the macro level, when economic activity begins to slow, consumers tend to reduce their purchasing of new clothes, cars, and even favorite snacks. When purchasing slows down, unemployment begins to rise. On the other hand, when economic activity is strong, purchasing increases so prices can begin to rise more quickly. Policymakers have ways to combat rising unemployment or rising prices, but cannot implement such policies until unemployment or inflation becomes measurable. For this reason we must first study how we detect unemployment and inflation, the economic impacts, and then how to target policies toward reducing those problems.

This unit focuses on the economic big idea of market inefficiency and public policy.

## CHAPTER 3 Circular Flow, GDP, and Unemployment



### LEARNING OBJECTIVES

- Define (using the circular flow diagram as appropriate) how GDP is measured and its components.
- Calculate nominal GDP.
- Define the limitations of GDP.
- Define the labor force, the unemployment rate, and the labor force participation rate.
- Explain how changes in employment and the labor market affect the unemployment rate and the labor force participation rate.
- Calculate the unemployment rate and the labor force participation rate.
- Define the limitations of the unemployment rate.
- Define the types of unemployment and the natural rate of unemployment.
- Explain changes in the types of unemployment.

## Concepts in Action

Chapter 2 demonstrated how competitive markets can provide for the exchange of goods and services, and generate market prices that help distribute those products from sellers to buyers. This chapter expands the idea of a single product market to a comprehensive model of the entire economy.

This circular flow model shows us the continuous flow of goods and services, resources, and money throughout the economy. We measure the sum of these transactions with a statistic called gross domestic product (GDP), the most commonly used measure of the size, and growth, of a nation's aggregate economy.

## The Circular Flow Model

The dynamic market economy creates continuous, repetitive flows of goods and services, resources, and money. The **circular flow diagram**, shown in **Figure 3.1 (Key Graph)**, illustrates those flows for a simplified economy in which there is no government. The figure groups the economy's decision makers into businesses and households. Additionally, we divide this economy's markets into the resource market and the product market.

### Households

The blue rectangle on the right side of the circular flow diagram in Figure 3.1 represents **households**, defined as one or more persons occupying a housing unit. There are currently about 123 million households in the U.S. economy. Households buy the goods and services that businesses make available in the product market. Households obtain the income needed to buy those products by selling resources in the resource market.

All the resources in our no-government economy are ultimately owned or provided by households. For instance, the members of one household or another directly provide all the labor and entrepreneurial ability in the economy. Households also own all the land and all of the capital in the economy either directly, as personal property, or indirectly, as a consequence of owning all of the businesses in the economy, and thereby controlling all of the land and capital owned by businesses. Thus, all the income in the economy—all wages, rents, interest, and profits—flows to households because they provide the economy's labor, land, capital, and entrepreneurial ability.

### Businesses

The blue rectangle on the left side of the circular flow diagram represents **businesses**, which are commercial establishments that attempt to earn profits for their owners by offering goods and services for sale.

**circular flow diagram** An illustration showing the flow of resources from households to firms and of products from firms to households. These flows are accompanied by reverse flows of money from firms to households and from households to firms.

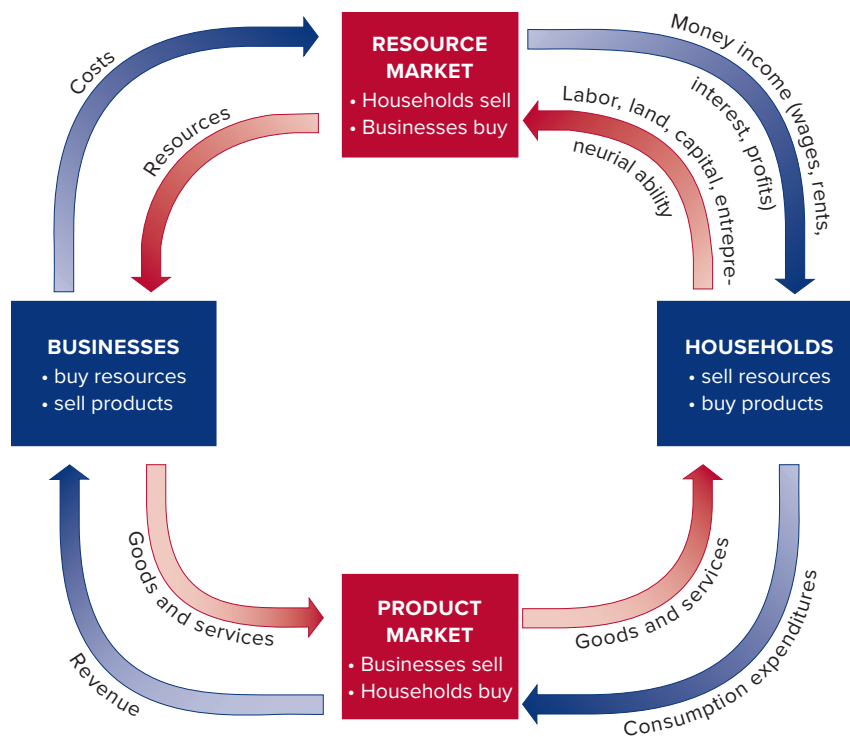
**households** Economic entities of one or more persons occupying a housing unit that provide resources to the economy and use the income received to purchase goods and services that satisfy economic wants.

**businesses** Economic entities (firms) that purchase resources and provide goods and services to the economy.

## KEY GRAPH

**FIGURE 3.1** The circular flow diagram.

Resources flow from households to businesses through the resource market, and products flow from businesses to households through the product market. Opposite these real flows are monetary flows. Households receive income from businesses (their costs) through the resource market, and businesses receive revenue from households (their expenditures) through the product market.



### QUICK QUIZ FOR FIGURE 3.1

1. The resource market is the place where:
  - a. households sell products and businesses buy products.
  - b. businesses sell resources and households sell products.
  - c. households sell resources and businesses buy resources (or the services of resources).
  - d. businesses sell resources and households buy resources (or the services of resources).

2. Which of the following would be determined in the product market?
  - a. manager's salary
  - b. the price of equipment used in a bottling plant
  - c. the price of 80 acres of farmland
  - d. the price of a new pair of athletic shoes
3. In this circular flow diagram:
  - a. money flows counterclockwise.
  - b. resources flow counterclockwise.
  - c. goods and services flow clockwise.
  - d. households are on the selling side of the product market.
4. In the circular flow diagram:
  - a. households spend income in the product market.
  - b. firms sell resources to households.
  - c. households receive income through the product market.
  - d. households produce goods.

Answers: 1. c; 2. d; 3. b; 4. a

Businesses sell goods and services in the product market to obtain revenue, and they incur costs in the resource market when they purchase the labor, land, capital, and entrepreneurial ability that they need to produce their goods and services.

There are about 30 million businesses currently in the United States, ranging from enormous corporations such as Walmart with 2020 sales of \$559 billion and 2.2 million employees worldwide, to single-person, sole proprietorships with sales of less than \$100 per day.

## Product Market

The red rectangle at the bottom of the diagram represents the **product market** in which households purchase the goods and services produced by businesses. Households use the income they receive from the sale of resources to buy goods and services. The money that they spend on goods and services flows to businesses as revenue.

**product market** A market in which products are sold by firms and bought by households.



**resource market** A market in which households sell and firms buy resources or the services of resources.

## Resource Market

Finally, the red rectangle at the top of the circular flow diagram represents the **resource market** in which households sell resources to businesses. The households sell resources to generate income, and the businesses buy resources to produce goods and services. Productive resources flow from households to businesses, while money flows from businesses to households in the form of wages, rents, interest, and profits.

To summarize: The circular flow model depicts a complex web of economic activity in which businesses and households are both buyers and sellers. Businesses buy resources and sell products. Households buy products and sell resources. The counterclockwise flow of economic resources and finished products, which is illustrated by the red arrows in Figure 3.1, is paid for by the clockwise flow of money income and consumption expenditures illustrated by the blue arrows.

### QUICK REVIEW 3.1

- ✓ The circular flow model illustrates how resources flow from households to businesses and how payments for those resources flow from businesses to households.

## **national income accounting**

The techniques used to measure the overall production of a country's economy as well as other related variables.

## Assessing the Economy's Performance

The circular flow diagram is a simplification of a complex economy. Is the economy robust, producing sufficient goods and services for the citizens, and creating ample opportunities for employment? Or is the economy stagnant, with idle resources and many unsuccessful job seekers?

Economists have developed methods, known as **national income accounting**, to measure the economy's overall performance. The Bureau of Economic Analysis (BEA), an agency of the U.S. Commerce Department, compiles the National Income and Product Accounts (NIPA) for the U.S. economy. This accounting helps economists and policymakers:

- Assess the economy's health by monitoring production and employment levels.
- Track the economy's long-run growth trajectory.
- Adjust economic policies to safeguard and improve the economy's health.



### Skill 1.D: Describe the similarities, differences, and limitations of economic concepts, principles, or models.

While the verb “describe” may not appear in a question, this skill can still be tested in the multiple-choice section. The below question offers multiple descriptions from which you must select the correct one that describes the stated concept of the circular flow model.

#### On the AP Exam

The sample exam question focuses on the circular flow model. First, look at the terminology used in the question and then think about the similarities and differences between the concepts.

In the simple circular flow model, there are two markets: the resource market and the product market. Which of the following statements regarding this model is correct?

- (A) Households are buyers in the product market and sellers in the resource market.
- (B) Households are sellers in the product market and buyers in the resource market.
- (C) Firms are buyers in the product market and sellers in the resource market.
- (D) Firms are buyers in the resource market and households are sellers in the product market.
- (E) Households are buyers in the resource market and firms are sellers in the product market.

What is the correct answer?

First, remind yourself what happens in the resource market and the product market. Then think about who buys in each market and who sells in each market.

Correct answer is **(A)**

### Gross Domestic Product

The primary measure of an economy’s performance is its *aggregate output*, or total output, of goods and services. There are several ways to measure aggregate output. The one favored by the Bureau of Economic Analysis is **gross domestic product (GDP)**, or the dollar value of all final goods and services produced within a country’s borders during a specific period of time, typically a year or a quarter. When GDP is measured for a specific year, the nation’s output in that year is valued using prices that prevailed during that year. This measure of **nominal GDP**, or current-dollar GDP, is how we describe GDP in this chapter. In Chapter 4 we will discuss how economists adjust nominal GDP

#### **gross domestic product**

**(GDP)** The total market value of all *final goods* and *services* produced annually within the boundaries of a nation.

#### **nominal GDP**

GDP measured in terms of the price level at the time of measurement; GDP not adjusted for inflation.

for inflation to calculate real GDP so that comparisons of a nation's aggregate output can be made over time.

### **final goods and services**

Products that have been purchased for final use rather than for resale or further processing or manufacturing.

### **intermediate goods and services**

Products that are purchased for resale or further processing or manufacturing.

**Final Products Only** Note that GDP only counts the value of **final goods and services**, that is, products that are purchased by their end (final) users. GDP excludes **intermediate goods and services** that are purchased for resale or as inputs used to produce other products. Thus, a loaf of bread that is purchased by a family for a camping trip is counted in GDP because the family is the end user. But an identical loaf purchased by a sandwich shop is not counted in GDP because the sandwich shop will be using the loaf of bread as an input to the production of its final product, sandwiches.

**Domestic Output Only** GDP includes only the value of final goods and services produced within a nation's boundaries. Thus, the value of the cars produced at a Japanese-owned Toyota factory in Ohio would count as part of U.S. GDP because the factory is located in the United States, but the value of the trucks produced at an American-owned Ford factory in Canada would not because the factory lies outside the borders of the United States. What matters for GDP is where the final output is produced, not who makes it or who consumes it.

**A Monetary Measure** The old expression, "You can't add apples and oranges" is true because apples and oranges are measured in different units. Apples are measured as 1 apple, 2 apples, 3 apples, 4 apples, and so forth. Oranges are measured as 1 orange, 2 oranges, 3 oranges, 4 oranges, etc. Thus it would make no sense to ask, "What is 2 apples plus 4 oranges?" You would get nowhere because the correct answer is "2 apples plus 4 oranges," which simply restates the question.

To add dissimilar items like apples and oranges together, they must share a common unit of measurement. When it comes to apples and oranges, one way to do this is by adding together pounds of apples and pounds of oranges. That can be done because both items (apples and oranges) now share a common unit of measurement (pounds).



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**TABLE 3.1** Comparing Heterogeneous Output by Using Money Prices

Year	Annual Output	Market Value
1	3 sofas and 2 computers	3 at \$500 + 2 at \$2,000 = \$5,500
2	2 sofas and 3 computers	2 at \$500 + 3 at \$2,000 = \$7,000

Another strategy is to add together the dollar values of apples and oranges—and, by extension, the dollar values of any group of items. This is the method used to calculate GDP. Statisticians sum up the monetary values of all the final goods and services produced in the economy.

Consider the example presented in Table 3.1, where the economy produces three sofas and two computers in year 1 and two sofas and three computers in year 2. Because sofas and computers lack a common unit of measurement, there is no way to add them together. But we *can* add together the number of dollars of sofas and the number of dollars of computers. At \$500 per sofa and \$2,000 per computer, the market value (dollar value) of the economy's output in year 1 is \$5,500 while the monetary value of the economy's output in year 2 is \$7,000. It is consequently clear that aggregate output has increased by \$1,500.

The higher valuation for aggregate output in year 2 is not at all obvious if you are merely told the numbers of sofas and computers produced in each year. Only by measuring individual outputs in the common unit of dollars can you understand that aggregate output has in fact increased.

Using dollars as the common unit of measurement for calculating GDP has an additional benefit. Because people put higher dollar values on things they like, we can infer that higher levels of GDP imply higher levels of satisfaction, all other things equal. It is for this reason that policymakers are deeply concerned with how to increase GDP.

### Value Added

GDP counts only final goods and services. But final goods and services are the result of a long chain of intermediate production steps. As an example, consider Table 3.2 and the multiple stages of production needed to manufacture a wool coat and get it to a final consumer. Firm A, a sheep ranch, sells \$120 worth of raw wool to firm B, a wool processor. Firm B takes that raw wool and combines it with land, labor, capital, and entrepreneurship to produce \$180 of processed wool that it sells to Firm C, a coat manufacturer. Firm C, the manufacturer, sells the coat to firm D, a wholesaler, which sells

it to firm E, a retailer. Finally, a consumer, the final user, buys the coat for \$350 from the retailer.

Because GDP counts only final goods and services, GDP in this example must be \$350, the price that the final consumer pays Firm E for the final product (the wool coat). But there is another way to calculate the \$350 dollar value of GDP that shines some light on the intermediate stages of production. It involves measuring and cumulating the value added at each stage of production.

**value added** The value of a product sold by a firm less the value of the products (materials) purchased and used by the firm to produce that product.

**Value added** is the market value of a firm's output less the value of the inputs the firm has bought. As Column 3 of Table 3.2 indicates, the value added by firm B is \$60, the difference between the \$180 value of its output, processed wool, and the \$120 it paid to firm A for raw wool. Similarly, the value added by firm C is \$40, or the difference between the \$220 market value of its output, a finished coat, and the \$180 it paid to firm B for processed wool.

Note that if you add together all of the value-added numbers in Column 3, they sum to \$350, which is the same as the value of GDP that we calculated by looking only at the \$350 market price paid by the final user. This is no coincidence. A final product's GDP value can always be calculated either as the market value paid by the final user or as the sum of the values added at each stage of the production process.

## Gross Output and Multiple Counting

**gross output (GO)** The dollar value of the economic activity taking place at every stage of production and distribution. By contrast, gross domestic product (GDP) only accounts for the value of final output.

**Gross output (GO)** sums together the sales values received by firms at each stage of production. In Table 3.2, gross output is \$1,140, or the sum of the sales values received by firms A through E.

Note that gross output is always larger than GDP because it includes not only the value of the final product but also the values of all of the earlier "business to business" transactions involving intermediate goods. Thus, in Table 3.2, we see that the GO of \$1,140 is much larger than the GDP of \$350.

**multiple counting** Wrongly including the value of intermediate goods in the gross domestic product; counting the same good or service more than once.

That large difference points out why we must do our best to avoid multiple counting when calculating GDP. **Multiple counting** is the mistake of including the sales values of intermediate goods in GDP. That is a mistake because GDP should only include the sales value of final products.

The most direct way of avoiding multiple counting is by making sure that you are adding together the sales values of final products only. The other is to calculate GDP by summing together values added. That method avoids multiple counting because the value added that is calculated at each stage of

production subtracts off the input costs incurred at earlier stages of production. By subtracting them off, they do not get counted multiple times. The only thing that gets counted is each firm's unique contribution to the value of the final product.

## **GDP Excludes Nonproduction Transactions**

Although many monetary transactions in the economy involve final goods and services, many others do not. These nonproduction transactions must be excluded from GDP because they have nothing to do with the production of final goods.

Two types of nonproduction transactions must be excluded from GDP: purely financial transactions and secondhand sales.

**Financial Transactions** Purely financial transactions include:

- **Public transfer payments** These are the social security payments, welfare payments, and veterans' payments that the government makes directly to households. Because the recipients contribute nothing to current production in return, including such payments in GDP would overstate the year's output.
- **Private transfer payments** These payments include, for example, allowance money given by parents to children and cash gifts given during the holidays. They produce no output. They simply transfer funds from one private individual to another and consequently do not enter into GDP.
- **Financial asset transactions** The buying and selling of stocks, bonds, and other financial assets is just a matter of transferring the ownership of existing financial assets from one person to another. Such transactions create nothing in the way of current production and are not included in GDP. Payments for the services provided by a stockbroker are included, however, because their services are currently provided and are thus a part of the economy's current output of goods and services.

**Secondhand Sales** Secondhand sales contribute nothing to current production and are therefore excluded from GDP.

Suppose you sell your 2015 Ford Mustang to a friend. That transaction will not be counted in this year's GDP because it generates no current production.

## **Two Ways of Looking at GDP: Spending and Income**

Let's look again at how the market value of total output—or of any single unit of total output—is measured. Given the data listed in Table 3.2, how can we measure the market value of a coat?

**TABLE 3.2 Value Added in a Five-Stage Production Process**

(1) Stage of Production	(2) Sales Value of Materials or Product	(3) Value Added
	\$ 0	
Firm A, sheep ranch	120	\$120 (= \$120 - \$ 0)
Firm B, wool processor	180	60 (= 180 - 120)
Firm C, coat manufacturer	220	40 (= 220 - 180)
Firm D, clothing wholesaler	270	50 (= 270 - 220)
Firm E, retail clothier	350	80 (= 350 - 270)
Total sales values	\$1,140	
Value added (total income)		<b>\$350</b>

The first approach is to see how much the final user paid for it. That will tell us the market value of the final product. Or we can add up the entire wage, rent, interest, and profit incomes that were created in producing the coat. The second approach is the value-added method demonstrated in Table 3.2.

The final-product approach and the value-added approach are two ways of looking at the same thing. What is spent on making a product is income to those who helped make it. If \$350 is spent on manufacturing a coat, then \$350 is the total income derived from its production.

We can look at GDP in the same two ways. We can view GDP as the sum of all the money spent in buying it. That is the output approach, or **expenditures approach**. Or we can view GDP in terms of the income derived or created from producing it. That is the earnings, allocations, or **income approach**.

As illustrated in Figure 3.2, we can determine GDP for a particular year either by adding up all the money that was spent to buy total output or by adding up all the money that was derived as income from its production. Buying (spending money) and selling (receiving income) are two aspects of the same transaction. On the expenditures side of GDP, all final goods produced by the economy are bought either by the three domestic sectors (households, businesses, and government) or by foreign buyers. On the income side, once certain statistical adjustments are made, the total receipts acquired from the sale of that total output are allocated to the suppliers of resources as wages, rents, interest, and profit.

**expenditures approach** The method that adds all expenditures made for final goods and services to measure gross domestic product.

**income approach** The method that adds all the income generated by the production of final goods and final services to measure the gross domestic product.

## FIGURE 3.2 The expenditures and income approaches to GDP.

There are two general approaches to measuring gross domestic product. We can determine GDP as the value of output by adding all expenditures on that output. Alternatively, with some modifications, we can determine GDP by adding all the components of income arising from the production of that output.

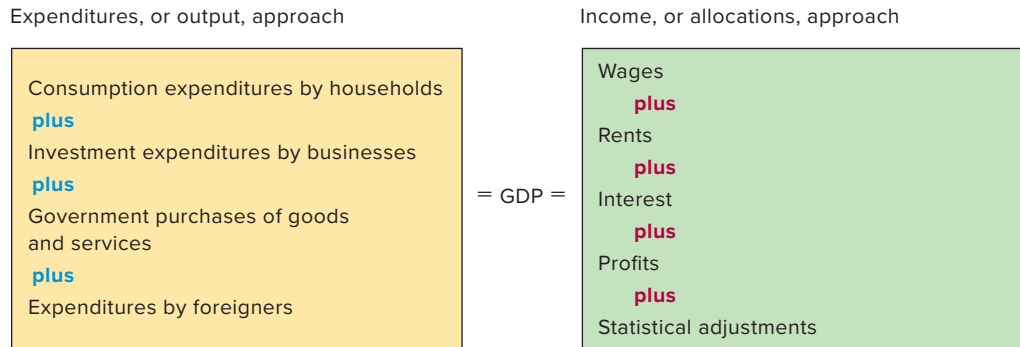


Table 3.3 shows U.S. GDP for 2021 totaled up using the expenditures approach. Table 3.4 shows U.S. GDP for 2021 totaled up using the income approach. Both methods lead to the same result: U.S. GDP in 2021 was \$22,996 billion.

**TABLE 3.3 Accounting Statement for the U.S. Economy Using the Expenditures (Output) Approach, 2021 (in Billions)**

Billions	
<i>Sum of:</i>	
Personal consumption expenditures (C)	\$15,742
Gross private domestic investment ( $I_g$ )	4,120
Government purchases (G)	4,053
Net exports ( $X_n$ )	-918
<i>Equals:</i>	
<b>Gross domestic product</b>	<b>\$22,996</b>

**SOURCE** U.S. Bureau of Economic Analysis.

### The Expenditures Approach

To determine GDP using the expenditures approach, we add up all the spending on final goods and services that has taken place throughout the year. National income accountants have developed precise definitions for each of the types of spending listed on the left side of Figure 3.2.



**TABLE 3.4 Accounting Statement for the U.S. Economy Using the Income (Allocations) Approach, 2021 (in Billions)\***

Billions	
<i>Sum of:</i>	
Compensation of employees	\$12,581
Rents	726
Interest	686
Proprietors' income	1,822
Corporate profits	2,806
Taxes on production and imports	1,299
<i>Equals:</i>	
<b>National income</b>	<b>\$19,920</b>
<i>Less:</i> Net foreign factor income	252
<i>Plus:</i> Consumption of fixed capital	3,848
<i>Plus:</i> Statistical discrepancy	-520
<i>Equals:</i>	
<b>Gross domestic product</b>	<b>\$22,996</b>

\*Some of the items in this table combine related categories that appear in the more detailed accounts. All data are subject to government revision.

**SOURCE** U.S. Bureau of Economic Analysis.

## QUICK REVIEW 3.2

- ✓ Gross domestic product (GDP) is a measure of the total market value of all final goods and services produced domestically in a specific quarter or year.
- ✓ GDP can be obtained by adding together the market selling prices of all final goods and services or by adding up the values added at each stage of production.
- ✓ GDP can be calculated as either the sum of all the money spent purchasing final goods and services (expenditures approach) or as the sum of all the incomes earned from providing the resources that went into producing those final goods and services (income approach).

## Personal Consumption Expenditures (C)

What we have called “consumption expenditures by households” is what the national income accountants call **personal consumption expenditures (C)**. This category covers all expenditures by households on goods and services. In a typical year, roughly 10 percent of personal consumption expenditures are on **durable goods**—products that have expected lives of 3 years or more. Such goods include new automobiles, furniture, and refrigerators. **Nondurable goods**—products with less than 3 years of expected life—make up 30 percent of personal consumption expenditures. Included in this category are food, clothing, and gasoline. About 60 percent of personal consumption expenditures is for **services**—the work done by lawyers, hair stylists, doctors, mechanics, and other service providers. Because of this high percentage, economists sometimes refer to the U.S. economy as a service economy. National income accounting combines the household spending on durable goods, nondurable goods, and services and uses the symbol C to designate the personal consumption expenditures component of GDP.

## Gross Private Domestic Investment ( $I_g$ )

**Gross private domestic investment ( $I_g$ )** includes the following items:

- All final purchases of machinery, equipment, and tools used by business enterprises.
- Residential construction.
- Expenditures for the research and development (R&D) of new productive technologies.
- Money spent on the creation of new works of art, music, writing, film, and software.
- Changes in inventories.

Investment—or, more correctly, economic investment—refers to activities that increase the nation’s stock of capital, which is the collection of human-made resources that help to produce goods and services. Those human-created resources can be divided into two broad categories that we can informally refer to as “tools” and “recipes.”

Tools are tangible physical objects that help to produce goods and services. Recipes are the intangible methods, techniques, and management practices necessary to produce goods and services. A well-stocked kitchen requires both cooking equipment (tools) and an understanding of how to cook (recipes). A productive economy requires both tangible, physical, capital (factories, wireless networks, infrastructure) and intangible intellectual capital (knowing when to plant a crop, understanding how to organize a factory).

The first two items fall into the tools category. Final purchases of plant, machinery, and equipment increase the amount of physical capital available to produce future output. In a similar fashion,

**personal consumption expenditures (C)** The expenditures of households for both durable and nondurable consumer goods.

**durable good** A consumer good with an expected life (use) of three or more years.

**nondurable good** A consumer good with an expected life (use) of less than three years.

**service** An (intangible) act or use for which a consumer, firm, or government is willing to pay.

**gross private domestic investment ( $I_g$ )** Expenditures that increase the nation’s stock of capital, which is the collection of physical objects and intangible ideas that help to produce goods and services. Includes spending on final purchases of plant, machinery, and equipment by business enterprises; residential construction; changes in inventories; expenditures on the research and development (R&D) of new productive technologies; and money spent on the creation of new works of art, music, writing, film, and software.

residential construction generates a future flow of output—housing services—that will keep people productive by keeping them healthy and sheltered.

The next two items fall into the recipes category. Spending on R&D increases the intangible stock of methods and techniques that we can use to produce output. The spending that funds the creation of new works of art, music, writing, and film increases the flow of entertainment and educational services, while spending that pays for new or improved software increases the productivity of everything from cell phones to self-driving cars.

Finally, please note that increases in inventories (unsold goods) are considered investments because they represent, in effect, “unconsumed output,” or output that will increase the future supply of final goods and services when it is sold out of inventory and consumed in future periods. For economists, all new output that is not consumed is, by definition, capital. So an increase in inventories is registered as an addition (although perhaps temporary) to the economy’s stock of capital goods (i.e., physical objects that increase future consumption).

**Positive and Negative Changes in Inventories** We need to look at changes in inventories more closely. Inventories can either increase or decrease over some period. Suppose they increased by \$10 billion between December 31, 2016, and December 31, 2017. Therefore, in 2017, the economy produced \$10 billion more output than people purchased. We want to count all output produced in 2017 as part of that year’s GDP, even though some of it remained unsold at the end of the year. We do so by including the \$10 billion increase in inventories as part of year 2017’s investment. That way, the expenditures in 2017 correctly measure the output produced that year.

Alternatively, suppose that inventories decreased by \$10 billion in 2017. This “drawing down of inventories” means that the economy sold \$10 billion more output in 2017 than it produced that year. It did so by selling goods produced in prior years—goods already counted as GDP in those years. Unless corrected, expenditures in 2017 will overstate GDP for 2017. So in 2017, we consider the \$10 billion decline in inventories as “negative investment” and subtract it from total investment that year.

**Excluding Financial Investment** Economists and NIPA accountants are careful to distinguish between *economic investment* and *financial investment*.

- Economic investment involves the creation of new productive capital, either new tools (plant, equipment, infrastructure) or new recipes (methods, systems, applications). As far as the national income and product accounts are concerned, economic investment is the only investment that matters and the only investment that should be included in the NIPA tables.

- By contrast, financial investment, like purchasing stocks or buying a bond, merely transfers the ownership of existing assets; it does not produce new capital goods. Thus, financial investment is not included in GDP.

While people in daily life do not distinguish between economic investment and financial investment, the only “investment” that is reported in the national income and product accounts is economic investment—the creation of new capital assets.

**Gross Investment versus Net Investment** When we speak of gross private domestic investment, the words “private” and “domestic” mean that we are speaking of investment spending by private businesses, not by government, and that the investment is taking place inside the country, not abroad.

The word “gross” means that we are referring to all investment goods—both those that replace machinery, equipment, and buildings that were used up (worn out or made obsolete) in producing the current year’s output as well as any net additions to the economy’s capital stock.

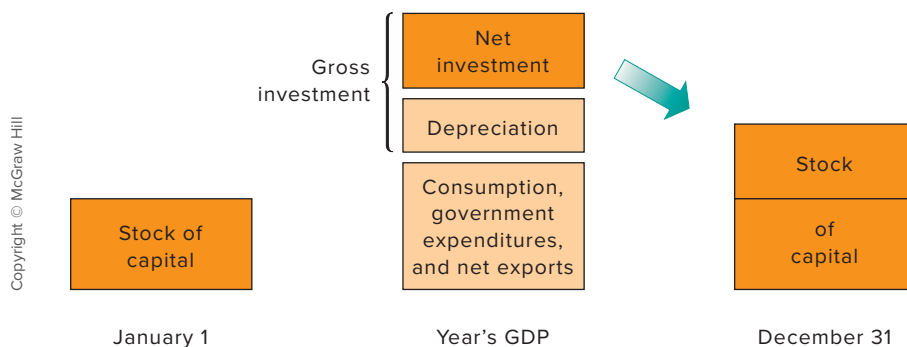
**Net private domestic investment** measures only the *net* additions to the economy’s total stock of capital. It is calculated by taking the economy’s gross amount of investment and subtracting off the amount of capital that is used up over the course of a year, a quantity that is referred to as depreciation:

$$\text{Net investment} = \text{gross investment} - \text{depreciation}$$

**net private domestic investment** Gross private domestic investment less consumption of fixed capital; the addition to the nation’s stock of capital during a year.

### FIGURE 3.3 Gross investment, depreciation, net investment, and the stock of capital.

When gross investment exceeds depreciation during a year, net investment occurs. This net investment expands the stock of private capital from the beginning of the year to the end of the year by the amount of the net investment. Other things equal, the economy’s production capacity expands.



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In typical years, gross investment exceeds depreciation. Thus net investment is positive and the nation's capital stock rises by the amount of net investment. As Figure 3.3 illustrates, the capital stock at the end of a typical year exceeds the capital stock at the beginning of the year by the amount of net investment.

Gross investment does not always exceed depreciation, however. When gross investment and depreciation are equal, net investment is zero and there is no change in the size of the capital stock. When gross investment is less than depreciation, net investment is negative. In that case, the economy is disinvesting—using up more capital than it is producing—and the nation's stock of capital shrinks, which is exactly what happened during the Great Depression of the 1930s.

National income accountants use the symbol  $I$  for private domestic investment spending. To differentiate between gross investment and net investment, they add either the subscript  $g$  or the subscript  $n$ . But it is gross investment,  $I_g$ , that they use when tallying up GDP—not net investment ( $I_n$ ).

### Government Purchases (G)

The third category of expenditures in the national income accounts is **government purchases**, officially labeled “government consumption expenditures and gross investment.” These expenditures have three components: (1) expenditures for goods and services that the government consumes in providing public services; (2) expenditures for publicly owned capital such as schools and highways, which have long lifetimes; and (3) government expenditures on R&D and other activities that increase the economy's stock of know-how.

These purchases include all government expenditures (federal, state, and local) on final goods as well as all direct purchases of resources, including labor. They do not include government transfer payments because, as we have seen, such payments merely transfer money to certain households and generate no production. National income accountants use the symbol  $G$  to signify government purchases.

### Net Exports ( $X_n$ )

International trade transactions are a significant item in national income accounting. But when calculating U.S. GDP, we must keep in mind that we want to total up only those expenditures that are used to purchase goods and services produced within the borders of the United States.

Thus, we must add in the value of exports,  $X$ , because the money that people in other countries spend purchasing U.S. exports is by definition spending on goods and services produced within the United States. The definition of GDP does

#### government purchases (G)

Expenditures by government for goods and services that government consumes in providing public services as well as expenditures for publicly owned capital that has a long lifetime; the expenditures of all governments in the economy for those final goods and final services.

not specify who is buying U.S.-made goods and services—only that the goods and services that they buy are made within U.S. borders. Thus, foreign spending on U.S. exports must be included in U.S. GDP.

At this point, you might incorrectly think that GDP should equal the sum of  $C + I_g + G + X$ . But  $C$ ,  $I_g$ , and  $G$  include, not only expenditures on domestically produced goods and services, but also goods and services produced outside the United States. So to correctly calculate gross domestic product, we must subtract off the spending that goes to imports,  $M$ . That subtraction yields the correct formula for calculating gross domestic product:

$$\text{GDP} = C + I_g + G + X - M.$$

Accountants simplify this formula for GDP by defining **net exports**,  $X_n$ , to be equal to exports minus imports:

**net exports ( $X_n$ )** Exports minus imports.

$$\text{Net exports}(X_n) = \text{exports}(X) - \text{imports}(M)$$

Using this definition of net exports, gross domestic product can be defined as the sum of household consumption expenditures, gross private domestic investment, government purchases, and net exports. In algebra:

$$\text{GDP} = C + I_g + G + X_n$$

Table 3.3 shows that in 2021 Americans spent \$918 billion more on imports than foreigners spent on U.S. exports. That is, net exports in 2021 were a minus \$918 billion.

### Putting It All Together: $\text{GDP} = C + I_g + G + X_n$

Taken together, the four categories of expenditures provide a measure of the market value of a specific year's total output—its GDP. Table 3.3 indicates that 2021 U.S. GDP (in billions) totaled:

$$\text{GDP} = \$15,742 + \$4,120 + \$4,053 - \$918$$

Global Perspective 3.1 lists the GDPs of several countries in U.S. dollars.

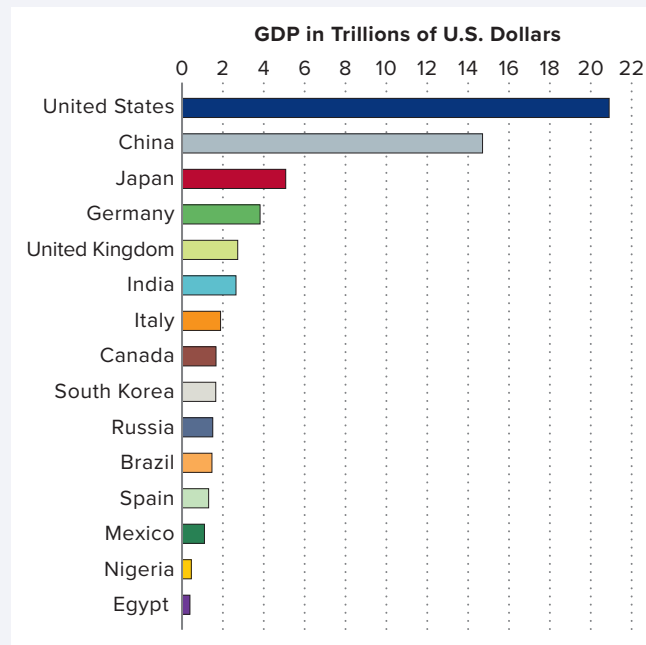
## The Income Approach

Table 3.4 shows how 2021's expenditures of \$22,996 billion were allocated as income to those responsible for producing that year's output. It would be convenient if we could say that the entire amount of expenditures flowed back to them in the form of wages, rent, interest, and profit. But some expenditures flow to other recipients (such as the government) or to other uses such as paying to replace the capital goods that have worn out while producing this year's GDP. These items must be taken into account in order for the income approach and the expenditures approach to arrive at the same value for GDP. We will begin by looking at the items that make up national income in Table 3.4.

## GLOBAL PERSPECTIVE 3.1

### COMPARATIVE GDPs IN TRILLIONS OF U.S. DOLLARS, SELECTED NATIONS, 2020

The United States, China, and Japan have the world's highest GDPs when local, domestic-currency GDPs are converted into U.S. dollars using international exchange rates. That method of comparing national incomes does not account for differences between countries in the cost of living. But it does demonstrate how countries compare in terms of being able to purchase and sell on international markets, which is a major concern for international trade and economic development.



**SOURCE** The World Bank Group, data.worldbank.org.

### Compensation of Employees

By far the largest share of national income, \$12,581 billion in 2021, was paid as wages and salaries by business and government to their employees. That figure also includes wage and salary supplements, including payments by employers into social insurance and into a variety of private pension, health, and welfare funds for workers.

### Rents

Rents consist of the income received by the households and businesses that supply property resources. They include the monthly payments tenants make to landlords and the lease

payments corporations pay for the use of office space. The figure used in the national accounts is net rent—gross rental income minus depreciation of the rental property.



## Interest

Interest consists of the money paid by private businesses to the suppliers of loans used to purchase capital. It also includes the interest that households receive on savings deposits, certificates of deposit (CDs), and corporate bonds.

## Proprietors' Income

The national income accounts divide “profits” into two accounts: *proprietors' income*, which consists of the net income of sole proprietorships, partnerships, and other unincorporated businesses; and corporate profits.

## Corporate Profits

Corporate profits are the earnings of corporations. National income accountants subdivide corporate profits into three categories:

- **Corporate income taxes** These taxes are levied on corporations' profits. They flow to the government.
- **Dividends** Dividends are the part of after-tax profits that corporations choose to pay out, or distribute, to their stockholders. They thus flow to households, which are the ultimate owners of all corporations.
- **Undistributed corporate profits** Any after-tax profits that are not distributed to shareholders are saved, or retained, by corporations to pay for subsequent investment. Undistributed corporate profits are also called retained earnings.



**taxes on production and imports** A national income accounting category that includes such taxes as sales, excise, business property taxes, and tariffs that firms treat as costs of producing a product and pass on (in whole or in part) to buyers by charging a higher price.

**national income** Total income earned by resource suppliers for contributions to gross domestic product plus taxes on production and imports; the sum of wages and salaries, rent, interest, profit, proprietors' income, and taxes.

## Taxes on Production and Imports

The account called **taxes on production and imports** includes general sales taxes, excise taxes, business property taxes, license fees, and customs duties. National income accountants add these indirect business taxes to wages, rent, interest, and profits to determine national income to account for expenditures that are diverted to the government. Consider an item that would otherwise sell for \$1 but costs \$1.05 because the government has imposed a 5 percent sales tax. When this item is purchased, consumers spend \$1.05 to buy it. But only \$1 will go to the seller, who then distributes it as income in the form of wages, rent, interest, and profit. The remaining 5 cents flow as revenue to the government. The GDP accountants place the extra 5 cents into the category called “Taxes on Production and Imports” and loosely consider these taxes to be “income” to government.

## From National Income to GDP

Expenditures on final goods and services flow either as income to private citizens or as “income” to government. As a result, **national income** is the total of all sources of private income (employee compensation, rents, interest, proprietors' income, and corporate profits) plus government revenue from taxes on production and imports. National income is all the income that flows to U.S.-supplied resources, whether here or abroad, plus taxes on production and imports.

Notice that the figure for national income shown in Table 3.4, \$19,920 billion, is less than GDP as determined by the expenditures approach in Table 3.3. The two versions of the national accounting statement—the expenditures version and the income version—are brought into balance by subtracting one item from national income and adding two others.

**Net Foreign Factor Income** First, we need to make a slight adjustment to account for the difference between “national income” and “domestic income”. National income includes the total income of Americans, whether it was earned in the United States or abroad. But GDP is a measure of domestic output—total output produced within the United States regardless of the nationality of those who provide the resources. So, in moving from national income to GDP, we must take out the income Americans gain from supplying resources abroad and add in the income that people living in other countries gain by supplying resources in the United States. That process yields net foreign factor income.

In 2021, net foreign factor income was \$252 billion, meaning that American-owned resources earned \$252 billion more in other countries than foreign-owned resources earned in the United States. Because this \$252 billion reflects the earnings of Americans, it is included in U.S. national income. But this income is not part of U.S. domestic income because it reflects earnings

from output produced in other nations. It is part of those nations' domestic income, derived from the production of their domestic output. Thus, we subtract net foreign factor income from U.S. national income to determine the value of U.S. domestic output (output produced within U.S. borders).

**Consumption of Fixed Capital** Next, we must recognize that the useful lives of private capital equipment, such as cell phone towers or automobile assembly lines, extend far beyond the year in which they were produced. To avoid understating profit and income in the year of purchase and to avoid overstating profit and income in succeeding years, the cost of such capital must be allocated over its lifetime. The amount allocated is an estimate of how much of the capital is being used up, or depreciated, each year.

The economywide amount of depreciation is called **consumption of fixed capital** because it accounts for capital that has been “consumed” in producing the year’s GDP. It is the portion of GDP that is set aside to pay for the ultimate replacement of the capital goods that have suffered depreciation and is consequently not available to flow to households as income. For that reason, it is not counted as part of national income.

On the other hand, depreciation *is* a cost of production and thus must be included in the gross value of output. We must therefore add the amount set aside for the consumption of fixed capital to national income in Table 3.4 to correctly calculate the economy’s expenditures on output.

**Statistical Discrepancy** As you know, it should be possible to calculate GDP either by totaling up expenditures or by adding incomes. Either method should give the same result.

In practice, however, it is not possible for NIPA accountants to measure every amount with total precision. Difficulties arise due to a wide range of factors, including people misreporting their incomes on tax returns and the difficulty involved with accurately estimating depreciation. As a result, the GDP number produced by the income method always differs by a small percentage from the GDP number produced by the expenditures method.

To account for this difference, NIPA accountants add a statistical discrepancy to national income. The addition of that number equalizes the GDP totals produced by the two methods. As Table 3.4 shows, in 2021 the discrepancy value was negative \$520 billion, or about 2.3 percent of GDP.

### **consumption of fixed capital**

An estimate of the amount of capital worn out or used up (consumed) in producing the gross domestic product; also called depreciation.

## QUICK REVIEW 3.3

- ✓ The expenditures approach to GDP sums the total spending on final goods and services:  $GDP = C + I_g + G + X_n$ .
- ✓ The economy's stock of private capital expands when net investment is positive; stays constant when net investment is zero; and declines when net investment is negative.
- ✓ The income approach to GDP sums compensation to employees, rent, interest, proprietors' income, corporate profits, and taxes on production and imports to obtain national income, and then subtracts net foreign factor income and adds consumption of fixed capital and a statistical discrepancy to obtain GDP.

### Shortcomings of GDP

GDP is a reasonably accurate and highly useful measure of how well or how poorly the economy is performing. But it has several shortcomings as a measure of both total output and well-being (utility).

### Nonmarket Activities

Certain productive activities do not take place in any market, for example the day-care services of stay-at-home parents and the labor of carpenters who repair their own homes. Such activities are not reflected in GDP because government accountants receive data only on economic transactions involving market activities—that is, transactions in which output or resources are traded for money. Consequently, GDP understates a nation's total output because it does not count unpaid work. There is one exception: The portion of farmers' output that farmers consume themselves is estimated and included in GDP.

### Leisure and Psychic Income

The average workweek (excluding overtime) in the United States has declined since the beginning of the 1900s—from about 53 hours to about 35 hours. Moreover, workers today have more paid vacations, holidays, and leave time. This increase in leisure time has clearly had a positive effect on overall well-being. But our system of national income accounting understates well-being by ignoring leisure's value. Nor does the system accommodate the satisfaction—the “psychic income”—that many people derive from their work.

### Improved Product Quality

Because GDP is quantitative rather than qualitative, it fails to capture the full value of improvements in product quality. For example, an \$800 smartphone purchased today is of much higher quality than a smartphone that cost \$800 a decade ago.

Quality improvement obviously has a great effect on economic well-being, an effect that goes above and beyond any increase in the quantity of output. Although the BEA adjusts GDP for the quality improvements of selected items, the vast majority of quality improvements are not yet reflected in GDP. (See this chapter's **Last Word** for more on this subject.)

## The Underground Economy

Embedded in our economy is a flourishing, productive underground sector. Some of the people who conduct business there are bookies, smugglers, “fences” of stolen goods, and drug dealers. They have good reason to conceal their incomes.

Most participants in the underground economy, however, engage in perfectly legal activities but choose illegally not to report their full incomes to the Internal Revenue Service (IRS). A barista at a coffee shop may report just a portion of the tips received from customers. Storekeepers may report only a portion of their sales receipts. Workers who want to hold onto their unemployment compensation benefits may take an “off-the-books” or “cash-only” job. A brick mason may agree to rebuild a neighbor’s fireplace in exchange for the neighbor’s repairing his boat engine. None of these transactions show up in GDP.

Global Perspective 3.2 presents estimates of the underground economy size in various countries. Since underground transactions amount to about 7 percent of U.S. GDP, we estimate that U.S. GDP was understated by about \$1.6 trillion in 2021.

## GDP and the Environment

The growth of GDP is sometimes accompanied by an increase in “gross domestic by-products,” including dirty air and polluted water, toxic waste, congestion, and noise. The social costs of the negative by-products reduce our economic well-being. Because those costs are not deducted from total output, GDP overstates our national well-being. Ironically, the expenses spent cleaning up pollution and reducing congestion are added to GDP!

## Composition and Distribution of Output

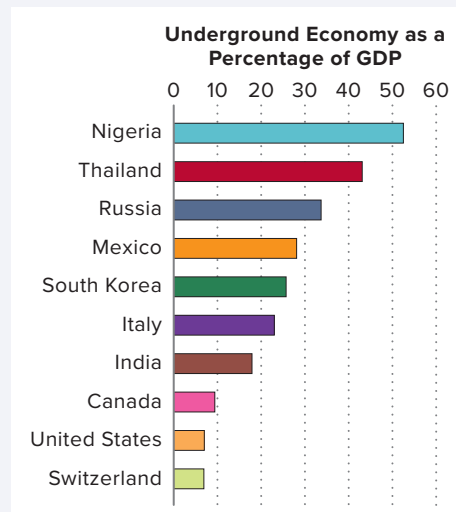
The composition of output is undoubtedly important for well-being, but GDP does not tell us whether the currently produced mix of goods and services is enriching or potentially detrimental to society. GDP assigns equal weight to an assault rifle and a laptop computer, as long as both sell for the same price. Moreover, GDP reveals nothing about the distribution of output. Does 90 percent of the output go to 10 percent of the households, for example, or is output more evenly distributed? The distribution of output may make a big difference for society’s overall well-being.

## GLOBAL PERSPECTIVE 3.2

### THE UNDERGROUND ECONOMY AS A PERCENTAGE OF GDP, SELECTED NATIONS

Underground economies vary in size worldwide. Three factors that help explain the variation are

- (1) the extent and complexity of regulation,
- (2) the type and degree of taxation, and
- (3) the effectiveness of law enforcement.



**SOURCE** Medina, Leandro, and Friedrich Schneider. Shadow Economies Around the World: What Did We Learn Over the Last 20 Years? International Monetary Fund (IMF). 2018.

### Noneconomic Sources of Well-Being

Finally, just as a household's income does not measure its total happiness, a nation's GDP does not measure its total well-being. Many things could make a society better off without necessarily raising GDP: a reduction of crime and violence, peaceful relations with other countries, people's greater civility toward one another, better understanding between parents and children, or a reduction of drug and alcohol abuse.

### The Importance of Intermediate Output

Because GDP focuses on final output, it ignores all of the business-to-business economic activity that takes place in the economy at earlier stages of production and distribution. That omission is worrisome because many people's jobs and many firms' profitability depend on economic activity at earlier stages.

We can get a sense of what is going on at those earlier stages by examining gross output (GO), which sums together the sales values received by firms at every stage of production. As you learned earlier in this chapter, GO is always larger than GDP because GO includes every stage of production while GDP only accounts for the final stage of production. In 2021, GO was \$41.2 trillion in the United States while GDP was \$23.0 trillion.

GO is particularly useful when attempting to gauge the magnitude of business cycle fluctuations. During the 2007–2009 recession, real GDP fell by 4.2 percent, while real GO fell by 8.6 percent. Thus, total economic activity fell by more than twice as much as final output. That substantial difference goes some way toward explaining why employment fell so dramatically during the Great Recession.

## Unemployment

Two problems that arise over the course of the business cycle are unemployment and inflation. Let's look at unemployment first.

### Measurement of Unemployment

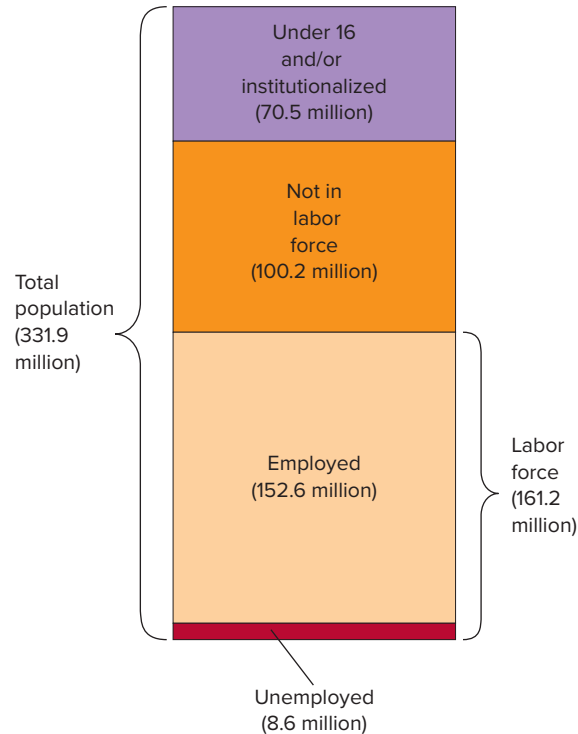
The U.S. Bureau of Labor Statistics (BLS) conducts a nationwide random survey of some 60,000 households each month to determine who is employed and who is not. It asks which members of the household are working, unemployed and looking for work, not looking for work, and so on. From the answers, it determines the nation's unemployment rate for the month.

Figure 3.4 explains the mathematics behind the employment versus unemployment data. To construct Figure 3.4, the BLS divides the total U.S. population into four groups:

- **Under 16 and/or institutionalized** is composed of people under 16 years of age, active duty military personnel, and those living in psychological hospitals, correctional institutions, or skilled nursing facilities. These people are assumed to be unemployable in the private sector either because of child labor laws, military obligations, or the circumstances that accompany institutionalization.
- **Not in labor force** is composed of noninstitutionalized people 16 years of age or older who are neither employed nor seeking work. They include stay-at-home parents, full-time students, and retirees.
- **Employed** consists of noninstitutionalized people age 16 and older who have jobs. These are people who both want to work *and* have a job.
- **Unemployed** consists of every noninstitutionalized person age 16 or older who is not employed but who wants to work and is actively seeking employment. Please note that to be classified as unemployed, a person has to not

### FIGURE 3.4 The U.S. labor force, employment and unemployment, 2021.

The labor force consists of persons 16 years of age or older who are not in institutions and who are (1) employed or (2) unemployed but seeking employment.



only want a job but also be *actively seeking* employment. A person who claims to want a job but who isn't bothering to look for work is classified as "not in labor force."

**Labor force** Persons 16 years of age and older who are not in institutions and who are employed or are unemployed and seeking work.

**unemployment rate** The percentage of the labor force unemployed at any time.

**Labor force participation rate** measurement of noninstitutionalized population above age 16 that is in the labor force.

The **labor force** consists of the latter two groups—the employed plus the unemployed. The labor force includes anyone who has a job plus anyone lacking a job who is actively seeking employment.

The **unemployment rate** is the percentage of the labor force that is unemployed:

$$\text{unemployment rate} = \frac{\text{unemployed}}{\text{labor force}} \times 100$$

The statistics underlying the rounded numbers in Figure 3.4 show that in 2021 the unemployment rate averaged:

$$\frac{8,600,000}{161,200,000} \times 100 = 5.3\%$$

Another useful statistic is the **labor force participation rate**. This measures the percentage of noninstitutionalized people in the

labor force above 16 years old. A higher labor force participation rate means a larger percentage are working or trying to find work.

$$\text{labor force participation rate} = \frac{\text{labor force}}{\text{population}} \times 100$$

Using the statistics from Figure 3.4, in 2021, there were 261.4 million people above the age of 16 and not in one of the institutions mentioned above. Of those 261.4 million, the labor force was 161.2 million, so the average labor force participation rate in 2021 was

$$\text{labor force participation rate} = \frac{161.2 \text{ million}}{261.4 \text{ million}} \times 100 = 61.7\%$$

Despite the use of scientific sampling and interviewing techniques, the data collected by the monthly BLS surveys are subject to the following criticisms:

- **Part-time employment** The BLS lists all part-time workers as fully employed. In 2021 about 28 million people worked part-time as a result of personal choice. But another 5 million part-time workers either (1) wanted to work full-time and could not find a full-time job or (2) worked fewer part-time hours than desired. By counting them as fully employed, critics claim the BLS understates the unemployment rate.
- **Discouraged workers** You must be actively seeking work to be counted as unemployed. But many jobless people stop actively searching for employment and are reclassified as “not in the labor force.” According to critics, that reclassification understates the unemployment problem. The discouraged workers are capable and may still want jobs, but are missing entirely in the official unemployment statistics. The number of such **discouraged workers** was roughly 463,000 in 2021, down from 657,000 in 2020.

#### **discouraged workers**

Employees who have left the labor force because they have not been able to find employment.

## **Types of Unemployment**

There are three types of unemployment: frictional, structural, and cyclical.

**Frictional Unemployment** At any given time some workers are “between jobs.” Some of them are moving voluntarily from one job to another. Others have been fired and are seeking reemployment. Still others have been laid off because they work seasonal jobs and the season just changed. In addition to those between jobs, there are always many young workers searching for their first job.

As these unemployed people find jobs or are called back from temporary layoffs, other job seekers and laid-off workers replace them in the “unemployment pool.” While the pool itself persists



because newly unemployed workers are always flowing into it, most workers do not stay in the unemployment pool for very long. Indeed, when the economy is strong, most unemployed workers find new jobs within a couple of months. We should be careful not to confuse the permanence of the pool itself with the false idea that the pool's membership is permanent, too. That being said, there are workers who do remain unemployed and in the unemployment pool for many months or even several years.

**frictional unemployment** A type of unemployment caused by workers voluntarily changing jobs and by temporary layoffs; unemployed workers between jobs.

Economists use the term **frictional unemployment**, or search unemployment, for workers who are unemployed as they actively search for a job. The word “frictional” reflects the fact that the labor market does not operate perfectly and instantaneously (without friction) in matching workers and jobs.

Frictional unemployment is inevitable and, at least in part, desirable. Many workers who are voluntarily between jobs are moving from low-paying, low-productivity jobs to higher-paying, higher-productivity positions. Their new jobs mean greater income for the workers, a better allocation of labor resources, and a larger real GDP for the economy.

**structural unemployment** Unemployment of workers whose skills are not demanded by employers, who lack sufficient skill to obtain employment, or who cannot easily move to locations where jobs are available.

**Structural Unemployment** Frictional unemployment blurs into **structural unemployment**. Changes over time in consumer demand and in technology alter the “structure” of the total demand for labor, both occupationally and geographically.

Occupationally, the demand for certain labor-intensive skills such as sewing or farming may decline or even vanish. The demand for other skills, particularly in high technology areas may intensify. Structural unemployment occurs because the composition of the labor force does not respond immediately or completely to the new structure of job opportunities. Workers whose skills and experience have become obsolete or unneeded thus find that they have no marketable talents. They are structurally unemployed until they develop skills that employers want.

Geographically, the demand for labor also changes over time. An example is the migration of industry and thus of employment opportunities from the Snowbelt to the Sunbelt over the past few decades. Another example is offshoring of jobs that occurs when the demand for a particular type of labor shifts from domestic firms to foreign firms. As job opportunities shift from one place to another, some workers become structurally unemployed.

The distinction between frictional and structural unemployment is hazy. The key difference is that frictionally unemployed workers have marketable skills and either live in areas where jobs exist or are able to move to areas that have job opportunities. Structurally unemployed workers find it hard to obtain new jobs without retraining, additional education, or moving to a new area. Frictional unemployment is short-term; structural unemployment is more likely to be long-term and consequently more serious.

**Cyclical Unemployment** Unemployment caused by a decline in total spending is called **cyclical unemployment**. It typically begins in the recession phase of the business cycle. As the demand for goods and services decreases, employment falls and unemployment rises. Cyclical unemployment results from insufficient demand for goods and services and is exacerbated by the downward stickiness of wages in the economy, as discussed in the nearby Consider This story. The 25 percent unemployment rate in the depth of the Great Depression in 1933 reflected mainly cyclical unemployment.

**cyclical unemployment** A type of unemployment caused by insufficient total spending (insufficient aggregate demand) and which typically begins in the recession phase of the business cycle.



## AP Economics Skills Practice

### Skill 1.C: Identify an economic concept, principle, or model using quantitative data or calculations.

In this skill, think about the economic concepts from this chapter that require a calculation to determine the answer.

#### On the AP Exam

In the sample question, you are given labor force data to find the unemployment rate. After reading the given data, review the definition of unemployment and consider if all groups listed are included in the labor force. After calculating the labor force, find the unemployment rate.

Labor Data for Northland:

Employed workers	100	Unemployed workers not looking for work	20
Unemployed	30	Retired workers	10
Population	200	Under the age of 16	30
Stay at home parents	10		

Given the above data, what is the unemployment rate in Northland?

- (A) 15%
- (B) 23%
- (C) 25%
- (D) 32.5%
- (E) 65%

What is the correct answer?

The formula to find the unemployment rate is number of unemployed workers divided by the labor force, which is comprised of employed and unemployed workers multiplied by 100.  $\frac{30}{100} \times 100 = 23\%$

Correct answer is **(B)**

## ? CONSIDER THIS . . .

### Downwardly Sticky Wages and Unemployment

Labor markets have an important quirk that helps to explain why unemployment goes up so much during a recession. The quirk is that wages are flexible upward but sticky downward.

On the one hand, workers are perfectly happy to accept wage increases. So when the economy is booming and firms start bidding for the limited supply of labor, wages rise—often quite rapidly.

On the other hand, workers deeply resent pay cuts. So if the economy goes into a recession and firms need to reduce labor costs, managers almost never cut wages because doing so would only lead to disgruntled employees, low productivity, and, in extreme cases, workers stealing supplies or actively sabotaging their own firms.

Instead, managers usually opt for layoffs. The workers who are let go don't like being unemployed. But those who remain get to keep their old wages. As a result, they keep on being as productive and cooperative as they were before.

The preference that managers show for layoffs over wage cuts results in downwardly sticky wages and an informal price floor that help to explain why unemployment goes up so much during a recession. The problem is that when the demand for labor falls during a recession, the informal price floor prevents wages from falling. As a result, there is no way for falling wages to help entice at least some firms to hire a few more workers. Thus, when a recession hits, employment falls more precipitously than it would have if wages had been downwardly flexible.



We will say more about the high costs of cyclical unemployment later, but first we need to define “full employment.”

### Definition of Full Employment

Because frictional and structural unemployment are largely unavoidable in a dynamic economy, full employment is something less than 100 percent employment of the labor force. Economists say that the economy is “fully employed” when it is experiencing only frictional and structural unemployment. That is, full employment occurs when there is no cyclical unemployment.

Economists label the unemployment rate that is consistent with full employment as the **full-employment rate of unemployment**, or the **natural rate of unemployment (NRU)**. At the NRU, the economy is said to be producing its **potential output**, the real GDP that occurs when the labor force and other inputs are “fully employed.”

Note that a fully employed economy does not mean zero unemployment. Even when the economy is fully employed, the NRU shows some positive percentage because it takes time for frictionally unemployed job seekers to find jobs. Also, it takes time for the structurally unemployed to achieve the skills needed for reemployment.

“Natural” does not mean that the economy will always operate at the NRU and thus realize its potential output. When cyclical unemployment occurs, the economy has much more unemployment than it would at the NRU. Moreover, the economy can operate for a while at an unemployment rate *below* the NRU. At times, the demand for labor may be so great that firms take a stronger initiative to hire and train the structurally unemployed. Also, some parents, teenagers, college students, and retirees who were casually looking for just the right part-time or full-time jobs may quickly find them. Thus the unemployment rate temporarily falls below the natural rate.

Also note that the NRU can vary over time as demographic factors, job-search methods, and public policies change. In the 1980s, the NRU was about 6 percent. Today, it is estimated to be between 3 and 4 percent.

## Economic Cost of Unemployment

High unemployment involves heavy economic and social costs.

**The GDP Gap** The basic economic cost of unemployment is forgone output. When the economy fails to create enough jobs for all who are able and willing to work, potential production is irretrievably lost. Unemployment above the natural rate means that society is operating at some point inside its production possibilities curve. Economists call this sacrifice of output a **GDP gap**—the difference between actual and potential GDP. That is:

$$\text{GDP gap} = \text{actual GDP} - \text{potential GDP}$$

The GDP gap can be either negative or positive:

- When unemployment is above the natural rate of unemployment, the GDP gap will be negative (actual GDP < potential GDP) because only a smaller amount of output can be produced when employing a smaller amount of labor.
- By contrast, when unemployment is below the natural rate, the GDP gap will be positive (actual GDP > potential GDP) because the large quantity of labor being utilized

**full-employment rate of unemployment** The unemployment rate at which there is no cyclical unemployment of the labor force; equal to around 4 percent (rather than zero percent) in the United States because frictional and structural unemployment are unavoidable.

**natural rate of unemployment (NRU)** The full-employment rate of unemployment; the unemployment rate occurring when there is no cyclical unemployment and the economy is achieving its potential output; the unemployment rate at which actual inflation equals expected inflation.

**potential output** The real output (*GDP*) an economy can produce when it fully employs its available resources.

**GDP gap** Actual gross domestic product minus potential output; may be either a positive amount (a positive GDP gap) or a negative amount (a negative GDP gap).

allows the economy to produce more than the full-employment level of output.

To calculate potential GDP at any point in time, the BLS estimates what the economy's output would be at that instant if the actual unemployment rate equaled the natural rate of unemployment. Figure 3.5(a) shows the U.S. GDP gap for recent years while Figure 3.5(b) shows the actual unemployment rate over the same time period. Please note the close correlation between the actual unemployment rate (Figure 3.5(b)) and the GDP gap (Figure 3.5(a)). The higher the unemployment rate, the larger the GDP gap.

**Okun's Law** Arthur Okun was the first macroeconomist to quantify the inverse relationship between the actual unemployment rate and the GDP gap. He noticed that, on average:

$$\text{GDP gap} = -2.0 \times (\text{actual unemployment rate} - \text{natural unemployment rate})$$

This relationship came to be known as **Okun's law**. With respect to recessions, it implies that for every 1 percentage point by which the actual unemployment rate exceeds the natural rate, a GDP gap of about negative 2.0 percent will occur.

By applying Okun's law, we can calculate the absolute loss of output associated with any above-natural unemployment rate. For example, in 2020, the average monthly unemployment rate was 8.1 percent, or 4.6 percentage points above that period's 3.5 percent natural rate of unemployment. Multiplying this 4.6 percent by Okun's negative 2.0 indicates that 2020's GDP gap was approximately negative 9.2 percent of potential GDP (in real terms). Applying this 9.2 percent loss of output to 2020's potential GDP of \$19,344 billion, we find that the economy sacrificed \$1,780 billion of real output.

As Figure 3.5 shows, sometimes the economy's actual output exceeds its potential or full-employment output. An unusually strong economic expansion in 1999 and 2000, for example, caused actual GDP to exceed potential GDP, thereby generating a positive GDP gap for those two years. You should note, though, that while actual GDP can exceed potential GDP for a time, positive GDP gaps create strong demand-pull inflationary pressures and cannot be sustained indefinitely.

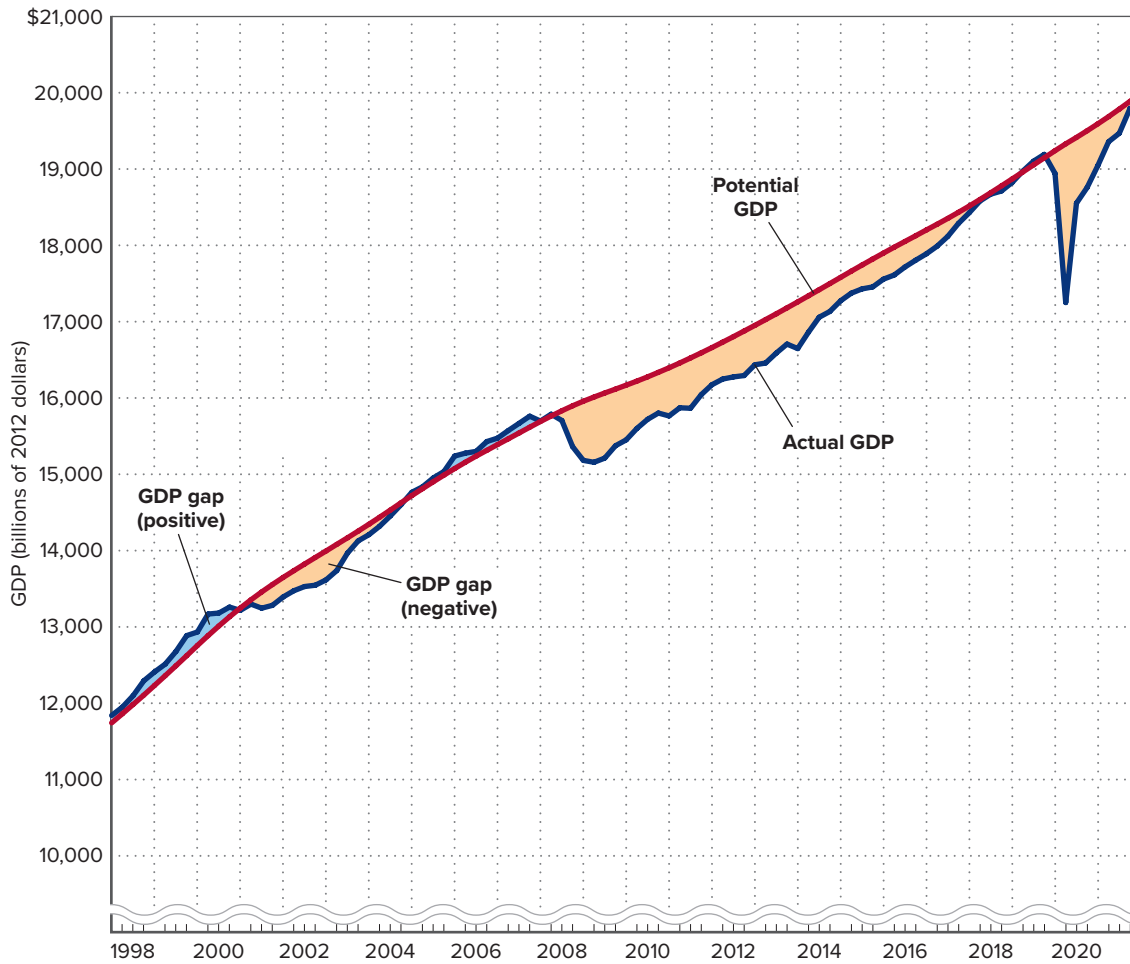
**Unequal Burdens** An increase in the unemployment rate from, say, 5 percent to 9 or 10 percent might be more tolerable to society if every worker's hours and income were reduced proportionally. But this is not the case. The burden of unemployment is unequally distributed. Because of the informal price floor, some workers retain their hours and income, while others become unemployed and earn nothing.

Table 3.5 examines unemployment rates for both the overall labor force and various demographic subgroups. We look at

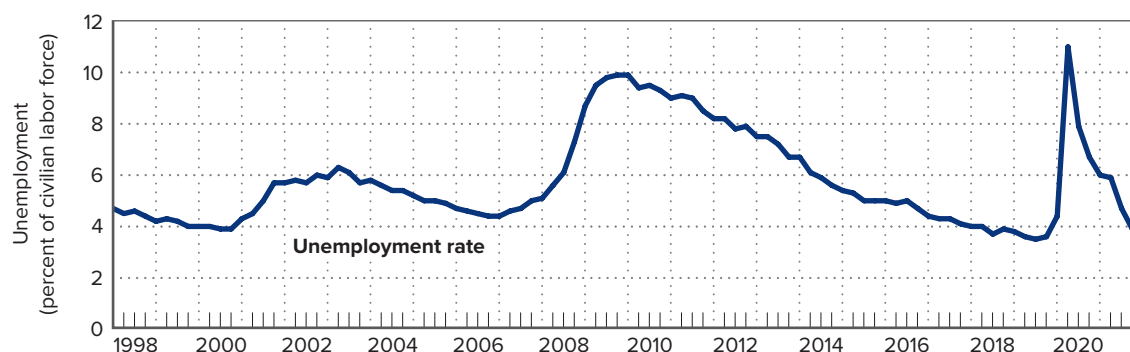
**Okun's law** The generalization that any 1-percentage-point rise in the unemployment rate above the full-employment rate of unemployment is associated with a rise in the negative GDP gap by 2 percent of potential output (potential GDP).

### FIGURE 3.5 Actual and potential real GDP and the unemployment rate.

(a) The difference between actual and potential GDP is the GDP gap. A negative GDP gap measures the output the economy sacrifices when actual GDP falls short of potential GDP. A positive GDP gap indicates that actual GDP is above potential GDP. (b) A high unemployment rate means a large GDP gap (negative), and a low unemployment rate means a small or even positive GDP gap.



(a)  
The GDP gap



(b)  
Unemployment rate

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Source: Congressional Budget Office; Bureau of Economic Analysis; and Bureau of Labor Statistics

the years 2019 and 2020 as a way of investigating how unemployment varies over the course of the business cycle. In 2019, for example, the business cycle reached a peak, with the unemployment rate averaging 3.7 percent over the year. The economy then receded quickly in the spring of 2020 when the COVID-19 lockdowns began. The unemployment rate increased, with the average monthly unemployment rate equaling 8.1 percent during 2020.

By observing the differences in unemployment rates in 2019 and 2020 for different demographic subgroups, we can generalize as follows:

- **Occupation** Workers in lower-skilled occupations (for example, laborers) have higher unemployment rates than workers in higher-skilled occupations (for example, professionals).
- **Age** Teenagers have much higher unemployment rates than adults. The unemployment rate for all teenagers rises during recessions.
- **Race and ethnicity** The unemployment rate of Asians is lower than all other races/ethnicities at all stages of the business cycle. In general, the unemployment rate for African Americans is about three times that of Asians and twice that of Whites. It also rises by about twice as many percentage points during most recessions.
- **Gender** The unemployment rates for men and women normally are very similar. But during the 2020 recession, the unemployment rate of women exceeded that of men.
- **Education** Less-educated workers, on average, have higher unemployment rates than workers with more education.
- **Duration** The number of persons unemployed for long periods—15 weeks or more—as a percentage of the labor force is much lower than the overall unemployment rate. But that percentage rises significantly during recessions. Notice that it rose from 2.8 percent of the labor force in 2019 to 4.2 percent in 2020.

**TABLE 3.5 Unemployment Rates by Demographic Group: Full Employment (2019) and Recession (2020)\***

Demographic Group	Unemployment Rate	
	2019	2020
Overall	3.7%	8.1%
Occupation:		
Management and professional occupations	2.0	4.5
Production occupations	3.9	9.0
Ages 16-19	12.7	17.9
Female, 20+	3.3	8.0
Male, 20+	3.4	7.4
Race and ethnicity (all ages):		
African American	6.1	11.4
Hispanic and Latino	4.3	10.4
Asian	2.7	8.7
White	3.3	7.3
Gender (all ages):		
Women	3.6	8.4
Men	3.7	7.8
Education: <sup>†</sup>		
Less than high school diploma	5.4	11.7
High school diploma only	3.7	9.0
College degree or more	2.1	4.8
Duration:		
15 or more weeks	2.8	4.2

\*Civilian labor force data.

<sup>†</sup>People age 25 or over.

**SOURCE** *Economic Report of the President 2019*, Bureau of Labor Statistics, Census Bureau.



## Noneconomic Costs

Policymakers are deeply concerned with unemployment rates and how to minimize the length and depth of business cycle downturns as a way of moderating the harm caused by unemployment. Their attention is warranted because severe cyclical unemployment is more than an economic malady; it is a social catastrophe.

- At the individual level, research links high unemployment to increases in suicide, homicide, heart attacks, strokes, and mental illness. The unemployed lose skills and self-respect. Morale plummets and families disintegrate. Widespread joblessness increases poverty, reduces hope for material advancement, and heightens ethnic tensions.
- At the social level, severe unemployment can lead to rapid and sometimes violent political upheaval. Witness Adolph Hitler's ascent to power against a background of unemployment in Germany.

### QUICK REVIEW 3.4

- ✓ There are three types of unemployment: frictional, structural, and cyclical.
- ✓ The natural rate of unemployment (frictional plus structural) is presently around 3.5 percent in the United States.
- ✓ A positive GDP gap occurs when actual GDP exceeds potential GDP; a negative GDP gap occurs when actual GDP falls short of potential GDP.
- ✓ According to Okun's law, for each 1 percentage point of unemployment above the natural rate, the U.S. economy suffers an additional 2 percent decline in real GDP below potential GDP.
- ✓ Lower-skilled workers, teenagers, African Americans, Hispanic Latinos, and less-educated workers have higher rates of unemployment, while the unemployment of men and women overall are almost identical.

# Chapter 3 Review

## Summary

Gross domestic product (GDP), a basic measure of an economy's economic performance, is the market value of all final goods and services produced within a nation's borders in a year. When output from a given year is valued by the prevailing prices from the same year, the result is nominal or current-dollar GDP.

Final goods are those purchased by end users, whereas intermediate goods are those purchased for resale or for further processing or manufacturing. Intermediate goods, nonproduction transactions, and secondhand sales are excluded in calculating GDP.

GDP may be calculated by summing total expenditures on all final output or by summing the income derived from the production of that output. By the expenditures approach, GDP is determined by adding consumer purchases of goods and services, gross investment spending by businesses, government purchases, and net exports:  $GDP = C + I_g + G + X_n$ .

Personal consumption expenditures consist of expenditures on durable and nondurable goods and services. About 60 percent of consumer expenditures in the United States are on services, leading economists to refer to the U.S. economy as a service economy.

Gross investment is divided into (a) replacement investment (required to maintain the nation's stock of capital at its existing level) and (b) net investment (the net increase in the stock of capital). In most years, net investment is positive, and therefore the economy's stock of capital and production capacity increase.

By the income, or allocations, approach, GDP is calculated as the sum of compensation to employees, rents, interest, proprietors' income, corporate profits, and taxes on production and imports, minus net foreign factor income, plus consumption of fixed capital and a statistical discrepancy.

GDP is a reasonably accurate and very useful indicator of a nation's economic performance, but it fails to account for nonmarket and illegal transactions, changes in leisure and in product quality, the composition and distribution of output, the environmental effects of pollution, noneconomic sources of well-being, and economic activity at earlier stages of production and distribution.

Economists distinguish among frictional, structural, and cyclical unemployment. The full-employment or natural rate of unemployment, which is composed of frictional and structural unemployment, is currently between 3 and 4 percent. The presence of part-time and discouraged workers makes it difficult to measure unemployment accurately.

The GDP gap, which can be either a positive or a negative value, is found by subtracting potential GDP from actual GDP. The economic cost of unemployment,

as measured by the GDP gap, consists of the goods and services forgone by society when its resources are involuntarily idle. Okun's law suggests that every 1-percentage-point increase in the actual unemployment rate above the natural rate of unemployment causes an additional 2 percent negative GDP gap.

## Key Terms and Concepts

circular flow diagram 577	income approach 586	labor force 602
households 577	personal consumption expenditures (C) 589	unemployment rate 602
business 577	durable good 589	labor force participation rate 602
product market 579	nondurable good 589	discouraged workers 603
resource market 580	service 589	frictional unemployment 604
national income accounting 580	gross private domestic investment ( $I_g$ ) 589	structural unemployment 604
gross domestic product (GDP) 581	net private domestic investment 591	cyclical unemployment 605
nominal GDP 581	government purchases (G) 592	full-employment rate of unemployment 607
final goods and services 582	net exports ( $X_n$ ) 593	natural rate of unemployment (NRU) 607
intermediate goods and services 582	taxes on production and imports 596	potential output 607
value added 584	national income 596	GDP gap 607
gross output (GO) 584	consumption of fixed capital 597	Okun's law 608
multiple counting 584		
expenditures approach 586		

## Discussion Questions

- Why do national income accountants compare the market value of the total outputs in various years rather than actual physical volumes of production? What problem is posed by any comparison over time of the market values of various total outputs? How is this problem resolved?
- Which of the following are included in this year's GDP? Which are excluded? Explain your answers.
  - Interest received on an AT&T corporate bond.
  - Social Security payments received by a retired factory worker.
  - Unpaid services of a family member who painted the family home.
  - Income of a dentist from the dental services she provided.
  - A monthly allowance that a college student receives from home.
  - Money received by Josh when he resells his nearly brand-new Honda automobile to Kim.
  - The publication and sale of a new college textbook.

- h. An increase in leisure resulting from a 2-hour decrease in the length of the workweek, with no reduction in pay.
  - i. A \$2 billion increase in business inventories.
  - j. The purchase of 100 shares of Alphabet (the parent company of Google) stock.
3. How is the labor force defined, and who measures it? How is the unemployment rate calculated? Does an increase in the unemployment rate necessarily mean a decline in the size of the labor force? Why is a positive unemployment rate—more than zero percent—fully compatible with full employment?
  4. Why is it difficult to distinguish among frictional, structural, and cyclical unemployment? Why is unemployment an economic problem? What are the consequences of a negative GDP gap? What are the noneconomic effects of unemployment?

## Problems

1. Suppose that annual output in year 1 in a three-good economy is 3 quarts of ice cream, 1 bottle of shampoo, and 3 jars of peanut butter. In year 2, the output mix changes to 5 quarts of ice cream, 2 bottles of shampoo, and 2 jars of peanut butter. If the prices in both years are \$4 per quart for ice cream, \$3 per bottle of shampoo, and \$2 per jar of peanut butter, what was the economy's GDP in year 1? What was its GDP in year 2?
2. If in some country personal consumption expenditures in a specific year are \$50 billion, purchases of stocks and bonds are \$30 billion, net exports are -\$10 billion, government purchases are \$20 billion, sales of secondhand items are \$8 billion, and gross investment is \$25 billion, what is the country's GDP for the year?
3. Assume the following data for a country: total population, 500; population under 16 years of age or institutionalized, 120; not in the labor force, 150; unemployed, 23; part-time workers looking for full-time jobs, 10. What is the size of the labor force? What is the official unemployment rate?
4. Suppose that the natural rate of unemployment in a particular year is 5 percent and the actual unemployment rate is 9 percent. Use Okun's law to determine the size of the GDP gap in percentage-point terms. If potential GDP is \$500 billion in that year, how much output is forgone because of cyclical unemployment?

## AP Exam Practice

### Multiple Choice:

**Directions: Each of the questions or incomplete statements below is followed by five answers or completions. Select the one that is best in each case.**

1. Which of the following would be considered personal consumption spending in national income accounting?
  - (A) The city of Boston buys a new snowplow.
  - (B) Dad buys a can of Boston baked beans.
  - (C) Dunkin' Donuts opens a new store in Boston.
  - (D) The Boston Red Sox add 500 new seats to their ballpark.
  - (E) Harvard University employs an economist.
2. A nation's GDP is a measure of
  - (A) happiness of the nation's population.
  - (B) unemployment in the nation.
  - (C) environmental quality in the nation.
  - (D) aggregate output in the nation.
  - (E) gross investment in the nation.

3. The unemployment rate is calculated by
- (A) dividing the size of the labor force by the total population.
  - (B) dividing the number of unemployed by the total population.
  - (C) dividing the number of unemployed by the size of the labor force.
  - (D) dividing the number of unemployed by the noninstitutionalized population.
  - (E) dividing the size of the labor force by the noninstitutionalized population.
4. Johnny used to work at the shipyard, but a slower economy resulted in his losing his job. He has been searching for work, but it seems like nobody is hiring these days, at least until the economy improves. Johnny's unemployment is best described as
- (A) cyclical.
  - (B) structural.
  - (C) frictional.
  - (D) seasonal.
  - (E) illegal.
5. There are 100,000 residents in a city, and 75,000 are above the age of 16 and noninstitutionalized. There are 60,000 employed residents and 10,000 that are unemployed and seeking work. Which of the following statistics is correct?
- (A) Unemployment rate is 10%.
  - (B) Unemployment rate is 13.3%.
  - (C) Labor force participation rate is 70%.
  - (D) Labor force participation rate is 75%.
  - (E) Unemployment rate is 14.2%.

### Free Response

**Directions: Respond to all parts of the question. Use correctly-labeled diagrams, if useful or required, in explaining your answers. A correctly-labeled diagram must have all axes and curves clearly labeled and must show directional changes.**

	2021 Output	2021 Prices
Food	18	\$3
Shelter	12	\$10
Energy	13	\$2

The economy of Theolivia produces three goods, food, shelter, and energy. The output and prices of these goods are in the table above.

- a. Calculate nominal GDP in 2021. Show your work.
- b. Suppose that the potential GDP in Theolivia is \$210 in 2021 and the natural rate of unemployment is 4%. Use the nominal GDP from part (a), and Okun's law, to estimate the unemployment rate in 2021. Show your work.  
  
Suppose that another country, Nation Z, produces clothing and furniture and the economy in Nation Z has nominal GDP below potential GDP.
- c. In a correctly labeled graph of Nation Z's production possibilities curve, identify a point X that describes the current state of the economy.
- d. Some of the long-term unemployed residents of Nation Z have become frustrated with their unsuccessful job search and have dropped out of the labor force. Will this increase, decrease, or have no impact on the official unemployment rate in Nation Z?