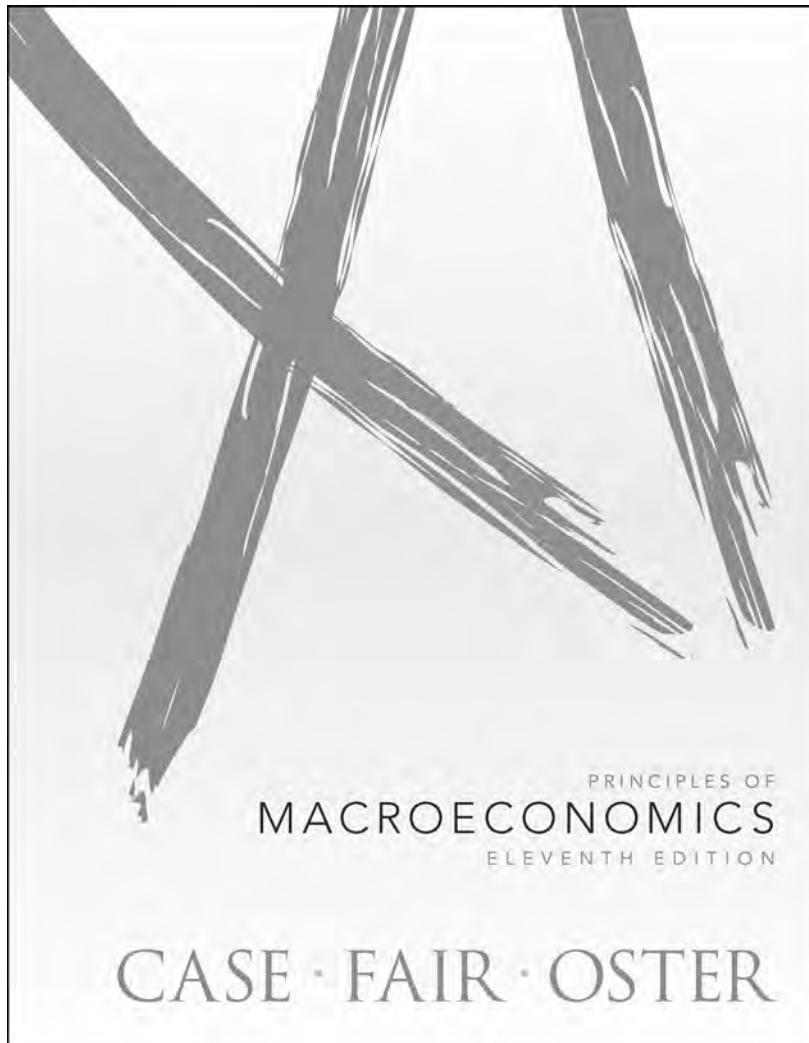


Instructor's Manual

for



TONY LIMA
CALIFORNIA STATE UNIVERSITY, EAST BAY

PEARSON

Boston Columbus Indianapolis New York San Francisco Upper Saddle River
Amsterdam Cape Town Dubai London Madrid Milan Munich Paris Montréal Toronto
Delhi Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo



This work is protected by United States copyright laws and is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.

AVP/Executive Editor: David Alexander
Senior Editorial Project Manager: Lindsey Sloan
Senior Production Project Manager: Roberta Sherman
Senior Manufacturing Buyer: Carol Melville

Copyright © 2014, 2012, 2009 Pearson Education, Inc. All rights reserved. Manufactured in the United States of America. This publication is protected by Copyright, and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Education, Inc., Permissions Department, One Lake Street, Upper Saddle River, New Jersey 07458 or you may fax your request to 201-236-3290.

Many of the designations by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and the publisher was aware of a trademark claim, the designations have been printed in initial caps or all caps.

PEARSON

www.pearsonhighered.com

10 9 8 7 6 5 4 3 2 1

ISBN-13: 978-0-13-302427-2

ISBN-10: 0-13-302427-X

Contents

| | |
|---|-----|
| Preface | v |
| Chapter 1 The Scope and Method of Economics | 1 |
| Chapter 2 The Economic Problem: Scarcity and Choice | 12 |
| Chapter 3 Demand, Supply, and Market Equilibrium | 23 |
| Chapter 4 Demand and Supply Applications | 39 |
| Chapter 5 [20] Introduction to Macroeconomics | 50 |
| Chapter 6 [21] Measuring National Output and National Income | 62 |
| Chapter 7 [22] Unemployment, Inflation, and Long-Run Growth | 76 |
| Chapter 8 [23] Aggregate Expenditure and Equilibrium Output | 93 |
| Chapter 9 [24] The Government and Fiscal Policy | 106 |
| Chapter 10 [25] The Money Supply and the Federal Reserve System | 118 |
| Chapter 11 [26] Money Demand and the Equilibrium Interest Rate | 133 |
| Chapter 12 [27] The Determination of Aggregate Output, the Price Level, and the Interest Rate..... | 144 |
| Chapter 13 [28] Policy Effects and Costs Shocks in the AS/AD Model | 158 |
| Chapter 14 [29] The Labor Market in the Macroeconomy | 168 |
| Chapter 15 [30] Financial Crises, Stabilization, and Deficits | 183 |
| Chapter 16 [31] Household and Firm Behavior in the Macroeconomy: A Further Look | 199 |
| Chapter 17 [32] Long-Run Growth | 216 |
| Chapter 18 [33] Alternative Views in Macroeconomics | 228 |
| Chapter 19 [34] International Trade, Comparative Advantage, and Protectionism.... | 239 |
| Chapter 20 [35] Open-Economy Macroeconomics, The Balance of Payments and Exchange Rate | 255 |
| Chapter 21 [36] Economic Growth in Developing and Transitional Economies | 271 |
| Solutions to Problems | 288 |

Preface

This Instructor's Manual is designed for use with Case, Fair, and Oster, *Principles of Economics*, 11th Edition, or the microeconomics and macroeconomics split editions. It is a central resource for teachers because it includes teaching tips, topics for class discussions, numerous extended applications for use in the classroom, and solutions to the end-of-chapter problems.

Features of this Instructor's Manual

Each chapter of this Instructor's Manual contains the following elements:

- Detailed *Chapter Outlines* provide key term definitions, teaching notes, and lecture suggestions.
- *Topics for Class Discussion* provide topics and real-world situations that help ensure that economic concepts resonate with students.
- Unique *Economics in Practice* features that are not in the main text provide extra real-world examples to present and discuss in class.
- *Teaching Tips* provide alternative ways to cover the material and brief reminders on additional help to provide students. These tips include suggestions for exercises and experiments to complete in class.
- *Extended Applications* include exercises, activities, and experiments to help make economics relevant to students.
- *Solutions* for all the end-of-chapter problems are grouped in the back of the Instructor's Manual.

Revisions to the Main Text

If you used Case/Fair/Oster, *Principles of Macroeconomics*, 10th Edition, here is a summary of the changes the authors made to the main text. Knowing about these changes will help you revise your current teaching notes and class presentations.

- The 11th edition has continued the changes in the *Economics in Practice* boxes that we began several editions ago. In these boxes, we try to bring economic thinking to the concerns of the typical student. In many cases, we do this by spotlighting recent research, much of it by young scholars.
 - Chapter 6 looks at recent work on “green” national income accounting, a topic likely to excite many environmentally conscious undergraduates.
 - Chapter 7 describes research on the long-term effects on wages and job prospects of new college graduates who begin their careers in a recession.

In other cases, we use recent events to show the power and breadth of economic models and principles.

- When Hurricane Sandy struck the east coast of the United States, why did most of the subsequent charges of price-gouging involve gas and hotel rooms? Chapter 4 uses principles of elasticity to answer this question.
- Several of the new boxes in the macroeconomics chapters focus on the debates we have had in the United States in the last year on tax and spending policy. Finally, more of the boxes are global, with examples on the move from tea to coffee drinking in China, or roads in India, or the relative productivity of American versus Indian managers.

It is our hope that students will come to see both how broad the tools of economics are and how exciting is much of the new research in the field. For each box, we have also added questions to take students back from the box to the analytics of the textbook to reinforce the underlying economic principles of the illustrations.

- As in the previous edition, we have reworked some of the chapters to streamline them and to improve readability. In this edition, Chapters 2 and 3 have been substantially reworked, while many of the other chapters have been tightened and made more current.
- A major change has been made in macro: We have replaced the LM curve with a Fed interest rate rule. Chapters 12 and 13 have been completely rewritten to incorporate this change. There is no IS/LM model, and no longer does the money supply play any exogenous role in the AS/AD model. This change simplifies the analysis and makes the model more realistic. The Fed does in practice target the interest rate and not the money supply! The supply of money and demand for money chapters (Chapters 10 and 11) have been retained because they deal with many basic questions in macro. The main point of these two chapters going forward is to show how the Fed controls the interest rate. This then allows us to use the Fed rule in Chapters 12 and 13. Without Chapters 10 and 11, students would not understand what is behind the Fed rule and would not understand quantitative easing and the like.
- U.S. short-term interest rates have been roughly zero since the 10th edition, and we have added discussion on what a zero interest rate bound means. This discussion is now framed around the Fed rule. We have also updated and expanded our discussion of the Fed's balance sheet (Chapter 10). Also, federal government deficits have been high since the 10th edition, and we have expanded our discussion of this (Chapters 9 and 15).
- All of the macro data has been updated through 2012. The slow recovery from the 2008–2009 recession is evident in these data. This gives students a good idea of what has been happening to the economy since they left high school.
- Many new questions and problems at the end of the chapters have been added.

Supplements for Instructors

In addition to the Instructor's Manual, the following supplements are available:

THREE TEST ITEM FILES

The Test Item Files help instructors easily and efficiently assess student understanding of economic concepts and analyses. Test questions are annotated with the following information:

Difficulty: 1 for straight recall, 2 for some analysis, 3 for complex analysis

Type: multiple-choice, true/false, short-answer, essay

Topic: the term or concept the question supports

Skill: fact, definition, analytical, conceptual

AACSB: see description that follows

Learning Outcome: This tagging system allows instructors to build assessments around desired departmental and course outcomes and track results in MyEconLab's gradebook.

The Test Item Files include questions with tables that students must analyze to solve for numerical answers. The Test Item Files also contain questions based on the graphs that appear in the book. The questions ask students to interpret the information presented in the graph. Many questions in the Test Item Files require students to sketch a graph on their own and interpret curve movements.

Macroeconomics Test Item File 1, by Randy Methenitis of Richland College: Test Item File 1 (TIF1) includes over 2,700 questions. All questions are machine-gradable and are either multiple-choice or true-false. TIF1 is for use with the tenth edition of Principles of Macroeconomics in the first year of publication. This TIF is available in a computerized format using TestGen EQ test-generating software.

Macroeconomics Test Item File 2, by Randy Methenitis of Richland College: This additional Test Item File contains another 2,700 machine-gradable questions based on TIF1 but regenerated to provide instructors with fresh questions when using the book the second year. This TIF is available in a computerized format using TestGen EQ test-generating software.

Macroeconomics Test Item File 3, by Randy Methenitis of Richland College: This third Test Item File includes 1,000 conceptual problems, essay questions, and short-answer questions. Application-type problems ask students to draw graphs and analyze tables. The Word files are available on the Instructor's Resource Center (www.pearsonhighered.com).

THE ASSOCIATION TO ADVANCE COLLEGIATE SCHOOLS OF BUSINESS (AACSB)

The authors of the Test Item Files have connected select questions to the general knowledge and skill guidelines found in the AACSB assurance of learning standards.

What Is the AACSB? AACSB is a not-for-profit corporation of educational institutions, corporations, and other organizations devoted to the promotion and improvement of higher

education in business administration and accounting. A collegiate institution offering degrees in business administration or accounting may volunteer for AACSB accreditation review. The AACSB makes initial accreditation decisions and conducts periodic reviews to promote continuous quality improvement in management education. Pearson Education is a proud member of the AACSB and is pleased to provide advice to help you apply AACSB assurance of learning standards.

What Are AACSB Assurance of Learning Standards? One of the criteria for AACSB accreditation is quality of the curricula. Although no specific courses are required, the AACSB expects a curriculum to include learning experiences in areas such as the following:

1. Communication
2. Ethical Reasoning
3. Analytic Skills
4. Use of Information Technology
5. Multicultural and Diversity
6. Reflective Thinking

Questions that test skills relevant to these guidelines are appropriately tagged. For example, a question testing the moral questions associated with externalities would receive the Ethical Reasoning tag.

How Can Instructors Use the AACSB Tags? Tagged questions help you measure whether students are grasping the course content that aligns with the AACSB guidelines noted. In addition, the tagged questions may help instructors identify potential applications of these skills. This in turn may suggest enrichment activities or other educational experiences to help students achieve these skills.

TESTGEN

The computerized TestGen package allows instructors to customize, save, and generate classroom tests. The test program permits instructors to edit, add, or delete questions from the Test Item Files; edit existing graphics and create new graphics; analyze test results; and organize a database of tests and student results. This software allows for extensive flexibility and ease of use. It provides many options for organizing and displaying tests, along with search and sort features. The software and the Test Item Files can be downloaded from the Instructor's Resource Center (www.pearsonhighered.com/irc).

POWERPOINT® LECTURE PRESENTATION

Three sets of PowerPoint® slides, prepared by Fernando Quijano of Dickinson State University are available for instructors to use.

1. A comprehensive set of PowerPoint® slides that can be used by instructors for class presentations or by students for lecture preview or review. The presentation includes all the graphs, tables, and equations in the textbook. Two versions are available—the first is in step-

by-step mode so that you can build graphs as you would on a blackboard, and in an automated mode, using a single click per slide.

2. A comprehensive set of PowerPoint® slides with Classroom Response Systems (CRS) questions built in so that instructors can incorporate CRS “clickers” into their classroom lectures. For more information on Prentice Hall’s partnership with CRS, see the description below. Instructors may download these PowerPoint presentations from the Instructor’s Resource Center (www.pearsonhighered.com/irc).
3. A student version of the PowerPoints is available as .pdf files from the book’s MyEconLab Course. This version allows students to print the slides and bring them to class for note taking.

CLASSROOM RESPONSE SYSTEMS

Classroom Response Systems (CRS) is an exciting new wireless polling technology that makes large and small classrooms even more interactive because it enables instructors to pose questions to their students, record results, and display the results instantly. Students can answer questions easily by using compact remote-control transmitters. Prentice Hall has partnerships with leading providers of classroom response systems and can show you everything you need to know about setting up and using a CRS system. We provide the classroom hardware, text-specific PowerPoint® slides, software, and support; and we show you how your students can benefit. Learn more at www.pearsonhighered.com/crs.

FOR THE INSTRUCTOR

MyEconLab is an online course management, testing, and tutorial resource. Instructors can choose how much or how little time to spend setting up and using MyEconLab. Each chapter contains two Sample Tests, Study Plan Exercises, and Tutorial Resources. Student use of these materials requires no initial setup by their instructor. The online Gradebook records each student’s performance and time spent on the Tests and Study Plan and generates reports by student or by chapter. Instructors can assign tests, quizzes, and homework in MyEconLab using four resources:

1. Preloaded Sample Tests
2. Problems similar to the end-of-chapter problems
3. Test Item File questions
4. Self-authored questions using Econ Exercise Builder

Exercises use multiple-choice, graph drawing, and free-response items, many of which are generated algorithmically so that each time a student works them, a different variation is presented. MyEconLab grades every problem, even those with graphs. When working homework exercises, students receive immediate feedback with links to additional learning tools.

FOR THE STUDENT

MyEconLab puts students in control of their learning through a collection of tests, practice, and study tools tied to the online interactive version of the textbook, as well as other media resources.

Within MyEconLab's structured environment, students practice what they learn, test their understanding, and pursue a personalized Study Plan generated from their performance on Sample Tests and tests set by their instructors. At the core of MyEconLab are the following features:

1. Sample Tests, two per chapter
2. Personal Study Plan
3. Tutorial Instruction
4. Graphing Tool

Sample Tests Two Sample Tests for each chapter are preloaded in MyEconLab, enabling students to practice what they have learned, test their understanding, and identify areas in which they need further work. Students can study on their own, or they can complete assignments created by their instructor.

Personal Study Plan Based on a student's performance on tests, MyEconLab generates a personal Study Plan that shows where the student needs further study. The Study Plan consists of a series of additional practice exercises with detailed feedback and guided solutions that are keyed to other tutorial resources.

Tutorial Instruction Launched from many of the exercises in the Study Plan, MyEconLab provides tutorial instruction in the form of step-by-step solutions and other media-based explanations.

Graphing Tool A graphing tool is integrated into the Tests and Study Plan exercises to enable students to make and manipulate graphs. This feature helps students understand how concepts, numbers, and graphs connect.

Additional MyEconLab Tools MyEconLab includes the following additional features:

1. **Economics in the News**—This feature provides weekly updates during the school year of news items with links to sources for further reading and discussion questions.
2. **eText**—While students are working in the Study Plan or completing homework assignments, one of the tutorial resources available is a direct link to the relevant page of the text so that students can review the appropriate material to help them complete the exercise.
3. **Glossary**—This searchable version of the textbook glossary provides additional examples and links to related terms.
4. **Glossary Flashcards**—Every key term is available as a flashcard, allowing students to quiz themselves on vocabulary from one or more chapters at a time.

MyEconLab content has been created through the efforts of: Charles Baum, Middle Tennessee State University; Sarah Ghosh, University of Scranton; Russell Kellogg, University of Colorado–Denver; Bert G. Wheeler, Cedarville University; and Noel Lotz and Douglas A. Ruby, Pearson Education.

RESOURCES FOR THE STUDENT

In addition to MyEconLab, described above, the following supplements are designed to help students understand and retain the key concepts of each chapter:

POWERPOINT

A student version of the PowerPoints is available as .pdf files from the book's MyEconLab Course. This version allows students to print the slides and bring them to class for note taking.

COURSESMART

CourseSmart is an exciting new *choice* for students looking to save money. As an alternative to purchasing the print textbook, students can purchase an electronic version of the same content and save up to 50 percent off the suggested list price of the print text. With a CourseSmart eTextbook, students can search the text, make notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages for later review. For more information or to purchase access to the CourseSmart eTextbook, visit www.coursesmart.com.

Acknowledgments

This guide is a collaborative effort. It accumulates the wisdom of the authors of the instructors' manuals for the previous editions. Mark Lieberman (Vassar College) wrote many of the teaching tips. Mary Lesser (Iona College) added a number of extended applications.

In the previous edition I thanked Professors Case, Fair, and Oster for including many of my suggestions. In this edition, I would like to thank them for putting up with my occasional e-mails about minor issues in the text. Chip, Ray, and Sharon have been patient and responsive to my suggestions, qualities that are all too rare in the economics profession.

Finally, my wife Norma Schroder has been a constant source of support, encouragement and love throughout this project.

About the Author

Dr. Tony Lima is Professor of Economics at California State University, East Bay (Hayward, CA). He has been teaching economics for over 25 years. He writes regularly on the subject of teaching economics as well as his other interests, the economics of the wine industry and the economics of sports.

Tony Lima
California State University, East Bay
Hayward, CA

The Scope and Method of Economics

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Why Study Economics? *p. 2*

- To Learn a Way of Thinking
- To Understand Society
- To Be an Informed Citizen

The Scope of Economics *p. 4*

- Microeconomics and Macroeconomics
- The Diverse Fields of Economics

The Method of Economics *p. 8*

- Theories and Models
- Economic Policy

An Invitation *p. 12*

Appendix: How to Read and Understand Graphs *p. 15*

DETAILED CHAPTER OUTLINE

I. Introduction, page 1

The authors show students how economics relates to their everyday lives. Case, Fair, and Oster discuss the interactions between the United States and other countries, while also comparing the United States to other countries. Along the way macroeconomics is introduced with the notions of employment, production and GDP (although the authors don't use that term). Foreign trade is also mentioned at the level of U.S. exports and imports. The section concludes with a definition of economics that emphasizes the two fundamental economic problems: scarcity and choice. *Economics* is the study of how individuals and societies choose to use the scarce resources that nature and previous generations have provided.

- ◆◆◆ TEACHING TIP: The opening sentence, "The study of economics should begin with a sense of wonder," is very true. Mention to your class that some people actually make a living teaching economics. Developed economies are truly highly specialized.
- ◆◆◆ TEACHING TIP: Each chapter of the book includes a feature entitled *Economics in Practice* that helps students apply the concepts of the chapter to a real-world observation or newspaper story. Each chapter of this Instructor's Manual includes one or more unique *Economics in Practice* to use in class. ◆

Unique Economics in Practice

Use the opening example on pages 1 and 2 to introduce the subject of globalization. Ask your students what "made in the U.S." means. Many will respond that the good has to be manufactured in the U.S. Raise the issue of where the parts were made. Quite a few goods that carry the "made in the U.S." label are actually assembled in the U.S. with the components manufactured in other countries. Then move on to a discussion of what it would mean for the U.S. or any developed economy to consume only what we make. The general answer is higher prices and less choice for consumers, but try to get the students to focus on specific goods (bananas and BMWs are two that are easy to understand). If you're ambitious, you can introduce using value added as a percentage of market value to measure the extent of local contribution to a final product.

Question: A shirt is stitched together in China using cloth made in Indonesia. The shirt is shipped to Mexico. A worker in Mexico sews in a label saying "Made in Mexico" and the shirt is exported to the U.S. under the North American Free Trade Agreement (NAFTA). The Mexican firm exporting the shirt argues that no tariff should be applied to this shirt because it was made in Mexico. Discuss the validity of the exporter's argument.

Suggested answer: This is an extreme example that illustrates an important point. What does "Made in the USA" mean? Clearly the shirt in the example is not "Made in Mexico." Most international trade agreements specify the minimum fraction of value added that must be incorporated into the product before the product can be labeled with a country of origin. It's a little early to discuss value added, so describe it as the fraction of the product's total cost added in the country.

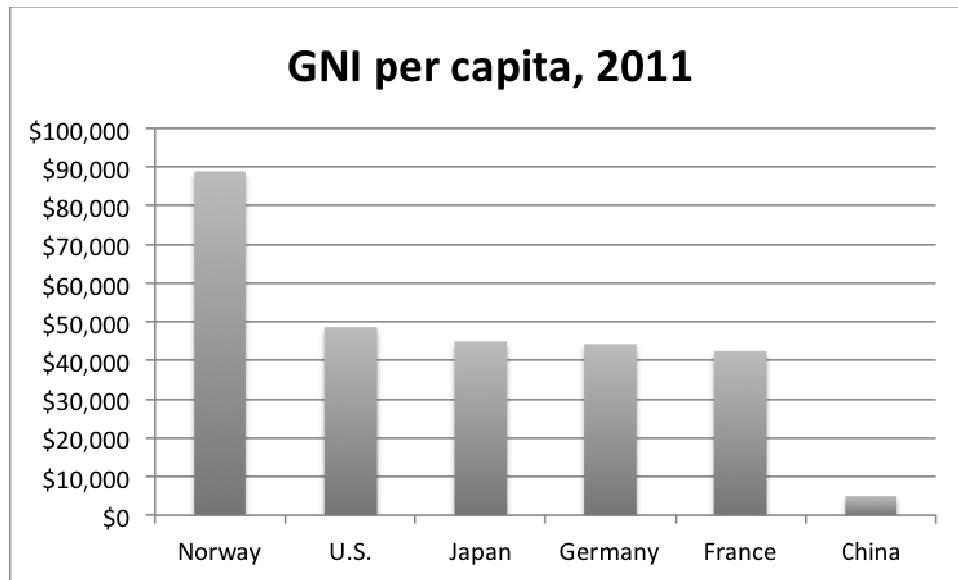
- ◆◆◆ TEACHING TIP: To help break first-day tensions, try getting your students involved from the start. Ask them why they are taking the course. Be persuasive — this is a good chance to show the class that you're really a nice person. You will get a variety of answers, from the serious — "To understand the world," "To help me get a good job when I graduate," "I'm thinking about becoming an economics major" — to the humorous — "My father made me," "Intro Politics was full". Some of these answers can prompt further questions: Why might learning economics help you get a job? Why do you think your father wanted you to take this course? The answers can help acquaint the rest of the class with the breadth and practicality of economics. ◆

TEACHING TIP: Try to get the class thinking in terms of substitutes. Ask them to think about substitutes for water. Most will say there are no substitutes for water. A few will say beer or wine, but point out that these start as water so they don't count. Things that can be used in place of water include plastic bottles of water placed in a toilet tank (reduces volume per flush); shorter showers; and brown lawns. Then point out that if there are substitutes for something as basic as water there almost certainly are substitutes for just about every other economic good. Wants exceed quantity available for any economic good.

Unique Economics in Practice

Show your students this list of countries: China, France, Germany, Japan, Norway, and the U.S. Ask them to rank these countries from highest to lowest per capita income. (You may have to explain what per capita income means. Income per household may work better for your class.) Many will put China first. Show them actual data:

| Country | GNI per capita, 2011 |
|---------|-------------------------|
| Norway | \$88,870 |
| U.S. | \$48,620 |
| Japan | \$44,900 |
| Germany | \$44,230 |
| France | \$42,420 |
| China | \$4,940 |



The point, of course, is that China is the world's second-largest economy. But they have the largest population, making their per-capita income fairly small. (The Excel workbook includes a tab on which the countries are sorted by total GNI.)

Tip: Data for this example is in the Excel workbook for this chapter. Also included is the full dataset from the World Bank for those who want to use different countries.

II. Why Study Economics? page 2

There are three main reasons to study economics:

A. To Learn a Way of Thinking

TEACHING TIP: Point out to students that economists use common everyday words to describe very specific ideas. The word *cost* is one example. How is the word used in everyday usage? Economists use the word to mean opportunity cost, the cost of choosing one alternative over another. Another example is efficiency. People generally use efficiency to describe any process that's accomplished with skill and dexterity. Economists mean producing the most output possible from given quantities of resources (*productive efficiency*). A related concept, *allocative efficiency* is probably too advanced for the first day (or week) of your class. ◉

Also described as a way to make decisions, the economic way of thinking involves understanding three fundamental concepts:

1. Opportunity Cost is the best alternative that we forgo, or give up, when we make a choice or a decision. Every decision means giving up something. Economists are fond of trade-offs as a way of thinking about decision making. Taking one action usually means giving up something else. As the text states, “The full ‘cost’ of making a specific choice includes [the value of] what we give up by not making the best alternative choice.”

Opportunity costs arise because resources are scarce. Scarce means limited. Resources are scarce because human wants exceed what we can produce from our current resources.

TEACHING TIP: Use the following exercise to quickly get across several points concerning opportunity costs. Ask students to think about what they would be doing if they were not in class. (Don't let them think about this too long or you may find yourself facing an empty classroom!) Make a list of the many suggestions you will receive: Go back to sleep, sunbathe, read a book. Answers will vary because tastes vary. Then ask each student to think about the value of that alternative. That value is the opportunity cost of attending class. (Clearly the benefits of attending your class always outweigh the cost!) Point out that measuring opportunity cost is subjective and depends on the perspective of the person making the choice. Conclude by noting that each student cannot have the whole list. Opportunity cost is not the value of *all* the alternatives forgone. It is the value of the single second best alternative. ◉

TEACHING TIP: One example in the text lends itself to further discussion. A firm purchases a piece of equipment for \$3,000. Is the opportunity cost of this decision really the interest that could have been earned in a savings account? Get the class to discuss the choices available to the firm. Use a computer as a specific example. There might be many alternatives to purchasing a new computer. These include upgrading existing computers, buying a computer with different features, or simply continuing to use the computers in use today. The opportunity cost of buying a new computer is the value of whatever alternative is viewed as second-best. ◉

TOPIC FOR CLASS DISCUSSION:

Have students discuss the costs of attending college. Most will usually name the explicit costs of tuition, books, and room and board. Some may note the implicit cost of not working full time. Explore the idea that cost is not always an explicit payment but also a loss. Have students consider what full-time jobs they might have if they were not in college. Make sure the students understand that opportunity costs are real costs. If they had not chosen to attend college, the opportunity cost would have been their net economic gain or loss. You may want to add a comment that this analysis only looks at the four years of college. Over a lifetime, the benefits of college are far greater than the costs. ■

2. *Marginalism* is the process of analyzing the additional or incremental costs or benefits arising from a choice or decision. Marginal means a small change. The text uses *marginal cost*, the cost of increasing production by one unit. This can be illustrated by putting added miles on a car; the change in the odometer reading is the marginal mileage.

TEACHING TIP: This example will be familiar to many faculty. Suppose your professional organization is holding the annual meeting in Honolulu. You are fortunate enough to be selected to attend. After considering alternatives, you decide to take a week's vacation on Maui after the conference. You did this because you realized the marginal cost of travelling to Maui from Honolulu is relatively small. People often use marginal analysis without realizing what they are doing! □

TEACHING TIP: To drive home the importance of marginal analysis, one example can come from the testing requirements you've outlined on your syllabus. Ask students to look into the future and imagine they've taken three exams and their average is a 78, say two points from a B. Given that their goal is to earn a B, the relevant grade is their grade on the final (fourth) exam; that is, the relevant grade is the marginal grade. At the end of semester, they have no control over what they earned on the first three exams (a sunk cost at this juncture), but they do have some control over their final exam grade. □

TOPIC FOR CLASS DISCUSSION:

The text uses the example of an airline with empty seats to illustrate marginal costs. Another example that works well is a hotel with vacant rooms. If someone arrives at 10 p.m. and wants a room, what should the hotel charge? Students will often refer to the "rack rate," the maximum price the hotel would charge for that room. Point out that a hotel room is very perishable. A room that is empty one night can't be rented twice the following night. Therefore, the hotel manager should accept any offer that exceeds marginal cost. Marginal costs include cleaning, laundry and a little bit of power to run the television. □

3. An *efficient market* is a market in which profit opportunities are eliminated almost instantaneously. In efficient markets, profit opportunities are eliminated rapidly by the actions of those seeking the profits. Use the text's example of checkout lines at a grocery store to make the point that it is the people seeking the shortest line (express lines not included!) whose actions result in all the lines being of about the same length.

TEACHING TIP: The text repeats an old joke about a \$20 bill lying on the sidewalk. Believers in perfectly efficient markets will argue that the \$20 can't be there because, if it was, someone would have picked it up already. If you decide to repeat this joke in class, make it a \$100 bill to drive the point home. The point, of course, is that no market is *perfectly* efficient. □

TEACHING TIP: This is a good point to introduce the economics of information. One of the main factors that causes profit opportunities to persist is slow dissemination of information. Use the stockbroker example from the text to illustrate the other extreme. If a stockbroker calls with a hot tip, what should you do? The answer in the text—do nothing—is correct. Expand on this answer to point out that a phone call from your stockbroker is way, way too late. By the time you get the phone call, the information has already been disseminated via the Internet and other electronic trading networks. The current price of the stock will already reflect the information, eliminating any chance you might have to earn a profit. □

B. To Understand Society

- a. Economic decisions shape the physical environment and influence the character of society. The text cites the examples of the Industrial Revolution of the late 18th and early 19th century and the e-revolution of the late 1990s. The *Industrial Revolution* was the period in England during the late eighteenth and early nineteenth centuries in which new manufacturing technologies and improved transportation gave rise to the

modern factory system and a massive movement of the population from the countryside to the cities.

1. The authors point to the market-driven miracle of millions of workers, each pursuing his or her own self-interest, producing output efficiently while also earning a living. These decisions have an enormous influence on the direction in which societies evolve. The text's example of the shrinking agricultural labor force is even more extreme today. At the same time, employment in technology-related industries has been booming. The text mentions internet companies. Biotech firms are also important. In each case, the main thrust of the change has been the desire of entrepreneurs to build new businesses and earn a profit.

TOPIC FOR CLASS DISCUSSION:

Near the top of the “dot-com” stock market bubble, Milton Friedman said he was absolutely sure some dot-com companies would be successful and worth their current valuations, but he was also quite certain he didn’t know which. Ask the class to discuss the impact of the stock market bubble on consumer spending and consumer behavior generally. This is a good time to introduce the differences between income and wealth. You might also point out that the fraction of income spent on consumption is much, much larger than the fraction of wealth. ■

TEACHING TIP: Demonstrate to students that economics is relevant. Bring in the front page from that morning’s newspaper (not the business page), and hold it up to the class. Briefly state how economics can shed light on each of the six or so stories on the front page.

This will be easy to do for stories about national health policy, budget deficits, and inflation. But with a little imagination (and good class participation!), you can show how economics relates to virtually any news story. A cocaine bust? Economics explains why cocaine costs so much and why selling it can be such a lucrative activity for lawbreakers. A war in a faraway region of the world? Economics can help us understand the origins of the conflict, as well as the true cost—the opportunity cost—of a possible U.S. military intervention. ◀

TEACHING TIP: Ask the students what percentage of the U.S. labor force is employed in agriculture. Few will guess the correct answer (less than two percent). ◀

Economics in Practice: iPod and the World, page 5

An iPod contains 451 parts. Final assembly is performed by several companies in southeast Asia. Toshiba made the most expensive component, the hard drive. But the largest fraction of the iPod’s price is the value added paid to Apple, various U.S. distributors, and domestic component makers. The true value of the iPod is its design and conception, not the parts that go into it.

Similarly, Mattell’s Barbie doll was designed in the U.S. The plastic used in the doll was made in Taiwan, the hair was made in Japan, and the clothes are made in China. The final doll assembly is also done in China. But of the \$10 retail price, \$8 is captured by the U.S. as Mattell’s gross margin on each doll.

C. To Be an Informed Citizen: Many political issues citizens vote for deal with economic issues. The authors mention the Great Recession of 2007 – 2009, the Obama health care plan, and ticket scalping as three examples. Without a basic understanding of economics, citizens are likely to vote for policies that are not in their best interests.

TEACHING TIP: Using the newspaper again, point out that the future of society depends on informed voters. The newspaper merely reports what has happened. An understanding of economics is vital for understanding why things happen and can enable us to make better decisions in solving important social problems. List some of those problems and indicate where they may be covered in more detail later in your course (or other courses). ◀

III. The Scope of Economics, page 4

A. Microeconomics versus Macroeconomics

1. *Microeconomics* is the branch of economics that examines the functioning of individual industries and the behavior of individual decision-making units—that is, firms and households.
2. *Macroeconomics* is the branch of economics that examines the economic behavior of aggregates—income, employment, output, and so on—on a national scale.

TEACHING TIP: Table 1.1 on page 6 in the text is an excellent summary of the differences between macro and micro. ◀

B. The Diverse Fields of Economics: Table 1.2 on page 7 of the text lists some fields of specialty in economics (analogous to specialties in medicine).

TEACHING TIP: Students often think of economics as a rather narrow field. Stress its applicability to the analysis of a wide range of interests and its usefulness in preparing for a variety of graduate degrees. Try discussing the “economic approach” to the pollution problem. Many students and scientists believe pollution control is strictly an issue of regulation and have never thought of the economics that cause pollution in the first place. Drawing on the analogy to medicine, explain why in the current context of managed health care even a premed student would find an economics course helpful!

Students who still find the list of topics in the text uninteresting may be intrigued by sports economics (refer them to the *Journal of Sports Economics*) and studies of the wine industry (the *Journal of Wine Economics*). ◀

Web Resources

Most fields of economic research have at least one web site. The American Association of Wine Economists is at <http://www.wine-economics.org/>. The *Journal of Sports Economics* (<http://jse.sagepub.com/>) is published in association with the North American Association of Sports Economists (<http://www.buylresearch.org/naasporseseconomists/>).

IV. The Method of Economics, page 8

A. Positive and Normative Economics

1. *Positive economics* is an approach to economics that seeks to understand behavior and the operation of systems without making judgments. It describes what exists and how it works.
2. *Normative economics* is an approach to economics that analyzes outcomes of economic behavior, evaluates them as good or bad, and may prescribe courses of action. Also called policy economics. When economists disagree, the points they argue about are often normative points (differences of opinion and values).

- TEACHING TIP:** One of the main contributions of economics to public debate is a clear distinction between positive and normative differences. This separation is often obscured in the media and some other social sciences.

Using the morning newspaper, find an economic issue on which government leaders disagree (e.g., the cause of the government budget deficit). Ask students: What sort of positive disagreement might be responsible for the dispute? There is disagreement over the appropriate size of the budget and the related size of government. This is a good chance to explore the concept of forecasts and the role of assumptions in making them. Next, make an arbitrary positive assumption. Say, about the future course of the economy. Could a normative difference still explain the policy dispute? One side believes that government is needed to provide more services, the other believes that people should spend their own money not have it spent for them by the government.◆

B. Theories and Models:

1. A *model* is a formal statement of a theory, usually a mathematical statement of a presumed relationship between two or more variables. A *theory* is a statement or set of related statements about cause and effect.
2. A *variable*: a measure that can change from time to time or from observation to observation.
3. *Ockham's Razor* is the principle that irrelevant detail should be cut away. Of course, be sure it's irrelevant! Formally, Ockham's Razor says that when there are two equally good explanations of a phenomenon, the simpler of the two should be used.
4. All Else Equal: *Ceteris Paribus* is a device used to analyze the relationship between two variables while the values of other variables are held unchanged.

- TEACHING TIP:** Here's an interesting exercise to try. Announce a new soft drink, Mocha-Cola, that you intend to market. Which variables do students think will be important in determining the amount of Mocha-Cola that people will want to buy? You will quickly compile a long, but not exhaustive, list. This gives you an excellent excuse to introduce abbreviations.

Ask in which way each variable will impact on the consumption of Mocha-Cola. Observe that a specific cause-and-effect pattern is being postulated in each case. If you choose, introduce functional notation at this point, distinguishing between dependent and independent variables, and labeling each independent variable with a positive or negative sign, according to the direction of its effect. (You can introduce the use of graphs here. See the note below under the Appendix to this chapter.)

Students have now unknowingly constructed a model of consumer behavior. Use this opportunity to underline the point that not all variables have been included in the model and that an all-inclusive list would be cumbersome and distract from the major elements of the model.

The values of the variables that you have compiled in your list will be continually changing. Bring out the point that to isolate the effect of any one on the consumption of Mocha-Cola, the *ceteris paribus* assumption can be invoked. You might suggest the analogy to experiments in the natural sciences, where tightly controlled environments actually make the *ceteris paribus* assumption a reality.◆

- TEACHING TIP:** This is a good point to introduce the scientific method as used in economics. A researcher develops a model and uses it to produce a series of hypotheses. These hypotheses are then tested statistically using real-world data. A hypothesis that has passed a number of these empirical tests becomes accepted and is called a theory.



TOPIC FOR CLASS DISCUSSION:

The text uses the example of what determines total miles driven during a time period. The factors listed there are the number of drivers (driving age, population growth, changes in state laws); the price of gasoline (a complement); household income; number and ages of children; commute distance; location of shopping areas; and availability and quality of public transportation. Make this more specific by using months as the measure of time. Then ask the class for some other factors that might affect average miles driven per month by a household. Two obvious factors are airfares (the price of a substitute) and special events such as September 11, 2001. ■

5. Expressing Models in Words, Graphs, Equations: Economists use graphs and mathematics to make it more difficult to overlook some effects. One obvious example is income and substitution effects in consumer theory.

■■■ TEACHING TIP: Relate models to how a coach or choreographer might diagram a play or dance routine on a chalkboard to illustrate how the play or routine should work on the field or on stage. ◀

■■■ TEACHING TIP: Use the Mocha-Cola example developed earlier to introduce graphs. You can draw a separate graph of the number of bottles purchased versus two or three of the independent variables that influence consumption. Be sure to select at least one independent variable with a positive relationship to quantity and one with a negative relationship, saving price for last. Explain what it means to move along each of these curves, and what *ceteris paribus* means in each case. ◀

6. Cautions and Pitfalls:

- a. *What Is Really Causal?*

Just because event A happened before event B does not mean A caused B. Examples of this sort of thinking are everywhere. Confusing correlation with causation has become a cottage industry for much of the media.

Post hoc, ergo propter hoc means literally “after this (in time), therefore because of this.” A common error made in thinking about causation: If Event A happens before Event B, it is not necessarily true that A caused B. The *post hoc fallacy* is the incorrect belief that because event B occurs after event A then A caused B. This is closely related to correlation and causation. *Correlation* refers to things happening together. Just because two variables move closely together doesn’t mean one *causes* the other.

■■■ TEACHING TIP: A few years ago, I taught 8:00 a.m. classes five days a week. I got out of bed at 5:30 a.m. Every morning when I got up, the sun would be rising. Obviously the act of getting out of bed caused the sun to come up. This example shows two things. First, just because two actions happen together does not mean one caused the other. A theory must be developed that explains why one might cause the other. Second, make sure you have gathered enough data. All I needed to do was include some weekend mornings to refute my hypothesis. ◀

■■■ TEACHING TIP: The text mentions obesity and soda consumption. New York City Mayor Michael Bloomberg has tried to ban sodas larger than 16 ounces, believing that will cure obesity. But all we have is correlation. It is far more likely that both obesity and high soda consumption are caused by a third factor. ◀

***Economics in Practice: Does Your Roommate
Matter for Your Grades? page 10***

Two studies seem to indicate that peer effects are real and significant. The lesson for students: you will become who you hang out with.

- b. The *fallacy of composition* is the erroneous belief that what is true for a part is necessarily true for the whole.

TEACHING TIP: Can students find examples of these pitfalls in the model of consumer behavior they constructed for Mocha-Cola? For example, do consumers in the aggregate behave as one individual consumer might? One individual consumer may purchase on impulse, but that is not true in the aggregate. This is a good opportunity to explain what it means to aggregate.¶

- 7. Testing Theories and Models: *Empirical economics* is the collection and use of data to test economic theories. Researchers look at data collected over time and across different categories or conditions (e.g., age groups, locations) and try to draw conclusions. Controlled experiments are difficult in economics (and other social sciences), but are not impossible.

TEACHING TIP: The text mentions Ph.D. economists employed by firms working with "big data." Perhaps the best-known example is Hal Varian, formerly of U.C. Berkeley, now at Google. Recently Peter Coles (Ph.D., Stanford, 2005, formerly at the Harvard Business School) accepted a job at eBay as their Director of Global Strategy in charge of designing new marketplaces for them.¶

Web Resources

Go to a Web site for data about the economy. The text mentions the Bureau of Labor Statistics, for example. Other good sources are the Bureau of the Census, the Federal Reserve, the Bureau of Economic Analysis and (more exotically) the CIA's World Factbook available at <https://www.cia.gov/library/publications/the-world-factbook/index.html>. The Factbook can be used either interactively online or downloaded for use on a computer.

TEACHING TIP: Mention that the statistical techniques used by economists often implicitly assume each independent variable changes while the others are held constant. These statistical techniques can be used to overcome some of the problems caused by our inability to construct controlled experiments.¶

- C. Economic Policy: Without objectives it's impossible to come up with policies. Economists have looked at four different criteria for judging outcomes: efficiency, equity, growth, and stability. Using these criteria to evaluate a policy often leads to conflicting recommendations. This is especially true for the first two (efficiency and equity).

- 1. *Efficiency* is used in the text to mean allocative efficiency. While there are a variety of ways to describe allocative efficiency, here is a definition students seem to understand: An *efficient economy* is one that produces what people want at the least possible cost.”

TEACHING TIP: The text discusses voluntary exchange as an activity that increases efficiency. It's impossible to stress this idea too much. Voluntary exchange makes both parties to the transaction better off. If one party would be made worse off they will walk away from the transaction.¶

- 2. *Equity* means fairness. This is impossible to define universally. An allocation that seems fair to one person will be viewed by another as highly skewed.

- TEACHING TIP:** Mention the “law of unintended consequences.” Rent control is a good example. This is a good spot to point out that rent control often hurts the very people it was intended to help. ◉

TOPIC FOR CLASS DISCUSSION:

Fairness is often in the eye of the beholder. My favorite exercise to provoke a discussion of fairness is to suggest a grading system for the course in which students with A's, B+'s, and B's at the end of the course will have points taken away from them and redistributed to those with C's, D's, and F's. In the end everyone receives a C+. (There is always at least one student who says, “I'll take it!”) Outline the issues involved. Compare this to the issues involved in income redistribution. ■

TOPIC FOR CLASS DISCUSSION:

Ongoing congressional debates over tax policy provide a good platform to discuss equity. Is it fair that those with high incomes receive most of the dollars of a tax cut? Point out that these people also pay most of the taxes. (If you have the time, a brief discussion of the earned income tax credit and the concept of negative income taxes will often be persuasive.) ■

3. *Economic growth* is an increase in total output of an economy. Economists often define growth as an increase in output per capita.

TOPIC FOR CLASS DISCUSSION:

The text refers to an increase in output per capita as if it automatically becomes an improvement in the standard of living. Ask the class whether they can think of circumstances in which higher output per capita would cause their standard of living to fall. They should come up with higher pollution levels, increased crowding and higher crime rates as items that reduce the standard of living but are not measured in output per capita. ■

4. *Stability* is a condition in which national output is growing steadily, with low inflation and full employment of resources. The causes of instability and the various techniques governments have used to try to improve stability are the core of macroeconomics.

Web Resources

Economic data (as well as a lot of other topics) is widely available on the web. I always try to download the data in spreadsheet format. For U.S. data students should visit <http://www.bea.gov>, <http://www.bls.gov>, and <http://www.census.gov>. Global data is available from <http://www.oecd.org>, <http://www.worldbank.org/>, <http://www.imf.org/>, and <http://www.un.org/en/databases/#stats>. Real statistics aficionados will want to try their hand at Eurostat (<http://epp.eurostat.ec.europa.eu/>). U.S. monetary statistics are at <http://www.federalreserve.gov> while Eurozone statistics are at <http://www.ecb.eu>.

- V. An Invitation, page 12: Remember what you've learned in previous chapters. You'll use this material in future chapters.

APPENDIX: HOW TO READ AND UNDERSTAND GRAPHS, PAGES 15 - 21

- TEACHING TIP:** You must face the unpleasant choice of either boring those who know this material or skipping the material and losing those who have forgotten it. If possible, try to hold a special half-hour section of class and invite those who feel “rusty” with graphs to come for a short review. Passing out an assignment that requires basic graphing skills will encourage those who need the review to attend.

Whatever you decide, it's usually better to include at least a brief review of graphs somewhere in the course. ◉

- TEACHING TIP:** Emphasize that the “45° line” is simply a graph of $y = x$. This is especially important in macroeconomics.

The Economic Problem: Scarcity and Choice

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Scarcity, Choice, and Opportunity Cost p. 26

- Scarcity and Choice in a One-Person Economy
- Scarcity and Choice in an Economy of Two or More
- The Production Possibility Frontier
- The Economic Problem

Economic Systems and the Role of Government p. 39

- Command Economies
- Laissez-Faire Economies: The Free Market
- Mixed Systems, Markets, and Governments

Looking Ahead p. 42

DETAILED CHAPTER OUTLINE

I. Introduction, pages 25 - 26

This chapter explores the questions of what, how, and for whom to produce. *Human wants are unlimited, but resources are not.* This creates scarcity. Scarcity, in turn, forces us to make choices. The chapter stresses positive and descriptive economics, postponing normative questions until the students have acquired analytical tools.

TEACHING TIP: Stress the idea that any society must answer the three fundamental questions regardless of its political organization. One reason command economies don't work well is the immense number of calculations that would be required to answer these questions correctly. ◉

A. *Resources*, used in its broadest sense, includes everything from natural resources (timber, minerals, energy), capital (buildings, machines), labor (human capital), and entrepreneurship. Resources are also called *factors of production, inputs*, or simply *factors*. *Output* is what is produced, goods and services of value to households.

B. Key definitions:

1. *Capital* includes things that are produced and then used in the production of other goods and services. As used by economists, capital means physical capital, including buildings and machines
2. *Factors of production (factors)* are the inputs into the process of production. Another term for resources.
3. *Production* is the process that transforms scarce resources into useful goods and services.
4. *Inputs or resources* include anything provided by nature or previous generations that can be used directly or indirectly to satisfy human wants.

TEACHING TIP: Many goods are used to produce other goods. Some of these goods are counted as intermediate goods ("parts") while others are counted as capital. In the national income accounts, the distinction is simple: Anything that firms expect to use for more than one year is capital. Examples include a computer, office furniture, or an assembly line. If firms expect to use something for less than one year, it is an intermediate good. For example, quick-release bolts are common in bicycles. Because the bicycle maker expects to use many of these bolts within a year they are intermediate goods, not capital goods. Even though they are goods used to make another good, they are not capital. Think of them as parts instead. This is especially useful for those teaching macroeconomics. ◉

5. Producers are those who transform resources into outputs (final goods and services).
6. *Outputs* are goods and services of value to households.
7. Households are the consumers in the economy. They purchase output.

II. Scarcity, Choice, and Opportunity Cost, pages 26 - 39

A. Scarcity and Choice in a One-Person Economy

1. Bill must make choices about how to allocate resources, what to produce, and how to produce it. Bill's situation is "constrained choice." His main constraint is available time. Bill must decide what goods and services he wants to produce, what he is able to produce given the island's resources, and how to use the resources to produce what he wants.

TOPIC FOR CLASS DISCUSSION:

What are some of the more useful skills Bill might want? Students will come up with things like building a fire, primitive construction, and being able to tell which berries are not poisonous. More subtle answers might include weather forecasting and knowledge of airline and shipping routes. ■

TEACHING TIP: This is a good place to follow the text's lead and discuss the cost of leisure time. As the text notes, Bill can use as much time as he wants to lie on the beach. However, the cost of that leisure time is lost production. ◀

2. *Opportunity cost* is the best alternative that we give up, or forgo, when we make a choice or decision.

TEACHING TIP: Instructors sometimes rush through their discussion of individual vs. societal opportunity cost because the point seems obvious. But the idea of opportunity cost makes a deep impression on students. They often find it valuable in their personal lives and remember it long after class is over.

Remind students that opportunity cost is relevant to societal as well as individual choices. A good way to drive the concept home is to find some social goal that virtually everyone in the class thinks is "good." National health insurance for all? A pristine environment? Completely safe streets? Point out that achieving the goal requires resources, which must be pulled out of producing something else. How much "other production" would class members be willing to sacrifice to accomplish the goal? A cut in their material standard of living of 10%? How about 50%? Or 90%?

Public policy debates suffer when opportunity cost is ignored or calculated incorrectly. A major contribution of economists is to keep opportunity cost—correctly measured—part of policy debates. ◀

Economics in Practice: Frozen Foods and Opportunity Costs page 28

Over the last 60 years, the frozen food market has boomed. In 2012, sales were \$44 billion, about 44 times what they were in the mid-1950s. Increased labor force participation by women has increased the opportunity cost of their time. In other words the cost of preparing meals "from scratch" has risen. A second factor complementing this is a technological improvement, the introduction of the microwave oven. In fact, the widespread acceptance of microwave ovens occurred because of the increasing opportunity cost of time for housework. Entrepreneurs look for areas in which opportunity cost is rising to get some ideas about new technology.

TOPIC FOR CLASS DISCUSSION:

Related to Economics In Practice, page 28. Ask the class to list other devices that were developed in response to higher opportunity costs of time. One of the more recent additions to the list, the Roomba, a robotic vacuum cleaner that is part of a line of personal robots produced by iRobot (<http://www.irobot.com>)... ■

B. Scarcity and Choice in an Economy of Two or More

1. Now there are two decision makers—Bill and Colleen. Their preferences, skills, and abilities probably differ. They will have to decide how much of each product each person should produce. They will probably benefit from specialization and trade.

- TEACHING TIP:** Students often have difficulty remembering that opportunity cost and comparative advantage are intertwined. Try using the term *comparative opportunity cost advantage* when calculating who should specialize in what. It helps students to remember that comparative advantage is what matters when calculating who should produce which good to maximize the gains from trade.❶
2. Specialization, Exchange, and Comparative Advantage: David Ricardo formulated the *theory of comparative advantage*, the idea that specialization and free trade will benefit all trading partners, even those that may be “absolutely” more efficient producers. (As we know today, this must be true of any voluntary exchange.) Ricardo’s most important point is that everyone—every individual, firm, and country—has a comparative advantage at something *even if another has an absolute advantage at producing all goods and services*. Trade and specialization allow the most efficient producer to produce each good. This increases productivity and aggregate output.
- A producer has an *absolute advantage* over another in the production of a good or service if he or she can produce that product using fewer resources (a lower absolute cost per unit). A producer has a *comparative advantage* over another in the production of a good or service if he or she can produce that product at a lower *opportunity cost*. In the text’s example, Colleen has an absolute advantage at both cutting logs and gathering food.
- Trade means both parties can consume at points outside their PPFs. This demonstrates the gains from specialization and trade.
- TEACHING TIP:** Comparative advantage is extremely important. It is the economic motivation for exchange between individuals (roommates, workers within an office, etc.); groups of individuals (divisions within a company, firms that specialize in productive tasks within an economy); and nations (international trade). Ask students to give examples from their own experiences. For example, who does which chores in their families and why?❷
- TEACHING TIP:** The data and graphs for Figure 2.3 are in the Excel workbook for this chapter.❸
- TEACHING TIP:** Walk through the example on pages 29 - 31 in the text in class. Do the calculations of opportunity costs. Show how Figure 2.3 on page 31 is constructed. It’s worth the time. If you don’t like the example in the text, try the following alternative example. Suppose Colleen and Bill subsist on fish and coconuts. Catching fish requires patience and good vision. Picking coconuts requires climbing ability and manual dexterity. Colleen can catch 18 fish per day or pick 36 coconuts. It costs her $36/18 = 2$ coconuts per fish or $18/36 = 0.5$ fish per coconut. Bill can catch 9 fish per day or pick 27 coconuts. It costs him $27/9 = 3$ coconuts to catch a fish or $9/27 = 0.33$ fish to pick a coconut. Colleen has a comparative advantage at fishing since one fish costs her only 2 coconuts compared to 3 for Bill. Bill has a comparative advantage at picking coconuts since it costs him 0.33 fish per coconut while it costs Colleen 0.5 fish per coconut. Colleen should specialize in fishing while Bill specializes in picking coconuts. Be sure the students understand how these calculations are done and why the numbers are opportunity costs.❹
3. Weighing Present and Expected Future Costs and Benefits: There is a trade-off between present and future benefits and costs. The simplest example of trading present for future benefits is saving part of our income, which allows us to consume more in the future.
- TEACHING TIP:** This is a good place to introduce the time value of money. Make the point that the interest rate is the marginal opportunity cost of consumption today and the marginal benefit for saving.❺

4. Capital Goods and Consumer Goods: *Consumer goods* are goods produced for present consumption. When a society devotes a portion of its resources to investment in capital, it is trading present benefits for future benefits. *Investment* is the process of using resources to produce new capital. By giving up some production of consumer goods today in order to produce more in the future, society will be able to consume more in the future.

TEACHING TIP: Emphasize that economists are quite specific when defining investment and capital. *Capital* means physical capital - buildings and machines. *Investment* is the process of creating new capital, often involving the construction industry. This is especially important when teaching macroeconomics. ■



TOPIC FOR CLASS DISCUSSION:

Introduce the idea of human capital. Explain that education is an investment in human capital. Draw on the analysis of the cost of going to college (from Chapter 1) to consider it as investment. Is it a trade-off of current benefits for future benefits? What are those benefits? ■

C The Production Possibility Frontier (PPF)

1. The PPF can be used to show the principles of constrained choice and scarcity.
 - a. A *production possibility frontier* is a graph that shows all the combinations of goods and services that can be produced if all of society's resources are used efficiently.
 - b. All points on the curve are combinations of output produced using full resource employment and production efficiency.
 - c. *Production efficiency* means producing a given combination of outputs at least cost. This implies producing the maximum quantities of both goods given society's resources and technology.
 - d. Points inside the curve are achievable but are not efficient. Points outside the curve are unattainable unless the quantities of resources increase or there is a technological improvement.
 - e. Different points on the PPF show the quantities of each of the two goods. At point *F* in Figure 2.4 the economy is producing more capital goods and less consumer goods than at point *E*. In subsequent years, the PPF will shift out further from point *F* than *E*.



TEACHING TIP: The presentation of the PPF is an excellent time to reinforce the way in which one should detail and use an economic model. Lay out the assumptions, being sure all variables are clearly defined, and use the model to explain what it is designed to explain (or predict). Advise students who are hesitant to work with graphs that the appendix to Chapter 1 provides a good review. ■



TOPIC FOR CLASS DISCUSSION:

Draw a PPF for the choice between military goods and consumer goods. Use that to start a discussion about economies during the Cold War. How have things changed since the Cold War ended? ■

2. Negative Slope and Opportunity Cost
 - a. When resources are used efficiently the only way to produce more of one good is to produce less of the other. The opportunity cost of increasing production of good X by one unit is the number of units of good Y that must be sacrificed.
 - b. The *marginal rate of transformation (MRT)* is the slope of the production possibility frontier.
3. The Law of Increasing Opportunity Cost
 - a. The "bowed out" shape of the PPF tells us that the more society tries to increase production of one good, the more costly it becomes (in terms of the number of units of the other good that must be given up).
 - b. In effect, the law of increasing opportunity cost says the absolute value of the slope of the PPF will increase as the quantity on the x-axis increases.

TEACHING TIP: Figure 2.5 on page 34 shows a PPF for corn and wheat production. The specialized resource is climate. Ohio has a wetter climate, better suited to growing corn. Kansas is drier, better for growing wheat. Growing corn in Kansas or Wheat in Ohio will be more costly because of the specialized resource (climate).

You may find the table below helpful. It expands Table 2.1 to include the MRT. With wheat on the horizontal axis, the correct measure of MRT is $\Delta C / \Delta W$.

| Point on PPF | Production Possibility Schedule | | MRT | |
|--------------|---------------------------------|-------|-----------------------|-----------------------|
| | Corn | Wheat | $\Delta W / \Delta C$ | $\Delta C / \Delta W$ |
| | 730 | 0 | | |
| A | 700 | 100 | -3.33 | -0.30 |
| B | 650 | 200 | -2.00 | -0.50 |
| C | 510 | 380 | -1.29 | -0.78 |
| D | 400 | 500 | -1.09 | -0.92 |
| E | 300 | 550 | -0.50 | -2.00 |
| | 0 | 650 | -0.33 | -3.00 |

TEACHING TIP: Figure 2.5 and Table 2.1 are included in the Excel workbook for this chapter. ◉

4. Unemployment
 - a. Every point inside the PPF is *inefficient* because some resources aren't being used. At point D in Figure 2.4 there is unemployment.
 - b. Inefficiency and unemployed resources mean production of either good can be increased without reducing production of the other. Along the PPF this is not possible.
 - c. Unemployment of labor also means unemployment of capital.
5. Inefficiency: An economy can be operating at full employment and still be inside the PPF. Although resources are being fully used, they are not being allocated to their most productive uses.

TEACHING TIP: Suppose LeBron James, a well-known professional basketball player, was forced to teach economics. Presumably that would not be his most productive activity. ◉

6. **The Efficient Mix of Output:** To be efficient, an economy must produce what people want. This means choosing the right point on the PPF. This is called *output efficiency*.

TEACHING TIP: Extreme examples can help students see the difference between allocative efficiency and productive efficiency. Suppose all of the land, labor, and capital in the country were used to produce something students might find undesirable, say Brussels sprouts or turnips. As long as the economy is producing the maximum amount possible of that good, then productive efficiency is achieved. However, the economy is not producing the best mix of outputs because it is not producing the goods people want. That means the mix of goods is not allocatively efficient. Make it clear to students that points on the curve represent a productively efficient combination of resources, but not necessarily an allocatively efficient combination of resources. *Productive efficiency* means all resources are being fully used. *Allocative efficiency* means the economy is producing the combination of goods and services consumers want to buy. ■

Unique Economics in Practice

Sometimes, government contributes to allocative inefficiency. Under current U.S. law, ethanol intended for use as vehicle fuel must be made from corn. Part of this law imposes a tariff of \$0.54 on every gallon of ethanol imported into the U.S. This tariff is aimed squarely at Brazil, which produces ethanol from cane sugar at about 20 percent of the cost of producing ethanol from corn. Technologically, producing ethanol from sugar needs only water and yeast, while corn needs to be cooked before fermentation. The result has been high corn prices leading to high prices of many other foods, such as beef and chicken because those animals feed on corn. Producing ethanol from sugar in the U.S. is economically unattractive because the government restricts sugar imports. The price of sugar in the U.S. is about twice the world price due to these import restrictions. While the U.S. economy may be productively efficient, it is not allocatively efficient, largely because of these policies. Figure 2.6 on page 34 in the text can be used as an example of this with very few changes. In fact, the ongoing example of increasing opportunity cost as the quantity of corn increases fits this example perfectly.

Question: Why does the government impose tariffs on ethanol and sugar imports?

Answer: Special interest groups seek ways to increase their incomes. One method they use is lobbying Congress to restrict imports and other forms of competition. In this case, those groups have been quite successful.

7. **Economic growth** is an increase in the total output of an economy. It occurs when a society acquires new resources or when it learns to produce more using existing resources. Growth causes an outward shift of the PPF. Growth is an increase in the total output of an economy.

TOPIC FOR CLASS DISCUSSION:

Growth is what happens when you relax the restrictive assumptions (fixed resources and technology) used to draw the first PPF. Have students consider what happens if a change in resources or technology affects society's ability to produce one product but not the other. This can lead into a discussion of how the Internet has changed productivity in different industries. ■

Unique Economics in Practice

This example shows how an increase in productivity in one sector of the economy can actually raise the opportunity cost of production in other sectors. During the mid-1980s, the lumber industry announced that a cord of wood (a 4-by-4-by-8 foot pile) could be converted into 942 one-pound books, 2,000 pounds of paper, 61,370 number 10 envelopes, or 7,500,000 toothpicks.

Measure the opportunity cost of books in terms of “toothpicks forgone.” Given the data above, the opportunity cost of a book is $7,500,000/942 = 7,961$ toothpicks per book. Suppose that a technological advance in the toothpick industry (perhaps a waste-reducing technique) enables more toothpicks, say 9,000,000, to be created from a cord of wood. Question: What happens to the opportunity cost of producing a book when productivity increases in the toothpick manufacturing industry?

Answer: The opportunity cost of producing a book increases! Now, one book “costs” $9,000,000/942 = 9,554$ toothpicks, even though there has been no change in book-producing technology.

8. Sources of Growth and the Dilemma of the Poor Countries

- a. Historically, the two most important sources of growth have been the accumulation of capital and technological advance.
- b. For poor countries, taking resources out of the production of consumer goods is very difficult because they are living so close to subsistence levels. This lack of saving can make it difficult for them to accumulate capital, pay for research and development, and grow.
- c. The paper by Robert Jensen discussed in the text is an excellent example of how a seemingly minor technological improvement can lead to large welfare gains.

TEACHING TIP: There are several directions you can go from here. It appears that poor countries are destined to remain poor based on this analysis. However, recent research by Lucas and Romer seems to show that accumulation of human capital is more important than either physical capital or technology. And Lawrence Summers has estimated the rate of return on educating women in less developed countries is more than 20 percent.¶

D. The Economic Problem: How do different economic systems answer the three basic questions?

Economics in Practice: Trade-Offs among the Rich and Poor, p. 39

Poor countries are very poor. Consumers spend well over half their income on food. But they still make choices. About 10 percent of income is spent on sugar. About the same amount is spent on weddings, funerals, and other festivals. Even poor economies find the time and income for entertainment.

III. Economic Systems and the Role of Government, pages 39 - 42

There are different types of economic systems:

- A. *Command Economies* are those in which the central government either directly or indirectly sets output targets, incomes, and prices. There are few true command economies left in the world. Even China has become a “magnet for private capital and entrepreneurship.”

TOPIC FOR CLASS DISCUSSION:

Ask the class if they can name any countries that are pure (or almost pure) command economies. Two examples are Cuba and North Korea. You can get a cheap laugh by referring to the People's Republic of Santa Monica (California) as a third example. ■

- B. Laissez-Faire Economies: The Free Market

A *laissez-faire* economy is one in which individuals and firms are free to pursue their own self-interest without central direction or regulation. The *market* is the institution through which buyers and sellers interact and engage in exchange. (“Laissez-faire” is from the French: “allow [them] to do.”) Laissez-faire economies rely on *markets*, institutions through which buyers and sellers interact and engage in exchange. Its characteristics include:

1. *Consumer Sovereignty* is the idea that consumers ultimately dictate what will be produced (or not produced) by choosing what to purchase (and what not to purchase). The mix of output produced is dictated by the tastes, preferences, and incomes of consumers.
2. Individual Production Decisions: Free Enterprise:
 - a. *Free enterprise* is the freedom of individuals to start and operate businesses in search of profits. This increases output and develops new production techniques.
 - b. In market systems, prices are signals of relative scarcity. These price signals to consumers and producers guide them in making decisions. This is Adam Smith's "invisible hand."
 - c. Markets promote competition and efficiency.
3. Distribution of Output: Also determined in a decentralized way, the distribution depends on a household's income and wealth. *Income* is the amount the household earns in a year. *Wealth* is the households accumulated saving (assets) out of income.
4. Price Theory: Prices are the basic coordinating and signaling mechanism. *Wage rates* are the prices of various kinds of labor.

C. Mixed Systems, Markets, and Governments

1. All real-world economies are mixed, with differing degrees of government intervention. Market systems have advantages, but are not perfect.
2. However, remember the “law of unintended consequences.” Government intervention may make things worse instead of better. Government sets and enforces the rules for an economy. Two important rules are the protection of private property and the enforcement of laws governing intellectual property.

TOPIC FOR CLASS DISCUSSION:

Have students research countries in transition and consider the problems and challenges faced in the process. ■

IV. Looking Ahead, page 42

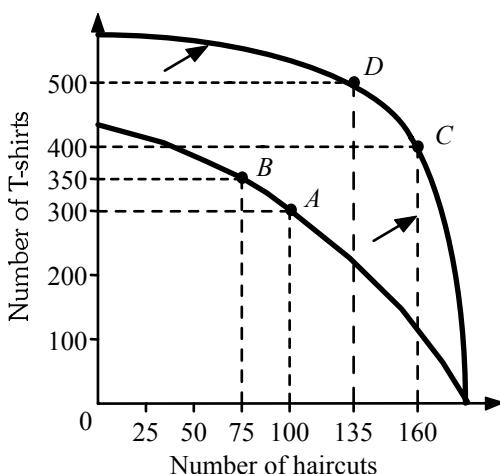
The next chapter discusses how markets work.

Extended Application

Application 1: The Rising Cost of Services

Consider how the cost of services tends to rise over time. Why do items like haircuts, medical care, and education keep getting more and more expensive, both absolutely (they cost more dollars) and relatively (they require a larger and larger portion of our incomes)? Using the concept of opportunity cost, the production possibilities frontier, and a little common sense, we can come up with a realistic answer.

The three items mentioned above are examples of services. A service is, by definition, provided by workers directly to consumers. (One of the fastest-growing service sectors in the United States is meals eaten away from home.) A service is always consumed the moment it is produced. It cannot be brought home in a shopping bag or resold to someone else. Services can't be inventoried. To keep the analysis simple, let us assume that a nation can produce only one good (T-shirts) and one service (haircuts). The nation's production possibilities frontier is shown in the following graph:



Initially, at Point *A*, the economy is producing 100 haircuts and 300 T-shirts per day. Between points *A* and *B* the opportunity of producing 50 more T-shirts (increasing from 300 to 350) requires the sacrifice of 25 haircuts (decreasing from 100 to 75). The marginal rate of transformation is thus $50/25 = 2.00$. Now (as students who are taking microeconomics will see

later on) relative prices in a market economy usually correspond quite closely to opportunity costs. That is, if producing 50 more T-shirts uses resources that could otherwise produce 25 haircuts, then a haircut should cost about two times the cost of a T-shirt. Let us suppose that for this economy at Point *A*, each T-shirt costs \$5 and each haircut costs \$10.

Many economists believe that the growth of productivity (output per hour) is much slower for services than for goods. This is easy to see in the case of T-shirts versus haircuts. Over the past 50 years, the number of T-shirts a worker can produce in an hour has increased dramatically due to technological advances in cotton-picking, weaving, and assembly-line production techniques. Over the same period, however, the number of haircuts a barber could perform in an hour has probably increased very little, if at all.

The effect of this asymmetrical change in productivity is illustrated in the diagram. Note that the vertical (T-shirt) intercept of the production possibilities frontier has increased, reflecting an increase in the maximum quantity of T-shirts that could be produced—after the productivity change—if all resources were devoted to T-shirt production. But the horizontal (haircut) intercept remains the same, as there has been no productivity change in this industry.

Suppose that the economy ends up at Point *C* on the new PPF. The economy is producing more T-shirts (160) and more haircuts (400). In addition, the opportunity cost has increased. As the economy moves from Point *C* to Point *D* (after the productivity change) it could produce 100 additional T-shirts with a sacrifice of 25 haircuts. The opportunity cost is now 4.00 instead of 2.00. In other words, even though there has been no change in haircut technology or productivity, the opportunity cost of haircuts has risen! One haircut should now cost the same as 10 T-shirts. If T-shirts continue to cost \$5 each, then haircuts should rise in price to \$50. Alternatively, if T-shirts fall to \$1.50 each, haircuts should remain priced at \$15. Either way, the relative price of haircuts will rise, as the opportunity cost of haircuts has risen.

This simple analysis has far-reaching implications. It explains why college tuition rises faster than the general price level, as providing an education relies heavily on services (teaching, building maintenance, administrative services) rather than goods. Similarly, it suggests that ongoing efforts to reform health care may be only partially successful. We can certainly choose, as a nation, to provide better health care to more of our population. But if manufacturing productivity continues to increase faster than productivity in medical services, then the relative price of health care like the relative price of haircuts, will rise.

If your class seems to enjoy this material, point out that global competition mostly has no effect on services such as haircuts because they are nontraded goods. Then note that technology is moving more and more goods from the "nontraded" category into "traded." Education is a good example. There are several consortiums of universities and a number of private companies hoping to exploit the trend toward online education.

Demand, Supply, and Market Equilibrium

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Firms and Households: The Basic Decision-Making Units *p. 48*

Input Markets and Output Markets: The Circular Flow *p. 48*

Demand in Product/Output Markets *p. 50*

Changes in Quantity Demanded versus Changes in Demand
Price and Quantity Demanded: The Law of Demand
Other Determinants of Household Demand
Shift of Demand versus Movement Along the Demand Curve
From Household Demand to Market Demand

Supply in Product/Output Markets *p. 60*

Price and Quantity Supplied: The Law of Supply
Other Determinants of Supply
Shift of Supply versus Movement Along the Supply Curve
From Individual Supply to Market Supply

Market Equilibrium *p. 65*

Excess Demand
Excess Supply
Changes in Equilibrium

Demand and Supply in Product Markets: A Review *p. 71*

Looking Ahead: Markets and the Allocation of Resources *p. 71*

DETAILED CHAPTER OUTLINE

I. Introduction, page 47

This chapter and the next discuss how markets work. Taken together they explain how individual and household decisions about demand and firms' decisions about supply interact. As Adam Smith pointed out, this coordination happens without any central planning or direction. Markets and prices answer the three basic questions of what to produce, how to produce, and who will get what is produced.

II. Firms and Households: The Basic Decision-Making Units, page 48

- A. The two fundamental decision-making units in the economy are firms and households.
- B. *Households* are the consuming units in an economy. Their decisions are based on their tastes and preferences and are constrained by their limited incomes and prices.
- C. A *firm* is an organization that transforms resources (inputs) into products (outputs). Firms are the primary producing units in a market economy.
 - 1. A firm exists when a person or group of people decides to produce something.
 - 2. Firms transform inputs (resources) into outputs (goods and/or services).
 - 3. Firms can be large or small or in-between.
 - 4. Most firms exist to make a profit for their owners.
- D. An *entrepreneur* is a person who organizes, manages, and assumes the risks of a firm, taking a new idea or a new product and turning it into a successful business.

TEACHING TIP: Naturally, not all new businesses are successful. And even those that have been successful for many years sometimes fail. The impending bankruptcy of Kodak is just one example of a company that failed to keep up with market trends. In that case, it was digital cameras that first destroyed the market for film, then took Kodak's camera market as well.¶



TOPIC FOR CLASS DISCUSSION:

Can students name some entrepreneurs? Can they identify the risks referred to in the previous description?■



TOPIC FOR CLASS DISCUSSION:

What types of firms exist near your campus? For example, outside the gates of my college is a small pizza shop and a McDonald's. Who are the entrepreneurs in each firm?■

III. Input Markets and Output Markets: The Circular Flow, pages 48-50

- A. Households and firms interact in both input and output markets.
1. To produce goods and services firms must buy resources in *input* or *factor markets*, the markets in which resources used to produce goods and services are exchanged. Firms buy or rent these inputs from households who own them. These resources are used to produce output which is sold in *output markets*. *Product* or *output markets* are the markets in which goods and services are exchanged.
 - TEACHING TIP: Students often have difficulty believing that households own all the factors of production. After all, they don't personally own any land or capital. Point out the important role of indirect ownership. Many households own parts of large corporations through their pension funds, retirement accounts, or other financial products.❶
 2. The *labor market* is the input/factor market in which households supply work for wages to firms that demand labor. Most households earn much of their income by supplying labor in this market.
 3. The *capital market* is the input/factor market in which households supply their savings, for interest or for claims to future profits, to firms that demand funds to buy capital goods.
 4. The *land market* is the input/factor market in which households supply land or other real property in exchange for rent.
 - TEACHING TIP: Students often find it difficult to picture firms as actors in both the input and output markets. Remind them that firms need to buy resources. (A good teaching tool to make this point is to use your favorite web search tool for the phrase "b to b websites.")
The term *capital market* may be confusing to students who have just grasped that economists do not include money in their definitions of capital and investment. Think of the phrase "capital market" as a single word to avoid this confusion. Or use the more general phrase "assets market" instead.❷
 5. *Factors of production* are the inputs into the production process. Land, labor, and capital are the three key factors of production. The general name for the labor, capital, land, and other inputs supplied by households is *input markets* or *factor markets*.
 - TEACHING TIP: Some economists include *entrepreneurship* as a fourth factor of production. The income earned by this factor is, of course, economic profits. It may be a little early to discuss the differences between economic and accounting profit, but mentioning the fact that innovation and entrepreneurship are partly motivated by profit-seeking behavior is a good idea.❸
- B. The circular flow implies that national income must equal national product.
- TEACHING TIP: There's more going on in Figure 3.1 than a quick glance will reveal. This is where the authors introduce their color-coding for various components of the economy. Firms and the flows they generate are red. Households and their flows are blue. Naturally, monetary flows are green. It's important to give equal emphasis to both directions of the circular flow: clockwise is products and counterclockwise is money.❹

IV. Demand in Product/Output Markets, pages 50-60

- A. A household's decision about what quantity of a particular product to purchase depends on:

1. The *price of the product*.
2. The *income available* to the household.
3. The household's *amount of accumulated net wealth*.
4. The *prices of other products* available to the household.
5. The household's *tastes and preferences*.
6. The household's *expectations* about future income, wealth, and prices.

TEACHING TIP: It is useful to write this list on one side of the board to help explain the importance of the distinction between "change in quantity demanded" and "change in demand." (Reserve the other side of the board for the list of supply determinants.) This makes it easy for you to keep referring to the list as you make your way through this section. It comes in handy later as you discuss the distinction between a movement along the demand curve and a shift of the demand curve. ◉

TOPIC FOR CLASS DISCUSSION: Introduce this analysis by asking students to list the factors that affect their decisions about what to buy and how much. See how many of the factors listed emerge in the class discussion. Relate recent events in the stock market to factor number 3 (and 6) just listed. ■

6. *Quantity demanded* is the amount (number of units) of a product that a household would buy in a given period if it could buy all it wanted at the current market price.
 - a. Emphasize the important role of time. Quantity demanded is a flow.
 - b. A change in quantity demanded assumes every other factor affecting demand is held constant (*cet. par.*).

TEACHING TIP: Students may be confused about the word "wanted" in this definition. It will help them if you explain that "wanted" implies "and could afford given their current income and wealth." ◉

B. Changes in Quantity Demanded versus Changes in Demand

1. A change in the price of the product changes *quantity demanded* per period. Only a change in price can cause a movement along a demand curve. This is the most important relationship in any market.
2. A change in any other factor affecting demand changes the entire relationship between price and quantity. This is called a *change in demand*. Changes in demand cause the demand curve to shift.

C. Price and Quantity Demanded: The Law of Demand

1. A *demand schedule* is a table showing how much of a given product a household would be willing to buy at different prices. A *demand curve* is a graph illustrating how much of a given product a household would be willing to buy at different prices. In other words a demand curve is a graph of a demand schedule.

2. Demand Curves Slope Downward

- a. The *law of demand* is the negative relationship between price and quantity demanded: *Ceteris paribus*, as price rises, quantity demanded decreases; as price falls, quantity demanded increases.

TEACHING TIP: The law of demand is based on decades of empirical research. Economists have statistically analyzed data from millions of different markets. The one common fact is that the demand curves always slope downward. Mentioning this fact will help students later if you teach microeconomics and discuss Giffen goods.¶

TEACHING TIP: The data and graph in Table 3.1 and Figure 3.2 are in the Excel workbook for this chapter.¶

- b. This is reasonable given that consumers have limited income; the more one thing costs the more they must sacrifice other products.

TEACHING TIP: The discussion preceding Table 3.1 in the text mentions that quantity is on the vertical axis and price is on the vertical axis. The text correctly notes that this is a convention. If your students can handle this, point out that the axes are reversed from the way we normally think of graphs. Usually the dependent variable (y) is placed on the vertical axis and the independent variable (x) on the horizontal axis. But along a demand curve quantity is the dependent variable and price is the independent variable.

If your students are curious, you can tell them the axes are placed correctly for supply curves.¶

- c. Also at work is the *law of diminishing marginal utility*: If successive units are worth less to the consumer, the person will not be willing to pay as much for them.

TEACHING TIP: A thought experiment can help students “discover” the law of diminishing marginal utility. Ask them to imagine having one slice of pizza to eat, and ask them to record how much utility this gives them. Use a simple 1 to 10 scale to avoid long discussions about how to measure utility. Then ask them to imagine having a second slice, etc. At some point there may be groans from some students as they imagine being full, while others may keep going. This is a good opportunity to point out the subjectivity of utility as well as differences between individuals. Interject your own tastes and preferences. Ask students to discuss their experience and most will note that they found the utility decreasing at some point. (Be careful—some students may overstate their marginal utilities as they try to persuade you to bring in actual pizzas to test this thought experiment empirically. This can be hazardous to your wealth.)¶

3. Other Properties of Demand Curves

- a. They have a negative slope.
- b. Most demand curves intersect the price axis somewhere. There is a maximum price a household (or an entire market) is willing and able to pay for any product.

TEACHING TIP: The price at which quantity demanded falls to zero is called the *choke price*.¶

- c. Most demand curves also intersect the quantity axis. Even if you give the product away there is a limit to the quantity that will be consumed.

TEACHING TIP: Students may find this hard to believe. Remind them that the analysis refers to consumption within some period of time and ask them to find examples. You may also find it helpful to refer to the previous teaching tip and remind the class about their diminishing marginal utility. At some point, their marginal utility of pizza will reach zero (perhaps even becoming negative).¶

D. Other Determinants of Household Demand

1. Income and Wealth

- a. *Income* is the sum of all a household's wages, salaries, profits, interest payments, rents, and other forms of earnings in a given period of time. It is a flow measure.
- b. *Wealth or net worth* is the total value of what a household owns minus what it owes. It is a stock measure.
- c. Higher income usually causes a household to buy more things. *Normal goods* are goods for which demand goes up when income is higher and for which demand goes down when income is lower. *Inferior goods* are goods for which demand tends to fall when income rises.

TEACHING TIP: The only example of an inferior good that has ever worked for me is public transportation. Students understand that when they graduate and get a job (and their income rises) one of the first things they will do is buy a (better) car and stop taking the bus. ◉

- d. Higher wealth also usually causes a household to buy more things.

TEACHING TIP: Students (and the media) often confuse income and wealth. Explaining that income is a flow variable and wealth is a stock variable will help, but many will not be convinced. A good illustration of the difference is to ask students whether they would prefer a raise of \$100 a week or a one-time gift of \$100. Some examples may also help; someone who inherits money and quits his or her job as a result would have no income from wages and salaries but would have wealth. Someone who is a big spender may have high income. By spending most of the income, they have little wealth.

Emphasize that wealth is the accumulation of past net saving. ◉

2. Prices of Other Goods and Services

- a. *Substitutes* are goods that can serve as replacements for one another; when the price of one increases, demand for the other increases. *Perfect substitutes* are identical products. If an increase in the price of good A causes the demand for good B to increase (and vice versa) the goods are *substitutes*.
- b. *Complements* or *complementary goods* are goods that “go together”; a decrease in the price of one results in an increase in demand for the other and vice versa. If an increase in the price of good X results in a decrease in the demand for good Y (and vice versa) the goods are *complements*.

TEACHING TIP: When discussing the prices of related goods, students often confuse the difference between products related in demand and those related in supply. Stress that the relationships are completely independent of one another. Students may also make the mistake of assuming that changes in supply cause changes in demand (rather than quantity demanded). For example, they may think an increase in the supply of leather will lead to an increase in the demand for leather jackets, rather than an increase in quantity demanded. It's impossible to overemphasize the distinction between supply and demand. ◉

Economics in Practice: Have You Bought This Textbook?, page 55

There are substitutes for textbooks. These include students sharing a single copy and using the library's copy. (See the *Unique Economics in Practice* on page 29.)

3. Tastes and Preferences

- a. As households have a greater preference for a product they buy more of it.
- b. Some products are sold based on fad or fashion.

TOPIC FOR CLASS DISCUSSION:

The July 25, 2003, *Wall Street Journal* had a front-page article about a current fashion, "low-rise" pants for women. According to this article women are unable to bend over at the waist or even sit in open-backed chairs without exposing more than they want to. Use this as an entry point to discussing the effect of fashion on demand curves in certain industries. If you want to have some fun bring in the Style section from the Sunday New York Times. ■

4. Expectations

- a. Your beliefs about future income or prices will affect your current purchasing decisions.
- b. People sometimes mistakenly think certain demand curves slope upward. They are confusing a change in quantity demanded with a change in demand caused by expectations of higher prices in the future.

TEACHING TIP: The gold market is a good example of a market in which people make this mistake. Point out that the reason demand for gold sometimes increases when the price rises is expectations that the price will rise even more in the future. This is an outward shift of a downward sloping demand curve. ◀

Unique Economics in Practice

There are substitutes for the "dead tree" editions of textbooks. Electronic versions of most textbooks are available today. Many textbook publishers offer e-book versions of many of their books. One interesting independent company, CourseSmart.com, will rent you an e-book for 180 days at half the retail price (<http://www.coursesmart.com>). CourseSmart offers apps for mobile devices that let you download the textbook onto your mobile device.

For those who want to stick with the hardcopy version, many bookstores (and publishers) offer to rent you the textbook. This is, of course, a substitute for the ever-popular book buyback at the end of each academic term. Instead of selling your books back to the bookstore, you just turn them in.

A popular source for reduced-price textbooks is <http://www.amazon.uk>. Textbook publishers sell almost identical versions of their books in Europe at much lower prices. The U.K. is popular because the books are written in English. This is a form of arbitrage.

And, of course, there are less legal substitutes. Most textbooks are available as pdf files somewhere on the internet.

Question: There is obviously competition in this market. What effect is increased competition likely to have on the price of books offered as e-books? What effect will that have on the price of paper books?

Answer: More competition generally means lower prices. Distribution costs for e-books are virtually zero. Since paper books are substitutes for e-books it's safe to predict that prices of paper books will also fall.

E. Shift of Demand versus Movement along a Demand Curve

TEACHING TIP: The data and graphs in Table 3.2 and Figure 3.3 are in the Excel workbook for this chapter. ◀

1. Price changes cause the quantity demanded to change. This is a movement along a demand curve. A *movement along a demand curve* is the change in quantity demanded brought about by a change in price.
2. When any of the other factors change, a new relationship between price and quantity is established. This is a shift of the demand curve. A *shift of a demand curve* is the change that takes place in a demand curve corresponding to a new relationship between quantity demanded of a good and price of that good. The shift is brought about by a change in the original conditions.

TEACHING TIP: If you used the earlier Teaching Tip and have the list of demand determinants on the board, tell students that when the price of the product itself is held constant, a change in one of the other factors is a “change in demand.” When the other factors are held constant, a change in the price of the product is a “change in quantity demanded.” This is a good way to illustrate the use of *ceteris paribus*.

Also Figure 3.4 in the text (page 58) is an excellent illustration of the factors that affect demand. ◀

F. From Household Demand to Market Demand

1. *Market demand* is the sum of all the quantities of a good or service demanded per period by all the households buying in the market for that good or service.
2. Economists do not actually add up individual demand curves to derive a market demand curve. Instead we use data from the entire market to statistically estimate a demand curve.

TEACHING TIP: The data and graphs for Figure 3.5 are included in the Excel workbook for this chapter. ◀

TOPIC FOR CLASS DISCUSSION:

Find a product that many students in the class purchase. Ask each to write down how many units of the product he/she buys in a week. Add them to illustrate how market demand is calculated. Discuss what would happen if the price changed. ■

TEACHING TIP: The above is a good exercise in moving from data to graphs. Have students develop a table of their data and then graph the results. ◀

V. Supply in Product/Output Markets, pages 60-65

A. Introduction

Supply decisions depend on profit potential. *Profit* is the difference between revenues and costs. Revenue is price per unit times the number of units sold. Total revenue depends on the price of the firm’s product in the market and how much it can sell. Cost depends on the inputs needed to produce the product, the quantities the firm uses, and input prices.

TEACHING TIP: Supply curves usually slope upward because in the short run total revenue usually increases faster than total cost. Taking the most extreme case, tell the class to assume for a moment that per unit cost remains constant as output changes. When the price of the product increases, profit per unit rises as well. Higher profit per unit induces firms to increase output to capture even more profit. ◀

B. Price and Quantity Supplied: The Law of Supply

1. *Quantity supplied* is the amount of a particular product that a firm would be willing and able to offer for sale at a particular price during a given time period.
2. A *supply schedule* is a table showing how much of a product firms will sell at alternative prices.
3. The *law of supply* is the positive relationship between price and quantity of a good supplied: An increase in market price will lead to an increase in quantity supplied, and a decrease in market price will lead to a decrease in quantity supplied.
4. A *supply curve* is a graph illustrating how much of a product a firm will sell at different prices. A supply curve is a graph of the supply schedule. The upward slope of the supply curve reflects the positive relationship between price and quantity supplied.

TEACHING TIP: Like the law of demand, the law of supply is based on both empirical and theoretical research. Be sure to mention the empirical basis for this law, too. ◀

TEACHING TIP: The data and graph for Table 3.3 and Figure 3.6 are included in the Excel workbook for this chapter. ◀

C. Other Determinants of Supply

1. The Cost of Production

- a. Per unit cost depends on a number of factors, including the available technologies and the prices of the inputs needed.
- b. When a technological advance lowers the cost of production, output is likely to increase. The supply curve shifts outward.
- c. An increase in the price of a variable input that's a significant fraction of production costs will cause the supply curve to shift inward.

TEACHING TIP: Mention that it's only variable (marginal) production costs that count. Changes in fixed costs don't shift the short-run supply curve. ◀

2. The Prices of Related Products

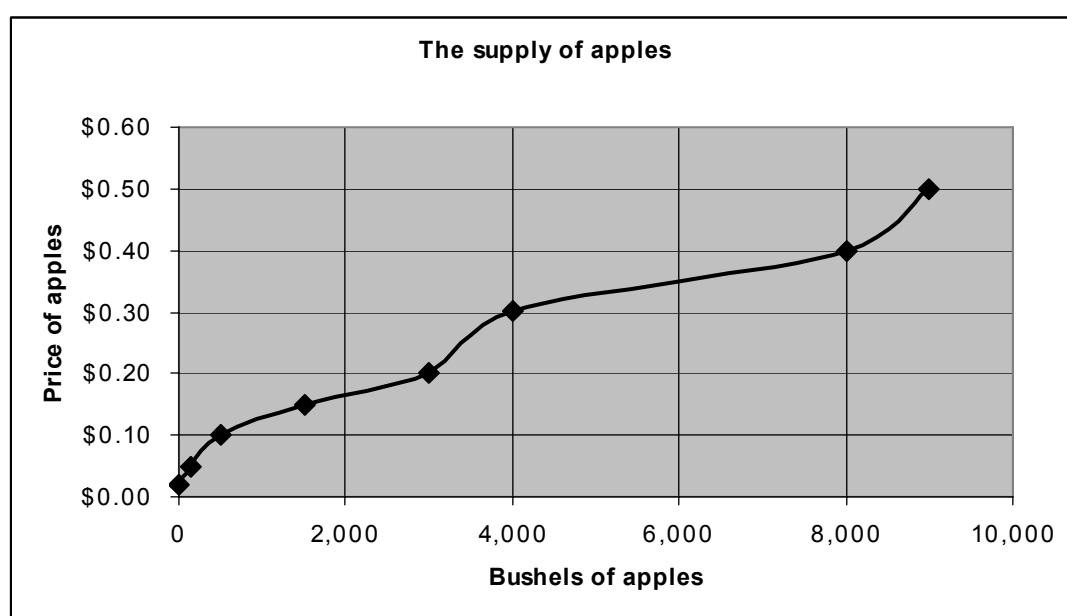
- a. If land can be used for corn or soybean production, an increase in the price of one crop can cause farmers to produce more of that crop and decrease the amount supplied of the other.
- b. When an increase in the price of one product causes decreased production of another product, the two are *substitutes in production*.
- c. There are also *complements in production*. An increase in the price of beef will induce ranchers to increase the quantity of beef supplied. There will also be more leather produced from the cowhides.

TEACHING TIP: You may find this example useful. Ask your students to imagine that they own an apple orchard and that, during the season, the trees can yield a maximum of 10,000 apples. Have three columns: "price," "quantity supplied," and "production technique." Make it clear that the "price" of an apple is determined in the market, and not something that a small orchard owner can affect. However, orchard owners can respond to different prices by producing more or fewer apples.

At the lowest price, it is probably best to let the apples rot, as there are better uses for one's time (refer to opportunity cost), and quantity supplied will be low. If price rises slightly, it

becomes worthwhile to exert some effort harvesting, and quantity supplied rises. If price rises further, it may pay to buy a ladder and a basket, and so on. The final result might look like this:

| Price | Quantity Supplied | Technique |
|-------|-------------------|--|
| \$.02 | 0 | Let the apples rot |
| \$.05 | 150 | One worker picks up apples from the ground |
| \$.10 | 500 | Handpick low-hanging apples |
| \$.15 | 1,500 | Pick using ladder and basket |
| \$.20 | 3,000 | Hire some workers, buy more ladders |
| \$.30 | 4,000 | Use insecticide to protect apples and increase yield |
| \$.40 | 8,000 | Rent apple-picking machinery |
| \$.50 | 9,000 | Train workers so they will pick more carefully. Fewer apples wasted. |



Be sure to emphasize the difference between supply and quantity supplied. Also stress that the new supply curve is an entirely new relationship, not merely a shift of the old curve. You can show this graphically by depicting a new supply curve with a different slope or shape.

Data and the graph for this example are included in the Excel workbook for this chapter. ■

Unique Economics in Practice

During the year 2008 food prices around the world soared. In part this was due to substitutes and complements in production. Under U.S. law ethanol to be sold as vehicle fuel could only be made from corn. Corn, however, is also used to feed animals and, to a lesser extent, people. The increased demand for corn pushed corn prices to record highs. This, in turn, caused the price of most meats to rise because corn is an important input to meat production. But the prices of other crops such as alfalfa and oats also rose in part because they are substitutes in production.

Question: Representatives of the U.S. ethanol industry denied their actions had contributed to the increase in corn prices, arguing that they “only” used about 25 percent of each corn kernel. The remaining 75 percent was converted into animal feed. Is their argument correct?

Answer: No. In effect they argued that their contribution to the increase in demand was only 25 percent as large as people thought. But an increase in demand still occurred.

D. Shift of Supply versus Movement along a Supply Curve

■■■ **TEACHING TIP:** The data and graph for Table 3.4 and Figure 3.7 are included in the Excel workbook for this chapter. ■

1. The supply curve is derived holding everything constant except the price of the product (*ceteris paribus*). A *movement along a supply curve* is the change in quantity supplied brought about by a change in price. When the price of a product changes, a change in the quantity supplied follows and a movement along the supply curve takes place.
2. If other factors change there will be a new relationship between price and quantity supplied. A *shift of a supply curve* is the change that takes place in a supply curve corresponding to a new relationship between quantity supplied of a good and the price of that good. The shift is brought about by a change in the original conditions. This is called a change in supply.

■■■ **TEACHING TIP:** If you used the earlier Teaching Tip and have the determinants of demand listed on the board, you can now add the determinants of supply and discuss the effects of changes in them. Again, this is a good way to illustrate the use of *ceteris paribus*. ■

E. From Individual Supply to Market Supply

■■■ **TEACHING TIP:** The data and graph for Figure 3.8 are included in the Excel workbook for this chapter. ■

1. *Market supply* is the sum of all that is supplied each period by all producers of a single product.
2. The market supply curve also shifts when there is a change in the number of firms producing output in the industry.

TOPIC FOR CLASS DISCUSSION:

Students generally have less familiarity with supply than demand. After all, everyone has bought something. Not many people have run businesses. Even those who have managed a business rarely reflect on supply decisions. However, students are familiar with themselves as suppliers of labor. That's a useful starting point for a discussion of supply. ■

VI. Market Equilibrium, pages 65-70

A. Introduction

The operation of the market depends on the interaction between buyers and sellers. *Equilibrium* is the condition that exists when quantity supplied and quantity demanded are equal. At equilibrium, there is no tendency for price to change. This holds as long as neither the supply nor the demand curve shifts.

TEACHING TIP: Emphasize that equilibrium means quantity supplied equals quantity demanded, not supply equals demand. And stress that it's changes in price that bring quantity demanded and quantity supplied into equilibrium. ◉

A. *Excess demand or shortage* is the condition that exists when quantity demanded exceeds quantity supplied at the current price. The price will increase until the shortage is eliminated. This is the process of *price rationing*: Price increases will distribute what is available to those who are willing and able to pay the most. The higher price will also induce some sellers to increase the quantity supplied.

TEACHING TIP: The data and graph for Figure 3.9 are in the Excel workbook for this chapter. ◉

TEACHING TIP: This is another example where the difference in the meanings of words as used in economics as opposed to everyday language may lead to confusion. It is important to stress that excess demand (a shortage) implies that at the existing price quantity demanded exceeds quantity supplied. Even in a famine, there may not be a shortage in economic terms. ◉

B. *Excess supply or surplus* is the condition that exists when quantity supplied exceeds quantity demanded at the current price. The price will decrease until the surplus is eliminated.

C. Changes in equilibrium occur when the supply curve or demand curve shifts. These shifts can create temporary shortages and surpluses and result in price changes.

TEACHING TIP: The data and graph for Figure 3.11 are in the Excel workbook for this chapter. ◉

Unique Economics in Practice

Economists usually think of persistent shortages being caused by some interference with the market mechanism. Ask the class if they can think of free markets that experience shortages. There are numerous examples, but one that most will understand is tickets to a hot concert. These tickets are often priced below equilibrium. One reason is to create “buzz” about the event. Some bands claim they keep ticket prices low to be fair to their fans. Ask the class who gains and who loses when the price is set below equilibrium. This can lead to a discussion of the value different people place on their time.

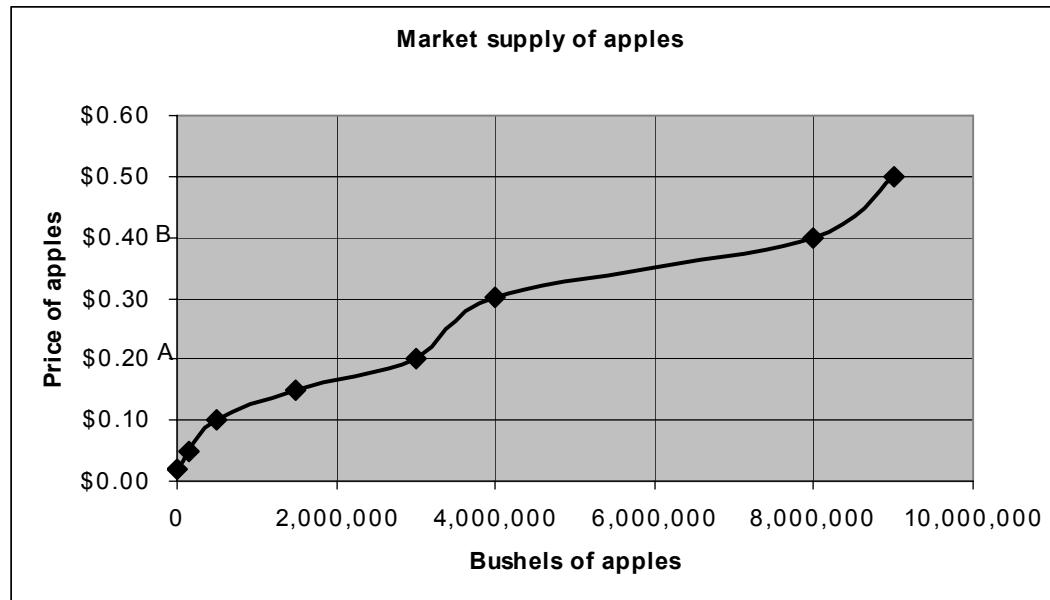
Question: Name two other industries or markets where shortages appear to be created for publicity and marketing purposes.

Answer: There are quite a few answers to this question. Concert promoters often do this, as do sellers of tickets to some athletic events. On rare occasions Starbucks will give away cups of coffee at all their outlets. Again, this creates publicity for the chain.

TEACHING TIP: Refer to the apple orchard example. Now imagine there were 1,000 identical apple orchards around the country, all making similar decisions. At each price for apples, how many would be supplied? Construct a table like the following:

| Market Price | Quantity Supplied |
|-----------------|----------------------|
| \$.02 | 0 |
| \$.05 | 150,000 |
| \$.10 | 500,000 |
| \$.15 | 1,500,000 |
| \$.20 | 3,000,000 |
| \$.30 | 4,000,000 |
| \$.40 | 8,000,000 |
| \$.50 | 9,000,000 |

Graph this supply curve, and mark two points like A and B.



To drive home the origins of the market supply curve, discuss what happens at a typical orchard as we move along the market supply curve from Point A to Point B (orchards are switching from unskilled labor with ladders and baskets to apple-picking machinery operated by skilled labor).

Data and the graph for this example are included in the Excel workbook for this chapter. ¶

TEACHING TIP: Remind students of the sequence of events in the adjustment to a new equilibrium: When either the supply curve or the demand curve shifts it will create excess supply or excess demand. Either causes a change in price leading to a new equilibrium quantity demanded and supplied. (For durable goods, there may also be a change in inventories that signals the producers.) Have students compare the initial and new equilibrium points for these shifts, particularly for cases when both curves are shifting.

Simultaneous shifts of supply and demand can be confusing to students, because unless the student knows which curve shifts more, the ultimate effect on equilibrium price or quantity will be indeterminate. Do a few examples in class to make students feel comfortable with the notion of indeterminacy. ¶

Economics in Practice: Coffee or Tea?, page 69

China and tea are almost synonymous. But recently the Chinese people discovered coffee. Starbucks has over 600 stores in China. Similar trends are happening in Vietnam and India. We expect that these trends will put upward pressure on coffee prices.

Unique Economics in Practice

A freeze in Florida during the winter of 2010 destroyed the tomato crop. Most fresh tomatoes sold in the U.S. during the winter are grown in Florida. The sharp inward shift of the supply curve increased prices by a factor of five. This is perhaps the ultimate expression of a decrease in supply: a decrease caused by a natural disaster of one sort or another. Yet the market continues to work with the high price establishing a new equilibrium between quantity demanded and quantity supplied.

The price of tomatoes spiked. But what wasn't noted was the decrease in price the following month. In July, 2009 the wholesale price of tomatoes in the U.S. was \$0.3170 per pound. In March, 2010 the price was \$1.1400 per pound. But the following month – April, 2010 – the price dropped to \$0.9970. The reason appears to be increased imports of fresh tomatoes from Mexico in response to the high U.S. price.

Question: Suppose the U.S. government had imposed a high tariff on tomato imports to "protect" domestic tomato growers. What effect would this have had on the market for tomatoes in the U.S.?

Answer: U.S. prices for tomatoes would be higher as the tariff would raise the domestic price of imported oranges.

Source for tomato prices: <http://usda.mannlib.cornell.edu/usda/ers/89011/Table049.xls>. Accessed Oct. 11, 2010. Also available as part of the Excel workbook for this chapter.

TEACHING TIP: Figure 3.12 is in an excellent summary of the chapter. Mention that if only the demand curve shifts, price and quantity change in the same direction. If only the supply curve shifts, price and quantity change in opposite directions. ¶

VII. Demand and Supply in Product Markets: A Review, page 71

This chapter has considered the basic way that the forces of supply and demand operate in free markets. This section summarizes the important points.

TEACHING TIP: A useful assignment at this point is to have students find a newspaper article that deals with a change in supply or demand for a product (preferably indirectly through a discussion of a change in price or sales). Have them illustrate the changes described in the article with a supply-and-demand graph. If each student answers this alone (possibly at the board), it will be particularly helpful. ¶

VIII. Looking Ahead: Markets and the Allocation of Resources, pages 71-73

This chapter summarizes the ways markets answer the three basic economic questions. If markets are functioning well, resources will flow in the direction of profit opportunities.

- A. Demand curves reflect what people are willing and able to pay for products. The more a product is wanted the higher the price will be and the more profitable it will be for firms to produce it. Hence, firms produce what people want.
- B. Firms seeking profits strive to keep costs down. This guides their decisions about how to produce (what technology to use).
- C. Markets also answer the distribution question. Those who are willing and able to pay the market price get what is produced.

The next chapter begins with a more detailed discussion of these topics.

Economics in Practice: Why Do the Prices of Newspapers Rise?, page 73

In 2006, the average price for a daily edition of a Baltimore newspaper was \$0.50. In 2007, the average price had risen to \$0.75. Three different analysts have three different explanations for the higher equilibrium price.

Analyst 1 states that the cause of the price increase is increased demand, brought on for the public's increased desire for news. Analyst 2 focuses on supply factors such as the higher cost of paper, ink, and distribution. Analyst 3 states that the cause is monopoly power as newspapers try to compensate for declining readership by raising price.

Looking at the graphs on p. 73, you will find a clue. When demand shifts to the right (as in Analyst 1's story) the price rises, but so does the quantity. When supply shifts to the left (as in Analyst 2's story) the price rises, but the quantity falls. So we would look at what happened to newspaper circulation during this period to see whether the price increase is from the demand side or the supply side. In fact, in most markets, including Baltimore, quantities of newspapers bought have been falling, so Analyst 2 is most likely correct.

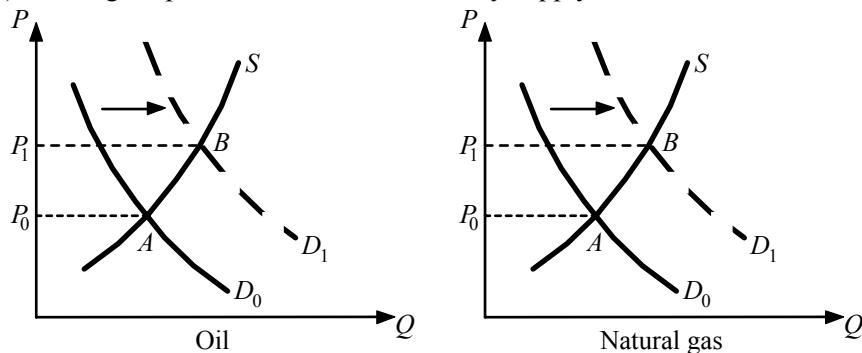
Analyst 3 clearly never had an economics course! Free Internet access to news is a substitute for print media. A decrease in the price of this substitute should shift the demand for newspapers to the left. The result should be a lower price, not a price increase.

Extended Application

Application 1: Supply and Demand in Energy Markets

During the late 1980s, many East Coast colleges purchased expensive equipment to enable them to switch rapidly from oil to natural gas in the event of a sudden oil price increase. In fall 1990, after Iraq invaded Kuwait and oil prices skyrocketed, the colleges put their new equipment to use. But when college administrators received bills from their local utility companies, they found that the price of natural gas had risen as well! Many of these administrators were surprised and angry at the utility companies, accusing them of “gouging” the public. The invasion of Kuwait did not threaten natural gas supplies, they reasoned, so there was no logical reason for a natural gas price hike. Why did the price of oil rise after Iraq’s invasion of Kuwait? Why did the price of natural gas rise? Were the administrators correct in their outrage?

Oil prices rose dramatically immediately after Iraq’s invasion of Kuwait, well before there was any actual disruption of oil supplies to the world market (it takes weeks for disruptions at the wellhead to impact oil deliveries to consuming nations). Thus, it would be incorrect to believe that oil prices rose because of a shift in the supply curve. In fact, the reason for the price change was a change in expectations: Buyers anticipated that supplies to oil-consuming nations might become disrupted in the future, which would cause a future rise in prices. This, in turn, caused speculators to increase their demand for oil, and the demand curve shifted rightward (see the diagram), causing oil prices to rise well before any supply shift occurred.



As for the colleges, the administrators may have made a serious mistake by ignoring the relationship between the oil market and the natural gas market. Natural gas is a substitute for oil. When the price of oil rises, many buyers—not just a few colleges—switch to natural gas as a source of energy. Although utilities buy some of their natural gas in a regulated market where state governments set the price, they also buy gas in unregulated markets where the price is set by supply and demand. When the utility companies increased their demand for natural gas in these unregulated markets, the demand curve for natural gas shifted rightward, and the price paid by the utility companies rose accordingly (see diagram). The utilities then passed on this price increase to their customers. (Many utilities, particularly in California, had switched from oil to natural gas because the latter generated less pollution.)

Had college administrators correctly understood the relationship between oil and natural gas prices, they might have decided that their expensive switching equipment was not a good investment. Perhaps the money could have been better spent on insulation for dorm rooms or on other energy-conserving measures.

Demand and Supply Applications

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Price System: Rationing and Allocating Resources p. 79

Price Rationing

Constraints on the Market and Alternative Rationing Mechanisms

Prices and the Allocation of Resources

Price Floors

Supply and Demand Analysis: An Oil Import Fee p. 86

Supply and Demand and Market Efficiency p. 88

Consumer Surplus

Producer Surplus

Competitive Markets Maximize the Sum of Producer and Consumer Surplus

Potential Causes of Deadweight Loss from Under- and Overproduction

Looking Ahead p. 92

DETAILED CHAPTER OUTLINE

I. Introduction, page 79

This chapter continues studying supply, demand, and the price system. Markets and prices allow society to make *decentralized* decisions.

TEACHING TIP: The chapter begins with a discussion of the role of prices in allocating resources. This helps to set the stage for the material on government intervention. However you don't necessarily need to discuss price rationing in detail at this point. If you're teaching microeconomics you'll have a chance again later on when students will have better tools. But if you're teaching macroeconomics this is your only chance to present this material. Depending on how important you believe this is, you may want to spend as much as an hour on the important role market prices play in rationing and signaling buyers and sellers.

Students may not see the role of prices as a source of information for firms. Remind students that firms see their competitors' advertising (just as consumers do), and that every consumer who does not buy from a firm leads its management to wonder why not. The more consumers "shop around" the more information firms gain about their rivals (are there stores in your area that advertise that they will meet or better their competition's price?).

Finally you may want to mention the information content of prices, especially the signals a market price conveys to buyers and sellers.¶

II. The Price System: Rationing and Allocating Resources, pages 79-86

A. The price system performs two important and closely related functions.

1. It allocates goods and services when there is a shortage (price rationing).
2. It determines the allocation of resources among producers and hence the final mix of outputs.

Unique Economics in Practice

For the 2008 fishing season, salmon fishing was banned off the coasts of northern California and southern Oregon. At the same time bad weather in Alaska limited the salmon catch from that source. According to the Alaska Public Radio Network prices for wild salmon ranged from \$9.77 to \$10.25 per pound. The prized Copper River salmon carried a hefty retail price of \$45 to \$50 per pound. Alaska Airlines had expected to ship 20,000 pounds of salmon. Their actual shipments were 7,500 pounds.

Sources:

<http://aprn.org/2008/02/04/southeast-salmon-prices-at-record-highs/>
<http://www.seafoodsource.com/newsarticledetail.aspx?id=1109>

Question: Is there a shortage in this market? Explain your answer.

Answer: There is no shortage. The high price in this market simply reflects increased scarcity. However the market is in equilibrium.

B. Price Rationing

TEACHING TIP: Data and the graph for Figure 4.1 are in the Excel workbook for this chapter.¶

1. *Price rationing* is the process by which the market system allocates goods and services to consumers when quantity demanded exceeds quantity supplied. Price rationing eliminates shortages and surpluses in free markets.
3. When there is a shortage or surplus the price will adjust toward equilibrium.
4. There is always some price that will clear any market.

Unique Economics in Practice

Between 2008 and 2009, the quantity of lobsters caught in Maine increased by 8 percent. But the total value of the catch fell by \$23 million, about 10 percent. (The “value” is, of course, total revenue to lobstermen.) The figures in the example imply prices for lobsters of \$3.50 in 2008 and \$2.93 in 2009. So total revenue in 2008 must have been \$245 million. The table below (from the Excel workbook for this chapter) summarizes the results.

| Year | P | Q | Total revenue | % change in P | % change in Q | % change in TR |
|-------------|----------|----------|----------------------|----------------------|----------------------|-----------------------|
| 2008 | \$3.50 | 70 | \$245.00 | | | |
| 2009 | \$2.93 | 75.6 | \$221.51 | -16.29% | 8.00% | -9.59% |

TEACHING TIP: Resist the temptation to even mention elasticity here. For now it's enough that the students recognize that an increase in P causes a decrease in Q, leaving the net impact on total revenue uncertain.¶

TEACHING TIP: Data and the graph for Figure 4.2 are in the Excel workbook for this chapter.¶

C. Constraints on the Market and Alternative Rationing Mechanisms

1. Governments and private firms sometimes decide to ration a particular product using some nonprice mechanism. The rationale given for this is usually “fairness” which includes:

- a. price-gouging is “bad”;
- b. income is distributed “unfairly”; and
- c. some items are “necessities” and everyone should be able to buy them at a “reasonable” price.

TEACHING TIP: The notion of “fairness” is often the justification given for government intervention in the market. There are other motivations for government involvement that are worth students’ consideration, such as lobbying and political support.

This is a good point to remind students of the “law of unintended consequences” first noted in the previous chapter. Even though price ceilings and price floors are supposed to help the poor, they often have the opposite effect. Rent control often means high-income people pay low rents. The minimum wage means some people will be unemployed who would otherwise have jobs.¶

2. There are two key results.

- a. Attempts to use non-price rationing are usually more difficult and more costly than expected.
- b. Very often such attempts distribute costs and benefits among households in unintended ways (the law of unintended consequences again).

Economics in Practice: Why is My Hotel Room So Expensive? A Tale of Hurricane Sandy, page 79

Demand and supply analysis can help us understand which products are likely to see sharp price increases after a natural disaster. Government usually intervenes, causing shortages.

3. Oil, Gasoline, and OPEC

- a. In 1973 and 1974 the OPEC oil embargo reduced the quantity of gasoline available in the U.S.
 - i. If the market system had been allowed to operate gasoline prices would have risen dramatically. A good estimate was an equilibrium price of \$1.50 per gallon (remember, this was the mid-1970s).
 - ii. Congress imposed a price ceiling of \$0.57 per gallon on gasoline. The equilibrium price and price ceiling are dramatically illustrated in Figure 4.3.
- b. A *price ceiling* is a maximum price that sellers may charge for a good, usually set by government.
- c. The “fairness” rationale was that the price ceiling would keep gasoline from being so expensive that the poor could not afford it.
- d. This did not resolve the problem of excess demand. Instead some other mechanism was used to ration. The three most common methods are queuing, favored customers, and ration coupons.
 - i. In 1974 the non-price rationing mechanism was queuing. *Queuing* means waiting in line as a means of distributing goods and services: a nonprice rationing mechanism.
 - ii. A second non-price rationing device was favored customers. *Favored customers* are those who receive special treatment from dealers during situations of excess demand. Some gasoline stations only sold to favored customers. Some non-favored customers tried to become favored by making “side payments” (bribes) to station owners.
 - iii. A ration coupon system requires two means of payment for a product. One payment is money. The other (and limiting) payment is ration coupons. This device was not used in the U.S. during the 1970s. *Ration coupons* are tickets or coupons that entitle individuals to purchase a certain amount of a given product per month.
- e. When a price ceiling is imposed a black market usually develops with illegal trading taking place at market determined prices. A *black market* is a market in which illegal trading takes place at market-determined prices.

TEACHING TIP: The footnote on page 83 is a useful introduction to welfare economics. Consider integrating this discussion with the material on the following page explaining how a system of tradeable ration coupons is almost identical to price rationing.❶

4. Rationing Mechanisms for Concerts and Sports Tickets

TEACHING TIP: Data and the graph for Figure 4.4 are in the Excel workbook for this chapter. □

- a. A ticket for a courtside seat to a game in the 2010 NBA championship series reportedly sold for \$19,000.
- b. The 2007 Justin Timberlake concert in Los Angeles priced tickets at \$50. The estimated equilibrium price was \$300. A front row ticket was offered for \$16,000.
- c. The 2000 Barbra Streisand concert in Sydney, Australia priced tickets at a face value of \$1,530. This record price still stands today.
- c. Some favored individuals – friends of the artists, friends of the promoters, local politicians, sponsors – will get tickets without queuing. They may even pay a price of zero for their tickets.
- d. Once the “dust settles” and the market mechanism begins to work the power of technology and the concept of *opportunity cost* take control. The true cost of a ticket to any event is the opportunity cost of actually using the ticket and sitting in the seat. If people are willing to pay \$500 for your ticket that is the true cost of attending the concert.

Unique Economics in Practice

Here are two examples of how regulation invites market innovation.

During the gasoline shortage in 1974 some students started an interesting business. These entrepreneurial students observed that the opportunity cost of waiting in line to buy gasoline was very high for many people. But there was another group – students – for whom the opportunity cost of time was considerably lower. These entrepreneurs hired their fellow students, then rented their services to wait in gasoline lines, allowing the car owner to make better use of their time. In addition the students could make use of that time for studying. (See **The Price Mechanism at Work for Shakespeare** on page 88 of the text, summarized here on page 46.)

An entrepreneurial gasoline station owner told prospective customers they could buy as much gasoline as they wanted. But they first had to buy a stuffed teddy bear from him. The price of the bear was \$25. (Federal regulators told him to cut it out.)

Question: Explain two ways in which these business activities improved overall economic welfare.

Answer: The students who hired their classmates to sit in cars in gas lines were improving welfare by substituting the labor of people who placed a low value on their time for those who place a high value on their time. The station owner was attempting to bring the market into equilibrium by charging a price closer to the equilibrium price. In both cases the deadweight loss was reduced.

TOPIC FOR CLASS DISCUSSION:

Ask students about a sporting event or concert they may have attended. How did they get the tickets? How was the amount they paid related to their willingness to pay? Ask whether anyone simply didn't go because the “scalper’s” price was too high. ■

D. Prices and the Allocation of Resources

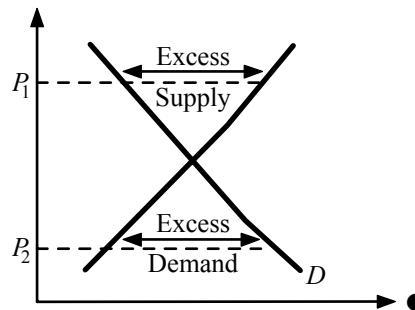
1. The market determines more than just the distribution of final outputs. It also determines what gets produced and how resources are allocated among competing uses.
2. Shifts in demand cause higher prices, which raise profits, attract capital and increase wages. Higher wages attract labor. Thus, markets determine the allocation of resources and the ultimate combinations of products produced.
3. An ongoing trend is the increase in meals eaten away from home. This trend began in the 1980s. Restaurant prices rose, increasing profits. The profits attracted entrants. Wages for culinary workers also rose. Enrollments in culinary schools rose. New cooking schools opened. Supply, demand and prices in both output and input markets influence the allocation of resources and the quantities of final products.

E. Price Floor

1. A *price floor* is a minimum price below which exchange is not permitted.
2. The result will be excess supply (a surplus).
3. The minimum wage is probably the most famous example of a price floor. A *minimum wage* is a price floor set for the price of labor.

TEACHING TIP: Point out that the true minimum wage is zero. That's the wage earned by people who are thrown into unemployment when the minimum wage is raised. ▶

TEACHING TIP: When discussing price ceilings and price floors, introduce students to the short-side rule: "When demand and supply differ, the short side of the market (whichever is less) determines the quantity that will actually be sold." This follows from the voluntary nature of exchange in a free market. In the diagram below, there is an excess supply at price P_1 , as supply at that price is larger than demand. Buyers are on the short side of this market, and they will determine the quantity actually bought. Why? Simply because in a free market, buyers cannot be forced to buy more than they want. At price P_2 , however, there is excess demand, as demand at that price is larger than supply. Here, sellers are on the short side, so they will determine the quantity actually bought. In a free market, sellers cannot be forced to sell more than they want.



TOPIC FOR CLASS DISCUSSION:

Some well-known economists have come out in favor of raising the minimum wage. After telling this to the class, ask them if they can figure out why. Students should quickly note that this is normative economics. Steer the discussion in the direction of gains and losses. Those who still have minimum-wage jobs after the increase will gain. Those who become unemployed will lose. The economists are making a value judgment: The gains outweigh the losses in their opinion. ■

III. Supply and Demand Analysis: An Oil Import Fee, pages 86-88

- A. Should the U.S. impose a tariff on imported oil? By using the tools of supply and demand we can see the preliminary results.
- B. Imposing this fee would increase domestic oil production and reduce domestic demand. U.S. oil imports would decrease. This would have the benefits of reducing air pollution, U.S. dependency on foreign oil, and the trade deficit. (The issues of “dependency” and the “trade deficit” are normative economics.)
- C. Will oil exporting countries retaliate with tariffs of their own?

DDD TEACHING TIP: Figure 4.5 is a standard graph used in international trade analysis. Spend a few minutes pointing out why the (apparent) shortage equals the quantity imported and how a tariff reduces imports (reducing quantity demanded and increasing domestic quantity supplied). ¶

DDD TEACHING TIP: It's impossible to mention the value of free trade too often. Point out that imposing a tariff on imports of anything - including oil - is a probable violation of WTO rules. But the more important point is that our oil imports are exports of other countries. The oil exporting countries will not be happy with the U.S. tariff and are likely to impose retaliatory tariffs of their own. One example is the 35 percent tariff President Obama imposed on tire imports from China. China has stated they will impose various tariffs on chicken imported from the U.S., with the tariff rate ranging up to 105 percent. Trade wars are bad for every country. Stress that free trade is almost always the best policy because it makes consumers better off. (For students who believe the U.S. is consuming too much oil, propose a large tax on gasoline sold in the U.S. That will have many of the same effects as a tariff, but won't discriminate against foreign oil producers.) ¶

DDD TEACHING TIP: This chapter covers only the rather simple case of a tax on imports. You may be tempted to extend the discussion of taxes and subsidies. At this early stage, students are still unclear on basic supply and demand. While a graphical analysis of general taxes and subsidies is attractive to economists it will probably be more than your students can handle. You might simply mention that taxes and subsidies are yet another method of government intervention and discuss some examples of each (educational subsidies, “sin” taxes) without going into details.

The chapter's example of a tax on oil imports is a good one and quite easy for students to master. But be prepared for questions on two points: (1) why a tax on oil imports has no effect on the world price of oil, and (2) why, after the tax, imported oil and domestic oil must have the same price (\$24 in the text example).

The first point results from the text's use of the “small country assumption.” Although not quite accurate for the United States, it is still true that the United States is just one of many oil importers. And the U.S. is a “small” country when measured in terms of the world oil market. Granted, the tax will reduce United States imports and probably cause the world price of oil to fall, but this effect is minor compared to the more profound impact analyzed here: the rise in the price of oil within the United States itself.

You might try explaining the second point with the old “suppose not” approach: Suppose the price of domestic oil did not equal the price of imported oil. For example, suppose imported oil costs \$24, whereas for some reason domestic oil costs less, say, \$22. Then everyone in the United States would want to buy domestic oil, and the resulting excess demand would drive up its price. When would the price stop rising? When the price of domestic oil reached the price of imported oil—\$24. (If your students have a business orientation you might point out that this is an example of arbitrage.)◆

***Economics in Practice: The Price Mechanism at Work for Shakespeare,
page 88***

Every summer, New York City puts on free performances of Shakespeare in the Park. Tickets are distributed on a first-come-first-serve basis at the Delacorte Theatre in the Park beginning at 1 P.M. on the day of the show. People usually begin lining up at 6 A.M. when the park opens; and by 10 A.M. the line has typically reached a length sufficient to give away all available tickets.

But there is a discrepancy between the people in line (young, often college students) and the actual audiences at the plays (older, clearly well past attending college).

The true price of a ticket includes the opportunity cost of the time spent standing in line. Thus, the tickets are cheaper for people (for example, students) whose time value is lower than they are for high-wage earners, like an investment banker from Goldman Sachs. The true cost of a ticket is \$0 plus the opportunity cost of the time spent in line. If the average person spends 4 hours in line, as is done in the Central Park case, for someone with a high wage, the true cost of the ticket might be very high. For example, a lawyer who earns \$300 an hour would be giving up \$1,200 to wait in line. It should not surprise you to see more people waiting in line for whom the tickets are inexpensive.

These days eBay.com is a great source of tickets to free events, sold by individuals with low opportunity costs of their time who queued up. Craigslist.com even provides listings for people who are willing to wait in line for you.

IV. Supply and Demand and Market Efficiency, pages 88-92

◆◆◆ TEACHING TIP: The data and graphs for Figures 4.6 to 4.9 are included in the Excel workbook for this chapter. There you will also find the calculations of consumer surplus, producer surplus, and total surplus for this example.◆

A. Price rationing is the key to understanding how markets allocate scarce goods and services.

1. Supply and demand can also be used to measure market efficiency.
2. Economists use consumer surplus and producer surplus to measure changes in market efficiency.

◆◆◆ TEACHING TIP: Draw a demand curve and label it “willingness to pay.” That emphasizes the important aspect of the demand curve when studying consumer surplus.◆

B. Consumer Surplus

1. A demand curve reveals the maximum prices consumers would be willing to pay for various quantities of a product.
2. In most markets, however, the product actually is sold at only one price.
3. Consumers who would have been willing to pay more for the product are getting a good deal.
4. *Consumer surplus* is the difference between the maximum amount a person is willing to pay for a good and its current market price.
5. Since we usually deal with market demand curves, we measure total consumer surplus as the total amount consumers would have been willing to spend. Total consumer surplus is the area between the demand curve and the market price.

C. Producer Surplus

1. A supply curve reveals the minimum prices at which sellers would be willing to sell various quantities of the product.
2. In most markets, however, the product actually is sold at only one price.
3. Producers who would have been willing to sell the product for less are earning producer surplus.

TEACHING TIP: If you drew the demand curve earlier, add a supply curve and label it “willingness to sell.”

4. *Producer surplus* is the difference between the current market price and the cost of production for the firm.
5. Since we usually deal with market supply curves, we measure total producer surplus as the area between the supply curve and the market price.

D. Competitive Markets Maximize the Sum of Producer and Consumer Surplus

1. *Total surplus* is the sum of producer and consumer surplus.
2. In equilibrium a competitive market maximizes total surplus.
3. If either the price or quantity is restricted there will be a deadweight loss. The *deadweight loss* is the total loss of producer and consumer surplus from underproduction or overproduction.

E. Potential Causes of Deadweight Loss from Under- and Overproduction

1. Monopoly power.
2. Taxes and subsidies.
3. External costs or benefits.
4. Price ceilings and floors.

V. Looking Ahead, p. 93

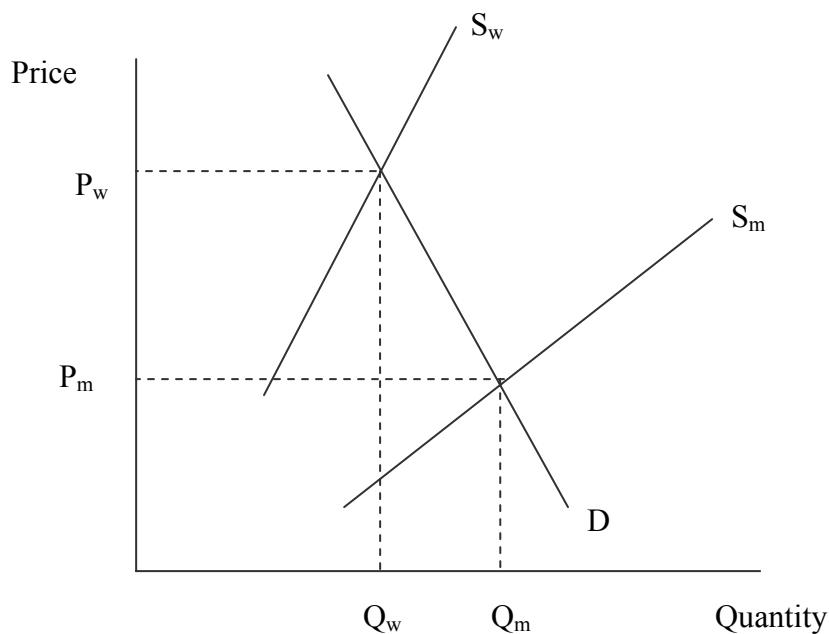
- A. The first four chapters cover the basics of microeconomics: scarcity, choice, markets, prices and supply-demand analysis.
- B. The next chapter discusses the important topic of elasticity.

Extended Application

Application 1: The War On Drugs

The U.S. government's "war on drugs" mainly focuses on restricting supply. This drives up prices and reduces quantity demanded. However, demand for many drugs is price inelastic. That means quantity demanded does not drop as much as the price rises. The net effect is higher total revenue to drug producers. Alternative policies might focus instead on reducing demand (education, rehabilitation); and legalization.

In the following graph P_m and Q_m are the free market price and quantity while P_w and Q_w are the "war on drugs" price and quantity. The supply curve has been shifted inward because the "war on drugs" emphasizes reducing supply. The steep demand curve, of course, is caused by inelastic demand.



TEACHING TIP: The movie *Traffic* makes these points more powerfully than most of us can manage in class. Be cautious recommending it, the movie includes graphic violence and profanity.¶

Application 2: Tariffs on Chinese Tires

In September, 2009, President Obama imposed a 35% tariff on imports of tires made in China. The immediate effect of this was to increase the price of those tires in the U.S. But the domestic tire market is more complicated than you might think. There are three "tiers" of tires sold here: flagship (Tier 1), secondary (Tier 2), and mass-market (Tier 3). Premium Tier 1 tires are mainly made by Bridgestone, Goodyear, and Michelin. Tier 2 tires are made by B.F. Goodrich, Firestone, and Uniroyal. Tier 3 is economy, mass-market tires. While the large multinationals have some presence in this market (e.g., Bridgestone's "Dayton"; Goodyear's "Remington"; Michelin's "Medalist") most Tier 3 tires are produced by smaller "private brand" U.S. companies (e.g., American Omni, Del-Nat, Dunlap & Kyle). Since margins are very low in Tier 3, major U.S.

producers have largely abandoned producing tires for this segment. There is, in fact, little substitution among consumers between Tier 1 and Tier 3.

Prof. Tom Prusa of Rutgers University has analyzed the U.S. tire market, focusing on the impact of these tariffs.¹ His conclusions are staggering, but not particularly surprising to economists. The 35% tariff was predicted to:

- Reduce Chinese tires to the U.S. by 2/3 (30 million fewer tires).
- Increase shipments from other countries by about 8 million tires. After 12 months or so the extent of trade diversion will increase and imports from countries other than China will increase.
- Increase domestic shipments by about 2 million tires, far fewer than the 30 million tires we will no longer import from China;
- Result in a net decrease in tires consumed of about 7% (from about 276 million to about 256 million);
- "Save" about 1,000 U.S. tire jobs but cost about 20,000 downstream jobs in related tire industries (e.g., installers, service, sellers, etc.).
- The lower sales (resulting from the higher prices caused by the tariff) puts a bunch of jobs at risk in light of the past 18 months weak economy.
- Consumer cost per job saved is over \$330,000.

Finally, consider some of the other consequences. Tier 3 tires are mainly purchased by low-income households. The two ways to make tires longer are to drive less or use the same tires for more miles. The increased risk from drivers with bald tires is not included in Prof. Prusa's analysis.

¹ Prusa, Tom, "Estimated Economic Effects of the Proposed Import Tariff on Passenger Vehicle and Light Truck Tires from China." Unpublished working paper, Rutgers University, July 26, 2009. Personal communication with the author.

Introduction to Macroeconomics

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Macroeconomic Concerns p. 98

Output Growth
Unemployment
Inflation and Deflation

The Components of the Macroeconomy p. 100

The Circular Flow Diagram
The Three Market Arenas
The Role of the Government in the Macroeconomy

A Brief History of Macroeconomics p. 103

The U.S. Economy Since 1970 p. 105

DETAILED CHAPTER OUTLINE

I. Introduction, pages 97-98

- A. *Microeconomics* examines the functioning of individual industries and the behavior of individual decision-making units—firms and households. *Macroeconomics* deals with the economy as a whole. Macroeconomics focuses on the determinants of total national income, deals with aggregates such as aggregate consumption and investment, and looks at the overall level of prices instead of individual prices.
 - 1. Macroeconomics is concerned with aggregates, or sums. *Aggregate behavior* is the behavior of all households and firms together. GDP is an aggregate. So is national income.
 - 2. Macroeconomics is also concerned with averages such as the average price level, the unemployment rate, and “the” interest rate.
- B. Macroeconomists observe that important prices in the economy often are “sticky downward.” *Sticky prices* are prices that do not always adjust rapidly to maintain equality between quantity supplied and quantity demanded. That means some prices do not seem to always adjust rapidly to maintain equilibrium in their particular market.
 - 1. The real wage rate is the most notorious example of this. When there is excess supply in the labor market, the real wage falls very slowly. However, the real wage is only “sticky downward.” Real wages rise rapidly when there is excess demand for labor.
 - 2. Other markets may also exhibit sticky prices caused by long-term contracts or other institutional arrangements.
- C. Since about 1970 much work in macroeconomics has been concerned with understanding the microeconomic behavior that causes macroeconomic effects.
 - 1. This is referred to as the microeconomic foundations of macroeconomics.
 - 2. For example, labor economists have developed the search theory of unemployment and other information-related theories to explain sticky wages.

II. Macroeconomic Concerns, pages 98-100

- A. The three major concerns of macroeconomics are output growth, unemployment, and inflation and deflation.
- B. Output Growth
 - 1. A *business cycle* is the cycle of short-term ups and downs in the economy. Economies experience cycles of expansion and contraction.
 - TEACHING TIP:** Emphasize that these cycles are very irregular. The stylized business cycles shown in Figure 5.1 [20.1] are far different from actual business cycles shown in Figure 5.2 [20.2].
 - 2. *Aggregate output* is the total quantity of goods and services produced in an economy in a given period. Aggregate output is usually measured by gross domestic product (GDP).

3. A business cycle has four phases:
- A *recession* is a period during which aggregate output declines. Conventionally, the definition is, “a period in which aggregate output declines for two consecutive quarters.” A *depression* is a prolonged and deep recession. A *contraction, recession, or slump* is the period in the business cycle from a peak down to a trough during which output and employment fall.
- TEACHING TIP:** Over the years, the National Bureau of Economic Research Business Cycles Committee has assumed the mantle of deciding when a recession begins and ends. Sometimes the announcement is delayed a bit. For example, the Business Cycles Committee declared that the 2008 recession ended in June, 2009. They made this pronouncement in September, 2010. See <http://www.nber.org/cycles/main.html>.
- An *expansion* or *boom* is the period in the business cycle from a trough up to a peak during which output and employment grow.
 - A peak is the transition from an expansion to a recession.
 - A trough is the transition from a recession to an expansion.

TOPIC FOR CLASS DISCUSSION:

This is a good place to introduce important ways of measuring macroeconomic performance. Today's students are, by and large, not very good at distinguishing levels from rates of change. Ask the class if they would rather live in (1) the country of Prospero where output and income are growing 3 percent per year or (2) the country of Depresia where output and income are growing at -3 percent per year. Most students will choose Prospero. Then give them the additional information that per-capita income in Prospero is \$8,000 per year, while in Depresia it is \$17,000 per year. To evaluate an economy's performance you need to know both the growth rate and the levels of variables. ■

C. Unemployment

- The *unemployment rate* is the percentage of the labor force that is unemployed. Before you can find work you have to look. People who are not actively seeking employment are not counted as unemployed; they are not in the labor force.
- Even when an economy is at full employment, there will be some unemployed workers moving between jobs or are spending all their time looking for a job.
- Unemployment above some minimum level implies the labor market is not in equilibrium. What prevents the market from reaching equilibrium?

TOPIC FOR CLASS DISCUSSION:

Ask the class if they would accept the first job offer they received. Then ask those who reply “yes” how they know that is the best offer they will receive. This is an introduction to unemployment and job search. ■

D. Inflation and Deflation

- Inflation* is an increase in the overall price level. *Hyperinflation* is a period of very rapid increases in the overall price level. The U.S. is fortunate to never have experienced a hyperinflation. A widely-accepted definition of hyperinflation is inflation rates in excess of 50 percent *per month*.

- DDD** TEACHING TIP: Explain to students that hyperinflations are caused by increases in the quantity of money in circulation that are far higher than needed to finance economic growth. Ask students what happens in such circumstances (in Russia, for example, people reverted to using barter).

If you have the time, students love anecdotes about hyperinflations. Here are two from the German hyperinflation of the 1920s.

A reporter for the *New York Times* walked into a Berlin restaurant for dinner. He paid in advance using dollars. When he had finished and was getting ready to leave, he was served another entrée and told “The mark has depreciated again.” What he paid for dinner when he sat down was now enough to buy two dinners.

German citizens often received more for returning empty beer bottles than they had originally paid for the full bottles. (Naturally, this effect depends on how fast you drink the beer.)

2. *Deflation* is a decrease in the overall price level.

- DDD** TEACHING TIP: This is a good place to introduce the notion of *disinflation*, a reduction in the inflation rate. During a deflation the price level is falling and the inflation rate is negative. During a disinflation the price level is still rising, but at a slower rate. It's worth pointing this out because the media so often get the distinction wrong.

III. The Components of the Macroeconomy, pages 100-103

- A. There are four major pieces of any macroeconomy.
 1. Households
 2. Firms.
 3. Government.
 4. The rest of the world.
 5. Households and firms together make up the private sector. Government is the public sector, and the rest of the world is the foreign sector.
 - B. The Circular Flow Diagram
 1. A *circular flow* diagram shows the income received and payments made by each sector of the economy. This diagram can help you understand how the four pieces of the economy fit together.
- DDD** TEACHING TIP: Figure 5.3 [20.3] shows the flows of income and spending. Mention that there are also flows of goods and services in the opposite direction from the arrows shown.
- a. This diagram illustrates the income received and the payments made by each sector.
 - b. Households rent their labor to firms and receive wages and salaries as payment. Households also receive interest, dividends, rent, and other payments for factors of production they own. Household receipts include *transfer payments*, cash payments made by the government to people who do not supply goods, services, or labor in exchange for these payments. They include Social Security benefits, veterans' benefits, and welfare payments. Taken together, these receipts are the total income received by households.

Unique Economics in Practice

From 1999 until August, 2008, Zimbabwe experienced a lengthy period of hyperinflation. Unsurprisingly this episode has been studied by economists. For data and analysis, Steve Hanke has a nice summary at <http://www.cato.org/zimbabwe>. A more detailed study by Albert Makochekanwa begins with this quotation:

“Zimbabweans are getting stronger. Thirty years ago it took five people to carry fifty Zimbabwean dollars (Z\$50)’s worth of groceries. Today a child can even carry five hundred thousand dollars (Z\$50 x 104)’s worth of groceries.” (page 2)

The highest inflation rate included in the paper is 79,600,000,000 percent in mid-November, 2008. That’s percent per month. At that rate, the price level almost doubles every day. It will come as no surprise to economists to hear that excessive monetary growth was a major causative factor. More recent information is available from the *Africa Research Bulletin* article cited below. Among the many interesting facts cited is this:

“Inflation in Zimbabwe has reached such proportions that it destroyed the value of a new national currency before a single one of its banknotes had been spent.” (page 17299)

In 2009 Zimbabwe gave up and stopped using their own currency. Today “hard” currencies are acceptable for transactions. The dollar appears to be most widely used. See <http://seekingalpha.com/article/217681-how-zimbabwe-defeated-hyperinflation> for a summary of recent events.

Question: Ask your students to do some research on the situation in Zimbabwe today. Have them focus on anecdotes rather than hard economics.

Answer: The anecdote above is pretty good. In late July, 2008 the government issued new currency with a face value equal to 1/10,000,000,000 of the previous currency. In other words they sliced ten zeroes from the currency. To say that this won’t solve the problem is a vast understatement.

Source: Albert Makochekanwa, “A Dynamic Enquiry into the Causes of Hyperinflation in Zimbabwe.” University of Pretoria [South Africa] *Department of Economics Working Paper Series*. Working Paper: 2007-10, July 2007. Available for download via link from <http://ideas.repec.org/p/pre/wpaper/200710.html> accessed June 8, 2013. Also “Zimbabwe: Hyperinflation.” *Africa Research Bulletin: Economic, Financial and Technical Series*, 44:2, April, 2007, pages 17299B - 17300C

2. Household spending and saving

- a. Households spend parts of their income purchasing products from firms. Naturally, some of their income is used to pay taxes.
- b. If a household spends less than its income it *saves* during the period. If a household spends more than its income during a period it *dissaves*. Saving is a “leakage” from the circular flow because it withdraws current purchasing power from the system.

TEACHING TIP: A good working definition of household income is total receipts from rental of resources plus the net change in the household’s wealth during the period. Introducing this idea to students will help them understand the relationships among income, savings and wealth. ●

TOPIC FOR CLASS DISCUSSION:

Part of household spending is the purchase of imports, goods and services produced in other countries. Residents of other countries purchase our exports, products produced in this country and sold in other countries. Ask the class to discuss how imports and exports affect U.S. income, production, and spending. See the teaching tip below for additional advice. ■

3. The government collects taxes from households and firms. The government also purchases goods and services from firms, pays wages and interest to households, and makes transfer payments to households.
4. A very important lesson from the circular flow diagram is that spending creates revenue. When you buy a new computer from Dell, your spending becomes part of Dell's revenue.

TEACHING TIP: Spending creates revenue, but production creates income. The difference between domestic production and domestic spending has three pieces: imports (included in spending, but not part of domestic production), exports (not included in spending, but part of domestic production), and the net change in business inventories (goods produced during a year but not sold during that year). ◉

C. The Three Market Arenas

1. Goods-and-Services Markets
 - a. In the *goods-and-services market*, households and the government purchase goods and services from firms.
 - b. Firms also purchase goods and services from each other.
 - c. The rest of the world both buys and sells goods and services in this market (international trade including both exports and imports).
 4. Households, government, and firms create demand. Firms create the *supply*.

2. Labor Market

- a. Interaction in the *labor market* takes place when firms and the government purchase labor from households (demand for labor).
- b. Households *supply* the labor.
- c. Labor is also supplied to and demanded from the rest of the world.

3. Money Market

- a. The *money market (financial market)* is where households purchase stocks and bonds from firms. Households *supply* funds expecting they will earn interest and dividends. Households also *demand* (borrow) from this market to finance consumption spending that exceeds their current income. Firms borrow to build plant and equipment, hoping for future profits. Government borrows to finance a deficit. The rest of the world can either lend or borrow.

TEACHING TIP: Use buying a house or a car as an example. For most people, spending \$200,000 to buy a house means spending in the month in which they make the purchase far exceeds their income for that month. Borrowing is used to consume more this month than current monthly income allows. If you want to be very dramatic, use annual income instead of monthly. ◉

- b. Households purchase common stock from firms and bonds from the government and firms. *Treasury bonds, notes and bills* are promissory notes issued by the federal government when it borrows money.

Corporate bonds are promissory notes issued by firms when they borrow money. *Shares of stock* are financial instruments that give the holder a share in a firm's ownership and therefore the right to share in the firm's profits. *Dividends* are the portion of a firm's profits that the firm pays out each period to its shareholders.

- TEACHING TIP: Once again, point out that households own the factors of production. Refer students to Chapter 3. Then remind them that most households own stocks and bonds indirectly through pension funds, mutual funds, and other assets.

This is also a good place to remind students that when a household purchases stock, bonds or other assets the purchase is *saving*. Households do not invest.¶

- c. Money market activity is coordinated through financial institutions like commercial banks, insurance companies, credit unions, etc.
- d. The most critical price in this market is the *interest rate*. Macroeconomics usually assumes there is a single interest rate. In fact, there are many different interest rates in the real world.

D. The Role of the Government in the Macroeconomy

1. *Fiscal policy* includes all government policies concerning taxes and spending.
 - a. The federal government collects taxes from households and firms, using the revenue to purchase all manner of goods and services.
 - a. When the economy is in a recession the government may use *expansionary fiscal policy*. This involves cutting taxes and/or raising government spending.
 - b. When the economy is experiencing high growth and inflation, the government may use *contractionary fiscal policy*. This means increasing taxes and/or cutting government spending.

- TEACHING TIP: You may want to talk about the relationship between the deficit (or surplus) and the national debt. One easy way for students to understand this is to point out that the U.S. national debt is the sum of all government deficits since 1776 minus the sum of all surpluses. You can also point out that they may have direct personal experience with deficits and debt.¶

2. Monetary Policy

- a. The Federal Reserve is the central bank of the United States. The Fed controls the quantity of money in circulation in the economy.
- b. The amount of money in circulation affects the overall price level, interest rates and exchange rates, the unemployment rate, and the level of output.
- c. *Monetary policy* includes all the tools used by the Federal Reserve to control the short-term interest rate. Like fiscal policy, monetary policy can be either expansionary or contractionary.

- TEACHING TIP: Students will often refer to "the Feds." Remind them that the Feds usually carry guns and badges. Such adornments are not usual at the Fed.¶

- TEACHING TIP: The United States is somewhat unique because the central bank is not part of the government. Talk about the Fed's independence.

The textbook notes that many people believe the Fed chair is the second most powerful person in the U.S. (the president is number one).

This is also a good place to make the distinction between money and income.¶

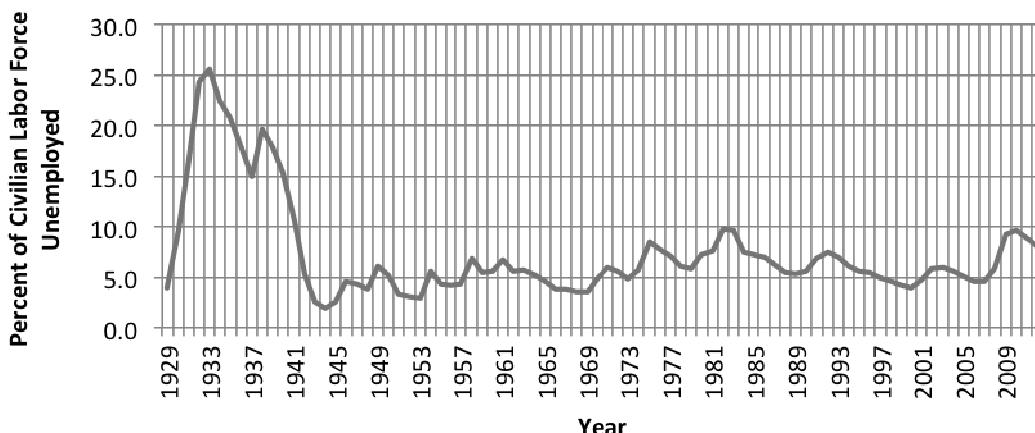
IV. A Brief History of Macroeconomics, pages 103-105

The Great Depression of the 1930s spurred a great deal of thinking about macroeconomic issues. The *Great Depression* was the period of severe economic contraction and high unemployment that began in 1929 and continued throughout the 1930s.

Unique Economics in Practice

One easy way to illustrate the situation during the Great Depression is with a graph:

U.S. Unemployment Rate, 1929-2012



In 1933 one in every four members of the civilian labor force were unemployed. In 1982-1983 and 2009, when the unemployment rate briefly exceeded 10 percent, the general view was that the economy could not be much worse. Indeed, it could be worse and has been, not all that long ago. You might also refer to Figure 5.2 [20.2] which shows real GDP since 1900.

Question: Ask your students if they know anyone who is unemployed. Be careful to make sure they know the difference between unemployment and not having a job.

Answer: The point of the exercise is that most students will not see 25 percent unemployment among their friends.

The data, graph, and citations for this example are in the Excel workbook that accompanies this chapter.

- A. Before 1930 there was no such field as macroeconomics. About the only macroeconomic issue economists were concerned with was the interest rate (Irving Fisher).
- B. Classical or market clearing models were the models applied by economists to economywide problems before the Great Depression. Classical economists believed that recessions (downturns in the economy) were self-correcting. The failure of such models to explain the prolonged high unemployment of the Great Depression gave some urgency to the work of economists developing macroeconomic theories (notably John Maynard Keynes).
- C. The Keynesian Revolution refers to a new way of looking at the macroeconomy developed by John Maynard Keynes. According to his theory, the level of aggregate

demand determines the level of employment. When aggregate demand is low the economy can become stuck in a recession. Keynes thought the government should increase spending or cut taxes to raise aggregate demand and lift the economy out of the recession.

- D. After World War II Keynes's views became increasingly influential. The view that government could intervene in the economy to attain specific employment and output goals became firmly established in the United States with the passage of the Employment Act of 1946.
 - E. During the 1960s economists began to talk about fine tuning the economy. *Fine-tuning* is the phrase used by Walter Heller to refer to the government's role in regulating inflation and unemployment. Proponents of fine-tuning believed the government could use the tools available to manipulate unemployment and inflation to hit fairly precise targets.
- TEACHING TIP:** The word to describe this is “hubris.”
- F. During the 1970s and early 1980s “fine tuning” became irrelevant as macroeconomists were forced to substantially revise their models. The economy simply did not behave the way it had before 1970. There was also the vexing problem of *stagflation*, a situation of both high inflation and high unemployment. A combination of the words “stagnation” and “inflation,” this is the term Paul Samuelson coined to describe this era. Consequently, economists and the public lost their faith in the simplified Keynesian model used during the 1950s and 1960s. What had been “conventional wisdom” during the 1960s was largely consigned to the dustheap of failed theories.

Economics in Practice: Macroeconomics in Literature, page 105

The two passages, from *The Great Gatsby* by F. Scott Fitzgerald and *The Grapes of Wrath* by John Steinbeck, capture in graphic, although not graphical, form the economic growth and spending of the Roaring Twenties and the human side of the unemployment of the Great Depression.

The Great Gatsby, written in 1925, is set in the 1920s, while *The Grapes of Wrath*, written in 1939, is set in the early 1930s. If you look at Figure 5.2 for these two periods, you will see the translation of Fitzgerald and Steinbeck into macroeconomics.

V. The U.S. Economy Since 1970, pages 105-107

- A. Since 1970 the U.S. economy has experienced five recessions and two periods of high inflation.
 - 1. A good deal of macroeconomic data is reported on a quarterly basis. The notation used is the four digit year followed by a space and the Roman numeral for the quarter. Thus 2007 IV is the fourth quarter of 2007.
- TEACHING TIP:** It's tempting to assume students know what the phrase “calendar quarter” means. Don't. Tell them the first quarter is January, February and March. The third quarter is July, August and September. You might also mention that the notation is not uniform. The fourth quarter of 2007 is sometimes written 2007-IV. Other times it will be written 2007:IV.

2. The four recessionary periods were 1974 I–1975 IV, 1980 II–1983 I, 1990 III–1991 I, 2001 I–2001 III, and 2008 I – 2009 II. The unemployment rate almost always rises during a recession. The highest unemployment rate of this period was 10.7 percent in the fourth quarter of 1982.

TEACHING TIP: The unemployment rate reached 10.8% in November and December, 1982. ◀

3. The two high inflation periods were 1973 IV–1975 IV and 1979 I–1981 IV. The highest inflation rate was 11.1 percent per year in the first quarter of 1975. This was nearly matched by the 10.2 percent rate in 1981 I.
4. Since 1983 both inflation and unemployment have been relatively low. Since 1994 U.S. inflation has been between one and three percent per year.



TOPIC FOR CLASS DISCUSSION:

Have students find newspaper articles that describe the current state of the economy. Point out the use of terms you are studying in class such as inflation, unemployment, interest rates, and real GDP. Point out that just as a doctor would test the temperature and blood pressure of a patient, economists look at the unemployment rate, the inflation rate, and the rate of growth as the “vital signs” of the economy. ■

TEACHING TIP: One easy way for students to understand the relationship between output and employment is to write this equation: Output = Employment x Labor Productivity. Then point out that productivity is often fairly constant in the short run. That means output (real GDP) and employment move together much of the time. ◀

Extended Application

Application 1: Economies at the Edge: Depressions and Hyperinflations

Bad economic times give economists quite a bit of interesting data. Students tend to have a morbid fascination with these events. It's worth spending a few minutes talking about the Great Depression and one or two hyperinflations. Don't be too technical – it's much too early in the course for that. But choose one or two of the following case studies to illustrate how badly things can go wrong in the macro-economy.

Case 1: The Great Depression

What was so great about the Great Depression? Not much. The table below shows data on real GDP (output), real GDP growth, the unemployment rate and the inflation rate (measured with the GDP deflator). Use this table to point out how bad the situation really was in the 1930s. Make sure you point out that there were no social welfare programs – no unemployment compensation, no Social Security, no Medicare, no social safety net of any kind. Those unemployed literally had incomes of zero. These were very bad times. (If you want to work with this data yourself the table can be easily pasted into Excel.)

| The Great Depression | | | | | |
|----------------------|-----------|-----------------|-------------------|-----------------------------|----------------|
| Year | Real GDP* | Real GDP growth | Unemployment Rate | Price Level (GDP Deflator)* | Inflation Rate |
| 1929 | 8.813 | | 3.9 | 11.943 | |
| 1930 | 8.054 | -8.61% | 9.6 | 11.480 | -3.88% |
| 1931 | 7.537 | -6.42% | 16.6 | 10.334 | -9.98% |
| 1932 | 6.557 | -13.00% | 24.3 | 9.150 | -11.46% |
| 1933 | 6.473 | -1.28% | 25.6 | 8.910 | -2.62% |
| 1934 | 7.173 | 10.81% | 22.4 | 9.351 | 4.95% |
| 1935 | 7.812 | 8.91% | 20.8 | 9.534 | 1.96% |
| 1936 | 8.828 | 13.01% | 17.7 | 9.644 | 1.15% |
| 1937 | 9.281 | 5.13% | 15.0 | 9.998 | 3.67% |
| 1938 | 8.961 | -3.45% | 19.7 | 9.810 | -1.88% |
| 1939 | 9.684 | 8.07% | 17.9 | 9.688 | -1.24% |

*The year 2000 is the base year for real GDP and the GDP deflator. In 2000 the value of each index is equal to 100.0.

Source: GDP and deflator data from www.bea.gov. Download section 1 (Domestic Product and Income). Unemployment rate from the Excel workbook for this chapter.

Students will inevitably want to know how such a calamity could have been allowed to occur. You could easily spend a week on this subject, but try to keep the discussion focused on macroeconomic causes. Make sure you include:

1. The Smoot-Hawley tariff. U.S. real exports fell from 3.185 in 1929 to 1.714 in 1932.
2. The collapse of real fixed investment. This was caused partly by an investment boom in the late 1920s. Gross investment was 5.529 in 1929 and fell to 0.665 by 1932.
3. The Federal Reserve allowed the money supply to decline precipitously. The nominal money supply was \$26.0 billion in 1929. Bank failures and the Fed's persistent inaction led to a decrease in the money supply to \$19.4 billion in 1933.
4. The stock market collapse of 1929. Try to emphasize that most economists believe the stock market collapse was more a symptom than a cause of the Great Depression.

The Great Depression is important to macroeconomics because it stimulated the thinking of John Maynard Keynes, John Hicks, Joan Robinson and others. These economists developed the basic models we still use today. However their models omitted a number of key factors (labor market analysis, supply shocks). Today's macroeconomic models are better, although still far from perfect.

Case 2: Modern Hyperinflations

The International Monetary Fund tracks many statistics. The following table is extracted from their *World Economic Outlook, 2013*. The data shows the annual percentage change in the CPI for each country. Clearly there are some countries that have ongoing problems with very high inflation. Divide your class into five teams. Have each try to gather data on other aspects of one country's economic performance. Make sure they include the level and growth rates of the money supply. The discussion should be lively. (The team assigned to Argentina should also be asked to explain footnote 5.)

| Country | Average 1995-2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|----------------------|------|------|------|------|------|------|------|------|
| Bulgaria | 52.8 | 6 | 7.4 | 7.6 | 12 | 2.5 | 3 | 3.4 | 2.4 |
| Argentina ⁶ | 4.3 | 9.6 | 10.9 | 8.8 | 8.6 | 6.3 | 10.5 | 9.8 | 10 |
| Brazil | 12.1 | 6.9 | 4.2 | 3.36 | 5.7 | 4.9 | 5 | 6.6 | 5.4 |
| Nicaragua | 8.4 | 9.2 | 9.7 | 9.3 | 16.8 | 11.6 | 3 | 7.4 | 7.9 |
| Angola | 320.9 | 23 | 13.3 | 12.2 | 12.5 | 13.7 | 14.5 | 13.5 | 10.3 |

⁵The data for Argentina are officially reported data. The IMF has, however, issued a declaration of censure and called on Argentina to adopt remedial measures to address the quality of the official CPI-GBA data. Alternative data sources have shown considerably higher inflation rates than the official data since 2007. In this context, the IMF is also using alternative estimates of CPI inflation for the surveillance of macroeconomic developments in Argentina.

Source: <http://www.imf.org/external/pubs/ft/weo/2013/01/pdf/statapp.pdf>.

Measuring National Output and National Income

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Gross Domestic Product *p. 112*

- Final Goods and Services
- Exclusion of Used Goods and Paper Transactions
- Exclusion of Output Produced Abroad by Domestically Owned Factors of Production

Calculating GDP *p. 113*

- The Expenditure Approach
- The Income Approach

Nominal versus Real GDP *p. 120*

- Calculating Real GDP
- Calculating the GDP Deflator
- The Problems of Fixed Weights

Limitations of the GDP Concept *p. 123*

- GDP and Social Welfare
- The Informal Economy
- Gross National Income per Capita

Looking Ahead *p. 125*

DETAILED CHAPTER OUTLINE

- I. Introduction, page 111
 - A. Macroeconomics relies on data.
 - 1. Much of this data is collected by the government and/or central bank.
 - 2. Before we can understand how the economy works we must know what it looks like. Data collected on GDP, national income, consumption expenditure, prices, interest rates and a host of other variables give us a picture of the economy.
 - B. National Income and Product Accounts
 - 1. The *national income and product accounts* include all data collected and published by the government describing the various components of national income and output in the economy.
 - 1. Most countries collect NIPA data.
 - a. In the United States the NIPA are collected and summarized by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA).
 - b. These accounts tell us how the economy is performing and give us a framework that we can use to help understand how the parts of the macroeconomic engine work together. They can be compared to blueprints of an engine.
 - 2. The NIPA do not explain how the economy works, but they do show the key parts and how they are connected.

Web Resources

The volume of macroeconomic data available online is staggering. Have your students spend some time browsing the data available at these sites:

Bureau of Economic Analysis: <http://www.bea.gov>

Bureau of Labor Statistics: <http://www.bls.gov>

Federal Reserve system: <http://www.federalreserve.gov>

For data on Europe, visit <http://europa.eu/> (European Union home page) and <http://www.ecb.int/home/html/index.en.html> (the European Central Bank home page).

International sources include the International Monetary Fund (<http://www.imf.org>) and the World Bank (<http://www.worldbank.org>).

II. Gross Domestic Product, pages 112-113

TEACHING TIP: It's important to emphasize to students that GDP measures production. We add up NIPA three ways that seem to be measuring different things: production, spending, and income. This causes confusion for students. At the end of each addition process, remind students of what you've done to make the total of that group equal total output. ¶

A. What Is GDP?

- 1. Gross Domestic Product (GDP) is the most basic measure of how an economy is performing.
- 2. *Gross domestic product (GDP)* is the total market value of all final goods and services produced within a given period by factors of production located within a country.

TEACHING TIP: Students like examples. Be sure to show them the value of GDP and its components for the most recent year. In 2012 U.S. GDP was \$15,684.8 billion. (The textbook says GDP was \$15,676.0 billion. This is an opportunity to talk about data revisions.) The Excel workbook for this chapter includes quite a bit of GDP data. There is a summary table showing annual and quarterly real and nominal values. The detailed tables for each of the four combinations are also included.

If your classroom is equipped with a computer and a projector, show the class the Excel worksheets so they will get some idea of the sheer quantity of data available. ◀

B. *Final Goods and Services* are goods and services produced for final use.

1. *Intermediate goods* are goods that are produced by one firm for use in further processing by another firm.

a. For example, a dairy farmer's cows produce milk. However, that is not the final good because the raw milk will be sold to a dairy. The dairy will pasteurize it, package it, and sell the milk to a grocery store. Once the milk is owned by the retailer, it has reached its final stage of production and can be added to GDP.

TEACHING TIP: GDP measures production. Technically when the retailer acquires the milk, it is added to business inventories. At that moment, it becomes part of GDP. When the milk is sold, inventories fall and consumption spending rises. ◀

b. Intermediate goods are not added separately in order to avoid double counting. Double counting can also be avoided by adding up national income using the value added approach.

TEACHING TIP: Students sometimes wonder about the distinction between intermediate goods and capital goods. After all, both are used to produce final goods and services. But only new capital goods (investment goods) are added into GDP. The rule used by the BEA is that any good that will be used longer than a year is counted as a final investment good. Any good that is expected to be used within a year is an intermediate good. ◀

2. *Value added* is the difference between the value of goods as they leave a stage of production and the cost of the goods as they entered that stage.

TEACHING TIP: Let's go back to the example of our dairy farmer. The farmer lets his cows graze in the pasture so the farmer's output is all value added. (Ignore minor purchases such as veterinary services.) The farmer's cows produce 1,000 gallons of milk per week. The farmer sells this milk to the dairy for \$.80 per gallon. The farmer's value added is \$800 per week. The dairy processes the raw milk and sells it to the grocer for \$2.70 per gallon. The dairy's value added is $(\$2.70 - \$0.80) \times 1,000 = \$1,900$. The grocer sells the milk for \$3.00 per gallon. The grocer's value added is \$300. Notice that the sum of the value added ($\$800 + \$1,900 + \$300$) is \$3,000. That's exactly the market value of the final good (\$3.00 per gallon \times 1,000 gallons). ◀

TEACHING TIP: The data in Table 6.1 [21.1] as well as the previous example of a dairy farmer are both included in the Excel workbook for this chapter. ◀

C. Exclusion of Used Goods and Paper Transactions

1. NIPA exclude purchases and sales of previously owned goods and paper asset transactions because GDP includes only newly produced goods and services.

2. Previously owned goods were counted when they were first produced.

3. Asset transactions are not counted because they are not new goods or services.

TEACHING TIP: Previously owned goods and asset transactions can be tricky. Suppose you sell your car to a (soon-to-be-ex-) friend. This adds nothing to GDP. However, if you give the car to a dealer on consignment, GDP will increase by the amount of the dealer's markup over what they pay you. That difference is newly produced retail services.

“Paper” asset transactions usually don’t involve much paper these days, at least in the financial markets. Most stocks and bonds exist only as electronic records of ownership stored in computers. But even then there are some small additions to GDP in the form of broker’s commissions and other transaction fees. Keep in mind that newly produced services are part of GDP even if the transaction involves an asset or previously owned product.¶

- D. Exclusion of Output Produced Abroad by Domestically Owned Factors of Production
 - 1. Output produced by U.S. citizens living in other countries is not counted in U.S. GDP because the output is not produced within the United States. The output produced by foreigners working in the United States is counted because the production occurs here. Domestic production creates domestic income which is why GDP is a better measure of national well-being than GNP.
 - 2. *Gross national product (GNP)* is the total market value of all final goods and services produced within a given period by factors of production owned by a country’s citizens, regardless of where the output is produced.
- TEACHING TIP:** The textbook’s example of Honda’s assembly line in Marysville, Ohio is an excellent way for students to understand the difference between GDP and GNP.¶
- 3. For most countries, including the United States, the difference between GDP and GNP is small.

III. Calculating GDP, pages 113-120

- A. Introduction
 - 1. We can add up GDP in two equivalent ways. We can sum the amount spent on all final goods and services during a year, then convert the total spending into production. Or we can add up all the income received by all factors of production in producing final goods. Either way, we should end up with the same total.
 - 2. The *expenditure approach* is a method of computing GDP that measures the total amount spent on all final goods and services during a given period.
 - 3. The *income approach* is a method of computing GDP that measures the income – wages, rents, interest, and profits – received by all factors of production in producing final goods and services.

B. The Expenditure Approach

TEACHING TIP: While discussing the components of GDP use an overhead projection of Table 6.2 [21.2] to give students a feel for the magnitude of each category. For the visual learners sketch a pie chart depicting the main components to give students a feel for their relative magnitude. The percentages of the components are given in the table. (The most recent data for 2012 as of June 9, 2013 can be found in the Excel workbook for this chapter. This data matches the format in Table 6.2 [21.2]. And there is a pie chart showing the major components of GDP by percentages.)¶

Consider using the circular flow of payments diagram in Chapter 5 [21] as you outline the expenditure approach to computing GDP.

Introduce the abbreviations that you will be using throughout the remainder of the course for the expenditure components. CAUTION: Deviating from the text notation can create hostility among students! (Case, Fair, and Oster use pretty standard notation.)¶

- 1. $\text{GDP} = \text{C} + \text{I} + \text{G} + (\text{EX} - \text{IM})$
- 2. *Personal Consumption Expenditures (C)* are expenditures by consumers on goods and services. There are three main categories of consumer expenditures: durable goods, nondurable goods, and services.

- a. *Durable goods* are goods that last a relatively long time, such as cars and household appliances.
- b. *Nondurable goods* are goods that are used up fairly quickly, such as food and clothing.
- c. *Services* are the things we buy that do not involve the production of physical things, such as legal and medical services and education.

TEACHING TIP: “Services” include meals eaten away from home, one of the fastest-growing segments of consumer service expenditures. ●

Economics in Practice: Where Does eBay Get Counted?, page 115

eBay runs an online marketplace with over 220 million registered users who buy and sell 2.4 billion items a year, ranging from children’s toys to oil paintings. In December 2007, one eBay user auctioned off a 1933 Chicago World’s Fair pennant. The winning bid was just over \$20.

Most items sold on eBay are previously owned. Their market value was added to GDP in the year in which they were produced. eBay’s business is to provide a marketplace for exchange. In doing so, it uses labor and capital and creates value. In return for creating this value, eBay charges fees to the sellers that use its site. The value of these fees do enter into GDP. So while the old knickknacks that people sell on eBay do not contribute to current GDP, the cost of finding an interested buyer for those old goods does indeed get counted.

Note, however, that some eBay merchants sell new goods. Since those goods are newly-produced, their full market value plus eBay’s fees will be added to GDP during the year in which they were produced and sold.

2. *Investment* is the purchase of new capital – housing, plants, equipment, and inventory. *Gross private domestic investment (I)* is total investment in capital — that is, the purchase of new housing, plants, equipment, and inventory by the private (or nongovernment) sector.
 - a. *Nonresidential investment* includes all expenditures by firms for machines, tools, plants, and so on.
 - b. *Residential investment* includes all expenditures by households and firms on new houses and apartment buildings.
 - c. The *change in business inventories* is the amount by which firms’ inventories change during a period. Inventories are the goods that firms produce now but intend to sell later.
 - d. Inventories are counted as the first step in converting spending into production. Inventories are also included because of the services they provide firms.
 $\text{GDP} = \text{Final sales} + \text{Change in business inventories.}$
 - e. *Depreciation* is the amount by which an asset’s value falls in a given period. *Gross investment* is the total value of all newly produced capital goods (plant, equipment, housing, and inventory) produced in a given period. *Net investment* equals gross investment minus depreciation.
 $\text{capital}_{\text{end of period}} = \text{capital}_{\text{beginning of period}} + \text{net investment}$

- TEACHING TIP:** Counting inventory changes as part of investment is potentially confusing for students. There are different approaches you can take explaining it. The material in the text is excellent. Here's an example that may be a useful supplement.

A shoe factory relies on their economist's forecast to decide how many pairs of shoes to produce next month. The economist forecasts sales of 1,000 pairs of shoes, so that's what the firm produces. At the end of the month they have sold only 600 pairs of shoes. The difference is the net change in their inventory, 400 pairs of shoes. Show that spending plus inventory change must equal production ($600 + 400 = 1,000$). Then make some comment about the firm firing the economist.¶

3. *Government Consumption and Gross Investment (G)* includes expenditures by federal, state, and local governments for final goods and services. It does not include government transfer payments or interest payments on the national debt because neither is a payment for any final goods or services.
4. *Net Exports (EX-IM)* is the difference between exports (sales to foreigners of U.S.-produced goods and services) and imports (U.S. purchases of goods and services from abroad). The figure can be positive or negative

- TEACHING TIP:** Exports and imports are the two other factors used to convert domestic spending into production. Domestic spending includes purchases of imports. For example, if you buy a new BMW that was made in Germany, the \$50,000 you spend will be included in C. However, the BMW is not part of U.S. production. Imports are subtracted to correct for this. Similarly, if a Japanese firm hires some U.S. consultants, the Japanese expenditure is not included in U.S. spending. However, the services the consultants provide are part of U.S. production. Therefore, exports are added to spending to reflect goods and services produced in the U.S. but sold elsewhere.¶

B. The Income Approach

- TEACHING TIP:** While discussing the components of GDP use an overhead projection of Table 6.3 [21.3] to give students a feel for the magnitude of each category. Just as when you presented the expenditure approach, sketch a pie chart depicting the main components to give students a feel for their relative magnitude. The percentages of the components are given in the table. (The most recent data for 2012 as of June 10, 2013 can be found in the Excel workbook for this chapter. This data matches the format in Table 6.3 [21.3]. Pie chart is included.)¶

1. *National Income* is the total income earned by factors of production owned by a country's citizens. It is the sum of compensation of employees, proprietor's income, rental income, corporate profits, net interest, indirect taxes minus subsidies, net business transfer payments, and the surplus of government enterprises.
 - a. *Compensation of employees* includes wages, salaries, and various supplements—employer contributions to social insurance and pension funds, for example—paid to households by firms and by the government.
 - b. *Proprietors' income* is the income of unincorporated businesses.
 - c. *Rental income* is the income received by property owners in the form of rent.
 - d. *Corporate profits* is the income of corporations.
 - e. *Net interest* is the interest paid by business. Since the interest is net, it must equal interest paid minus interest received by business. Household and government interest payments are excluded because they are not caused by the production of any good or service.
 - f. *Indirect taxes minus subsidies* includes taxes such as sales taxes, customs duties, and license fees less subsidies that the government pays for which

it receives no goods or services in return. These items are added because indirect taxes are included in calculating final sales. Subsidies are treated as negative indirect taxes.

- TEACHING TIP:** To the consumer, sales tax is part of the purchase price. However, the seller only receives the price net of the sales tax. Therefore, these taxes must be accounted for on the income side. They are part of the government's income. Subsidies are payments made by the government for which it receives no goods or services in return. These are subtracted from national income to get GDP.

Because indirect business taxes (sales taxes, customs duties, license fees) are included in the sale price of items in the expenditure approach to GDP accounting they must be added in the income approach so that the two sides of the national income accounting ledgers balance.

Subsidies must be subtracted because they are not paid to the recipient in exchange for any currently produced services so they do not directly appear in the expenditure side of the ledger.

- g. *Net business transfer payments* are net transfer payments by businesses to others, thus becoming income to the recipients.
- h. *Surplus of government enterprises* is the income of government enterprises. In 2012 this item was negative, indicating that, on balance, government enterprises operated at a loss.

2. GDP is not exactly the same as national income. GDP measures total production within a country. National income measures income received by the citizens of the country (regardless of where in the world they live). To transform GDP into national income we must add net factor payments received from the rest of the world and subtract depreciation.

- TEACHING TIP:** The most recent data for 2012 as of June 10, 2013 can be found in the Excel workbook for this chapter. This data matches the format in Table 6.4 [21.4].

- a. Net factor payments received from the rest of the world equal the receipts of factor income from the rest of the world minus the payment of factor income to the rest of the world. Since national income includes total income of all domestic citizens (not residents) net factor payments must be added. This transforms GDP into gross national product (GNP). Gross National Product (GNP) is total output produced by domestically owned factors of production regardless of where in the world they are physically located.

- TEACHING TIP:** To make this more concrete for students, explain that these payments consist of interest and dividends that U.S. citizens receive on investments abroad, as well as the reinvested earnings of foreign subsidiaries of U.S. corporations. Factor income paid to the world consists of the same types of payments except that they are made from investments in the United States to recipients abroad.

- TEACHING TIP:** A good way to help students remember the difference between GNP and GDP is to first present the definitions. Then ask which is larger for Saudi Arabia, GDP or GNP? Experience shows that two groups will emerge. Ask a representative from each "group" to justify its answer.

Those who say that GDP is larger are usually thinking of all the foreign workers in Saudi Arabia—laborers, doctors, oil executives, and so on. The output of these foreign workers is part of GDP, but not GNP. Those who say that GNP is larger are probably thinking of the interest and profit Saudis earn on assets held abroad. These payments are included in Saudi GNP, but not GDP because the production takes place abroad.

In theory, either answer could be correct. But in fact, Saudi earnings from foreign assets are so large that they dominate the foreign worker effect. Saudi Arabia's GNP is significantly larger than its GDP.

Ireland provides a good example of the opposite situation; compare the number of foreign firms who produce in Ireland (and so contribute to its GDP) to the number of Irish firms that produce in other countries (which would count in GNP). Ireland's GDP is greater than its GNP as a result.❶

3. Depreciation is the measure of the decrease in the value of capital assets as they wear out over time. *Net national product (NNP)* is gross national product minus depreciation; a nation's total product minus what is required to maintain the value of its capital stock.
4. Net national product plus the statistical discrepancy equals national income. The *statistical discrepancy* is the data measurement error.

TEACHING TIP: Depreciation can be thought of as income paid to a factor of production. A robot used to manufacture automobiles incurs wear and tear during the production process. Its value depreciates as it becomes less productive. This is a cost to the firm. By adding depreciation to the firm's profits, the robot is compensated for its services rendered, just as human employees are paid wages for their services.❷

5. *Personal income (PI)* is the total income of households. PI is calculated by starting with NI. Subtract undistributed corporate profits (profits minus dividends) and social insurance payments. Then add personal interest income from the government and consumers. Finally add transfer payments made to persons.

TEACHING TIP: The most recent data for 2012 as of June 10, 2013 can be found in the Excel workbook for this chapter. This data matches the format in Table 6.5 [21.5], but includes much of the detail as well as the summary. In addition, the complete BEA release from 1947 through 2012 is included as a separate tab.❸

6. *Disposable Personal Income (DPI)* or *after-tax* income is PI minus personal income taxes. This is the amount that households have to spend or save.
 - a. Households spend part of DPI. They save the rest.
 - b. Total consumer spending includes personal consumption expenditures, interest paid by consumers to business, and personal transfer payments to foreigners.
 - c. *Personal saving* is the amount of disposable income that is left after total personal spending in a given period.
 - d. The *personal saving rate* is the percentage of disposable personal income that is saved. If the personal saving rate is low, households are spending a large amount relative to their incomes; if it is high, households are spending cautiously.

Economics in Practice: GDP: One of the Great Inventions of the 20th Century, page 119

As the 20th century drew to a close, the U.S. Department of Commerce embarked on a review of its achievements. At the conclusion of this review, the Department named the development of the national income and product accounts as "its achievement of the century."

J. Steven Landefeld Director, Bureau of Economic Analysis

The list of economists singing the praises of the NIPA is truly impressive. Simon Kuznets developed the first set of national income accounts for the U.S. He received the Noble Prize in economics in 1971.

IV. Nominal Versus Real GDP, pages 120-123

- A. *Nominal GDP* is gross domestic product measured in *current dollars*, the current prices we pay for goods and services.

1. This is not a desirable measure of production. Nominal GDP can increase because the price level has increased with no change in output.
2. The BEA creates an index of the average price level (the GDP deflator mentioned in Chapter 5 [20]) to adjust nominal GDP for inflation.
3. Inflation is an increase in the average price level.
4. The *weight* is the importance attached to an item within a group of items.

TEACHING TIP: Here's a good example to try. Suppose that in Year 1 a firm produces 5 cars valued at \$10,000 each. It has contributed \$50,000 to GDP. In Year 2 its contribution is \$60,000. Has the firm produced more cars? Students will point out that it may have produced 6 cars at the same \$10,000 value, but it could have produced the same number (5) cars if the price had risen to \$12,000. In fact, the firm might have produced only 4 cars at \$15,000 each! This points out why eliminating price changes allows us to see more clearly whether or not there have been output changes. ¶

B. Calculating Real GDP

1. Real GDP is nominal GDP adjusted for changes in the price level.
2. Before 1996 the BEA calculated real GDP and the GDP deflator by selecting a base year and using the prices in that year to calculate the two. This is called a fixed-weight procedure. The *base year* is the year chosen for the weights in a fixed-weight procedure. A *fixed-weight procedure* is a procedure that uses weights from a given base year.
3. However, calculated growth rates could be very sensitive to the choice of a base year, which led the BEA to change its procedure. It now uses a procedure that calculates a geometric average over two consecutive years comparing each year to the previous year. This procedure is done in a way that guarantees that real GDP times the GDP deflator still equals nominal GDP.

TEACHING TIP: The geometric average procedure is called chain weighting. The example in the textbook using the data in Table 6.6 [21.6] is excellent. This data and the calculations of fixed-weight and chain-weighted real GDP and the GDP deflator are included in the Excel workbook for this chapter. ¶

C. Calculating the GDP Deflator

1. The GDP deflator is one way of measuring the overall price level.
2. Like real GDP, the BEA once used a fixed-weight procedure. However, since a price index is being calculated, the weights used are the quantities of the products. And, like real GDP the choice of base year can have a significant impact on the results.
3. The BEA now calculates the geometric average of the quantity-weighted price indexes. Many of the problems caused by arbitrary choice of a base year are eliminated.

TEACHING TIP: Table 6.6 [21.6] provides a good numerical example to illustrate these calculations. Point out to the students that understanding the procedure will be easier if they pay careful attention to the subscripts on the variables. You may wish to write a list of what each variable represents on the board for constant reference as you go through the example (i.e., P_2 represents prices in year 2, etc.).

Chain-weighted real GDP is calculated by valuing changes in quantities by the geometric average of prices charged at the beginning and end of the period of change. First, calculate the value of output in each year using both base year prices and current year prices. Then calculate real GDP at fixed year 1 prices by dividing the value of year 2 output in year 1 prices by the value of year 1 output in year 1 prices. Note: the denominator is just nominal GDP in year 1. In Table 6.6 [21.6], this value is $\$15.10/\$12.10 = 1.2479$. Calculate real GDP at fixed year 2 prices by dividing the value of year 2 output in year 2 prices by the value of year 1 output in year 2 prices. Note: the numerator is just nominal GDP in year 2. In Table 6.6 [21.6], this value is $\$19.20/\$18.40 = 1.0435$. Chain-weighted real GDP is the square root of the product of these two results: $\sqrt{1.2479 \times 1.0435} = 1.1411$.

TEACHING TIP (continued)

The chain-weighted GDP deflator (the average price level) is the geometric average of the GDP deflator using beginning of period and end of period quantities. Calculate expenditures each year using both year 1 quantities and year 2 quantities. Calculate the GDP deflator using year 1 quantities by dividing year 2 expenditures on year 1 quantities by year 1 expenditures on year 1 quantities. Note that the denominator is nominal GDP in year 1. In Table 6.6 [21.6], this value is $\$18.40/\$12.10 = 1.5207$. Calculate the GDP deflator using year 2 quantities by dividing year 2 expenditures on year 2 quantities by year 1 expenditures on year 2 quantities. Note that the numerator is nominal GDP in year 2. In Table 6.6 [21.6], this value is $\$19.20/\$15.10 = 1.2715$. The chain-weighted GDP deflator is $\sqrt{1.5207 \times 1.2715} = 1.3905$. ◉

- D. The Problem of Fixed Weights: The BEA switched to the new procedure after decades of complaints by economists about the inaccuracy of the old fixed weight system. There were serious problems with the fixed weight method of calculating real GDP. Three of these problems were:
 - 1. Structural changes that have occurred in the U.S. economy make it seem unlikely that prices for 1987 (the last year for which BEA gathered fixed weights) are good weights to use for the 1950s – or the 21st century for that matter.
 - 2. The use of fixed weights does not account for supply shifts, and therefore substitution responses are not considered.
 - 3. Similar problems arise when using fixed weights to compute price indexes. Substitution responses are ignored resulting in an overstatement of the increase in the overall price level.
 - 4. There is no “right” way to calculate real GDP or the GDP deflator. However, the BEA’s new procedure avoids some of the problems inherent in the old fixed-weight procedure.

V. Limitations of the GDP Concept, pages 123-125

- A. GDP and Social Welfare
 - 1. Serious problems arise when we try to use GDP as a measure of happiness or well-being.
 - 2. Some changes in social welfare are not measured by GDP. Some increases in social welfare are associated with decreases in GDP.
 - 3. Most nonmarket and domestic activities are not counted in GDP even though they often involve production of a good or service. House cleaning and preparing your taxes are two examples.
 - 4. GDP seldom reflects losses or social ills and has nothing to say about the distribution of output among individuals in a society.

5. GDP is neutral about the kinds of goods an economy produces.
6. However, GDP remains a highly useful measure of economic activity and well-being.

TEACHING TIP: A good illustration of this is to compare the situation in which an empty piece of land is developed and a number of houses are built on it. Suppose the number of new houses equals the number leveled by a hurricane. When the destroyed houses are rebuilt, the increase in GDP will be the same as when the new houses are built, but the effect on society is different.

A second example illustrates the impact of household production on GDP. Suppose I hire someone to do my taxes. After a few years, we decide to get married. GDP will fall by the amount I was paying to have my taxes done. However, there has been no reduction in total output. What was once a market transaction has become household production which is not counted as part of GDP.❶

Economics in Practice: Green Accounting, page 124

A recent paper by Nick Muller, Robert Mendelsohn, and Bill Nordhaus estimates that for some "dirty" U.S. industries including properly valued air pollution in the national income and product accounts as an offset to the value of the marketed goods produced by these industries would make the contribution of these industries to our nation's GDP negative!

B. The *Informal Economy* is the part of the economy in which transactions take place and in which income is generated that is unreported and therefore not counted in GDP. These transactions may be missed because they are illegal activities or tax evasions. This causes two problems.

1. The size of GDP will be underreported. Italy's informal economy is estimated at between 10 and 35 percent of Italian GDP. At the other end of the spectrum, Switzerland's informal sector is between 3 and 5 percent of GDP. The best estimates for the U.S. are between 5 and 30 percent of GDP.
2. Since countries differ in the relative sizes of their underground economies, inter-country comparisons based on GDP or any GDP-related measurement are suspect. Unemployment may be overstated as people working in the informal economy have incentives to claim they are unemployed.

TEACHING TIP: Point out to students that the underground economy includes people performing perfectly legal activities but being paid "off the books" (i.e., waiting tables, bartending, child care, etc.). Naturally, illegal activities are also part of the underground economy (i.e., drugs, etc.). Ask the students if any of them have ever been offered a discount for paying in cash. If so, chances are excellent that the transaction was never measured in GDP. If you have the time make the point that the BEA relies heavily on tax data to estimate GDP and its components. Income not reported on a tax return will probably not be included in GDP. (Some countries have begun calling the underground economy the *informal sector* in recognition of its importance in their economies.)❷

C. Gross National Income per Capita

1. *Gross national income (GNI)* converts GNP into dollars using an average of currency exchange rates over several years adjusted for rates of inflation.
2. GNI per capita is a better measure of well-being for the average person than is total GDP. GNI per capita is also extremely useful when trying to compare the economies of two different countries.

TEACHING TIP: The data and graph for Figure 6.1 [21.1] are in the Excel workbook for this chapter.❸

VI. Looking Ahead, page 125

The following chapters will discuss other important data about the economy.

Unique Economics in Practice

The informal economy has been the subject of many studies. An entertaining question is which activities should be included in a country's NIPA. In reading the following material, here's a guide to TLAs (three-letter acronyms). SNA is the U.N.'s recommended System of National Accounts. AEG is the Advisory Expert Group on National Accounts, part of the U.N. OECD is the Organization for Economic Cooperation and Development. The following discussion of how theft should be handled is instructive.

- 1993 SNA records only production of stolen goods, but not in household final consumption even if the amount is large because theft is not a transaction (which requires mutual agreement). When the value of stolen goods is small, it is not counted as output. When the value of stolen goods is large, it is counted as output, put into inventory and taken out of the balance sheet as "other change in volume."
- OECD [recommends]: Recurrent thefts of significant value should be treated as transactions. This means output is recorded: AEG rejects this recommendation.
- OECD [recommends]: Recurrent thefts of significant value by employees should be treated as compensation of employees AEG rejects this recommendation.
- AEG agrees: Sales of stolen goods (fencing) should be recorded similar to the recording of second-hand goods.*

*<http://unstats.un.org/unsd/nationalaccount/workshops/2007/Teheran/AC141-8.PPT> document AC141-8.ppt, slide 3 accessed June 10, 2013.

Question: Why do you suppose AEG rejected the first two recommendations from OECD but accepted the third?

Answer: AEG's stance is based on their philosophy in the first paragraph: "...theft is not a transaction (which requires mutual agreement)."

Sources: Workshop on Integrated Economic Statistics and Informal Sector for the ECO Member Countries, United Nations Department of Economic and Social Affairs Statistics Division 10-13 November 2007, Teheran, Iran. Documents available at

<http://unstats.un.org/unsd/nationalaccount/workshops/ac141-2.asp> accessed September 27, 2010
SNA-93 Framework, Workshop on Household Surveys and Measurement of Labour Force with Focus on Informal Economy Maseru, Lesotho, 14-18 April 2008. Document available at
http://unstats.un.org/unsd/newsletter/unsd_workshops/Lesotho2008/Review%20SNA%20framework.ppt September 27, 2010.

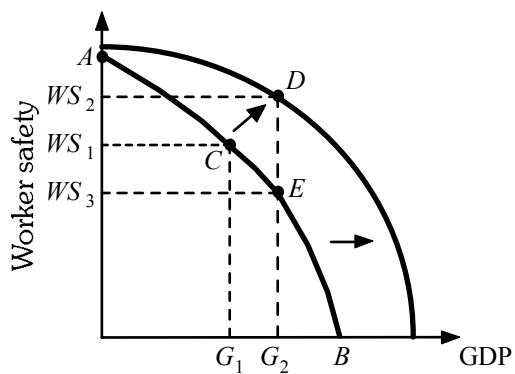
System of National Account Series (SNA) Series Tables, New Zealand Budget Economic and Fiscal Update, 1997. Available at

<http://www.treasury.govt.nz/budget/forecasts/budget/1997/pdfs/befu97-sna.pdf> accessed September 27, 2010.

Extended Applications

Application 1: GDP and Social Welfare

To reinforce the point that GDP is not the same as consumer welfare, draw a production possibilities frontier with GDP on the horizontal axis and some aspect of social welfare not directly included in GDP (such as worker safety) on the vertical axis. Discuss why there is a trade-off between these two goods. (For example, factory inspections and worker-safety rules slow down production.) Point *A* represents the maximum possible safety of the population, where nothing would be produced because all production involves some risk to workers. Point *B* represents maximum production of goods, with no concern at all for worker safety.



Suppose the nation is currently at Point *C*, with GDP at G_1 and worker safety at WS_1 . How can GDP be increased from G_1 to G_2 ? One way—which could be regarded as desirable—would be an outward shift in the production function itself, due, say, to the discovery of a new and safer technology. In this case, society might move from Point *C* to Point *D* on the new production function, with increases in both GDP (to G_2) and worker safety (to WS_2). An alternative, however, would be to move along the original production function itself, from Point *C* to Point *E*. In this case, while GDP increases, worker safety decreases (to WS_3). Society may or may not be better off by this move, depending on how safety is valued versus gains in GDP at the margin.

Increases in GDP—for which there is a single, national number—are visible, easy to track, and newsworthy. Changes in worker safety or health or environmental quality are more difficult to track. If economic policy is judged by growth in GDP alone, there will be a failure to distinguish between the different methods of increasing output, and may mean pursuing policies that actually make society worse off.

Application 2: Role Playing

The following role-playing idea was presented at the 1995 National Science Foundation funded seminar on incorporating race and gender into the introductory economics curriculum. It was held in Wellesley, MA. This exercise is quite entertaining and informative.

The instructor plays the role of a quiz show master of ceremonies. Ask for nine student volunteers and meet with them beforehand to prepare the exercise. Divide volunteers into three teams of three members each: Teams 1 and 2 are teams on the quiz show. Team 3 are the mystery guests. Each mystery guest describes to the teams (and the larger class) their economic activities:

Mystery guest 1: Unemployed doctor temporarily volunteering at a medical clinic

Mystery guest 2: Production worker working two shifts and contributing to chores at home

Mystery guest 3: Mother of three and housewife who volunteers at her kids' school

Each team describes their perceptions as to whether the mystery guests are contributing to the economy. One team uses a liberal definition of economic activity. The other team uses a strictly defined definition of marketplace activity.

Unemployment, Inflation, and Long-Run Growth

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Unemployment *p. 130*

- Measuring Unemployment
- Components of the Unemployment Rate
- The Costs of Unemployment

Inflation *p. 136*

- The Consumer Price Index
- The Costs of Inflation

Long-Run Growth *p. 140*

- Output and Productivity Growth

Looking Ahead *p. 142*

DETAILED CHAPTER OUTLINE**I. Introduction, page 130**

Unemployment, inflation, and long-run growth are three key variables used to measure economic well-being.

- A. The unemployment rate has information about the state of the labor market.
- B. The inflation rate has information about the average price level.
- C. The long-run growth rate determines changes in our economic standard of living over long time periods.
 - 1. Much of macroeconomics is concerned with short-run fluctuations called business cycles.
 - 2. The average growth rate of U.S. GDP from Figure 5.2 [22.2] is 3.2 percent per year.

DDD TEACHING TIP: These concepts are very abstract. Use several numerical examples if possible. Here's some recent data to get you started.

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|--|-------------|-------------|-------------|-------------|-------------|
| Real GDP (billions of chained 2005 dollars) | 13,228.8 | 12,880.6 | 13,063.0 | 13,299.1 | 13,593.2 |
| Population (thousands) | 304,374.8 | 307,006.6 | 309,326.2 | 311,587.8 | 313,914.0 |
| Labor Force (thousands) | 154,321.6 | 154,188.5 | 153,887.5 | 153,618.9 | 154,965.8 |
| Employment (thousands) | 145,362.5 | 139,877.5 | 139,064.0 | 139,869.3 | 142,469.0 |
| Real GDP / Population | \$43,462.20 | \$41,955.46 | \$42,230.50 | \$42,681.71 | \$43,302.30 |
| Real GDP / Labor Force | \$85,722.29 | \$83,538.01 | \$84,886.69 | \$86,572.02 | \$87,717.40 |
| Real GDP / Employment | \$91,005.59 | \$92,084.86 | \$93,935.17 | \$95,082.37 | \$95,411.63 |

(More data is available in the Excel workbook for this chapter.)

Unique Economics in Practice

This chapter includes a lot of data from various sources. One of the most useful tools available for retrieving data and keeping it up to date is the FRED database at the Federal Reserve Bank of St. Louis (<http://research.stlouisfed.org/fred2/>). Even more useful is the FRED plugin for Microsoft Excel (<http://research.stlouisfed.org/fred-addin/>). This handy tool lets you access FRED data from within an Excel workbook by simply pressing some hotkeys. On a Macintosh the key combination is Command-Option-T. For Windows versions of Excel, FRED installs as a new tab on the ribbon. Note that the Fed says versions of this plugin for Excel 2007 and Apple OS X are no longer supported. I've been using the plugin with Excel 2011 for the Mac for several years with no problems.

Question: Ask the students to explore various data options. Make sure that they do at least one data transformation and one frequency aggregation. They should also learn how to change the starting date for their series.

Answer: Data transformation and frequency aggregation are on the FRED menu. The starting date can be entered in standard mm/dd/yyyy date format in row 4.

II. Unemployment, pages 130-136**A. Measuring Unemployment**

DDD TEACHING TIP: The data in Table 7.1 [22.1] is in the Excel workbook for this chapter. Also included is Table B-35 from the Economic Report of the President, 2013.

1. The unemployment statistics released to the press on the first Friday of each month are based on a survey of about 60,000 households conducted by the Bureau of Labor Statistics, a branch of the Department of Labor.
2. An *employed* individual is any person 16 years old or older (1) who works for pay, either for someone else or in his or her own business for 1 or more hours per week, (2) who works without pay for 15 or more hours per week in a family enterprise, or (3) who has a job but has been temporarily absent with or without pay.
3. An *unemployed* individual is someone 16 years old or older who is not working, is available for work, and has made specific efforts to find work during the previous 4 weeks.
4. Someone *not in the labor force* is any person who is not looking for work because he or she does not want a job or has given up looking.
5. The *labor force* is the number of people employed plus the number of unemployed.
6. The *unemployment rate* is the ratio of the number of people unemployed to the total number of people in the labor force.
7. The *labor-force participation rate* is the ratio of the labor force to the total population 16 years old or older.

TEACHING TIP: The text includes a numerical example using data from December, 2012. It's worth spending a few minutes on this example in class. ◉

B. Components of the Unemployment Rate

TEACHING TIP: The data in Table 7.2 [22.2] is in the Excel workbook for this chapter. Also included are the complete BLS tables for each group from January, 1982 through May, 2013. ◉

1. By looking at unemployment rates across groups of people, regions, and industries we can better understand the unemployment rate.
2. Unemployment Rates for Different Demographic Groups
 - a. There are large differences by gender, age, and race.
 - b. The lowest unemployment rates tend to be among white men and women over the age of 20.
 - c. The highest unemployment rates tend to be among African Americans between ages 16 and 19.

TEACHING TIP: Students may be discouraged about these statistics because there isn't much they can do to control their gender or race. Point out to them that college graduates almost always have very low unemployment rates, generally about half the national average. ◉

3. Unemployment Rates in States and Regions
 - a. Different states and regions have different unemployment rates.
 - b. Unlike some demographic characteristics, regional unemployment rates vary over time.
 - c. California (technology, good weather) and Michigan (automobile industry) consistently have unemployment rates higher than the national average.

- d. The unemployment rate in Texas (farming, ranching, no state income tax) seems to be consistently below the national average. The year 2003 was an exception to this rule of thumb.
 - 4. Discouraged-Worker Effects
 - a. A discouraged worker is someone who is unemployed but recently stopped looking for work.
 - b. The *discouraged-worker effect* is the decline in the measured unemployment rate that results when people who want to work but cannot find jobs grow discouraged and stop looking, thus dropping out of the ranks of the unemployed and the labor force.
 - c. Discouraged workers are not included in the labor force. They are neither employed nor unemployed.
 - d. In the late stages of a recession the unemployment rate sometimes begins to fall. This decline is not being caused entirely by economic growth increasing. Part of the decrease in the unemployment rate is caused by more discouraged workers.
 - 5. The Duration of Unemployment is the average length of time an unemployed worker is out of work. Unemployment duration tends to increase during recessions. The duration of unemployment following the 2008-2009 recession has remained higher than expected.
- TEACHING TIP:** See Extended Application 1 at the end of this chapter for an interesting way to present this material. The data in Table 7.4 [22.4] is in the Excel workbook for this chapter. ◉
- D. The Costs of Unemployment
- 1. Some Unemployment Is Inevitable
 - a. At any moment there is a group of job seekers and a group of job openings. Matching members of the two groups is time consuming.
 - b. While job seekers are looking for a job that suits their skills and abilities they are counted as unemployed.
 - c. Some unemployment is caused by job seekers gathering information about the number and type of jobs available as well as wage rates. This unemployment implies the labor market is working well because workers and jobs will be well matched.

***Economics in Practice: A Quiet Revolution: Women Join the Labor Force,
page 133***

Table 7.1 shows that the labor force participation rate in the United States increased from 59.2 percent in 1950 to 65.4 percent in 2009. Much of this increase was due to the increased participation of women in the labor force. In 1955, the labor force participation rate of women was 36 percent. For married women, the rate was even lower at 29 percent. By the 1990s, these numbers shifted considerably. In 1996, the labor force participation rate was 60 percent for all women and 62 percent for married women. The reasons for these changes are complex. Certainly, in the 1960s, there was a change in society's attitude toward women and paid work. In addition, the baby boom became the baby bust as greater availability of birth control led to fewer births.

Note that the increased opportunity cost of time spent on household activities such as cooking and cleaning led to the rapid growth of two parts of the service sector: housecleaning and restaurant meals.

2. Frictional, Structural, and Cyclical Unemployment
 - a. *Frictional unemployment* is the portion of unemployment that is due to the normal working of the labor market; used to denote short-run job/skill matching problems. Frictional unemployment is good for the economy because these workers will usually find a job that suits them better (and in which they are likely to be more productive).
 - b. *Structural unemployment* is the portion of unemployment that is due to changes in the structure of the economy that result in a significant loss of jobs in certain industries. Structural unemployment creates longer-run adjustment problems that may last for years.
 - c. The *natural rate of unemployment* is the unemployment that occurs as a normal part of the functioning of the economy. Sometimes taken as the sum of frictional unemployment and structural unemployment. Estimates range from 4 percent to 6 percent.
 - d. *Cyclical unemployment* is unemployment that is above frictional plus structural unemployment. Cyclical unemployment is the increase in unemployment that occurs during recessions and depressions. When the unemployment rate topped 9% in the late 2000's, economists were pretty sure that number included some cyclical unemployment.
 - e. The cost to the economy of cyclical unemployment is the lost GDP. This lost output can never be recovered.
4. Social Consequences of unemployment include economic hardship as well as a number of social and personal ills (anxiety, depression, a deterioration of physical and psychological health, drug abuse, and suicide).

DDD TEACHING TIP: You may wish to add a fourth category of unemployment, seasonal unemployment, to the three listed in the text. Including seasonal unemployment provides an opportunity to explain the phrase “seasonal adjustment” that students often see in newspapers. This can be done very simply. First, explain what seasonal unemployment is. (Predictable changes in the unemployment rate due to seasonal factors.) Then provide a few examples. (An example close to home is the increase in unemployment every summer, when college and high-school students start looking for temporary jobs.)

The basic idea behind “seasonal adjustment” is to remove the predictable seasonal unemployment from the reported unemployment rate so that we are left with a measure that more accurately reflects changes in the state of the economy. For example, if the unemployment rate generally tends to rise by .5 percent each June, then the seasonally adjusted unemployment rate for June would be the actual unemployment rate minus .5 percent. In this way, if the seasonally adjusted rate changes, we know it is not because college students are looking for jobs, but rather because of some nonseasonal change in labor market conditions. ¶

***Economics in Practice: The Consequences of Unemployment Persist,
page 135***

Economist Lisa Kahn followed people who graduated from college between 1979 and 1989. She found that those who graduated during the severe recession of 1979-1982 did not catch up with the others. In fact, fifteen years later those with post-college unemployment were still faring worse than those who had moved directly into a job.

III. Inflation, pages 135-140

A. Defining Inflation

1. Not all price increases are inflation. Over any time period, prices of some goods will rise and other prices will fall.
2. Inflation is an increase in the overall (average) price level. Deflation is a decrease in the overall (average) price level. Inflation happens when prices of many goods and services increase together.

DDD TEACHING TIP: Students, the media, and many people who should know better confuse deflation with disinflation, a decrease in the inflation rate. Make sure your students know the difference between them. An example will help. ¶

B. The Consumer Price Index

DDD TEACHING TIP: The data in Table 7.5 [22.5] and Fig. 7.1 [22.1] is in the Excel workbook for this chapter. ¶

1. Price indexes are used to measure average price levels.
2. The *Consumer Price Index (CPI)* is a price index computed each month by the Bureau of Labor Statistics using a bundle that is meant to represent the “market basket” purchased monthly by the typical urban consumer. The CPI is the most commonly quoted price index.
 - a. The CPI is based on a bundle of goods and services that represent the “market basket” purchased by a typical urban household. The fixed-weight version of the CPI therefore overstates inflation by not allowing substitution.
 - b. The Bureau of Labor Statistics (BLS) is gradually moving the CPI from a fixed weight index to a chain-weighted index.

- c. Even after the calculation methodology is changed the CPI will still cover only prices of consumer goods and it will include import prices (subtracted when calculating the GDP deflator).

TOPIC FOR CLASS DISCUSSION:

Spend a few minutes in class discussing Figure 7.1 [22.1]. To drive home the point that the CPI is an average price level, ask the class how their budgets compare with the percentages shown. Chances are very good that no one in class will have a budget close to those percentages. To help you out, the Excel workbook includes the data for this figure as well as a pie chart. ■

4. *Producer Price Indexes (PPI)*) are measures of prices that producers receive for products at all stages in the production process.
 - a. The PPIs are indexes of prices producers receive for products at various stages of the production process.
 - b. The three main categories for which PPIs are constructed are finished goods, intermediate materials, and crude materials. There are subcategories within each.

TEACHING TIP: Although much improved over the past decade, the consumer price index still probably overstates the “true” inflation rate. The reasons for this are worth discussing in class. The Economics in Practice on p. 139 briefly describes these problems. Here’s some additional detail:

- ◆ The CPI ignores many “quality improvements” in goods, especially technological goods. The BLS has been steadily working to take quality improvements into account, but it’s a difficult job. Students should understand that if we pay more but also get more, it is not really inflation. However, the CPI will label it inflation.
- ◆ There is a long lag before the CPI introduces new technological goods. In general, these are the goods whose prices are falling most rapidly. The price of pocket calculators, for example, fell 95 percent between 1972 and 1982, but did not enter the CPI’s “typical household basket” until 1982. In general, this means the CPI is systematically ignoring a category of goods whose prices are falling. Note that this works the other way as well. New goods whose prices are rising will also be ignored until they are included in a CPI survey.
- ◆ The quantities in the CPI’s “typical household basket” of goods remain fixed for up to 10 years, even though the actual quantities consumed may have changed considerably. In particular, we would expect households to economize on those goods rising most rapidly in price and to substitute goods that are falling in price or rising less rapidly. Thus, the CPI systematically overweights the goods whose prices are rising the most rapidly and underweights those goods whose prices are falling or rising more slowly.

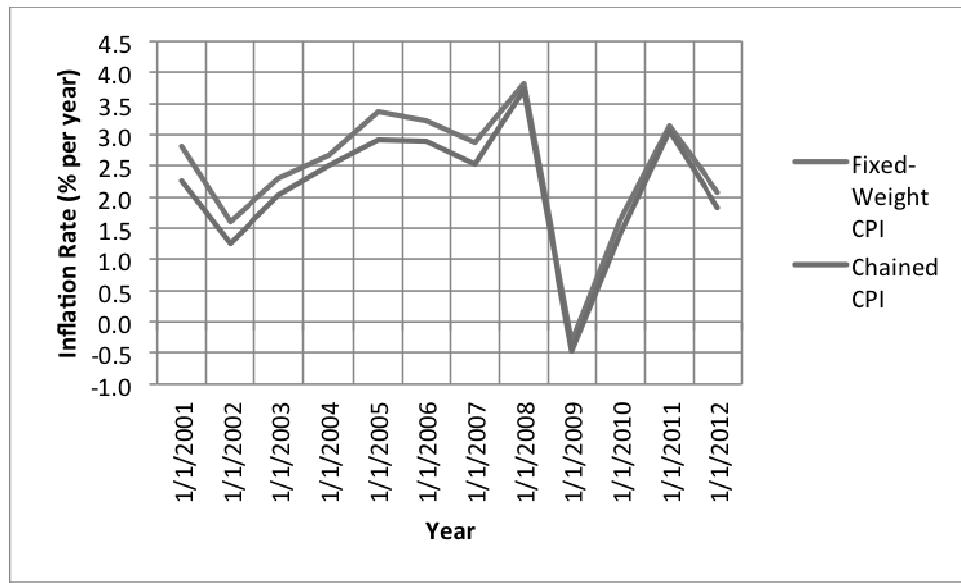
The CPI is the measure that union wages, government retirement funds, and social security benefits use as an index. If the CPI overstates inflation, then any reported price increase will lead to a rise in the real incomes of those tied to the index. Of course, this increase in income comes at the expense of those whose incomes are not tied to the index. ◀

***Economics in Practice: Chain-Linked Consumer Price Indexes in the News,
page 139***

Many government programs are indexed using the Consumer Price Index. These include Social Security payments, veterans' benefits, and even the federal income tax tables. The CBO estimates that switching to the chain-linked CPI would reduce these payments by about \$145 billion over ten years.

Unique Economics in Practice

To chain or not to chain, that is the question. It's fairly easy for students to get the data for the fixed-weight CPI and the chain-linked CPI. Have them do a comparison. (Chained CPI data is only available since December, 1999.) Annual data (both the raw index and the inflation rates) are included in the Excel workbook for this chapter. Here's the graph using annual data:



Question: As we would expect, the fixed-weight CPI gives a generally higher inflation rate than the chained CPI. Why didn't this seem to be true during the disinflation, deflation, and reflation of 2008-2011?

Answer: When prices are rising, people will tend to substitute. But when prices are falling, people often don't do as much comparison shopping. This is behavioral economics.

D. The Costs of Inflation

1. Inflation May Change the Distribution of Income

- a. Contrary to popular opinion, general inflation does not lower purchasing power because nominal income keeps pace with the average price level.

TEACHING TIP: Point out to your students that national income must keep pace with inflation because of the national income accounting identity. Since national income equals national product, inflation must affect income in the same way it affects nominal GDP. ■

- b. Inflation changes the distribution of income; some groups may be hurt more than others.
- c. Some workers have contracts that automatically increase their wage rate to compensate for increases in the price level. These cost of living adjustment (COLA) clauses protect those workers against inflation – at least for the duration of their contract.

TEACHING TIP: Groups that gain and lose because of inflation are often not those students think of. They may have heard that “the elderly” are hurt by inflation. Tell them Social Security is indexed to inflation. If time permits, you can briefly mention the difference between fixed and variable annuities. One group that is certainly hurt by inflation is the poor; welfare payments are rarely indexed.

As we all know too well, one group whose wages are not indexed for inflation is college professors. ■

- d. Anticipated inflation causes few problems. Unanticipated inflation is largely responsible for the negative effects outlined here. When inflation is high and variable, there is an incentive to try to forecast inflation and buy securities based on these forecasts. Guessing at the inflation rate is not a productive use of resources.
 - e. If inflation is unanticipated net creditors lose and net debtors gain. In most developed economies, households are net creditors and businesses are net borrowers.
 - f. If inflation is anticipated it will be incorporated into the nominal interest rate through the Fisher equation ($i = r + p^e$). The *real interest rate* is the difference between the interest rate on a loan and the inflation rate. The real interest rate measures the net transfer of purchasing power, usually from borrowers to lenders.
4. Administrative Costs and Inefficiencies include changing price tags, more frequent bank transactions. Some economists call these menu costs because restaurants have to print new menus to raise prices.

TEACHING TIP: The text cites the inflation rate in Zimbabwe. This would be a good time to revisit the Unique *Economics in Practice* in the instructor’s manual (chapter 5, page 59). ■

TOPIC FOR CLASS DISCUSSION:

Ask the class which inflation rate should be used to calculate the real interest rate. Should it be the anticipated inflation rate or the actual inflation rate? This is an opportunity to introduce the notion of *ex post* (after the fact) and *ex ante* (before the fact) measurement. We should use the anticipated inflation rate to estimate future interest rates (*ex ante*). (Technically the anticipated inflation rate should cover the time to maturity of the instrument whose interest rate we are measuring.) If we want to know the net change in our purchasing power caused by a previous loan, we should use the historical inflation rate (*ex post*). The real interest rate is the net transfer of purchasing power from borrower to lender. If the *ex post* real interest rate is negative there was a transfer of purchasing power from lender to borrower. ■

5. Public Enemy Number One?
- a. Economists disagree about the seriousness of the costs of inflation. But the public believes it is important.
 - b. Anticipated inflation and unanticipated inflation have very different costs.
 - c. Stopping inflation is also costly since a recession is usually required.

IV. Long-Run Growth, pages 140-142

A. Introduction

1. *Output growth* is the growth rate of the output of the entire economy.
2. *Per-capita output growth* is the growth rate of output per person in the economy.
3. *Productivity growth* is the growth rate of output per worker.

B. Output and Productivity Growth

1. Since 1900 the U.S. economy has grown 3.3 percent per year on average. Why 3.3 percent? Why not 2 percent or 4 percent?
2. Will such a small difference in growth rates matter?
3. Output can increase if there is an increase in labor or capital or if there is an increase in the amount of time labor and capital are working per week. Capital is anything that is produced that is then used as an input to produce other goods and services.
4. Another way for output to increase is if the quality of the workers increases (*human capital*) or if the quality of the machines increases (*technological improvement*).
5. *Labor productivity* is total output (real GDP) divided by total worker hours (output per worker hour).

Unique Economics in Practice

Do small changes in growth rates matter? Let's look at a 100 year span. Using various growth rates, the following table shows the multiple (calculated as $(1 + g)^{100}$).

| Growth rate | GDP multiple |
|-------------|--------------|
| 1% | 2.705 |
| 2% | 7.245 |
| 3% | 19.219 |
| 3.4% | 28.317 |
| 4% | 50.505 |

In other words by growing 3.4% per year GDP will be over 28 times as large after 100 years.

Question: What are the implications for income and the standard of living?

Answer: National income equals GDP. If GDP is 28 times larger, then so is income.

6. The long-run upward trend in U.S. productivity (Fig. 7.2 [22.2]) has been due to:
 - a. increases in the amount of capital per worker and
 - b. improvements in the quality of both workers and machines.

7. Why did productivity growth slow in the 1970s and 1980s, then speed up again in the 1990s and (so far) in the twenty first century? The best answer economists have is variations in the rate of technological improvement.

V. Looking Ahead, page 143

In the chapters that follow we will study how the macroeconomy functions.

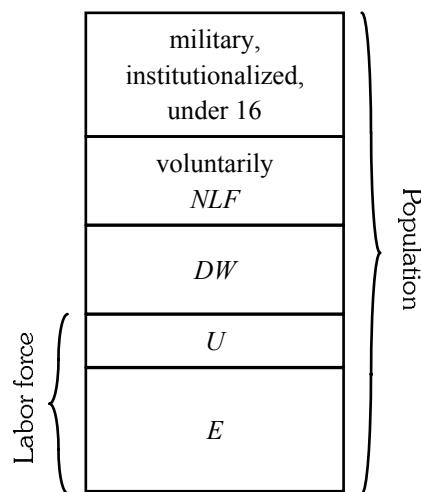
EXTENDED APPLICATION

Application 1: The Discouraged-Worker Effect

A sure way to pique student interest is to show them how a “sacred statistic” like the unemployment rate—which most assume is measured scientifically and accurately by experts who know what they are doing—may not measure what most people believe it measures.

The most important problem with the unemployment rate is the “discouraged-worker” problem. The text has a good discussion of how discouraged workers—those who want to work but have become so discouraged that they’ve given up looking—can lower the reported unemployment rate. That means the unemployment rate may sometimes not be a reliable measure of the economic distress those without jobs are experiencing. But that is only part of the discouraged-worker effect. An equally serious problem is the distortion of changes in the unemployment rate over the business cycle.

To demonstrate this problem, draw the following rectangle which represents the U.S. population divided into groups.

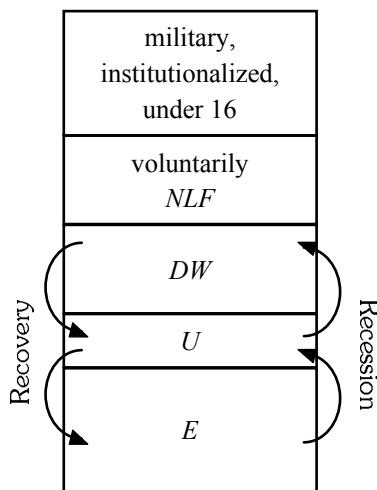


Two major parts of the population are excluded from the labor force: (1) people under age 16, in the armed forces, or institutionalized (hospitals, prisons); and (2) those who are voluntarily not in the labor force (the retired, many students, the idle wealthy, and anyone else who chooses not to work). Discouraged workers (*DW*), are officially “not in the labor force.” Even though discouraged workers have dropped out of the labor force voluntarily, their absence is somewhat induced by labor market conditions. The unemployed (*U*) and the employed (*E*) together make up the labor force.

Once the division of the population into these categories has been explained, you can begin to demonstrate how their composition changes over a business cycle. During a recession output

declines and workers are laid off. The newly unemployed begin looking for new jobs. In the previous diagram this is a flow from “employed” (E) to “unemployed” (U). The official unemployment rate rises.

If this was the only movement taking place, the rise in the unemployment rate would give an accurate picture of labor-market stress. Unfortunately layoffs and reduced hiring make it more difficult for those who were unemployed before the recession to find jobs. Some of them will stop looking for work—at least until conditions improve. Thus, in addition to those who flow from E to U , there is a second flow as people move from U to DW , where they are no longer counted in the labor force. This flow causes the reported unemployment rate to be lower than it would be if the new DWs had kept looking for jobs. To sum up, in a recession, there are two flows: one that increases the unemployment rate and one that decreases it. These flows are shown in the diagram below.



The flow from U to DW may be larger than the flow from E to U . This would occur if, say, for every worker laid off, two previously unemployed workers stopped looking for work. In this case, the official unemployment rate would show a decrease when actually conditions had worsened. At a minimum, the second flow from U to DW will reduce the rise in unemployment. The discouraged-worker effect causes the rise in the official unemployment rate to underestimate the true level of stress in the labor market.

The opposite occurs during a recovery. There is a flow from U to E as some of those looking for work find jobs. This decreases the unemployment rate. But as labor-market conditions improve, there is also a flow from DW to U as many previously discouraged workers begin again to look for work. In the extreme, the flow from DW to U could be larger than that from U to E , and the official unemployment rate would rise in the midst of the recovery. At a minimum, the drop in the official unemployment rate will underestimate the true reduction in labor market stress.

For these (and other) reasons many economists use another measure of labor-market conditions in addition to the reported unemployment rate. The ratio of total employment to total population over age 16 is one of these measures. Note that in a recession this ratio will always fall, and in a recovery it will always rise. The employment-population ratio, which basically divides the population into segments of “employed” and “everyone else,” is unaffected by flows between DW and U . Unfortunately this measure is subject to changes caused by the age distribution of population. For example, when the post-World War II baby boom generation turned 16, the

denominator increased faster than the numerator, causing the employment to population over 16 ratio to fall for reasons unrelated to economic conditions.

The moral is that there is no single perfect measure of labor market stress. Economists who follow business cycles and labor market conditions must look at many different statistics to get a good picture of what's going on.

One additional note: Each quarter, the U.S. Bureau of Labor Statistics (BLS) attempts to count the number of discouraged workers in the population. The count, which is typically in the 500,000 to 1 million range, would seem to indicate a relatively modest “discouraged-worker effect” on the unemployment rate. But in reality the effect is more serious, and the count itself seriously underestimates the number of discouraged workers. To be counted as a “discouraged worker,” the BLS requires that a worker cite inability to find work as the *only* reason he or she is not actively searching for a job. Someone who also mentions child-care responsibilities, the flu, the desire to go back to school, or any other reason when explaining his or her lack of job-search activity is not included in the discouraged-worker count. Because many discouraged workers are likely to cite a multitude of reasons for not seeking work—especially those collecting unemployment insurance—this requirement seems unrealistically restrictive and artificially skews the count.

Application 2: The Declining Labor Force Participation Rate

Starting in 2006 the U.S. labor force participation rate began a precipitous decline. In October, 2009 the U.S. reached the depth of the recession with an unemployment rate of 10.0 percent. The labor force participation rate was 65.0 percent with 82.7 million people not in the labor force. By the end of 2012 it had declined to 63.6 percent and 88.8 million people not in the labor force. In fact, much of the decrease in the unemployment rate since October, 2009 was caused by the decrease in the labor force participation rate. By comparison, between October, 2009 and December, 2012 the civilian noninstitutional population 16 and over grew from 236.6 million to 244.4 million. That population grew by 7.8 million while the labor force shrank by 6.1 million. The number of discouraged workers rose from 808 to 909 thousand. A broader measure, those marginally attached to the labor force, grew by 143 thousand over the same interval. (It's a little tricky to find this data on the BLS website. Start here: <http://www.bls.gov/webapps/legacy/cpsatab16.htm>.)

The question is why? Economists have advanced a number of explanations:

1. Discouraged workers dropping out of the labor force, with the number increasing because of the depth and breadth of the recession.
2. Baby boomers beginning to retire, removing themselves from the labor force.
3. An increasing fraction of the labor force that does not have the skills needed for available jobs today.

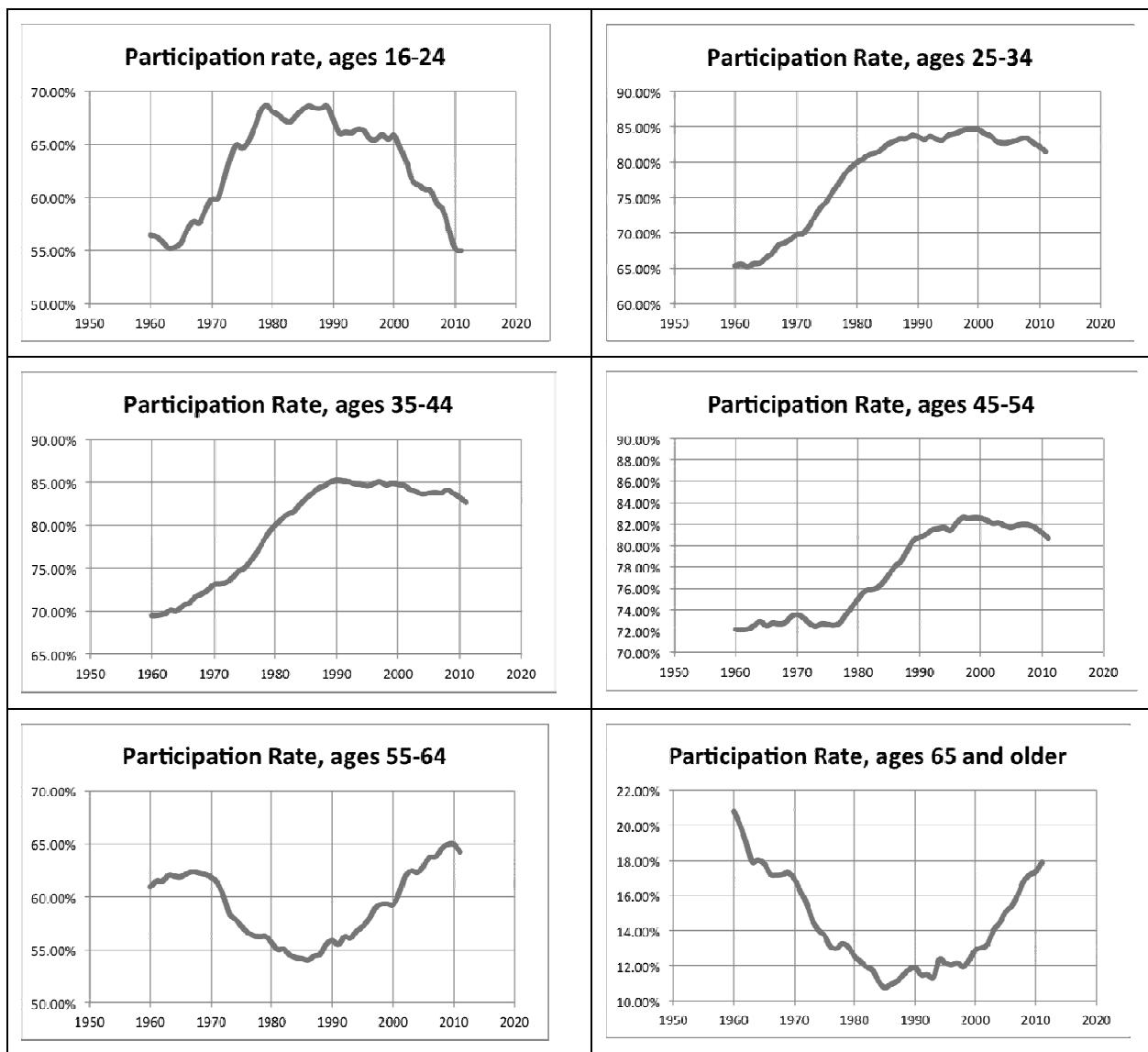
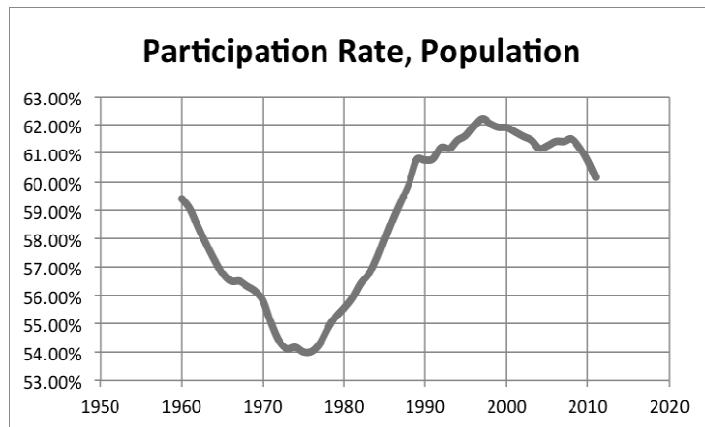
This is a good chance to let your class explore data. There are five data series on the last five tabs of the Excel workbook for this chapter. These are measures of various reasons for not being in the labor force. The relationship among them is as follows:

Not in the labor force includes people who currently want a job. The difference between those two should be those not in the labor force who don't want a job.

Not in the labor force but want a job includes those marginally attached to the labor force. The difference between the two is that those marginally attached are available for work now, while the rest are not available for work now.

Those marginally attached to the labor force are the sum of discouraged workers and those who are not in the labor force for reasons other than discouragement. The last two pages of this chapter give a reasonably complete codebook for these variables.

Turn this data over to your students and have them investigate the three hypotheses. They should reject the discouraged worker hypothesis quickly. Discouraged workers grew by about 100,000 while the change in the labor force was in the millions. The second hypothesis will take some digging on their part. The BLS website has labor force participation rates broken down by age. If they get frustrated, there are some useful graphs on the following pages. It's pretty clear that the decline in the participation rate is not caused by baby boomers retiring -- quite the opposite, in fact. People 55 and over are increasing their participation, not reducing it. The groups that are leaving the labor force are the 16 - 34 age group. To say that this does not bode well for the future of the economy is a vast understatement.



The BLS codebook for those not in the labor force.
Compiled and annotated by Tony Lima, June 11, 2013

Not in labor force

Series Id: LNU05000000

Not Seasonally Adjusted

Series title: (Unadj) Not in Labor Force

Labor force status: Not in labor force

Type of data: Number in thousands

Age: 16 years and over

Not in labor force, want a job

Series Id: LNU05026639

Not Seasonally Adjusted

Series title: (Unadj) Not in Labor Force, Want a Job Now

Labor force status: Not in labor force

Type of data: Number in thousands

Age: 16 years and over

Job desires/not in labor force: Want a job now

Marginally attached to the labor force (equals sum of two following)

Series Id: LNU05026642

Not Seasonally Adjusted

Series title: (Unadj) Not in Labor Force, Searched For Work and Available

Labor force status: Not in labor force

Type of data: Number in thousands

Age: 16 years and over

Job desires/not in labor force: Want a job now

Reasons not in labor force: Available to work now

Discouraged workers

Series Id: LNU05026645

Not Seasonally Adjusted

Series title: (Unadj) Not in Labor Force, Searched For Work and Available, Discouraged

Reasons For Not Currently Looking

Labor force status: Not in labor force

Type of data: Number in thousands

Age: 16 years and over

Job desires/not in labor force: Want a job now

Reasons not in labor force: Discouragement over job prospects (Persons who believe no job is available.)

Others marginally attached

Series Id: LNU05026648

Not Seasonally Adjusted

Series title: (Unadj) Not in Labor Force, Searched For Work and Available, Reasons Other Than Discouragement

Labor force status: Not in labor force

Type of data: Number in thousands

Age: 16 years and over

Job desires/not in labor force: Want a job now

Reasons not in labor force: Reasons other than discouragement

Aggregate Expenditure and Equilibrium Output

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Keynesian Theory of Consumption p. 148

Other Determinants of Consumption

Planned Investment (I) versus Actual Investment p. 152

Planned Investment and the Interest Rate (r) p. 153

Other Determinants of Planned Investment

The Determination of Equilibrium Output (Income) p. 154

The Saving/Investment Approach to Equilibrium

Adjustment to Equilibrium

The Multiplier p. 157

The Multiplier Equation

The Size of the Multiplier in the Real World

Looking Ahead p. 161

Appendix: Deriving the Multiplier Algebraically p. 164

DETAILED CHAPTER OUTLINE

Part III [V]: The Core of Macroeconomic Theory, pages 145-146

Chapters 8 through 14 present the current understanding of how market economies work.

- Chapters 8-9 cover the goods-and-services market.
- Chapters 10-11 cover the money market.
- Chapter 12 connects the output market and the money market, develops the theory of aggregate supply, and explains the AS/AD model.
- Chapter 13 looks at policy and cost effects in the AS/AD model, specifically using an LM curve based loosely on the Taylor rule.
- Chapter 14 covers the labor market and presents the underpinnings of aggregate supply.

Figure III.1 [V.1] on page 145 is a useful guide to what happens where. Basically, however, this material is the Aggregate Demand – Aggregate Supply neo-Keynesian model as it is currently understood. An innovation in this edition is using a variant of the Taylor rule to model monetary policy. The specific equation allows policy flexibility in applying the rule. This rule replaces the LM curve.

One key concept introduced here is the *production period*. Quoting from page 146, “A period might be a month long or 3 months long. During each period, output is produced, income is generated, and spending takes place. At the end of each period, we can examine the results. Was everything that was produced in the economy sold? What percentage of income was spent? What percentage was saved? Is output (income) likely to rise or fall in the next period?”

TEACHING TIP: You may want to discuss the idea of a *production period*. A period might be a month long or 3 months long. During each period, output is produced, income is generated, and spending takes place. At the end of each period, we can examine the results. Was everything that was produced in the economy sold? What percentage of income was spent? What percentage was saved? Is output (income) likely to rise or fall in the next period? Think of a period as a month or 3 months. Students will wonder why 3 months was mentioned. This is a good opportunity to point out that most NIPA data is quarterly. Define calendar quarters and (if you have time) explain the meaning of a quarterly variable whose value is given at the annual rate. ◀

I. Introduction, page 147

A. This chapter starts presenting macroeconomic theory.

1. What factors determine GDP?
2. What causes inflation and unemployment?

B. Aggregate Output and Aggregate Income

1. When aggregate output increases, additional income is generated and vice versa. The act of production creates income.
2. *Aggregate output* is the total quantity of goods and services produced (or supplied) in an economy in a given period.
3. *Aggregate income* is the total income received by all factors of production in a given period.
4. *Aggregate output (income)* (Y) is a combined term used to remind you of the exact equality between aggregate output and aggregate income.

5. Think in “real terms” means the student should think “real GDP” whenever the term “GDP” is used.
6. In chapters 8 and 9 we assume the interest rate (r) and the overall price level (P) are constant.

TEACHING TIP: Introductory students often have a difficult time mastering the basic Keynesian model. You can ease their task considerably by using the same symbols and abbreviations as the text. It is surprising how disturbed students become even if a superscript is changed to a subscript!◀

II. The Keynesian Theory of Consumption, pages 148-152

A. Income and Spending

1. Keynes noted that increases in income cause increases in consumption spending. Equally important, he noticed that the increase in consumption would usually be less than the increase in income.

2. The *consumption function* is the relationship between consumption and income.

TEACHING TIP: The text uses lowercase letters for the household consumption function and uppercase letters for the aggregate consumption function. ◀

- a. The *marginal propensity to consume (MPC)* is the fraction of a change in income that is consumed, or spent.

- b. The MPC is also the slope of the consumption function $C = a + bY$. The MPC is the b coefficient in a linear consumption function.

TEACHING TIP: Keynes described it best when he wrote in the *General Theory of Employment, Interest, and Money* (Book III, Chapter 8): “The fundamental psychological law...is that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income.” This quote appears on page 148 of the text. ◀

3. *Aggregate saving* is the part of aggregate income that is not consumed.

- a. The *marginal propensity to save (MPS)* is that fraction of a change in income that is saved.

- b. The MPS is also the slope of the saving function $S = -a + (1-b)Y$.

$$MPC = \frac{\Delta C}{\Delta Y} = b$$

4. In this simple world, disposable personal income can only be consumed and saved. $S \equiv Y - C$. And $MPC + MPS \equiv 1.00$.

- a. An *identity* is something that is always true.

- b. The \equiv symbol means the equation is an identity.

- TEACHING TIP:** Some texts draw a distinction between saving (the part of income not spent, a flow variable) and savings (wealth, a stock variable). Rather than forcing your students to listen for that trailing s, just call savings wealth instead. ◉
- TEACHING TIP:** Explain this point in the following way: For the entire economy the *MPC* must take on a value between 0 and 1. Any change in income (*Y*) will be divided up between consumption (*C*) and saving (*S*), that is

$$\Delta Y = \Delta C + \Delta S$$

Divide each side of the above equation by ΔY

$$\Delta Y / \Delta Y = \Delta C / \Delta Y + \Delta S / \Delta Y \text{ or } 1 = MPC + MPS$$



TOPIC FOR CLASS DISCUSSION:

Even though *MPC* + *MPS* must equal 1.00 for an entire economy that's not true for individuals. Ask students if they've ever had a month in which they've spent more than their income. If so, their *MPC* has exceeded 1.00 for that month. (Technically it's the *APC*, but don't let the discussion get bogged down in details.)

This opens the door to a larger discussion of exactly who the savers in the economy are. Students often find it difficult to believe the *MPC* is less than 1.00 because of their personal experience. Point out that an economy is made up of a wide variety of people. At any time some are going into debt (buying a house or car) while others are paying off debt and saving for retirement. Still others are spending their wealth in retirement. Mention that economists call this the life cycle model of consumption, saving, and wealth. ■

5. Households only consume and save. They do not invest. Investment is business spending on new plant and equipment.
- TEACHING TIP:** Case and Fair use the example $C = 100 + 0.75 Y$. Students generally pick up this material faster with numerical examples, no matter how contrived they seem. Follow the authors' example through Fig. 8.3 [23.3] and beyond. Use the numbers. Using the same numerical examples as those in the text may seem repetitive to you but your students will thank you. (After you've covered the examples in the text you can, of course, make up one or two of your own.) This ongoing numerical example and the graphs are also available in the Excel workbook for this chapter. ◉
- B. Other Determinants of Consumption
- a. Household wealth: higher wealth leads to higher spending and saving.
 - b. Interest rates reflect the cost of borrowing, so lower rates increase spending but may reduce saving (there are income and substitution effects).
 - c. Households' expectations about the future: If expectations improve, spending will increase.
- TEACHING TIP:** This is a good point to introduce the permanent income model (but probably too early to call it that). Just point out that if your expectations of your future income suddenly increase (you've discovered Great Aunt Clara has included you in her will), you will probably increase your spending today. ◉

Economics in Practice: Behavioral Biases in Saving Behavior, page 152

Behavioral economists have looked at ways to change saving behavior. One simple method to increase saving is switching from an "opt-in" approach to pension plans to an "opt-out" system. Under a second plan, called Save More Tomorrow, employees are offered a program that allows them to precommit to save more whenever they get a pay raise. Behavioral economists argue that people find this option attractive because it is easier for them to commit to making sacrifices tomorrow than it is for them to make those sacrifices today.

Unique Economics in Practice

In May, 2008 the U.S. government began sending one-time tax rebate checks to taxpayers. These checks were supposed to stimulate the economy by increasing consumer spending. Many economists, remembering the permanent income model, predicted there would not be much impact on the economy. Other economists, apparently under the sway of Potomac fever, predicted the rebate checks would do the job. One member of the latter group was Dr. Martin Feldstein of the NBER. In a column published in the *Wall Street Journal* (August 6, 2008, page A15), Dr. Feldstein notes that economists at the Brookings Institution estimated half the rebate checks would be spent. In a *mea culpa* he admits they were wrong. In fact, only 20 percent of the checks were spent. The tax rebate was, to use Dr. Feldstein's words, "a flop."

Question: Why didn't people spend more of their rebate checks?

Answer: People will not adjust their lifestyles in response to a one-time payment. As Milton Friedman put it, "permanent consumption is a function of permanent income."

III. Planned Investment (I), page 152-153

A. Investment is spending by firms on new buildings and equipment, and additions to inventories.

1. Spending on buildings and equipment is called business fixed investment. Fixed investment is the gross increase in the capital stock. Fixed investment minus depreciation is the net increase in the capital stock.
2. The net change in business inventories is included to convert domestic spending on domestically produced goods into domestic production. This was discussed in chapter 6 [21] in the text (page 116).

TEACHING TIP: It is important to review the definition of investment, as students will always want to associate the word with buying financial assets. Use local examples of investment to solidify students' understanding of the term as applied by economists. ◉

B. Actual versus Planned Investment

1. A firm may not always end up investing the exact amount that it planned.
2. Firms do not control inventory in that if there are fewer sales than expected, inventory increases and so actual investment will be greater than planned. The *change in inventory* is production minus sales.
3. However, firms sometimes change their desired inventory levels. Not every change in inventory is an unplanned change.
4. *Planned investment* is additions to the capital stock and inventory that are planned by firms.
5. *Actual investment* is the actual amount of investment that takes place; it includes items such as unplanned changes in inventories.

TEACHING TIP: It is important that students understand the concept of "unplanned changes in inventories" because of the role it plays in the equilibrium adjustment process. Writing the following cases on the board and then discussing them will help set the stage for the subsequent discussion of the equilibrium adjustment process.

- ◆ If actual investment > planned investment, then inventories are accumulating above desired levels, giving firms the incentive to cut back on current output (income).

- ◆ If actual investment < planned investment, then inventories are being drawn down below desired levels, giving firms the incentive to increase current output (income).
- ◆ If actual investment = planned investment, then inventories are at the desired levels. Firms will continue to produce the current output level. ◀

III. Planned Investment and the Interest Rate (r), pages 153-154

- A. A substantial fraction of investment spending is financed by borrowing.
 1. The cost of borrowing is the interest rate.
 2. Generally, an increase in the interest rate reduces planned investment. This leads to the planned investment schedule shown in Figure 8.5 [23.5]. This graph is also called the "marginal efficiency of investment" curve.
- B. Other Determinants of Planned Investment focus on businesses' expectation about future sales (Keynes's "animal spirits").

IV. The Determination of Equilibrium Output (Income), pages 154-157

- A. *Equilibrium* occurs when there is no tendency for change. In the macroeconomic goods market, equilibrium occurs when planned aggregate expenditure is equal to aggregate output ($Y - AE$).
 - ◆◆◆ TEACHING TIP: If you have the time, Extended Application 2 shows one way of presenting the 45° line. If time is a problem, emphasize to your students that the 45° line is simply a graph of the line along which planned spending equals actual output. The 45° line shows all the possible points where equilibrium might occur. (I try to avoid using the phrase "45° line" as much as possible. Use $AE = Y$ line instead.) ◀
 1. This implies planned investment equals actual investment.
 2. It also implies there is no unplanned change in inventories.
 - ◆◆◆ TEACHING TIP: Emphasize that these three definitions are really just three ways of saying the same thing. ◀
 3. *Planned aggregate expenditure (AE)* is the total amount the economy plans to spend in a given period. Equal to consumption plus planned investment. $AE = C + I$.
 4. *Disequilibrium*
 - a. Suppose $Y > C + I$. Output exceeds planned spending, causing an unplanned increase in business inventories.
 - b. Suppose $Y < C + I$. Output is less than planned spending, causing an unplanned decrease in business inventories.
 - ◆◆◆ TEACHING TIP: Mention that the assumption of a constant price level means the only possible adjustment to equilibrium is a change in the quantity of output. Unplanned inventory changes are signals to firms about the direction in which they should adjust output. ◀
 - ◆◆◆ TEACHING TIP: Table 8.1 [23.1] and the implied graph are included in the Excel workbook for this chapter. ◀
4. An Example
 - a. Table 8.1 [23.1] uses the consumption function $C = 100 + 0.75Y$ along with $I = 25$ to derive equilibrium and disequilibrium income.
 - b. At $Y = AE = 500$, the unplanned inventory change is 0.

c. Mathematically,

$$AE = C + I$$

$$C = 100 + 0.75Y$$

$$I = 25$$

$$AE = 100 + 0.75Y + 25$$

$$AE = 125 + 0.75Y$$

Equilibrium means

$$AE = Y$$

$$Y = 125 + 0.75Y$$

$$Y - 0.75Y = 125$$

$$Y(1 - 0.75) = 125$$

$$0.25Y = 125$$

$$Y = \frac{125}{0.25} = 500$$

B. The Saving/Investment Approach to Equilibrium

TEACHING TIP: Figure 8.7 [23.7] and the implied table are included in the Excel workbook for this chapter. ◀

1. Equilibrium occurs when saving equals planned investment.
 - a. Saving always equals actual investment. (Saving only equals planned investment in equilibrium.)
 - b. When saving does not equal planned investment the difference is the unplanned inventory change.
2. Only at $Y = 500$ does saving ($500 - 475 = 25$) equal planned investment (25).

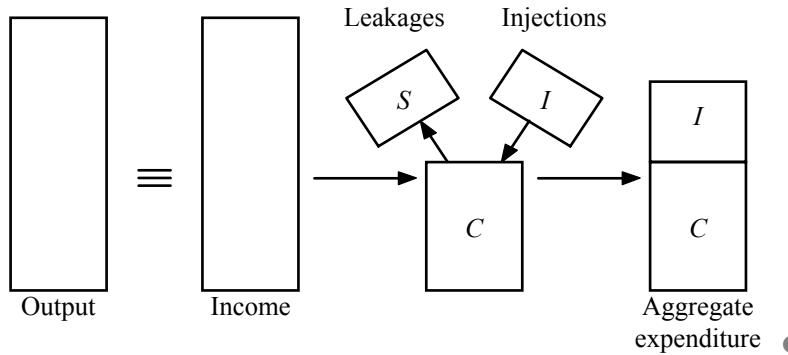
TEACHING TIP: A simple way (and very visual way) to show students the equivalence of the two equilibrium conditions $Y = C + I$ and $S = I$ follows:

Draw a rectangle representing some given level of output. As students already know from national income accounting, output and income are equal, so draw another rectangle (the same size) indicating the value of total income in the economy.

What happens to this income? With no government or foreign sector, households can only spend or save their income. Draw a third rectangle—smaller than the first or second—indicating the value of consumption spending. On this rectangle, show savings as a leakage and investment as an injection. The last rectangle—aggregate expenditure or total spending—shows the net result of subtracting saving from income and adding investment.

TEACHING TIP (continued)

Compare the first and fourth rectangles. The first indicates output; the fourth indicates total spending on output. Equilibrium requires these two rectangles to be the same size. When will this occur? Note from the diagram that the equality of output and spending ($Y = C + I$) requires the equality of saving and investment ($S = I$).



TEACHING TIP: If households save more than businesses expect, that means consumption must have been less than was forecast. Consumption spending below what was forecast must mean an unplanned inventory increase. It's easy to show that the amount of the unplanned inventory increase will exactly match the unexpected drop in consumption (increase in saving). Therefore, any unplanned change in saving will be exactly matched by an unplanned change in inventories. ◀

C. Adjustment to Equilibrium

1. *Disequilibrium* means the economy is not in equilibrium.
2. If output (income) is greater than planned aggregate expenditure, there will be an unplanned inventory increase. The signal to businesses is warehouses filling up. Businesses respond by reducing production, moving the economy toward equilibrium (and, possibly, into a recession).
3. If output (income) is less than planned aggregate expenditure, there will be an unplanned inventory decrease. The signal to businesses is warehouses emptying. Businesses respond by increasing production, moving the economy toward equilibrium (and, possibly, into a boom).

TEACHING TIP: Point out the implicit assumption: The price level is constant. Therefore, businesses can't respond to unplanned inventory changes by raising or lowering prices as well as output. ◀

V.. The Multiplier, pages 157-161

A. A change in planned investment will have a multiplied impact on equilibrium income.

1. The *multiplier* is the ratio of the change in the equilibrium level of output to a change in some exogenous variable. An *exogenous variable* is a variable that is assumed not to depend on the state of the economy — that is, it does not change when the economy changes. For the moment, planned investment is assumed to be exogenous.
2. The increase in planned investment spending raises income paid to those working on the investment projects. They will increase their spending and saving. Higher spending creates more income, which is again spent, and so on and so on.
3. The size of the multiplier depends on the slope of the aggregate planned expenditure line.

- DDD** TEACHING TIP: The data and graph for Figure 8.8 [23.8] is included in the Excel workbook for this chapter. ◀

B. The Multiplier Equation

- The easiest way to derive the multiplier is from the textbook:

$$MPS = \frac{\Delta S}{\Delta Y}$$

For equilibrium,

$$\Delta S = \Delta I$$

$$MPS = \frac{\Delta I}{\Delta Y}$$

$$\Delta Y = \Delta I \times \frac{1}{MPS}$$

- The traditional solution (covered in the Appendix):

- DDD** TEACHING TIP: I try to call this the income-expenditure multiplier to separate it from other multipliers later in this course (or other courses).

Also, point out that the multiplier process takes time. People who see their income increase don't spend even the MPC fraction of it in one day. Spending increases happen over time. This creates the outside lag for fiscal policy. ◀

C. The Size of the Multiplier in the Real World

- The size of the multiplier in the real world is about 2.
- The real-world multiplier is reduced because of induced taxes, induced imports, asset market repercussions (interest rates), and changes in the price level.

Economics in Practice: The Paradox of Thrift, page 160

If people in the aggregate decide to save a larger fraction of their income, the total volume of saving will remain unchanged. Equilibrium income will decline by just enough to offset the higher marginal propensity to save. This must be true because saving always equals investment. Since investment is exogenous, it cannot change in response to increased saving. The only endogenous variable that can change is equilibrium income.

- DDD** TEACHING TIP: There is an example of the Paradox of Thrift in the Excel workbook for this chapter. However, it differs from the example in the text in which autonomous consumption is changed. The Excel example changes the MPC instead. ◀

V. Looking Ahead, page 161

In the next chapters we will add the government and foreign sectors to our picture of the economy to make it more realistic.

TEACHING TIP: There are a number of points to make about the multiplier that will help avoid future confusion. Use the following list as a wrap-up to your lecture on this topic.

- ◆ Anything that causes the aggregate planned expenditure line to shift upward will have a multiplier effect on total output and income. Thus, an upward shift in the consumption line—due to an increase in its vertical intercept “ a ”—has the same multiplier impact as an increase in planned investment of the same amount. (A shift in the consumption function like this occurred in 1997 to 2000 during the dot-com boom. Higher wealth shifted the consumption function upward.)
- ◆ A movement along the consumption line does not initiate a multiplier effect on income. Rather, the movement along the consumption line is what happens during the multiplier process, as changes in income lead to further changes in consumption, and so on. (The movement along the consumption function is an induced change in consumption spending.)
- ◆ The multiplier works in both directions. Just as an upward shift in the aggregate expenditure line will raise equilibrium output and income, a downward shift in the aggregate expenditure line will decrease output and income.
- ◆ Only a sustained shift in the aggregate expenditure line will cause a sustained shift in equilibrium output. A one-time shift in either planned investment or consumption will cause only a temporary change in output. (For example, think of a one-time increase in investment as two separate changes: an increase in investment, causing a positive multiplier impact, and then a decrease in investment, causing a negative multiplier impact. The two effects cancel each other out, bringing us back to the original output level.)

APPENDIX: DERIVING THE MULTIPLIER ALGEBRAICALLY

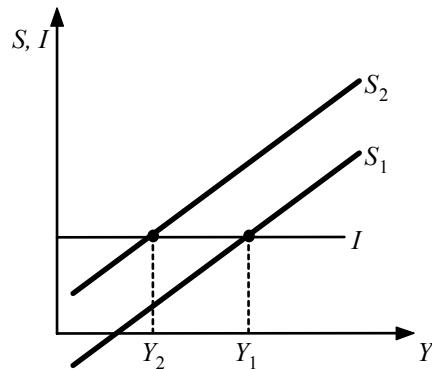
TEACHING TIP: If you go over this material in class, do so quickly. Focus instead on doing the same math, but with numbers instead of symbols. ¶

EXTENDED APPLICATIONS

Application 1: Putting More Paradox into the Paradox of Thrift

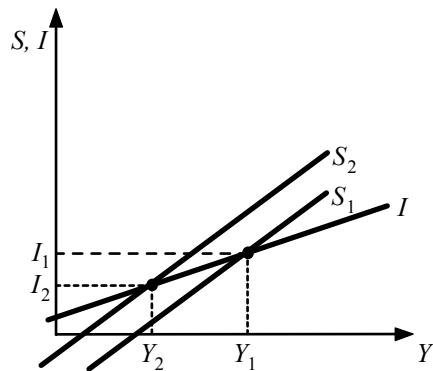
The paradox of thrift is one of those wonderful ideas in macroeconomics that students find both fascinating and puzzling. The following application can be used to increase student interest in the paradox and also to help resolve their confusion.

First, present the basic paradox of thrift model as it is covered in the text. In this basic model, planned investment spending is exogenous (although the text does not use this term). An increase in the desire to save causes an upward shift in the saving line (more saving at any level of income). The result, as in the diagram that follows, is a recession that causes equilibrium output to decrease (from Y_1 to Y_2) until saving falls back to its original level.



Saving must return to its original level because S must equal planned I in equilibrium, and planned I has not changed. In other words Y must fall by just enough to bring S back down to its original level. The result, in simple words: households' taste for saving increases, but this just causes their incomes to drop. The decrease in income exactly offsets the increase in the MPS, leaving the amount of saving unchanged!

To enhance the paradox, change the model by adding the assumption that investment spending depends positively on output. This is easily justified. At higher levels of output, more firms come up against capacity constraints, so capital spending should increase. At low levels of output, with more firms experiencing excess capacity, capital spending should fall. (It doesn't have quite the sophistication of the accelerator model, but it is easy for students to grasp.) In the leakage-injection diagram, the investment line will now slope upward.

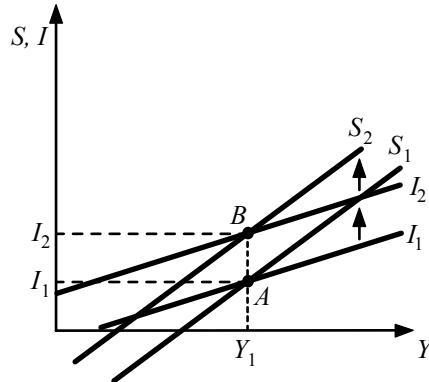


As before, shift the saving line upward, and observe that equilibrium Y declines from Y_1 to Y_2 . This time, however, as Y declines so does planned investment. Equilibrium is restored when saving is equal to the new, lower level of investment spending. In other words, an increase in the desire to save has not only thrown the economy into a recession, it has also resulted in lower aggregate saving (from I_1 to I_2)!

This result will fly in the face of many students' intuition that an increase in saving can be good for the economy. It also contradicts the pro-saving rhetoric of macroeconomic policy in the past several decades. It is important, therefore, to take one more step with this model, so as not to leave students in an intellectual quagmire.

The basic assumption that makes the paradox of thrift work is that investment spending is independent of saving. Point out to students that, in the long run, this assumption is not very realistic. As time passes, savings will be cycled through the various financial markets toward firms who want to purchase capital. That is, in the long run, an increase in saving will be translated into an increase in planned investment spending, which is good for the economy. (You can insert a brief presentation of the classical credit market, with saving as the supply of credit, planned investment as the demand for credit, and the interest rate adjusting to equate the two.)

For a longer-run analysis, then, the paradox-of-thrift diagrams above have left something out. When the saving line shifts upward, the investment line will shift upward as well (see diagram below). In this case, there is no recession, and aggregate saving does indeed increase.



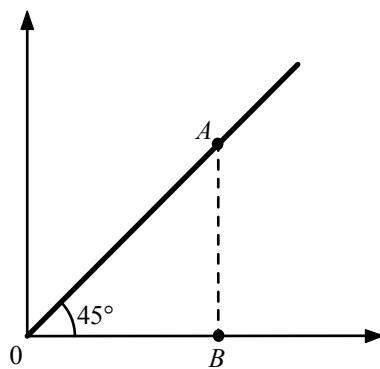
What to conclude then about the paradox of thrift? The model is useful, in that it points out the short-run dangers of a sudden increase in saving. To avoid these short-run dangers, policies designed to increase saving could be complemented with investment incentives. But the paradox of thrift should not imply a generally negative view of saving.

Application 2: The Meaning and Purpose of the 45-Degree Line

It is important that the 45-degree line diagram be explained patiently and logically, in a way convenient for note taking so students can review it again and again. The following is one way to do this.

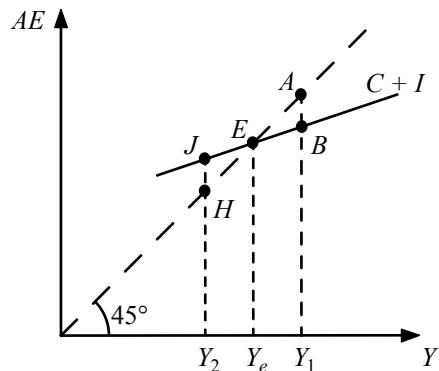
Draw the aggregate expenditure line ($C + I$) but do not yet draw the 45-degree line. Explain to students that you are looking for the level of output and income, Y , where total spending just happens to be equal to Y . The problem is that Y is measured horizontally, whereas total spending ($C + I$) is measured vertically. This is inconvenient. Wouldn't it be nice if both total spending and total output could be measured along the same axis? Enter the 45-degree line.

Off to the side, draw two blank axes and bisect with a 45-degree line, like the one below. Point out the wonderful property of such a line: At any point along the line the vertical and horizontal distances are equal. For example, if Point A is selected, the distance OB and BA are equal.



This means that whenever there is a horizontal distance to be measured, it can instead be read as a vertical distance by drawing a 45-degree line and projecting upward. The 45-degree line is, in a sense, a “translator” line that converts horizontal distances into vertical distances.

Superimpose the 45-degree line on the aggregate expenditure diagram. Any level of output along the horizontal axis can now be measured as a vertical distance by simply projecting up to the 45-degree line. Total spending ($C + I$) is already measured as a vertical distance. Thus, there is an easy way of finding our equilibrium.



Rather than going straight to the equilibrium, it is helpful to go through the thought process aloud with students. Consider the output level Y_1 . Could this be the equilibrium? Reflecting up to the 45-degree line gives a vertical measure of this output level as the distance Y_1A . But spending at this output level is equal to the vertical distance Y_1B . Clearly when output equals Y_1 , output is greater than spending. The excess output, BA , is the increase in inventories over the period. Output will decline, so this cannot be the sought-after equilibrium.

Consider the output level Y_2 . Reflecting upward gives a vertical measure of output as Y_2H . But now spending is equal to the vertical distance Y_2J . In this case, spending is greater than output, and HJ is the decrease in inventories over the period. Output will rise in future periods, so once again, equilibrium has not been found.

Finally, consider Y_e . Here, both output and spending are given by the distance Y_eE . Because spending and output are equal, there is no unplanned change in inventories, output should remain unchanged in future periods, and so equilibrium has been found.

The Government and Fiscal Policy

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Government in the Economy p. 166

Government Purchases (G), Net Taxes (T), and Disposable income (Y_d)
The Determination of Equilibrium Output (Income)

Fiscal Policy at Work: Multiplier Effects p. 170

The Government Spending Multiplier
The Tax Multiplier
The Balanced-Budget Multiplier

The Federal Budget p. 175

The Budget in 2012
Fiscal Policy Since 1993: The Clinton, Bush, and Obama Administrations
The Federal Government Debt

The Economy's Influence on the Government Budget p. 179

Automatic Stabilizers and Destabilizers
Full-Employment Budget

Looking Ahead p. 182

Appendix A: Deriving the Fiscal Policy Multipliers p. 184
Appendix B: The Case in Which Tax Revenues Depend on Income p. 185

DETAILED CHAPTER OUTLINE

I. Introduction, page 165

- A. There is much controversy over the appropriate role government should play in the economy. This controversy constantly shifts between positive and normative arguments.
 - 1. Keynesians believe that the macroeconomy is likely to fluctuate too much if left on its own
 - 2. Others (known by various names but whose antecedents are the classical school) claim that fiscal and monetary policies are incapable of stabilizing the economy and, even worse, may be destabilizing and harmful.
 - 3. Most agree, however, that governments are important actors in the economies of virtually all countries, like it or not.
- B. The government can affect the macroeconomy through fiscal policy (its spending and taxing behavior) and monetary policy (the behavior of the central bank regarding the nation's money supply). In the U.S. the central bank is the Federal Reserve.
 - 1. *Fiscal policy* is any action that affects the government's spending and taxing policies. Fiscal policy includes changes in government purchases of goods and services (mainly labor services), taxes, and/or transfer payments to households with the objective of changing the economy's growth.
 - 2. *Monetary policy* is the behavior of the Federal Reserve concerning the nation's money supply. Monetary policy is fundamentally changes in the quantity of money in circulation with the objective of changing the economy's growth. Often monetary policy uses an interest rate target.

TEACHING TIP: In the United States the central bank is not part of the government. Technically the U.S. government only has control of fiscal policy. ☐

II. Government in the Economy, pages 166-170

- A. We need to distinguish between variables that the government controls directly and those that are a consequence of government decisions. Neither can be evaluated without taking the state of the economy into account.
 - 1. For example, the government controls tax rates, but tax revenues are also affected by the state of the economy.
 - 2. Similarly, government spending also depends both on government decisions and on the state of the economy. For example, when the economy moves into a recession and unemployment rises, government spends more on unemployment compensation.
 - 3. *Discretionary fiscal policy* refers to any changes in taxes or spending that are the result of deliberate changes in government policy.
- B. Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)
 - 1. Definitions
 - a. *Net taxes* (T) are taxes paid by firms and households to the government minus transfer payments made to households by the government. Net taxes equals tax revenue less transfer payments.

TEACHING TIP: Students may be confused as to why transfer payments are deducted from tax revenue. The logic is simple. The government drains tax revenue from the household sector. Some of this tax revenue is returned to households in the form of transfer payments (welfare, social security, unemployment insurance, etc.). These transfer payments are funds taken from one household and given to another. It's like the government never collected this revenue at all. Subtracting transfer payments from tax revenue gives the government's net drain of income from households.

Another explanation that may help some students: transfer payments are negative taxes. ◀

- b. *Disposable or after-tax income (Y_d)* is total income minus net taxes: $Y - T$. Naturally, $Y - T \equiv C + S$ and $Y \equiv C + S + T$.
- c. Planned aggregate expenditure now includes government purchases of goods and services (G): $AE \equiv C + I + G$.
- d. A *budget deficit* is the difference between what a government spends and what it collects in taxes in a given period: $G - T$.
- e. When the government runs a budget deficit, part of household savings is diverted from financing investment to loans to the government.
- f. If G is less than T the government is running a budget *surplus*.

TEACHING TIP: Today mentioning the possibility of a government budget surplus is rather like believing in unicorns. Nevertheless, it's worth pointing out that when the government runs a budget surplus there is a net contribution to national saving. ◀

2. Adding Taxes to the Consumption Function

Consumption spending now depends on disposable personal income rather than on personal (before-tax) income: $C = a + bY_d$ so $C = a + b(Y - T)$.

3. Planned Investment is affected by government tax policies, general economic conditions, and interest rates. For now we continue to assume that planned investment is fixed.

C. The Determination of Equilibrium Output (Income)

1. Equilibrium GDP is still the level of income that makes actual output equal to planned spending.

TEACHING TIP: This section begins with a lengthy example. You may be tempted to speed through this. Avoid that temptation. Do the algebra on the board using the numbers in the text. $C = 100 + 0.75(Y - T)$, $T = 100$, $I_p = 100$, $G = 100$. Show that $Y_e = 900$. Then increase G by 20 so $G = 120$. Show that Y_e rises to 980. These examples are included in the Excel workbook for this chapter. ◀

2. The Saving/Investment Approach to Equilibrium

- a. Taxes are an added leakage and government spending is an added injection.
- b. $S + T = I + G$ must always be true as long as I is actual investment.
- c. $S + T = I_p + G$ will only be true in equilibrium (I_p is planned investment spending).

TEACHING TIP: Do the algebra on the board using the numbers in the text. $C = 100 + 0.75(Y - T)$, $T = 100$, $I_p = 100$, $G = 100$. Show that $Y_e = 900$. Then increase G by 20 so $G = 120$. Show that Y_e rises to 980. These examples are included in the Excel workbook for this chapter. ◀

Unique Economics in Practice

The relationship between the government budget deficit or surplus and the government debt is often confused in the popular press (not to mention the halls of Congress). Here are some basics.

The government debt is the stock of net borrowing by the government. In the U.S. the government debt began when the government began, 1776. The government debt changes when the government runs a budget deficit or a budget surplus.

If G exceeds T , the government is running a budget deficit and must borrow from the public to finance the deficit. It does this by selling Treasury bonds and bills. When the government runs a budget deficit, the new borrowing is added to the government debt. The stock of government debt increases.

If G is less than T , the government is running a surplus (a negative deficit). The surplus buys back a small part of the government debt from the public. The stock of government debt decreases.

To make this point, ask students if their spending has ever exceeded their income during a month. (If they need prodding, ask if there has ever been a month when they didn't quite pay all of a credit card bill.) Point out that they can impress their friends by saying they had to "issue some debt" last month. Then make the point that if they continue to spend more than their income month after month, the amount they owe will be the sum of their budget deficits. The only way to pay down the debt is for them to run a budget surplus – to have several months in which their income exceeds their spending.

Question: Suppose over a period of three months a student's income and spending are as follows:

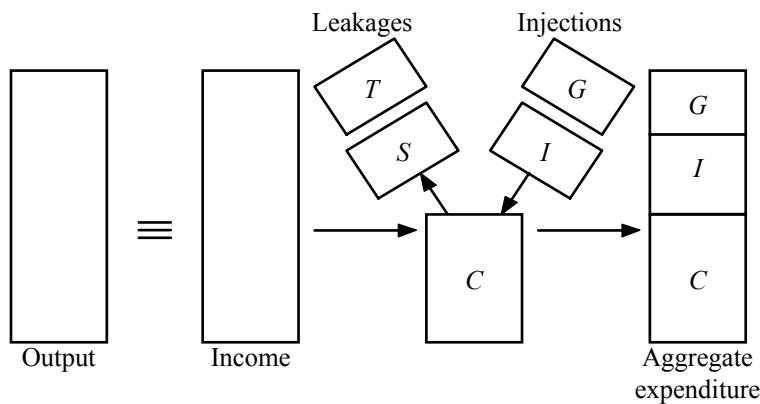
| Month | Income | Spending |
|-------|--------|----------|
| Jan | \$750 | \$800 |
| Feb | \$800 | \$850 |
| Mar | \$600 | \$800 |

What will be their net stock of debt at the end of March?

Answer: $(\$800 - \$750) + (\$850 - \$800) + (\$800 - \$600) = \$300$.

TEACHING TIP: As in the previous chapter, there is a simple (and very visual) way to show students the equivalence of the two equilibrium conditions $Y = C + I + G$ and $S + T = I + G$.

Draw a rectangle representing some given level of output, and remind students that output and income are equal, so the next rectangle representing total income in the economy should be the same size. Ask: What happens to this income? With the government sector included, there are only three things households can do with their income: spend it, pay it out in taxes, or save it. Draw a third rectangle—smaller than the first or second—indicating the value of consumption spending. Above this rectangle, show saving and taxes as leakages and investment and government spending as injections. The last rectangle—aggregate expenditure or total spending—shows the net result of subtracting saving and taxes from income and adding investment and government spending.



Compare the first and fourth rectangles. The first indicates output; the fourth indicates aggregate expenditure. Equilibrium requires these two rectangles to be the same size. When will this occur? As can be seen in the diagram, only when total leakages equal total injections, or $S + T = I + G$. ◉

III. Fiscal Policy at Work: Multiplier Effects, pages 170-175

A. In this section we will review three multipliers:

1. Government Spending Multiplier

TEACHING TIP: The same definition used in the previous chapter for the investment multiplier is used again in this chapter, but now the autonomous variable is government spending rather than planned investment. ◉

2. The Tax Multiplier
3. The Balanced-Budget Multiplier

B. The Government Spending Multiplier

1. Increased government spending will lead to increased output, which leads to increased income. More workers are employed, and they in turn act as consumers and spend their incomes.
2. Output will rise again and so will income, etc. This is the multiplier in action. The government spending multiplier is the same as the investment multiplier,

$$\text{government spending multiplier} = \frac{1}{MPS} = \frac{1}{1 - MPC}$$

3. The *government spending multiplier* is the ratio of the change in the equilibrium level of output to a change in government spending.

TEACHING TIP: The data from Table 9.2 [24.2] is in the Excel workbook for this chapter. ◉

C. The Tax Multiplier

1. To reduce unemployment without increasing government spending, taxes must be cut. This increases disposable income, which is likely to add to consumption, which will lead to an increase in output and employment, and hence income, etc.

2. The tax multiplier is not the same as the government spending multiplier. This is because government spending increases aggregate expenditures dollar for dollar, while a tax cut leads to increased dollars of disposable income and only part of those dollars are spent (the MPC). The rest is increased saving.
3. The *tax multiplier* is the ratio of the change in the equilibrium level of output to a change in taxes. In an economy with only autonomous taxes the tax multiplier equals

$$\text{tax multiplier} = -\frac{MPC}{MPS} = -\frac{MPC}{1-MPC}$$

D. The Balanced Budget Multiplier

1. What happens if taxes and spending are increased by the same amount?
2. The *balanced budget multiplier* is the ratio of change in the equilibrium level of output to a change in government spending where the change in government spending is balanced by a change in taxes so as not to create any deficit. The balanced-budget multiplier is equal to 1: The change in Y resulting from the change in G and the equal change in T are exactly the same size as the initial change in G or T .

TEACHING TIP: The tax multiplier and balanced budget multiplier are in the Excel workbook for this chapter. ◀

TEACHING TIP: Students are usually intrigued by the balanced budget multiplier. It's also a source of confusion. A multiplier of one does not mean no multiplier effect. A change in any variable that had no impact on equilibrium GDP would have a multiplier of zero, not one.

The intuition for the balanced budget multiplier is pretty straightforward. When the government taxes the public and spends the money, it is taking income from people who would not have spent it all, and giving it to government agencies that *will* spend it all. The net increase in spending is the amount of the tax revenue households would have saved. And, of course, the MPS times the multiplier ($1/MPS$) is just 1.0.

If you decide to demonstrate the balanced budget multiplier with an example, make sure you only use autonomous taxes and a simple model of the economy. Otherwise you'll probably take too much class time. ◀

3. A Warning

- a. The story about the multiplier is still incomplete and oversimplified. One omission, income taxes, is discussed in Appendix B to this chapter. The other omitted factor that reduces the size of the multiplier, of course, is induced imports.
- b. We are still assuming there are no assets markets or markets for factors of production. The practical effect of omitting these markets is to treat the price level and interest rate as constant. Correcting those two omissions reduces the size of the multiplier considerably.

IV. The Federal Budget, pages 175-180

- A. The *federal budget* is the budget of the federal government.
- B. The Budget in 2012.
 - 1. Reminder: fiscal policy is the manipulation of items in the federal budget with the goal of changing the future course of the economy.
 - 2. The budget includes both total receipts of the government as well as its expenditures. Table 9.5 [24.5] shows a summary of the federal government budget for 2009.
- TEACHING TIP: More recent federal government budget data is available in the Excel workbook for this chapter.
- 3. Personal income taxes were 37.1 percent of government receipts. But that does not include the payroll tax (contributions for social insurance), another 42.7 percent.
- TEACHING TIP: If you mention the payroll tax, be prepared for at least one student to state that half the payroll tax is paid by employers. This merits a two-part response. First, self-employed people pay the entire tax themselves. Second, economic research has consistently shown that workers pay the entire payroll tax. The employer contribution just creates lower wage rates.
- 4. The *federal surplus* (+) or *deficit* (-) equals federal government receipts minus expenditures. Also called federal government saving.

Economics in Practice: The U.S. Congress Fights about the Budget, page 179

Debates in Congress tend to mix economics, ideology, and rhetoric. Note that the government actually did fall off the "fiscal cliff" when budget sequestration went into effect in 2013.

C. Fiscal Policy Since 1993: The Clinton, Bush, and Obama Administrations

- 1. Tax policy
 - a. The average tax rate rose significantly during the Clinton years (from about 10 percent to 13 percent).
 - b. The Bush tax cuts reduced this percentage to less than 9 percent in 2003.
 - c. The Obama administration kept the average tax rate low, although the rate rose once the stimulus ended.
- 2. Government expenditure policy
 - a. As a percentage of GDP, government spending and transfers both fell during the Clinton administrations, helped by the dot-com boom of 1995 – 2000.
 - b. Both rose under the Bush administrations. Government expenditures rose because of the Afghanistan and Iraq wars. The increase in transfer payments was caused mainly by increased Medicare spending. The new prescription drug benefit contributed to the Medicare increase.
 - c. Spending continued to increase during the first five years of the Obama administration. Transfer payments increased sharply, due to the deep recession and the stimulus bill. Spending on the war in Afghanistan was also a contributing factor.

4. From 1998 – 2001 the federal government ran a budget surplus. The remaining years from 1993 – 2012 saw budget deficits. The federal government budget deficit increased sharply during the Obama administration, reaching 9.5 percent of U.S. GDP by the second quarter of 2009.

TEACHING TIP: The data and graphs for Figures 9.4 [25.4], 9.5 [25.5] and 9.6 [25.6] are included in the Excel workbook for this chapter. Data may not match the textbook exactly due to revisions and the use of different data sources.¶

D. The Federal Government Debt

1. When the government runs a deficit it spends more than it collects in revenue. The government must finance a deficit by borrowing. To do this the government sells securities to the public.
2. The *federal debt* is the total amount owed by the federal government. *Privately held federal debt* is the privately held (non-government-owned) debt of the U.S. government. One way to add up any government's debt is by adding all deficits since the country was founded, then subtracting the sum of all the surpluses. For example, the U.S. government debt is the total of all accumulated deficits minus surpluses since 1776. (The starting year will be different for other countries.)

TEACHING TIP: Students are always captivated by the size of the government debt. Explain why the debt decreased in 1997 to 2000, then began to increase again starting in 2002 as shown in Fig. 9.7 [24.7].¶

TEACHING TIP: See the Unique *Economics in Practice* on page 105 of this book for an update on the fiscal stimulus package's effect on the economy.¶

V. The Economy's Influence on the Government Budget, pages 179-182

- A. Tax revenues depend on the state of the economy. And some government expenditures (such as unemployment compensation) also depend on the state of the economy.
- B. Automatic Stabilizers and Destabilizers
 1. *Automatic stabilizers* are revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to stabilize GDP. This affects the size of a deficit or surplus. Unemployment compensation is an automatic stabilizer. So is the automatic drop in tax revenue during a recession.
 2. *Automatic destabilizers* are revenue and expenditure items in the federal budget that automatically change with the state of the economy in such a way as to destabilize GDP. Examples include government transfer payments that adjust when inflation rises or falls.
 3. *Fiscal drag* is the negative effect on the economy that occurs when average tax rates increase because taxpayers have moved into higher income brackets during an expansion. Since federal tax brackets were indexed for inflation in 1982, fiscal drag has been much less of a problem.

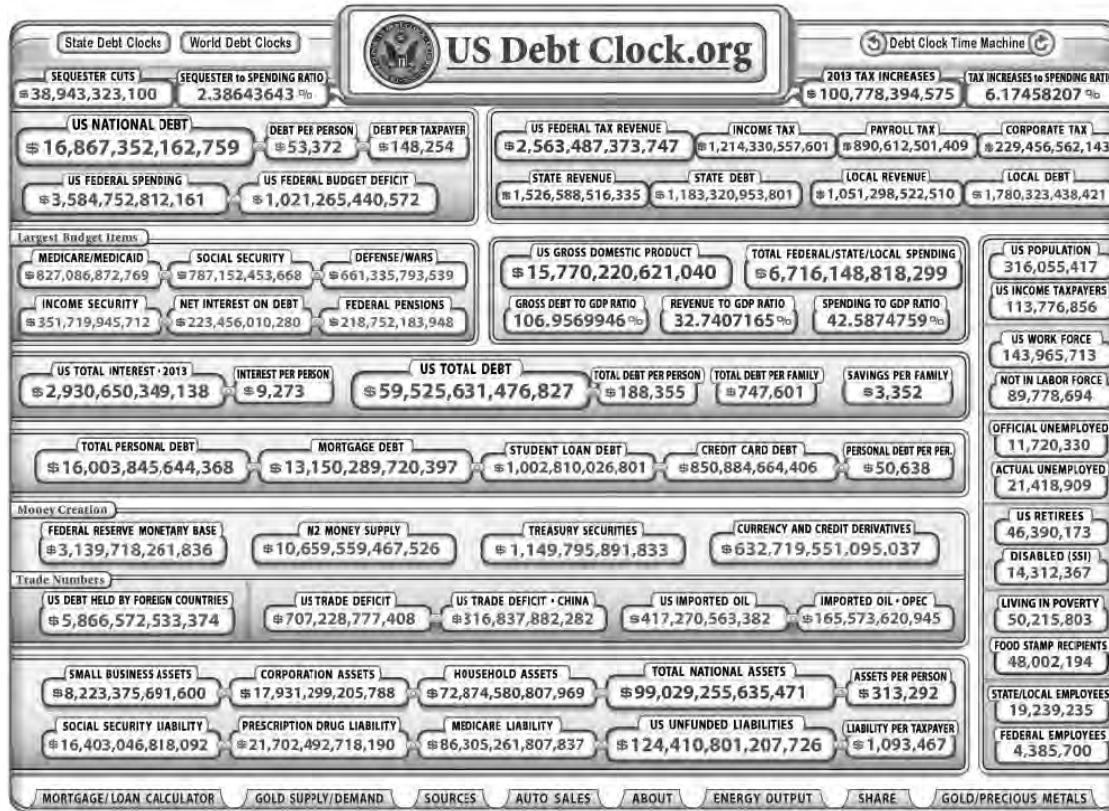
- TEACHING TIP: This is a good opportunity to talk about the interaction between the budget and inflation. Before 1982, federal tax brackets were based on nominal incomes. When inflation was high, people found themselves paying higher taxes even though their real incomes had not changed. In 1982 federal tax brackets were indexed to inflation. In addition to being fairer to taxpayers, indexing the brackets also means the government doesn't gain from inflation.¶
- C. The *Full-Employment Budget* is what the federal budget would be like if the economy were producing at the full-employment level of output.
1. The full-employment budget is used as a benchmark to evaluate fiscal policy. Most economists use it to compare fiscal policy in different years.
 2. The *structural deficit* is the deficit that remains at full employment. A structural deficit implies that the structure of tax and/or spending programs is out of alignment.
 3. The *cyclical deficit* is the deficit that occurs because of a downturn in the business cycle.
 4. Of the \$1.1 trillion U.S. government budget deficit in 2012, a substantial portion was caused by the persistent high unemployment rate.
- TEACHING TIP: Explain to students that much of the budget surplus of the late 1990s was a "windfall" caused by the prosperous economy. Point out that with more people working more taxes are paid to and less transfers are received from the government.¶

Economics in Practice: The Debt Clock, page 181

A clock that measures the U.S. debt is on a building in New York City (West 44th and Avenue of the Americas).

Unique Economics in Practice

There is also a debt clock on the internet at <http://www.usdebtclock.org/>. As of 20:45 GMT June 15, 2013 total debt was \$16.87 trillion dollars.



Question: The debt clock shown above says the "U.S. National Debt" is \$16.87 trillion dollars. However, according to the Treasury Department's "Monthly Statement of the Public Debt" for December 31, 2012, \$11.58 trillion is debt held by the public. What's the difference?

Answer: The total debt on the debt clock includes state and local government debt as well as intragovernmental holdings of debt. The Excel workbook for this chapter includes the public debt statement as well as a worksheet that does the calculations shown below:

| Unique Economics in Practice: The U.S. Government Debt | | | | |
|---|-------------------|------------------------|--------------------------|------------------------------------|
| Date | Total debt | State and Local | Intragovernmental | Federal debt held by public |
| 12/31/12 | 16,432,730 | 162,587 | 4,851,213 | 11,418,931 |

Sources: Statement of Public Debt from <http://www.treasurydirect.gov/govt/reports/pd/mspd/mspd.htm> accessed June 15, 2013.

VI. Looking Ahead, page 182

In the next two chapters we analyze monetary policy.

APPENDIX A: DERIVING THE FISCAL POLICY MULTIPLIERS

$$Y = [1/(1 - b)] \times [a + I + G - bT]$$

APPENDIX B: THE CASE IN WHICH TAX REVENUES DEPEND ON INCOME

$$Y = [1/(1 - b + bt)] \times [a + I + G - bT]$$

TEACHING TIP: When you cover the material in the appendices, most students will understand it better if you focus on numerical examples. ◀

Extended Application

Application 1: Fiscal Policy Choices

When it comes to numerical examples that show how multipliers are used, the more the better. The following classroom presentation not only reinforces the material on the various multipliers, but also adds some realistic constraints to fiscal choices.

Suppose the authorities wish to increase Y by \$400 billion in an economy with an MPC of .75. The government spending multiplier is

$$1/(1 - MPC) = 4,$$

the tax multiplier is $MPC/(1 - MPC) = -3$, and the balanced-budget multiplier, as always, is 1. This suggests three choices for increasing Y by the required amount as shown in the following table:

| Policy Options | Multiplier | Required Change | Impact on Deficit |
|--|------------|-----------------|-------------------|
| 1. Increase G | 4 | 100 | +100 |
| 2. Decrease T | -3 | -133 | +133 |
| 3. Increase G and T by equal amounts | 1 | 400 | no change |

Notice that all three policies increase output by the required \$400 billion. But given the results in the table, it looks like the preferred choice should always be option 3 because it alone leaves the budget deficit unchanged. It is important to flag this result for students: Fiscal expansion does not require an increase in the budget deficit.

But the table presents only part of the story. Output changes are composed of changes in C , I , and G . The impact on C can be calculated as $MPC\Delta(Y - T)$ or, with lump sum taxes only, $MPC(\Delta Y - \Delta T)$. In this example, there is no change in I , so one needs to list only the impacts on C and G :

| Policy Options | Impact on C | Impact on G |
|--|---------------|---------------|
| 1. Increase G | +300 | +100 |
| 2. Decrease T | +400 | 0 |
| 3. Increase G and T by equal amounts | 0 | +400 |

Viewed from the perspective of the above table, these three policies look very different. Although all three raise output by \$400 billion, options 1 and 2 do so mostly by increasing the output of consumption goods, whereas option 3 relies entirely on an increase in government sector output. And here is the problem: Real-world economies—unlike the economy of the simple mathematical

model—have a productive infrastructure (factories, capital equipment, human capital, retail outlets, etc.) suited to a particular mix of output. To suddenly and radically change the actual mix of output can be dislocating to the economy, causing shortages in the expanding sector without alleviating unemployment in the depressed sectors. When the economy goes into recession, the decrease in output occurs in the private sector. Thus the least dislocating policies would rely heavily on an expansion of private-sector output. In this way, not only would the economy be restored to its previous output level, but also to its previous output mix.

Only options 1 and 2 rely on the expansion of private sector output, and both policies increase the deficit. Hence, although fiscal expansion does not require deficit spending, a smooth fiscal expansion might require a deficit.

The Money Supply and the Federal Reserve System

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

An Overview of Money *p. 189*

- What Is Money?
- Commodity and Fiat Monies
- Measuring the Supply of Money in the United States
- The Private Banking System

How Banks Create Money *p. 193*

- A Historical Perspective: Goldsmiths
- The Modern Banking System
- The Creation of Money
- The Money Multiplier

The Federal Reserve System *p. 199*

- Functions of the Federal Reserve
- Expanded Fed Activities Beginning in 2008
- The Federal Reserve Balance Sheet

How the Federal Reserve Controls the Money Supply *p. 203*

- The Required Reserve Ratio
- The Discount Rate
- Open Market Operations
- The Supply Curve for Money

Looking Ahead *p. 209*

DETAILED CHAPTER OUTLINE

- I. Introduction, page 189
 - A. This chapter begins the discussion of what money is and the role it plays in the U.S. economy.
 - B. The text then describes the forces that determine the supply of money and show how banks create money.
 - C. Finally, it describes the workings of the nation's central bank (the Federal Reserve) and the tools it uses to control the money supply.
- II. An Overview of Money, pages 189-193
 - A. What Is Money?
 - 1. Money is anything generally accepted as a medium of exchange.

TEACHING TIP: Students are typically confused about the meanings of money, income, and wealth and will tend to use them interchangeably. As a means of clarification, write the following sentence on the blackboard: "She has a lot of money."

Does this mean that:

 - ◆ This woman has a lot of currency in the basement of her house, or a large checking account balance?
 - ◆ This woman earns a large salary?
 - ◆ This woman has a large amount of wealth?

Students will recognize the distinctions among these ideas. Explain that wealth and money are stock variables (quantities measured at a given point in time), whereas income, consumption, and saving are flow variables (that take place over a period of time). *Wealth* is the difference between the market value of an individual's assets (what is owned) and the market value of liabilities (what is owed). *Money* is one such asset; it is that part of wealth that can be used as a medium of exchange (most typically, via cash and checking accounts).

Finally, to reinforce the idea that money is not the same as income, try the following demonstration. Declare that the first row of your classroom is a model economy, where each student provides some service worth a dollar to the person next to him or her. (Say, allowing the neighboring student to copy from their notes.) Then take a single dollar bill from your wallet, give it to the first student, and have each student "pay" the one next to him or her for services provided with that single dollar bill. When the bill reaches the end of the line, ask: How much money was there in this economy over the relevant period (one dollar). How much income was earned? (If there are 15 students, total income will be \$15.) This should show students that money and income are not the same thing.❶

 - 2. A Means of Payment, or Medium of Exchange
 - a. Economies that don't use money run on the *barter* system, the direct exchange of goods and services for other goods and services.
 - b. A *medium of exchange (means of payment)* is anything sellers generally accept and buyers generally use to pay for goods and services.
 - c. Barter requires a double coincidence of wants, which can be a problem.

TEACHING TIP: If students ask about this, tell them that barter doesn't really require a double coincidence of wants. All that's required for barter to work is the patience to arrange for the roundabout transactions that are a part of a barter economy. If a double coincidence of wants was truly required, no barter economy would ever function at all!❷

 - d. Money eliminates many of the inefficiencies present in barter systems.

3. A Store of Value
 - a. A *store of value* means an asset that can be used to transport purchasing power from one time period to another.
 - b. Money is an asset that usually maintains its purchasing power over time.
 - c. There are other stores of value, but money has the advantages of (1) being available in convenient denominations and being easily portable, and (2) being usable as a means of payment for all goods at any time. These two factors mean money is completely liquid.
 - d. The *liquidity property of money* is the property of money that makes it a good medium of exchange as well as a store of value: It is portable and readily accepted and thus easily exchanged for goods.
4. A Unit of Account
 - a. A *unit of account* is a standard unit that provides a consistent way of quoting prices.
 - b. In money economies prices are quoted in the monetary unit.
 - c. Even money economies could use some other good for pricing, but that would not be efficient as buyers and sellers would be forced to constantly convert from the money unit into prices and back again.

B. Commodity and Fiat Monies

1. *Commodity monies* are those items used as money that also have an intrinsic value in some other use. Cigarettes have long been used as money in prisons.

Economics in Practice: Don't Kill the Birds!, page 191

In the nineteenth century, red feathers from the Scarlet Honeyeater were used as currency for trade among the south Pacific islands of Santa Cruz and nearby Pacific Islands. More than 20,000 of these birds were killed each year to create money. Running printing presses is much better for the environment. And it's almost certainly true that the Scarlet Honeyeater population would vote for fiat money.

TOPIC FOR CLASS DISCUSSION:

(Warning! Some of the answers to the question posed here are not particularly nice or pleasant. Make sure your class has the maturity to deal with possibly offensive answers.)

Many prisons have outlawed smoking. While cigarettes are still used as money, other goods and services are being used as well. Ask students to do some research to find out what goods and services are used for barter in prisons today. ■

2. *Fiat money (token money)* are items designated as money that are intrinsically worthless.
3. Most governments monopolize the printing of money by declaring it to be *legal tender*, money that a government has required to be accepted in settlement of debts.
4. The government also promises that it will not print so much that the money will lose its purchasing power. *Currency debasement* is the decrease in the value of money that occurs when its supply is increased rapidly.

- TEACHING TIP:** Even today many students believe currency is backed by gold or silver. While the text makes it clear that this is not true, you should try to emphasize this fact in class. Ask the class what will happen if you take a \$20 bill to the Federal Reserve or Treasury and ask to have it converted into "real money?" Assuming they make it past security (unlikely) either agency will give them a crisp new \$20 bill in exchange for their worn currency. ◀

Unique Economics in Practice

We generally think of fiat money as paper currency, while commodity money has intrinsic value in some other use. But what about red bird feathers, dolphin teeth, or the infamous stone money of Yap? Feathers are only intrinsically useful to the birds they adorn. Dolphin teeth don't have much use unless you are a dolphin. And circular stones with a hole in the middle?

Question: What is the real distinction between fiat and commodity money?

Answer: The cost of producing fiat money is minimal, whereas commodity money requires resources to create. Even the stone money of Yap had to be imported from a neighboring island 400 miles away. Crossing that distance in the Pacific Ocean in an open canoe is potentially very costly and certainly very risky.

- TEACHING TIP:** An aura of mystery surrounds the use of gold and silver as money for long periods of history. What is so special about these two metals? The answer is not mysterious at all. Money must have certain properties to function well as a medium of exchange. One type of money is replaced by another when the newer money fulfills these properties better than the old.

The six properties that a "good" medium of exchange must possess are:

- (1) Verifiable at low cost (people must be able to distinguish real money from counterfeit money at low cost). Discuss the ongoing redesign of U.S. paper currency.
- (2) Portable (people must be able to carry it around conveniently). Paper money works better than gold or silver in many respects.
- (3) Divisible (people must be able to make change). Again, this can be a problem with gold and silver coins.
- (4) Durable (money shouldn't wear excessively). This is a problem with gold because very pure gold flakes easily.
- (5) Available in sufficient supply (to avoid the need for barter). In the era of "free coinage" in the United States the main determinant of the money supply was the location and timing of the most recent gold strike.
- (6) Have a stable purchasing power. Gold and silver do not have a stable purchasing power because their price changes with changes in supply and demand.

For centuries, gold and silver coins satisfied these conditions better than any other alternative; hence, their popularity as money. Fiat money, however, also satisfies these conditions quite well. ◀

TOPIC FOR CLASS DISCUSSION:

Despite these laws it's still legal for groups to print their own currency. The "money" printed by these groups is usually valued in labor units and accepted by a limited number of local merchants. Ask your students to do some research to find out about one of these groups. A good place to start is the Web site of the Schumacher Center for a New Economics (<http://centerforneweconomics.org/content/local-currencies>) Their site includes material on starting a "local currency group" as well as a worldwide directory of such groups.

- TEACHING TIP:** Students get a kick out of some of the things that have been used as money over the ages. This usually works better if you give the previous six characteristics of "good" money first. Some of these items include reindeer (Finland), circular rocks with holes in the middle

(Yap), butter (China and Tibet), and many others. Point out that portability is not a problem if reindeer are money, but divisibility appears to be difficult. ◉

C. Measuring the Supply of Money in the United States

1. Economists use several different measures of the quantity of money in circulation in the United States.

TEACHING TIP: When introducing the measurement and analysis of money, it is important for students to understand that money is valuable to a society because money reduces transaction costs. This in turns leads to increased levels of mutually beneficial trade. The more complex and diverse an economic system becomes, the greater the value of a reliable monetary system to society. The following points are worth stressing.

- ◆ A monetary unit is valuable if it's scarce relative to the amount demanded.
- ◆ If the purchasing power of money is to be stable over time its supply must be controlled. ◉

2. *M1: Transactions Money* is money that can be directly used for transactions. M1 includes currency held outside banks, demand deposits, traveler's checks, and other checkable deposits.

TOPIC FOR CLASS DISCUSSION:

If you have time, discuss the issue of counterfeiting. Hold up one of the newer U.S. notes and ask why the Treasury started adding color and other features.

U.S. currency is a popular target for counterfeiters around the world because it is as close to a world currency as is available today. There are two different classes of counterfeiters. Professionals focus on the \$100 bill. That note has been redesigned several times during the last 20 years, adding security features that make the job difficult even for the most professional bank note artists. But there are also the casual counterfeiters, those who put a note in a color copier or use a color laser printer. The redesigns of the \$5, \$10, \$20, and \$50 notes include specific features to deter casual counterfeiters. Color is the most obvious. There is a wealth of information available on the Treasury web site. In fact, they have set up a separate site ([newmoney.gov](http://www.newmoney.gov)) just to explain what's going on. Start here:

<http://www.newmoney.gov/newmoney/default.aspx>. If your classroom has internet access and a computer projector, show the students the interactive note page ("Explore the Interactive Note" link at the top of the page.) You may also want to show them one of the podcasts discussing how and why the currency was redesigned. If you want historical information about the first redesign of the \$100 bill, the PBS Nova series produced "Secrets of Making Money" in 1996. For details and a few updates, see <http://www.pbs.org/wgbh/nova/moolah/>.

One reason traveler's checks have become less popular over the past two decades is the ease of counterfeiting them. That has made them much less useful as a medium of exchange.

TEACHING TIP: Other checkable deposits include negotiated order of withdrawal (NOW) accounts at thrift institutions and share draft accounts at credit unions. Legally only commercial banks can offer an account called a "checking account." ◉

3. *M2: Broad Money*

- a. *Near monies* are close substitutes for transactions money, such as savings accounts and money market accounts.
- b. *M2, or broad money* includes M1 plus savings accounts, money market accounts, and other near monies.

TOPIC FOR CLASS DISCUSSION:

Ask students what happens to M2 when someone moves \$100 from a savings account into a checking account. Someone will usually get the answer fairly quickly, but make sure everyone understands it. ■

4. Beyond M2 are measures that incorporate a wide variety of financial instruments that have some resemblance to money
 - a. One such measure includes the credit limit on all credit cards in the economy.
 - b. For the remainder of this chapter (and textbook) money means transactions money and is measured by M1. And M1 will be assumed to consist only of currency and checkable deposits.

TEACHING TIP: Students often wonder how the numbers of \$100, \$20, \$10, \$5, and \$1 bills are determined. The answer is supply and demand. The public determines the quantities of bills of each denomination. Suppose people suddenly preferred to carry around more ten and fewer twenty dollar bills (shifts in demand). They will then request more tens as change when shopping, and storekeepers, finding themselves with an excess of twenties and a shortage of tens, will request more tens and fewer twenties from their banks. The banks, in turn, will ship their rapidly accumulating twenties to the Federal Reserve and request tens in exchange. The Fed will store or shred the twenties, and fresh tens will be printed to satisfy the banks' demand. (If students don't believe this, ask how many of them have ever seen a U.S. dollar coin.)

A second factor affecting the currency denominations in circulation is the cost of obtaining various denominations (supply). In some states, ATMs will only dispense twenties. Since using an ATM is often less costly than other ways of obtaining currency, more twenties and fewer other denominations will be in circulation in those areas.

Interestingly, more than half of the coin and currency in circulation consists of hundred dollar bills, and this proportion is growing steadily. Presumably, this is because hundreds are the bills of choice for those who are transporting large quantities of money for illegal transactions. In addition, hundreds are the currency of choice for foreigners who want to hold dollar balances but can't find a bank to accommodate their wishes. Tracking the fraction of the money supply in hundreds has been used by some economists to estimate the size of the informal economy. ◉

D. The Private Banking System

1. Banks and other financial institutions borrow from individuals or firms with excess funds and lend to those who need funds. This describes the function of *financial intermediaries*, banks and other institutions that act as a link between those who have money to lend and those who want to borrow money.
2. The main types of financial intermediaries are commercial banks, savings and loan associations, life insurance companies, and pension funds.
3. Since 1970 there has been a gradual relaxation of the barriers that once separated different types of financial intermediaries.

III. How Banks Create Money, pages 193-199

A. A Historical Perspective: Goldsmiths

1. In the fifteenth and sixteenth centuries people used gold for money.
2. Those who held large quantities of gold would leave it with goldsmiths for safekeeping in exchange for a receipt.
3. In time the receipts themselves came to be traded for goods. This was an early form of paper money.
4. When goldsmiths realized that they had "extra" gold sitting around, they began to make loans by creating added receipts.
5. The goldsmiths were creating money. This system was the first fractional reserve banking system.

6. Fractional reserve banking works well as long as people remain confident in the banking system. Otherwise there could be a “run on the goldsmith (bank).” A *run on a bank* occurs when many of those who have claims on a bank (deposits) present them at the same time.

TEACHING TIP: The most important use of this section is laying out the concepts underlying the money creation process. An explanation of how the goldsmiths of the past altered the money supply when they began to issue loans helps students to understand the link between loans and money creation under a fractional reserve banking system. Using the text example (or some similar example) in your lecture will make it easier when you begin discussing T-account entries.

TOPIC FOR CLASS DISCUSSION:

Describe the standard picture of a run on the bank: a queue of depositors outside the front door waiting to withdraw their funds. Ask students if that’s how they think a run would work today. Most likely those in line outside the front door are much too late. Electronic funds transfers will have stripped the bank of deposits, possibly before the bank itself even opens for business. ■

B. The Modern Banking System

TEACHING TIP: The material that follows can be confusing to students who have never taken an accounting course. Go over this material slowly because students need to understand the nuances of manipulating T-account entries in the process of creating money in order to appreciate the implications of monetary policy actions later on. ◉

1. A Brief Review of Accounting

- a. The *Federal Reserve Bank (the Fed)* is the central bank of the United States.
- b. *Assets* are things a firm owns that are worth something. A bank’s assets are its loans, vault cash, and reserve deposits at the Federal Reserve. Bank *reserves* are the deposits that a bank has at the Federal Reserve bank plus its cash on hand.
- c. *Liabilities* are the firm’s debts—what it owes. A bank’s liabilities are deposits owed to customers. Net worth is assets – liabilities, the difference between what the firm owns and what it owes.
- d. $\text{Assets} - \text{Liabilities} = \text{Net Worth}$
- d. $\text{Assets} = \text{Liabilities} + \text{Net Worth}$

TEACHING TIP: Figure 10.1 [25.1] is included in the Excel workbook for this chapter. ◉

2. Banks are legally required to hold a certain minimum percentage of their deposit liabilities as reserves. The *required reserve ratio* is the percentage of its total deposits that a bank must keep as reserves at the Federal Reserve. (To keep things simple, assume bank deposits at the Fed are the only reserves. For now, ignore vault cash.)

TEACHING TIP: Try using the concept of the “paper test” to communicate this idea. An asset belongs to the economic agent that ultimately receives the promise made by the asset’s paper (or computer) record. Ask students whether a one million-dollar business loan is a liability or an asset to the lending bank. (It is an asset to the bank and a liability to the business because, eventually, the bank will receive the repayment of the loan.) Is a checking account balance a liability or an asset to the bank? (It’s a liability to the bank and an asset to the depositor because the bank must return this balance on demand.) ◉

C. The Creation of Money

1. Money is created when banks make loans.
 - a. Banks can lend up to the amount of their excess reserves. *Excess reserves* is the difference between a bank's actual reserves and its required reserves.

$$\text{excess reserves} \equiv \text{actual reserves} - \text{required reserves}$$
 - b. When a loan is made, a demand deposit is created for the borrower, which the borrower can then spend.
2. When a bank makes a loan to a current customer, they often don't even write a check. They simply credit the customer's deposit account. Even if the bank writes a check, it will be deposited somewhere when the customer uses it to make a purchase.

TEACHING TIP: Figure 10.2 [25.2] is included in the Excel workbook for this chapter. ◉

Unique Economics in Practice

Figure 10.3 [25.3] is fine as far as it goes. The Excel workbook for this chapter calculates the totals for 20 banks (Loans = \$395.39, Deposits = \$494.24).

Question: What will the loan and deposit totals be if there are 30 banks?

Answer: Loans = \$399.50, Deposits = \$499.38 (see Excel workbook).

- D. The *Money Multiplier* is the multiple by which deposits can increase for every dollar in reserves; equal to 1 divided by the required reserve ratio.

TEACHING TIP: The text formula is a simplified version of the real-world money multiplier because of the assumptions made. A more realistic multiplier would capture the public's transactions demand for currency and banks' desires to hold a cushion of excess reserves. (During recessions the banks' desires to hold excess reserves tends to increase, making it more difficult for the Fed to achieve money supply targets.)

Technically what is described in the text is the deposit multiplier, not the money multiplier. Don't worry about this distinction unless you are teaching a class full of economics majors. ◉

IV. The Federal Reserve System, pages 199-203

A. Introduction

1. The ability of banks to create money is limited by the volume of reserves in the system. The Fed controls the total volume of reserves.

TEACHING TIP: Emphasize that the abbreviation is Fed, not Feds. Point out that the Feds usually carry badges and guns, two items rarely seen in the halls of the Fed. ◉

2. The Federal Reserve System was created in 1913 by an act of Congress.
 - a. The Fed is made up of a Board of Governors and 12 Federal Reserve Banks.
 - b. Monetary policy is set by the *Federal Open Market Committee (FOMC)*, a group composed of the seven members of the Fed's Board of Governors, the president of the New York Federal Reserve Bank, and four of the other 11 district bank presidents on a rotating basis; it sets

goals concerning the money supply and interest rates and directs the operation of the Open Market Desk in New York.

- c. The FOMC directs the *Open Market Desk*, the office in the New York Federal Reserve Bank from which government securities are bought and sold by the Fed.

TEACHING TIP: Figure 10.4 [24.4] is an excellent summary of the structure of the Fed. One interesting question to ask is why there are district bank headquarters in Boston, New York, Philadelphia and Richmond, but only one west of the Rocky Mountains (San Francisco). The answer, of course, is that these districts were drawn in the Federal Reserve Act in 1913. The economy looked very different 95 years ago. ◉

B. Functions of the Federal Reserve

1. The Fed is the central bank for the United States.
 - a. Although its most important role is to control the money supply, it also performs several important functions for banks, including clearing interbank payments (check clearing), regulating the banking system, and assisting otherwise sound banks in a difficult financial position by lending them reserves through the discount window.
 - b. The Fed also manages exchange rates and the nation's foreign exchange reserves.
2. Other Duties of the Fed include being a lender of last resort.
 - a. A *lender of last resort* provides funds to troubled banks that cannot find any other sources of funds.
 - b. The Fed is the ideal lender of last resort because private banks or other institutions would not be likely to perform this function, and the Fed has virtually unlimited funds with which to bail out banks.
 - c. By definition, banks are illiquid because they borrow short and lend long. It's up to the Fed to supply the missing liquidity during banking crises.

TEACHING TIP: Make sure your students understand that being a lender of last resort is not the same as lending to banks that get in trouble because they are badly managed. A lender of last resort supplies the liquidity that is inherently missing from the banking system. This illiquidity is caused by borrowing short and lending long. The lender of last resort should make those loans to otherwise financially sound banks that experience a liquidity crisis. The Fed's lender of last resort function is lending through the Discount Window. ◉

C. Expanded Fed Activities Beginning in 2008

1. The mortgage market collapse in 2005 led to the worldwide financial crisis that began in 2008.
2. The Fed responded to the crisis in several ways.
 - a. They bailed out Bear Stearns even though Bear was not a commercial bank.
 - b. They helped the government take over Fannie Mae and Freddie Mac.
 - c. They made an \$85 million loan to AIG, an insurance company.
 - d. They began buying unconventional securities, including federal agency debt certificates (many issued by Fannie Mae and Freddie Mac), long-

term government notes and bonds, and mortgage-backed securities from the private sector.

D. The Federal Reserve Balance Sheet

1. Assets include gold, loans to banks, and U.S Treasury securities. With the new programs implemented in 2008, the Fed's asset portfolio changed significantly. As of January 30, 2013 the Fed held \$966 billion of mortgage-backed securities.

TEACHING TIP: You can't repeat it too often - stress that U.S. currency is not backed by gold, silver, or goose feathers. U.S. money is fiat money. Period. ◀

2. The bulk of its liabilities are the Federal Reserve Notes we use as currency. Reserve deposits are its other important liability.

TEACHING TIP: A more complete version of Table 10.1 [25.1] is available in the Excel workbook for this chapter, ◀

V. How the Federal Reserve Controls the Money Supply, pages 203-208

A. The key is controlling the quantity of bank reserves.

1. The *money supply* is the sum of deposits inside banks and currency in circulation outside banks.
2. The Fed has three tools it can use to change the money supply.
 - a. Changing the required reserve ratio.
 - b. Changing the discount rate.
 - b. Engaging in open market operations.

B. The Required Reserve Ratio

1. Changes in the required reserve ratio affect how much banks can lend from their reserves.
2. Since changing this ratio changes the money multiplier, a small change in the required reserve ratio will have a very large impact on the money supply. For this reason the Fed rarely changes reserve requirements.

TEACHING TIP: Table 10.3 [25.3] is available in the Excel workbook for this chapter, ◀

Unique Economics in Practice

Starting in late 2010 China began to tighten monetary policy in response to a huge increase in their domestic money supply. China's M2 had increased 19.3 percent year-on-year, at the end of October, 2010. M1 increased by 22.1 percent year-on-year to 25.33 trillion yuan in the same period. In response, the People's Bank of China increased the reserve requirement by 0.5 percentage points on November 16.

Question: Why did China's central bank decide to raise the reserve requirement instead of using open market operations?

Answer: Raising the reserve requirement is a drastic action. But given the huge increases in the money supply (and the likelihood of future inflation), drastic action was probably necessary.

Sources: <http://english.peopledaily.com.cn/90001/90778/90862/7200631.html> (accessed June 16, 2013.)

- TEACHING TIP:** Banks can also meet their reserve requirements by borrowing from other banks in the federal funds market. Such loans are typically for very short periods, sometimes just overnight. The interest rate banks charge other banks on interbank loans is called the federal funds rate. The Fed controls the fed funds rate only indirectly, by controlling the supply of reserves.

It's called the federal funds market because the Fed's computers are used to keep track of the loans. A typical flow of federal funds is loans from small country banks to large urban banks. ◉

C. The Discount Rate

1. The *discount rate* is the interest rate that banks pay to the Fed to borrow from it. Only banks can borrow from the Fed. They're borrowing reserves, so an increase in discount borrowing will increase total bank reserves.
3. On January 9, 2003, the Fed announced a new discount rate policy. The Fed now sets the discount rate above the federal funds rate. Banks were no longer discouraged from borrowing at the Fed; instead, the tools of the market (a high price) were used to discourage excess borrowing. Before this the Fed used *moral suasion*, the pressure that in the past the Fed exerted on member banks to discourage them from borrowing heavily from the Fed, to exert pressure on member banks not to borrow heavily from the discount window.

TOPIC FOR CLASS DISCUSSION:

Why did the Fed change their discount policy? The text has one possible answer (to remove the discount rate from their policy toolkit). There are others. See what the class can come up with. (One popular theory is that the Fed wants to make their lender of last resort function more market driven and reduce the potential for politics playing a part.) ■

- TEACHING TIP:** Table 10.4 [25.4] is available in the Excel workbook for this chapter, ◉

Unique Economics in Practice

In March, 2008, investment bank Bear Stearns experienced a run on the bank. In this case there was a worldwide loss of confidence in the investment bank, causing other firms to be less willing to engage in transactions with Bear. This led directly to Bear's demise via its fire-sale acquisition by J.P. Morgan Chase & Co.

As part of this financial meltdown the Fed began a new policy. Until March, 2008 only commercial banks that were members of the Federal Reserve system (nationally chartered banks) could borrow at the Discount Window. Now investment banks were to be given access to that avenue of funding. Fed Chairman Ben Bernanke took this action under emergency authority granted to the Fed.

Question: Why did the Fed suddenly decide to start discount lending to investment banks?

Answer: If Bear Stearns had collapsed, a large part of the global financial system would have been (at best) out of business for a few days. In today's world of finance that would be a major catastrophe. The Fed made a mistake in the early 1930s by not lending to banks, allowing them to fail instead. That was a contributing factor to the Great Depression. No Fed chairman wants that sort of blot on his or her record. Nevertheless, Lehman Brothers was allowed to collapse, a decision many policymakers have come to regret.

D. Open Market Operations

1. *Open market operation* are the purchase and sale by the Fed of government securities in the open market; a tool used to expand or contract the amount of reserves in the system and thus the money supply.
2. Two Branches of Government Deal in Government Securities: The Treasury sells securities to finance the deficit, and the Fed buys and sells Treasury securities already held by the public (previously owned) to change the quantity of reserves.
3. The Mechanics of Open Market Operations.
 - a. When the Fed sells securities it collects payment and the level of reserves decreases. The reverse happens with a purchase.
 - b. Each business day the Open Market Desk in the New York Fed buys or sells millions of dollars worth of securities. This is the preferred tool for controlling reserves because it can be used with some precision, it is extremely flexible, and the effect on the money supply is fairly predictable.

TEACHING TIP: Table 10.4 [25.4] is available in the Excel workbook for this chapter.¶

E. Excess Reserves and the Supply Curve for Money

1. Beginning in September, 2008 and continuing today, U.S. banks hold large quantities of excess reserves. Table 10.1 [25.1] shows \$1,645 billion in total reserves. Of that, only \$110 billion are required reserves.
- TEACHING TIP:** In May, 2013 total reserves were \$1.98 trillion. Of that, \$117.1 billion were required reserves. The remaining \$1.86 billion is excess reserves. This data (from Fed series H.3, Table 1) is in the Excel workbook for this chapter.¶
2. The economy is in an excess reserves trap, similar to Keynes's liquidity trap. That means the basic money supply mechanism is not working.
3. Because these are exceptional times, we continue to assume that the money supply curve is vertical. This means the Fed sets the money supply independent of the interest rate. This may not be true in practice.
- TEACHING TIP:** Drawing the money supply curve relative to the interest rate may seem like a leap for some students because the role of the interest rate has not yet been defined in the analysis. There are a couple of ways to overcome this. One is to wait until the next chapter to draw the money supply curve. Another is to use this as the first step in building a bridge between monetary policy and the determination of equilibrium output in the macroeconomy. The interest rate provides the first link—as the cost of planned investment—between the money market and the market for goods and services.¶

VI. Looking Ahead, page 209

In the next chapter we turn to the demand side of the money market.

Extended Application

Application 1: Why Do Governments Regulate the Banking System?

A good way to review the deposit-expansion process and also provide a macroeconomic justification for a central bank is the following. Ask students to imagine that the private banking system were completely unregulated while the economy went through the typical boom and bust cycle. Consider what would happen as the economy went into a recession. A common characteristic of all recessions is a rise in the bankruptcy rate. The debt of bankrupt companies, largely held by banks, becomes highly discounted or worthless and will lead some deposit holders to fear for the solvency of their bank. Even if this doesn't cause insolvency at individual banks, it will cause a multiplied decrease in the money supply: withdrawals of cash cause a decrease in bank reserves, which means banks will have to decrease their volume of lending ("call in loans").

This process can be demonstrated with *T*-accounts. Suppose an individual withdraws \$10,000 from her account in Bank #1 and stuffs it under her mattress. Bank #1 loses \$10,000 in both assets (cash reserves) and liabilities (demand deposits). This is illustrated on the *T*-account for Bank #1 as stage 1. With a required reserve ratio of .10, the bank's required reserves were allowed to drop only by \$1,000, but its actual reserves dropped by \$10,000, so it now has deficient reserves of \$9,000. The bank will have to call in loans of \$9,000. (Actually, because loans are routinely paid back and rolled over each day, the bank need only decrease its lending volume by \$9,000 that day.) This action is illustrated in the *T*-account as stage 2.

| Bank #1 | | |
|----------------|-----------------------|------------------------------|
| | Assets | Liabilities |
| Stage 1 | -\$10,000 Reserves | -\$10,000 Demand Deposits |
| | +\$9,000 Reserves | |
| Stage 2 | -\$9,000 Loans | |

Assume that whoever paid back his loan to Bank #1 did so with a check drawn on Bank #2. Bank #2 will lose \$9,000 in reserves and \$9,000 in demand deposits, and will find itself with deficient reserves of \$8,100. Bank #2 thus calls in loans of \$8,100, and the process continues.

| Bank #2 | | |
|----------------|----------------------|-----------------------------|
| | Assets | Liabilities |
| Stage 1 | -\$9,000 Reserves | -\$9,000 Demand Deposits |
| | +\$8,100 Reserves | |
| Stage 2 | -\$8,100 Loans | |

The money multiplier $1/(required\ reserve\ ratio) = 1/0.1 = 10.0$ tells us the decline in deposits will ultimately total $\$10,000/0.1 = \$100,000$. The effect on the balance sheet of the entire banking system will be as follows:

| Entire Banking System | |
|------------------------------|--------------------|
| Assets | Liabilities |
| -\$10,000 | -\$100,000 |
| Reserves | Demand Deposits |
| -\$90,000 | |
| Loans | |

Review what has occurred. The recession led to fears of bank insolvency, which led to cash withdrawals. In the example, the withdrawal of \$10,000 from Bank #1 ultimately causes total demand deposits to decrease by \$100,000. The money supply itself has actually decreased by \$90,000—the \$100,000 drop in demand deposits minus the \$10,000 increase in cash in the public's hands. A decrease in the money supply—as students will see in the next chapter—has a contractionary effect on the economy. Thus, with an unregulated banking system a recession leads to further contractions of output due to a declining money supply. In short, an unregulated private banking system would be an automatic destabilizer.

The same argument holds during a recovery. As the economy improves, the public would redeposit its cash and cause an expansionary increase in the money supply just as the economy was expanding on its own. Once again, an automatic destabilizer.

The solution—adopted in the United States and in most other countries—is for a central bank to guarantee the deposits of the public in the case of bank insolvency. In this way, FDIC protection for bank accounts can be viewed as a stabilizing influence on the economy [Note: With an unregulated banking system, another impact on the macroeconomy would come from the behavior of the banks themselves. As the economy goes into recession, banks become more hesitant to lend (due to an expected rise in borrower bankruptcies). They thus accumulate excess reserves, causing a contraction of the money supply. Once again, the monetary contraction occurs just as the economy is already heading into recession. This destabilizing influence requires countervailing moves by the Fed.]

TEACHING TIP: Instructors teaching at schools close to a regional Fed bank or to Washington, DC, might consider inviting a Fed economist/spokesperson as a guest lecturer to describe what the Fed does.¶

Application 2: Central Bank Independence

There have been numerous papers written studying the link between central bank independence and average inflation. Perhaps the best known is Alberto Alesina and Lawrence H. Summers, "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence." *Journal of Money, Credit and Banking*, 25:2 (May, 1993), pages 151-162. Figure 1a from their paper:

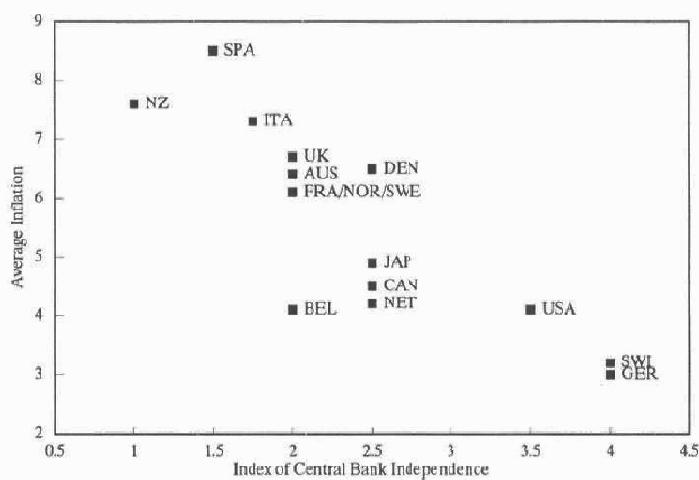


FIG. 1a. Average Inflation

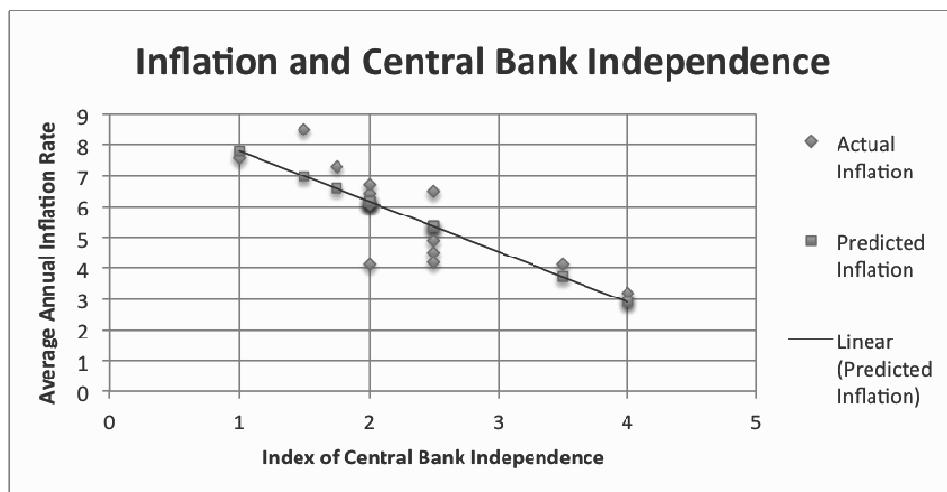
Alesina and Summers include the underlying data in Appendix Table A1. The Excel workbook for this chapter includes the entire data set. In addition, there is an SPSS data file as well as the results of a simple linear regression of average inflation on central bank independence. If a few students have taken a bit of statistics you might consider turning them loose on this data. Groups probably work best for this. Here are the results of the simple linear regression:

$$\text{Average inflation} = 9.440 - 1.636 \text{ Index of Central Bank Independence}$$

(-5.896)

Adjusted R² = 0.692, F = 34.769

Number in parentheses is the t-statistic.



Money Demand and the Equilibrium Interest Rate

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Interest Rates and Bond Prices *p. 213*

The Demand for Money *p. 215*

- The Transaction Motive
- The Speculation Motive
- The Total Demand for Money
- The Effect of Nominal Income on the Demand for Money

The Equilibrium Interest Rate *p. 220*

- Supply and Demand in the Money Market
- Changing the Money Supply to Affect the Interest Rate
- Increases in $P \cdot Y$ and Shifts in the Money Demand Curve
- Zero Interest Rate Bound

Looking Ahead: The Federal Reserve and Monetary Policy *p. 223*

Appendix A: The Various Interest Rates in the U.S. Economy *p. 225*

Appendix B: The Demand for Money: A Numerical Example *p. 227*

DETAILED CHAPTER OUTLINE

- I. Introduction, page 213
 - A. The previous chapter covered the money supply and how money is created.
 - B. This chapter covers the demand for money.
 - C. We need money supply and demand so we can find out the equilibrium interest rate.
- II. Interest Rates and Bond Prices, pages 213-214
 - TEACHING TIP:** The three bond examples given in the textbook are included as Bond Example 1, 2, and 3 in the Excel workbook for this chapter.
 - A. *Interest* is the fee that borrowers pay to lenders for the use of their funds.
 - B. A bond is a debt instrument. Fundamentally a bond is a promise to make one or more future payments on specific dates.
 - 1. Many bonds make coupon payments, specified amounts of money paid once or twice a year.
 - 2. Every bond has a maturity date, the date on which the final coupon payment is made as well as the bond's face value.
 - 3. The face value of the bond (also called the maturation value) is the dollar amount of the loan originally made when the bond was first issued.
 - TEACHING TIP:** If you call a loan "renting money" then interest is the rent a borrower pays. Another way of saying this is to note that people usually borrow funds when they want to make a major purchase - in other words, when their spending exceeds their income. Interest is the price paid for spending more than income.
 - C. Interest rates and bond prices are inversely related. An increase in a bond's price always means the interest rate on the bond (the yield to maturity) has fallen.
 - D. The interest rate is the annual interest payment on a loan expressed as a percentage of the amount of the loan.
 - E. We assume there is only one interest rate.

***Economics in Practice: Professor Serebryakov Makes an Economic Error,
page 214***

In Chekhov's play Uncle Vanya, Professor Serebryakov calls his household together to make an announcement. He has retired to his country estate, but he does not like living there. Unfortunately, the estate does not derive enough income to allow him to live in town. To his gathered household, he thus proposes the following:

Omitting details, I will put it before you in rough outline. Our estate yields on an average not more than two per cent, on its capital value. I propose to sell it. If we invest the money in suitable securities, we should get from four to five per cent, and I think we might even have a few thousand roubles to spare for buying a small villa in Finland.

The point, of course, is that the price of the estate is being overestimated. No rational buyer would pay the price required for a yield of 2 percent when 5 percent can be earned in securities. The price of the estate must fall until it, too, yields 5 percent.

Unique Economics in Practice

This is a good point to make use of Excel (or some other spreadsheet software). The file Ch11Examples.xls includes several examples. To calculate the price of the bond (the present value of its future payments) use the PV(i, n, c, f) function. The parameters are the interest rate (i, the yield to maturity), the number of years to maturity (n), the annual coupon payment (c) and the face value (f). The PV function returns a negative number, indicating that the buyer will have a cash outflow to purchase the bond. The examples add a – sign to make the value positive. UEIP Bond Example 1 takes the coupon, yield to maturity, face value, and years to maturity as given, calculating the price. UEIP Bond Example 2 takes the coupon, face value, years to maturity, and price as given, calculating the yield to maturity. Example 2 uses the same data as example 1 for comparison. The RATE(n, c, p, f) function does the calculation. The price today is, of course, p entered as a negative number. Both examples 1 and 2 base results are:

| Annual Coupon | Yield to Maturity | Face Value | Years to Maturity | Price |
|---------------|-------------------|------------|-------------------|------------|
| \$300 | 10.00% | \$10,000 | 3 | \$8,259.20 |

Question: We have assumed one coupon payment per year. Suppose instead the bond makes one payment every six months. How will the results change?

Answer: The easiest way to handle this is to calculate the yield to maturity per half-year ($i/2$) and the number of periods to maturity as the number of half-years ($n*2$). This is shown in UEIP Answers to Student Question assuming coupon payments of \$150 every six months. The yield to maturity is now the yield per six months. To annualize the interest rate, calculate $(1 + r)^2 - 1$. Naturally, receiving half the coupon payments six months earlier raises the yield to maturity slightly.

TOPIC FOR CLASS DISCUSSION:

The authors assume there is only one interest rate. Implicitly they are also assuming that all assets are perfect substitutes. In the real world this assumption is certainly not true. If your class is advanced you might want to discuss the issue of asset substitutability. To what extent are various assets (financial and real) substitutes for each other? How does that affect the degree to which their prices (and therefore rates of return) move together? The material in Appendix A to this chapter will be essential if you decide to include this topic in your class. ■

TEACHING TIP: Students are often fascinated by interest rates. Showing them how to read the financial pages (especially bond markets) in the *Wall Street Journal* is a good way to hold their interest. Other useful sources are <http://wsj.com> and <http://bloomberg.com>. ◉

III. The Demand for Money, pages 215-220

A. Introduction

1. A household only wants to hold a fraction of its financial wealth as money.
2. Money earns no interest (or very little interest), while other financial assets do earn interest. The total amount of financial assets is taken as given.
3. The central question is the fraction of your financial assets you want to hold in the form of money.

TEACHING TIP: It's impossible to say it too often: Money, income, and wealth measure three different aspects of the economy. The demand for money is the quantity of liquid assets an economic agent (household, firm, government) wants to hold given its income, wealth, and the current interest rate. The demand for money is not infinite (although you might add a joke that the demands for income and wealth certainly appear to be very large). ◉

B. The Transaction Motive

1. According to Keynes there were three motives for holding money: transactions, precautionary, and speculation. Of these the transactions motive is most important today.
 - a. The precautionary demand for money has been largely replaced by credit cards.
 - b. The speculation demand for money has been entirely replaced by short-term liquid financial instruments that earn market interest.
2. The *transaction motive* states that the main reason that people hold money is to buy things.
3. Assumptions
 - a. There are only two kinds of assets: bonds and money. Money earns zero interest, bonds earn positive nominal interest.
 - b. Income and spending are not synchronized. Spending is exactly equal to income but occurs at times different from receiving the income.
 - c. *Nonsynchronization of income and spending* describes the mismatch between the timing of money inflow to the household and the timing of money outflow for household expenses.
4. Money Management and the Optimal Balance
 - a. There is a trade-off between the quantity of money people want to hold and the interest lost by holding money.
 - b. The *optimal balance* is the level of average money balance that earns the consumer the most net profit, taking into account both the interest earned on bonds and the costs paid for switching from bonds to money.
 - c. When interest rates are high people tend to hold very little money.
 - d. The demand curve for money slopes downward.

TEACHING TIP: Students simply don't believe the money - bonds story because they don't know anyone who behaves that way. Try telling the story from the perspective of a corporate treasurer instead. Treasurers' careers are made or broken over squeezing an extra five basis points out of their liquid asset portfolio. The business demand for money really makes the optimal balance story work. ◉

This is also a good point to mention the names of the two economists who developed the optimal balance theory: James Tobin and William Baumol.

The example that accompanies Figure 11.2 [26.2] as well as the figure itself are in the Excel workbook for this chapter. The model there is dynamic, allowing you to change the number of bond sales per month, income, and so on. The following worksheet incorporates the Baumol-Tobin optimum cash balance equation. ◉

- C. The *Speculation Motive* is one reason for holding bonds instead of money: Because the market price of interest-bearing bonds is inversely related to the interest rate, investors may want to hold bonds when interest rates are high with the hope of selling them when interest rates fall.

TEACHING TIP: The extreme example of hyperinflation can help your students understand and remember the important result that higher interest rates lead to lower desired money balances. In hyperinflations (formally defined as any inflation rate greater than 50 percent per month), the nominal interest rate usually exceeds the inflation rate in order to preserve the purchasing power of lenders. Thus, with an inflation rate expected to be about 800 percent per year, the nominal interest rate might be 810 percent or 820 percent. Because the opportunity cost (the lost interest) of holding money is so high, the optimal balance will be quite small. In the Latin American hyperinflations of the late 1980s and early 1990s, desired (optimal) balances were so small that individuals had to make several trips to the bank each day! They wasted hours waiting in line at the bank, time that could otherwise have been used to produce goods and services and earn income. This is yet another way hyperinflation lowers a nation's standard of living. ◉

D. The Total Demand for Money

1. The quantity of money demanded at any moment depends on the opportunity cost of holding money, the interest rate.
2. Total demand for money includes both household demand and business demand.
3. At any given moment there is a demand for cash and checkable deposit balances. Total money demand will always be less than income. The demand for money at any moment depends on the opportunity cost of holding money (the interest rate) and total income.

E. The Effects of Nominal Income on the Demand for Money

1. Let $P \cdot Y$ denote nominal output and nominal income. At any given interest rate a higher volume of nominal output means an increase in nominal income.
2. Higher income means more spending. This increase in the number of transactions increases the demand for money.
5. Nominal income can increase because of increases in P , Y , or both.

TEACHING TIP: From now on label the money demand curve as $M^d(P \cdot Y)$. Stress that changes in the interest rate correspond to movements along the M^d curve whereas changes in Y or P shift the M^d curve. ◉

Economics in Practice: ATMs and the Demand for Money, page 219

Back in the dark ages of banking (the 1970s and 1980s) obtaining currency meant a trip to an actual bank, standing in line, and presenting a paper check to a bank teller. All this was very costly. ATMs and web banking have lowered the transaction costs of banking considerably. The study by Orazio Attansio, Luigi Guiso, and Tullio Jappelli looked at the impact of the introduction of ATMs in Italy. Italian banks pay interest on checking account deposits, but currency still earns zero interest. During the period of ATM installation, currency in circulation divided by total consumption fell from 3.6 percent to 2.8 percent. And higher interest rates reduced the quantity demanded of currency as we would expect.

TEACHING TIP: Money demand is modeled in this chapter (and the rest of the text) as the demand for nominal balances, not the demand for real balances. If you're accustomed to working with supply of and demand for real money, be careful. I advise using Case and Fair's

methodology as students need that consistency. However, you might want to mention the alternative approach.❶

III. The Equilibrium Interest Rate, pages 220-223

- A. Equilibrium is the interest rate at which the quantity of money demanded equals the quantity of money supplied.
- B. Supply and Demand in the Money Market
 - 1. The Fed controls the money supply through its manipulation of the quantity of bank reserves. We assume it has a fixed target for the money supply.
 - 2. Money demand is inversely related to the interest rate. If the money demand is greater than the money supply, the interest rate rises. If money demand is less than the money supply, the interest rate falls.

DDD TEACHING TIP: Since the money supply curve is vertical the entire adjustment to equilibrium must occur via a change in the interest rate. Talk about the behavior this implies. For example, if the current interest rate is above equilibrium, there is an excess supply of money. People and businesses will find they are holding more money than they want. They will try to get rid of the excess by purchasing bonds. Doing this increases the demand for bonds, driving the interest rate down. The interest rate will fall until (guess what?) people and businesses are happy holding the original quantity of money!

If they have trouble believing that story, point out that most of the behavior we see like that in the real world is in the business sector. Also point out that people and businesses can't create or destroy money. We can only transfer it to others.❷

C. Changing the Money Supply to Affect the Interest Rate

- 1. The Fed can raise the interest rate by decreasing the money supply.
- 2. The Fed can lower the interest rate by increasing the money supply.

D. Increases in $P \cdot Y$ and Shifts in the Money Demand Curve

- 1. Shifts in money demand can also influence the equilibrium interest rate.
- 2. An increase in $P \cdot Y$ increases the demand for money and increases the interest rate.

E. Zero Interest Rate Bound

- 1. The Fed lowered the interest rate in the U.S. to zero starting in 2008. As of June 17, 2013 that policy remains in place (although some interest rates had begun to edge up, possibly in anticipation of the Fed winding down its expansionary policies.)
- 2. At an interest rate of zero people are indifferent between holding money and bonds. Essentially, when the interest rate is zero no further monetary stimulus is possible from conventional means.

IV. Looking Ahead, page 223

The next chapter answers the question, "Why would the Fed want to change the interest rate and what impact would that have on the economy?" We will also see how the interest rate affects the equilibrium level of output in the goods market.

DDD TEACHING TIP: Some instructors may want to use the following algebraic example of monetary equilibrium. Let money demand be given by $M^d = 180 - 500r + 0.2Y$, the money supply is fixed at \$200 billion, and income is \$300 billion. Money demand is measured in billion dollars. Point out

the meaning of the money demand equation: The demand for money falls by \$5 billion when the interest rate rises by 1 percentage point or .01 (the opportunity cost effect). The demand for money rises by \$0.2 billion when income rises by \$1 billion (the transaction effect). Then, set $M^d = M^s$, and substitute the given values to obtain $180 - 500r + 60 = 200 \rightarrow r = 40/500 = 0.08$ or $r = 8\%$.

The example can be extended to show the effects of an increase in income, say, from \$300 billion to \$400 billion (the equilibrium interest rate rises from 8 percent to 12 percent) or a decrease in the money supply, say from \$200 billion to \$180 billion (the interest rate rises from 8 percent to 12 percent).◆

APPENDIX A: THE VARIOUS INTEREST RATES IN THE U.S. ECONOMY

- I. The *term structure of interest rates* (yield curve) is the relationship between the interest rates offered on securities of different maturities.
 - A. The Fed can affect short-term rates (mainly the federal funds rate).
 - B. The Fed hopes that changing short-term rates will shift the yield curve and alter long-term rates.
 - ◆◆◆ TEACHING TIP: See Extended Application 3 for a discussion of the Fed's Maturity Extension Program.◆
- II. Types of Interest Rates
 - A. The Three-Month U.S. Treasury Bill Rate is the most widely followed short-term interest rate. Government securities that mature in less than a year are called *Treasury bills*, or *T-bills*.
 - B. U.S. Government Bond Rates: 1 yr., 2 yr., up to 30 yr. Government securities that mature in one year or more are called *government bonds*.
 - ◆◆◆ TEACHING TIP: During the years 1997 to 2000 when the government ran a budget surplus the Treasury stopped issuing 30-year bonds. Thirty year bonds were issued again in February 2006. See <http://www.treasurydirect.gov/indiv/products/products.htm> for details.◆
 - C. The *federal funds rate* is the rate banks charge each other for 24-hour loans of reserves.
 - 1. The Federal Funds Rate is the interest rate the Fed uses as a target.
 - 2. Since the Fed can control the quantity of reserves in the banking system they can also control the price of those reserves.
 - D. The Commercial Paper Rate is the rate on short-term corporate borrowing that offer a designated rate of interest.
 - 1. Commercial paper is short-term borrowing. In the United States all commercial paper issued matures in 270 days or less. (The reason for this is the SEC requires registration of any commercial paper issue longer than 270 days to maturity.)
 - 2. The rate depends on the financial condition of the firm and the maturity of the IOU. However, in order for a firm to be able to borrow at all in this market it must be in very good financial condition. The main determinant of the yield is the time to maturity.
 - E. The *prime rate* is a benchmark rate that banks use in deciding how much to charge in interest.
 - F. The AAA Corporate Rate (*triple A corporate bond rate*) is the interest rate on the highest rated corporate bonds.

APPENDIX B: THE DEMAND FOR MONEY: A NUMERICAL EXAMPLE

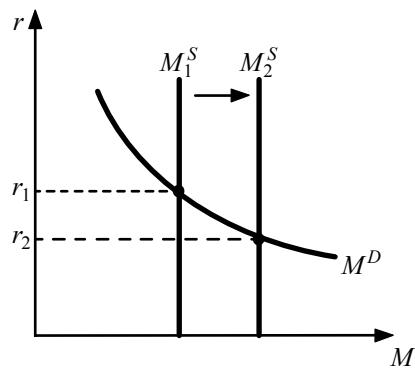
This appendix presents a numerical example of the Baumol-Tobin money demand model. However, rather than derive the theoretical result then use it to calculate optimal money holding, the appendix calculates costs and benefits for various levels of average money holding, selecting the level that maximizes the difference between interest earned and transaction cost. If you're feeling ambitious you can point out that the maximum occurs at roughly the point where marginal benefit equals marginal cost.

Extended Applications

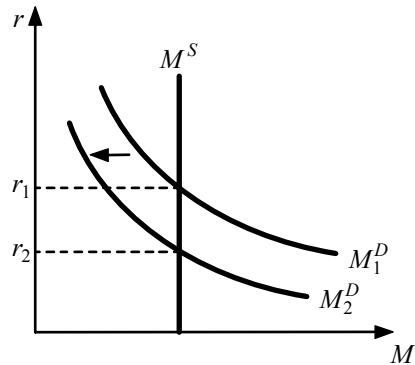
Application 1: Expectations and the Money Market

The money market provides a good opportunity to introduce students to the importance of expectations. Announcement effects, expected changes in interest rates, and self-fulfilling prophecies can all be demonstrated with the simple diagrams of this chapter.

Consider what happens when agents expect the Fed to increase the money supply. In the diagram following, this future move by the Fed is expected to decrease the interest rate from r_1 to r_2 .



A future drop in the interest rate means a future rise in the price of bonds. Thus, agents will want to purchase bonds now, before the Fed takes its action. They will shift their wealth out of money and into bonds. In the money market, this causes the money demand curve to shift to the left, causing an immediate drop in the interest rate from r_1 to r_2 , as in the diagram below.



Note that the drop in the interest rate occurs without any action taken by the Fed. The expectation that interest rates will fall causes agents to act in such a way that interest rates fall—a classic self-

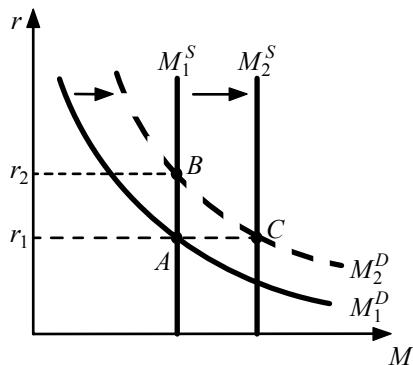
fulfilling prophecy. Because expectations can have such a profound impact on money markets, government officials must phrase their public announcements carefully, to avoid strong suggestions of a policy shift that might destabilize markets. The Fed is a master of “careful phrasing.” The desire to prevent destabilizing changes in expectations is the main reason for the characteristic (and confusing) ambivalence of Fed announcements.

Since 1994 the Fed has attempted to be “more transparent” in the press releases it makes following meetings of the Federal Open Market Committee. Moreover, it has made a conscious effort to explicitly state its outlook. Consider, for example, this excerpt from a Federal Reserve press release dated November 16, 1999: “Today’s increase in the federal funds rate, together with the policy actions in June and August and the firming of conditions more generally in U.S. financial markets over the course of the year, should markedly diminish the risk of inflation going forward. As a consequence, the directive the Federal Open Market Committee adopted is symmetrical with regard to the outlook for policy over the near term.”

This is not to say that there is not still some ambiguity in the pronouncements of the Federal Reserve chairman. After meeting with international bankers in Seattle on June 7, 1999, Chairman Greenspan met with reporters and discussed the economy, inventory levels, and the possibility of a recession. The reporters all heard the same words, but the resulting headlines ranged from “Recession Risk Up, Greenspan Says” in the *Baltimore Sun* to “Recession Is Unlikely, Greenspan Concludes” in the *Washington Post*. Perhaps most on target was the *Philadelphia Inquirer* which ran the headline “Greenspan: Recession?” (Source: Public Information Office, New York Federal Reserve Bank.)

Application 2: Interest Rate versus Money Supply Targets

A longtime controversy concerning monetary policy is whether the Fed should keep the money supply constant or try to keep the interest rate constant. These two policies can be demonstrated with the basic money market diagrams of this chapter. Suppose that equilibrium is initially at Point A, with the interest rate at r_1 , and then for some reason the demand for money increases.



Now we have an excess demand for money equal to the distance AC . With a constant money supply, the new equilibrium is at Point B with the interest rate rising to r_2 . Therefore, if the Fed follows a money supply rule there will be variability in the interest rate. If the Fed does not want interest rates to rise at all, it would increase the money supply to M_2^S . In this case there will be relatively more variability in the money supply. Given that disturbances originate with changes in money demand, there is no way for the Fed to target both the interest rate and the money supply. (In later chapters, students will learn how these policies impact the economy.)

Application 3: The Fed's Maturity Extension Program

Beginning in 2009, the Fed periodically purchased longer-term government securities. Here's what the "term structure" of Fed holdings looked like as of January 30, 2013 (in millions of dollars, from Federal Reserve release H.4.1, included in the Excel workbook for this chapter):

| | |
|-----------------|-------------|
| Treasury Bills | \$0 |
| Notes and Bonds | \$1,623,279 |
| TIPS | \$76,130 |

The Fed has shifted entirely out of T-bills and into notes and bonds (maturities greater than one year). Here's what the Fed says:

"Maturity Extension Program

On September 21, 2011, the FOMC announced that it would extend the average maturity of its holdings of securities--by purchasing \$400 billion par of Treasury securities with remaining maturities of 6 years to 30 years and selling or redeeming an equal par amount of Treasury securities with remaining maturities of 3 years or less--by the end of June 2012. The maturity extension program was intended to put downward pressure on longer-term interest rates and to help make broader financial conditions more accommodative. Additional information is available at www.newyorkfed.org/markets/opolicy/operating_policy_110921.html and www.newyorkfed.org/markets/pomo_landing.html.

On June 20, 2012, the FOMC announced that it would continue through the end of the 2012 its program to extend the average maturity of its holdings of securities. The maturity extension program concluded as scheduled and resulted in the purchase, as well as the sale and redemption, of about \$667 billion in Treasury securities since the inception of the program."

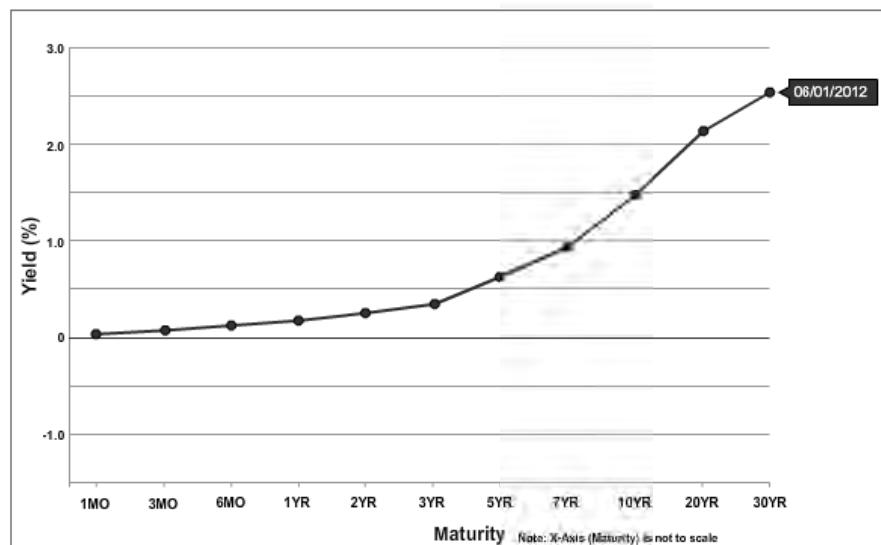
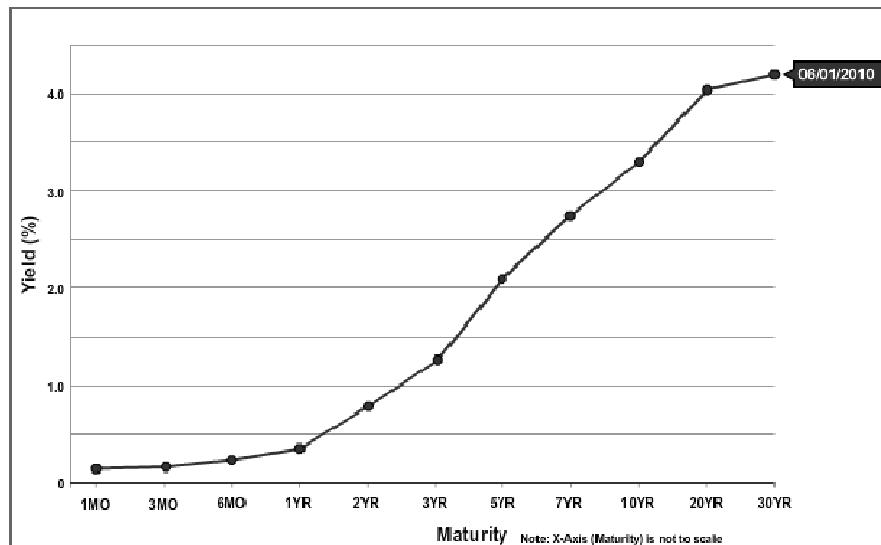
(Source: <http://www.federalreserve.gov/monetarypolicy/bsd-monetary-policy-tools-201305.htm>)

The table below is from 2011. It sets out the Fed's goals for the maturity extension program as percentages of total holdings of U.S. government securities.

| Nominal Coupon Securities by Maturity Range (years) | | | | TIPS** |
|---|------|-------|-------|-----------|
| 6 – 8 | 8–10 | 10–20 | 20–30 | TIPS 6–30 |
| 32% | 32% | 4% | 29% | 3% |

(Source: http://www.newyorkfed.org/markets/opolicy/operating_policy_110921.html)

The Fed has been trying to bend the yield curve. To a certain extent this seems to have worked. Here are some Treasury yield curves from 2010 and 2012 (from <http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/Historic-Yield-Data-Visualization.aspx>):



Not only did the Fed's actions flatten the yield curve, it also slashed the 30 year bond rate from 4.2% to 2.5%. Chairman Ben Bernanke appears to know something about monetary economics.

The Determination of Aggregate Output, the Price Level, and the Interest Rate

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Aggregate Supply (AS) Curve, p. 229

Aggregate Supply in the Short Run

Shifts of the Short-Run Aggregate Supply Curve

The Aggregate Demand (AD) Curve, p. 232

Planned Aggregate Expenditure and the Interest Rate

The Behavior of the Fed

Deriving the AD Curve

The Final Equilibrium, p. 239

Other Reasons for a Downward-Sloping AD Curve, p. 240

The Long-Run AS Curve, p. 240

DETAILED CHAPTER OUTLINE

- I. Introduction, page 229
 - A. Chapters 12 and 13 assemble the models built in chapters 8 – 11.
 - B. The complete *AD-AS* model is developed and investigated in these two chapters.
 - C. By using the "Fed rule" the textbook avoids some of the issues
 - TEACHING TIP:** By using the "Fed rule" the textbook avoids some of the issues caused by the *LM* curve. In fact, the *IS-LM* model has been banished from the 11th edition. ◉
- II. The Aggregate Supply Curve, pages 229-232
 - A. Introduction:
 - 1. *Aggregate supply* is the total supply of goods and services in an economy.
 - 2. The *aggregate supply curve* is a graph that shows the relationship between the aggregate quantity of output supplied by all firms in an economy and the overall price level.
 - a. The *AS* curve is *not* a market supply curve and it is *not* the sum of all the individual supply curves in the economy.
 - b. When we derived the supply curve for a firm we assumed per unit production costs were constant in the short run. Firms set prices instead of simply responding to them. In other words, we are assuming imperfect competition for most firms in the economy. And since firms in imperfect competition have no supply curves, we cannot simply add the firms' individual supply curves to get a market supply curve -- there is nothing to add.
 - c. The *AS* curve is a *price/output response* curve. It traces out the price decisions and output decisions of all the markets and firms in the economy given a set of circumstances.
 - TEACHING TIP:** The text gives two important reasons why the short-run *AS* curve cannot be obtained by adding up individual micro supply curves: (1) The micro (competitive market) supply curve assumes input prices are constant as the price of output rises, whereas along the *AS* curve input prices (that is, wages and prices of intermediate goods) usually rise with the price level, and (2) in imperfectly competitive markets, there is no market supply curve because firms are price setters rather than price takers.
 - It is useful to give students an alternative label for the short-run *AS* curve that conveys more meaning, such as "the price/output response" curve suggested in the text. ◉
 - TEACHING TIP:** First-time users of the Case, Fair, and Oster text should note the realistic treatment of the *AS* curve. Many introductory texts have adapted the intermediate-level approach: deriving the *AS* curve as points of labor-market equilibrium at differing price levels, assuming money illusion or institutional lags in labor-supply adjustment. In this approach, changes in the price level are viewed as causing changes in output along the *AS* curve.
 - Other texts use an approach similar to that of Case, Fair, and Oster, heuristically deriving the *AS* curve from the behavior of firms as output changes. In this approach, the causation is reversed: Changes in output are viewed as causing changes in the price level. Texts using this approach typically assume that input prices (including wages) are held constant along the short-run *AS* curve.

TEACHING TIP (continued)

Case, Fair, and Oster take the heuristic approach, but allow wages and other input prices to rise to some degree with the overall price level. The key is that input prices do not adjust completely over the short run. This is what gives the short-run *AS* curve its positive slope. Over the long run, when input prices adjust completely to output prices, the *AS* curve is vertical. This assumption of incomplete adjustment (rather than no adjustment) in the short run is stressed at several points in the chapter. To avoid confusing your students, you may want to modify your lecture notes accordingly.

B. Aggregate Supply in the Short Run

1. The short-run aggregate supply curve slopes upward. When an economy is in a deep recession, the short-run aggregate supply curve may be fairly flat. The deeper the economy sinks into a recession, the flatter the short-run *AS* curve (usually). *AS* becomes steeper at high levels of output. As the economy approaches full employment, increases in aggregate demand cause smaller increases in output and larger increases in the price level.

TEACHING TIP: It is risky to make absolute pronouncements about the behavior of aggregate supply. Predictions tend to be quickly contradicted by reality. Emphasize to students that economists have been studying macroeconomics for about 75 years but we have only focused on aggregate supply for about 40 of those years. We still have much to discover.

2. Why an Upward Slope?

- a. If all prices, including input prices (particularly wages) changed at the same rate, there would not be any output response. The short-run aggregate supply curve would be vertical.
- b. But if there are any prices that are “sticky” the *AS* curve may slope upward. Often the sticky price is the wage rate.
- c. Generally, some input prices will rise when *AD* increases. That would shift the *AS* curve up. We assume that these input costs are small relative to wage costs. If wages are a large fraction of input costs and wage changes lag behind price changes, we have an upward-sloping *AS* curve.

2. Why the Particular Shape?

- a. In two words, capacity constraints. To understand this shape, consider the response of firms to increases in aggregate demand. This response depends on capacity utilization and how fast input prices respond to increases in the overall price level.
- b. At low levels of capacity utilization, increases in demand result in increases in output with little impact on the price level. Wages are likely to be even stickier upward if firms have kept excess workers during the downturn to preserve worker morale.
- c. When the economy is producing at its maximum level of output (at capacity) the *AS* curve becomes steep because additional increases in aggregate demand mainly induce a higher price level with only a small impact on output.

TOPIC FOR CLASS DISCUSSION:

Standard neoclassical wage theory says the quantity of labor should be adjusted to make labor's marginal revenue product equal to the wage rate. That does not allow much room for firms keeping excess labor during a recession. Invite the class to speculate about why firms might keep more workers than the neoclassical rule dictates. The text gives one answer -- to preserve

worker morale. In fact, efficiency wage theory notes that there are significant costs to hiring new workers: screening, interviewing, training, and so on. One way to avoid those costs is to keep more workers around such that $MRP_L < w$. ■

C. Shifts of the Short-Run Aggregate Supply Curve

1. Technological progress and increases in the size of the labor force both shift the AS curve.

TEACHING TIP: Both the short-run and long-run AS curves shift right. ◀

- a. This can be the result of increases in the supply of labor, the stock of capital, labor quality (human capital), or technological improvements.
- b. The text correctly notes that immigration can be a major cause of increases in the quantity of labor available for production.
- c. The influx of women into the labor force since the mid-1960s also shifted the AS curve.

2. Cost Shocks (Supply Shocks)

- a. A *cost shock (supply shock)* is a change in costs that shifts the short-run aggregate supply (AS) curve.
- b. For the last 40 years a major source of supply shocks has been dramatic changes in energy prices. These changes induce changes in the prices of substitutes, namely other forms of energy such as natural gas.

TEACHING TIP: Properly speaking, supply shocks are shifts of the short-run AS curve that are not caused by an earlier shift of AD . A shift of AD causes an initial movement along an AS curve followed by shifts of the AS curve in subsequent periods as workers adjust to the demand shock. However, this is not a supply shock. ◀

TOPIC FOR CLASS DISCUSSION:

Ask the class which input prices might cause supply inflation. Labor and energy are two obvious answers. Then ask how the wage rate would have to change to create a supply shock. It turns out we have two good examples in the real world. Both France and Vietnam have laws that limit employees to 35 hours work per week. These laws specified no change in weekly pay, meaning the economy experienced about a 12.5 percent wage hike (if the average work week was 40 hours before the law). (French president Nikolas Sarkozy has tried to change this law. So far his efforts have been partly successful.)

Students sometimes ask why these countries passed such a law. The answer lies in a discredited economic theory called the “bundle of work” theory. According to this model there is only so much work to go around in an economy. If everyone works a little less, more people will be employed. What the bundle of work theorists ignored was the fact that output changes. ■

III. The Aggregate Demand (AD) Curve, pages 232-239

TEACHING TIP: If you've used earlier editions of Case, Fair, and Oster, you're probably expecting a section on investment at this point. That was covered in the previous chapter in this edition. ◀

A. Planned Aggregate Expenditure and the Interest Rate

1. $AE = C + I + G$.
2. Since planned investment (I) is an inverse function of the interest rate, planned aggregate expenditure (AE) must also be an inverse function of the interest rate.
3. When the interest rate rises, planned investment falls, shifting the AE curve down (Figure 12.3 [27.3]). This causes equilibrium income to fall.

4. The relationship between aggregate output and the interest rate in the goods market is called the *IS curve* (Figure 12.4 [27.4]).
5. An increase in G shifts the *IS* curve to the right. For now, the interest rate is assumed to remain constant.

TEACHING TIP: The shorthand notation used in the text—reprinted following—is a useful teaching device. Be sure that students understand the full economic content of the words *implies*, *leads to*, and *resulting in* so that they do not just memorize the shorthand without the underlying understanding.

$$r \uparrow \rightarrow I \downarrow \rightarrow AE \downarrow \rightarrow Y \downarrow$$

In words: A rise in interest rates *implies* a decrease in investment, which *leads to* a decrease in planned aggregate expenditure *resulting in* a decrease in aggregate output.

$$\text{Also } r \downarrow \rightarrow I \uparrow \rightarrow AE \uparrow \rightarrow Y \uparrow$$

In words: A fall in interest rates *implies* an increase in investment, which *leads to* an increase in planned aggregate expenditure *resulting in* an increase in aggregate output. ¶

B. The Behavior of the Fed

1. From the previous two chapters, we know that the Fed controls the money supply and the interest rate.
2. The FOMC meets every six weeks to discuss the state of the economy and set an interest rate target. They issue a directive to the New York Fed that specifies a target interest rate.
3. The Fed's policy goals are high levels of output and employment, along with low inflation.

TEACHING TIP: The text notes the Humphrey-Hawkins Full Employment Act of 1978 mandates full employment and a stable price level. Since those two goals are sometimes in conflict, the Fed regularly violates this law. The laws of economics trump laws passed by Congress every time. ¶

4. While the process sounds mechanical, FOMC members and Fed presidents are experts in economics, finance, and related subjects. There is considerable brain-power in the room at an FOMC meeting. Many factors are taken into account when setting monetary policy. We call these factors the *Z* factors. They are exogenous.
5. The *Fed rule* is an equation that shows how the Fed's interest rate decision depends on the state of the economy:

$$r = \alpha Y + \beta P + \gamma Z$$

TEACHING TIP: The *Z* variable can also include non-interest-rate monetary policy. Here are two examples. First, the Fed's Quantitative Easing programs starting in 2009 focus on monetary aggregates rather than interest rates. Second, there is an episode in monetary history that everyone should know about. It is discussed in the Unique Economics in Practice on page 154. Paul Volcker, as Fed chairman, specifically targeted the quantity of nonborrowed reserves rather than interest rates. ¶

6. The coefficients α , β , and γ are assumed to be positive.
 - a. High output or a high price level should cause the Fed to raise the interest rate.
 - b. By defining the *Z* variables appropriately, we can assume γ is positive without loss of generality.

**Economics in Practice: What Does Ben Bernanke Really Care About?,
page 237**

Media speculation in late 2012 focused on what factors Ben Bernanke was likely to take into account when debating monetary policy at FOMC meetings. This speculation translates directly into which variables in the Fed rule are most important.

7. Figure 12.7 [27.7] shows how the Fed rule interacts with the *IS* curve:

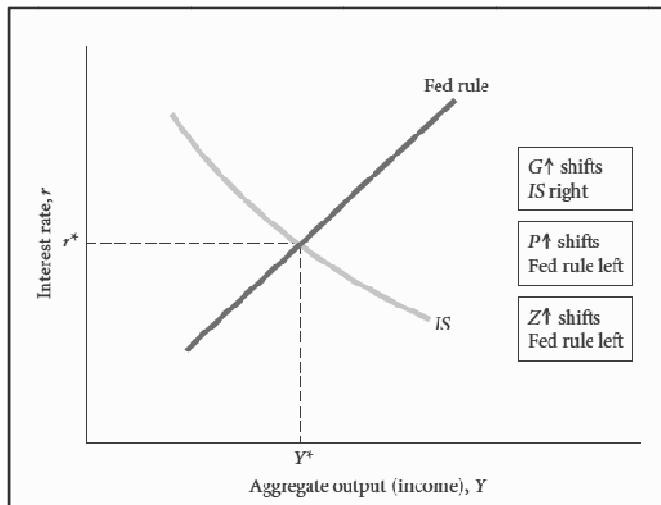


Figure 12.7 [27.7]

C. Deriving the *AD* Curve

1. The *AD* Curve Slopes Downward

- a. Suppose there is an increase in P . The Fed rule curve shifts left (Figure 12.7 [27.7]). The Fed rule says that an increase in P must cause r to also rise.
- b. The interest rate rises and equilibrium output falls. Thus, as P rises equilibrium Y falls. This is the basis for the downward-sloping *AD* curve.
- c. An increase in G shifts *IS* and *AD* to the right. An increase in Z shifts the Fed rule curve and the *AD* curve to the left. (Remember, this is how Z was defined.)

2. The Aggregate Demand Curve: A Warning

- a. The *AD* curve is not a market demand curve and is not the sum of all market demand curves in an economy.
- b. Aggregate demand is a function of the overall price level, not the price of any single product. An increase in the price level causes the demand for money to rise, increasing the interest rate and decreasing aggregate expenditure.

3. Figure 12.8 [27.8] summarizes the *AD* curve:

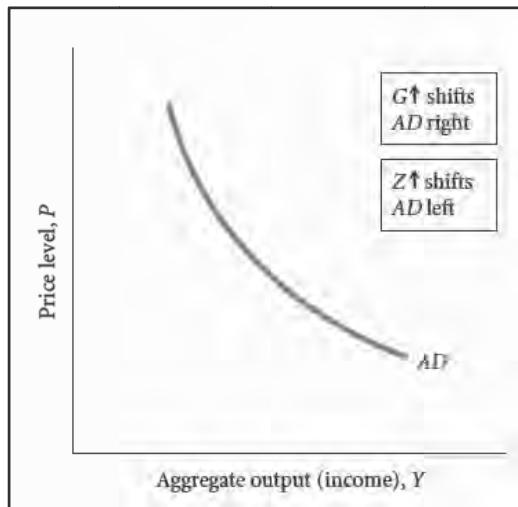


Figure 12.8 [27.8]

IV. The Final Equilibrium, pages 239-240

- A. Figure 12.9 [27.9] summarizes the *AD-AS* model:

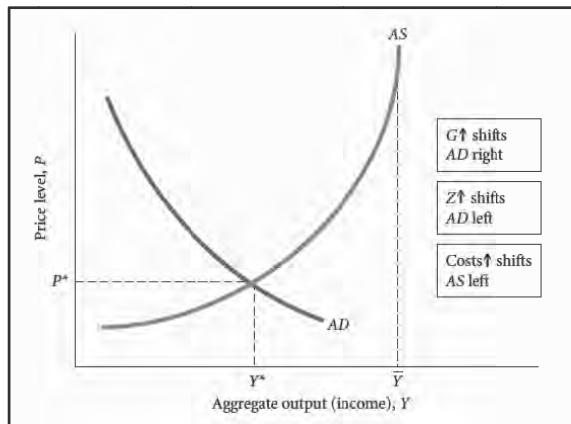


Figure 12.9 [27.9]

- B. Interpreting the *AD-AS* model.

1. At every point on the *AS* curve, firms make price and output decisions that maximize profits.
2. At every point on the *AD* curve there is equilibrium in both the goods and money markets.
3. At equilibrium, values of other endogenous variables (r , C , I) are determined.
4. The exogenous variables include G , T , Z , and exogenous cost changes that shift the *AS* curve.

TEACHING TIP: This chapter demonstrates another factor that affects the size of the expenditure multiplier—the price level. Recall from the fixed-price analysis of Chapter 12 [27] that an increase in government purchases leads to an increase in income and hence an increase in money demand. This places upward pressure on the interest rate and crowds out private investment. If the Fed accommodates the increase in money demand, it would appear that crowding out is no longer a problem. But this is not so when output prices are flexible.

In the short run, if the economy is near full capacity, then expansionary fiscal policy will not have much effect on aggregate output and employment. In the long run, an economy beginning at full employment will eventually return to the original output level. Thus, the rise in government spending will generally cause some crowding out, even in the case where the Fed accommodates. In this case, it is a rising price level that causes the crowding out: Investment spending will decrease (via the interest rate effect of a rising price level) and consumption spending will decrease (via the interest rate effect and the real wealth effect).

The implications can easily be demonstrated with a production possibilities curve. Label the vertical axis “private sector output” and the horizontal axis “government purchases.” From a point inside the production possibility frontier, both the private sector and the government can increase their consumption of goods and services, as the economic pie is expanding. This corresponds to operating with excess capacity in the AS-AD model. Once the frontier is reached, any further increase in government expenditure must come at the expense of private-sector output because the economic pie is now fixed.❶

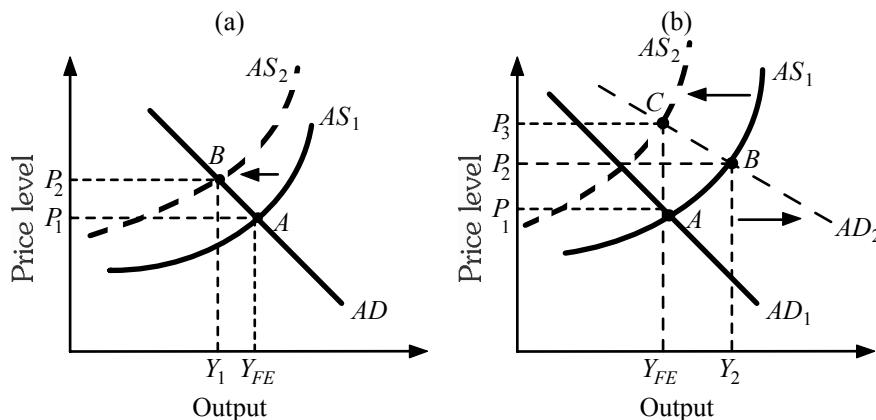
V. Other Reasons for a Downward-Sloping AD Curve

- A. In addition to planned investment, consumption spending also falls as the price level rises because of the higher interest rate.
- B. The *real wealth effect* is the change in consumption brought about by a change in real wealth that results from a change in the price level.

TEACHING TIP: The real wealth effect is also called the real balance effect. Some textbooks may call it the Pigou effect.❷

TEACHING TIP: In the late 1970s and early 1980s, newspaper columnists and TV commentators claimed that economists were “puzzled” or “confused” by stagflation. “Economists can explain falling output or they can explain rising prices,” the story went, “but they cannot explain why both occur at the same time.” The media were wrong, and you can demonstrate this with two simple explanations for stagflation with the AD-AS model.

The most direct explanation (and the one stressed in the text) is an adverse supply shock. In panel (a) of the diagram following, a supply shock (e.g., a rise in oil prices, a bad year for crops, an increase in inflationary expectations) shifts the AS curve leftward. Output declines from Y_{FE} to Y_1 , and the price level rises from P_1 to P_2 .



An alternative explanation is provided in panel (b), where stagflation arises as the natural aftermath of an expansionary demand shock (e.g., an increase in government spending or an increase in the money supply) in an economy already at full employment. In the diagram, the

economy is initially at point A, with full employment output (Y_{FE}) and price level P_1 . When the AD curve shifts to the right and, in the short run the economy moves along the AS curve to point B, with rises in both output (to Y_2) and prices (to P_2). But in the long run, the economy will end up at point C. The long-run adjustment process involves a leftward movement along AD_2 as rising input prices cause rising output prices. During this movement, the economy will experience both rising prices (from P_2 to P_3) and falling output (from Y_2 back to Y_{FE}).

VI. The Long-Run Aggregate Supply Curve, pages 240-242

- A. Variable production costs per unit lag behind price-level changes in the short run, but will eventually catch up with the overall price level. If costs and prices move in tandem in the long run, the long-run AS is vertical.

- B. *Potential GDP (potential output)* is the level of aggregate output that can be sustained in the long run without inflation.

TEACHING TIP: Read the above definition carefully. Case, Fair, and Oster use a very pragmatic description of potential GDP. Rather than worrying about the correct value for the natural rate of unemployment or the NAIRU they simply use a practical, measurable explanation.

1. Potential GDP lies to the left of the level of output at which the short-run AS curve becomes vertical.

a. A vertical short-run AS curve implies the economy is operating at 100 percent capacity. This is not sustainable in the long run since plants need some downtime for preventive maintenance.

b. As the economy approaches 100 percent capacity, wages begin to rise faster, causing the short-run AS curve to shift upward and moving the equilibrium back toward potential GDP.

2. Short-Run Equilibrium Below Potential GDP

a. The economy can be in a short-run equilibrium below potential GDP. (Equilibrium simply means planned spending equals actual output. That may or may not happen at potential GDP.)

b. If the economy is in a short-run equilibrium below potential GDP, the level of GDP may eventually rise. Below potential GDP there is cyclical unemployment meaning the labor market is not in equilibrium. The excess supply of labor will cause real wages to fall shifting AS to the right. This automatic adjustment works only if input prices fall when excess capacity and unemployment exist. (Economists are pretty sure the economy works like this. The remaining issue is how long it takes for the economy to return to full employment equilibrium on its own.)

Economics in Practice: The Simple “Keynesian” Aggregate Supply Curve, page 242

Some versions of the short-run AS curve show a kinked line. This AS curve is horizontal until full employment is reached, then takes a 90 degree turn north and immediately becomes vertical. The implications for adjustments to equilibrium are, of course, highly misleading.

Despite the fact that the kinked aggregate supply curve provides some insights, most economists find it unrealistic. It does not seem likely that the whole economy suddenly runs into a capacity “wall” at a specific level of output. As output expands, some firms and industries will hit capacity before others.

TEACHING TIP: Students are often troubled by the notion that potential or full employment output is less than the maximum output the economy can produce. They wonder how output could ever be beyond potential, or how it is possible to have employment beyond full employment. Explain that macroeconomists rather than engineers coined these terms. The idea is not to establish the maximum output the economy is physically capable of producing, but rather what the economy can sustain in the long run without causing a rising rate of inflation.

At levels of output above potential GDP, inflation becomes a problem. The inflation is caused by high demand for inputs. This leads to bottlenecks and delivery delays. This in turn puts upward pressure on input prices. As input prices rise the aggregate supply curve shifts to the left.

This can be seen most readily by examining the labor market. Remind students of the different types of unemployment they learned earlier (cyclical, frictional, and structural). At “full employment” there is no cyclical unemployment, but frictional and structural unemployment still exist. The levels of these types of unemployment are determined primarily by microeconomic forces (how quickly people find jobs, the availability of retraining, the prevalence of job-market discrimination, etc.). It is possible to overstimulate the economy with macroeconomic policy and cause a decrease in frictional and structural unemployment (as happened in the United States in the late 1960s, when the unemployment rate fell below 4 percent). However, this creates a shortage of workers in many job markets and leads to rapidly rising wages, a wage-price spiral, and a rising inflation rate.

Point out that the levels of structural and frictional unemployment in an economy are not carved in stone. They can be reduced in the long run with microeconomic policies. Indeed, in Japan, Sweden, and several other countries the “full-employment” rate of unemployment is lower than that in the United States, partly due to differences in microeconomic policies. Many European countries have much higher levels of structural unemployment due to inflexibilities in their labor markets. The only safe and sustainable role for macroeconomic policy, however, is the elimination or control of cyclical unemployment.❶

TEACHING TIP: At this point in the course, students have begun to see the power of monetary and fiscal policy to change the direction of the economy. But as economists often say, “There is no such thing as a free lunch.” The major trade-offs will be examined later on in the text, but some of the microeconomic issues will not. Hence, this might be the appropriate place to examine the microeconomic consequences of macroeconomic policies.

First, consider fiscal policy. As the text discusses, increasing government spending to expand the economy leads to crowding out of some private investment. Therefore, the composition of aggregate expenditure has changed, with the public sector’s portion of aggregate output becoming larger at the expense of private sector investment. If the economic “pie” is not growing as fast as government expenditure, then the government is siphoning off relatively more of society’s output for its own use. Individual choice is the motivating factor behind the operation of markets; and as the government consumes more of society’s output, market allocation of output begins to give way to political allocation of output. This may be good or bad depending on one’s belief in market allocation and one’s view of the efficiency of the government sector.

Lowering or raising taxes is another way to expand or contract the economy. But there are a variety of taxes and tax rates to lower or raise. Which ones should be changed? If income tax rates are altered, the risk is changing the progressivity of the income tax system even though that is not the objective. If excise taxes are chosen, then some portions of society will bear a disproportionate burden of “adjusting” the macroeconomy to the desired level. Similar arguments can be made concerning transfer payments. If transfer payments (such as welfare, unemployment compensation, and social security) are raised, the rewards for not working are increased. This clearly is not fair to those who are working. Alternatively, if transfer payments are cut, then the poor, the elderly, and the unemployed bear the burden of “adjusting” the macroeconomy to its desired level.

Next, consider monetary policy. Sectors of the economy that are the most sensitive to changes in interest rates will be affected the most. The housing industry has cried “foul” for years over the Fed’s incessant tinkering with interest rates to achieve macroeconomic objectives. The automobile industry is similarly affected. This also raises consumer equity issues, as lower-income consumers may be most hurt by tighter credit conditions.

TEACHING TIP (continued)

Although time constraints may force instructors to gloss over the microeconomic consequences of macroeconomic policy making, one should not forget that there are important normative issues involved.

Unique Economics in Practice

Monetary policy in the years from 1975 to 1982 is fascinating. If the class seems interested, ask them to do some research on the Fed during this period to prepare for a class discussion. The discussion may mention G. William Miller, President Carter's first Fed chairman. Miller's monetary policy was targeting the Federal Funds rate. Unfortunately, with both interest rates and inflation high and volatile, the bond and money markets were very sensitized to inflation. Therefore, when interest rates started to rise because of an increase in expected inflation, Miller simply increased the money supply. This actually raised inflation expectations, putting more upward pressure on interest rates. President Carter quickly replaced Miller with Paul Volcker who changed the policy target to monetary aggregates. The result was a very sharp recession—and the end to high inflation.

Question: Why did interest rates rise when monetary policy was expansionary?

Answer: The market believed the increase in the money supply would lead to more inflation. This was factored into the nominal interest rate via the Fisher equation. Make sure students understand there are periods when targeting the nominal interest rate is not such a good idea..

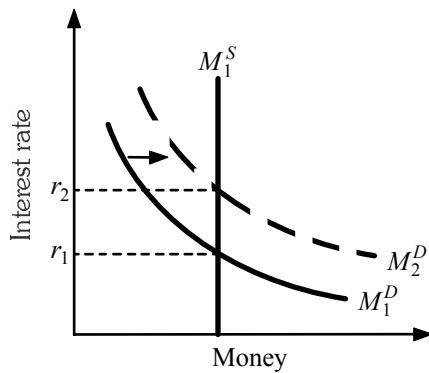
Extended Application**Application 1: Budget Deficits and the Money Supply**

It is easy to become confused about the link between budget deficits and the money supply. Students often hear that governments finance their budget deficits by “printing money.” The recent hyperinflations in the nations of Eastern Europe serve to reinforce this idea. Remind students that in many countries the central bank is part of the government. Since the government directly controls both fiscal and monetary policy, they can, in effect, finance a deficit by printing money. The government simply sells the newly issued bonds directly to the central bank.

In these countries, the ability to raise tax revenue is limited by poor enforcement and accounting standards, and the ability to borrow is constrained by lack of faith in the government’s ability to honor its debts. Thus, when government spending exceeds tax revenue, these governments simply order more money to be issued by their central banks.

In the United States (and many other developed countries) the link between budget deficits and the money supply is not so simple. In the United States, if the Treasury spends more than it collects in tax revenue, it must finance the resulting deficit by borrowing funds from the public, which it does by selling U.S. Government bonds. As students have learned in Chapter 10 [23], only the Federal Reserve can create money. The Fed is not part of the U.S. government. The fact that the government is operating with a deficit does not necessarily mean that the Fed will choose to increase the money supply. However, the Fed may very well be pressured to increase the money supply in response to a budget deficit. Whether this pressure will be effective depends on the strength and independence of the Fed chairman. Hence there may sometimes be an indirect link between the U.S. budget deficit and money creation.

To better understand this link, consider an economy that begins with a balanced budget, but now runs a deficit by increasing government spending or reducing taxes. This will stimulate output, and the increase in output (income) will increase money demand. In the following diagram, the money demand curve shifts to the right (from M_1^D to M_2^D) and the interest rate rises (from r_1 to r_2). The rise in the interest rate will crowd out private-sector investment spending (and also consumption of durable goods). Thus, even though aggregate output is increasing, in some industries output will decrease and workers will be laid off. (Industries sensitive to interest rate changes include automobile and housing as well as the industries that serve them, e.g., steel, rubber, and cement.) These sectors of the economy are highly unionized and their representatives—union leaders and industry associations—will begin to put pressure on the Fed to increase the money supply and force interest rates back down.

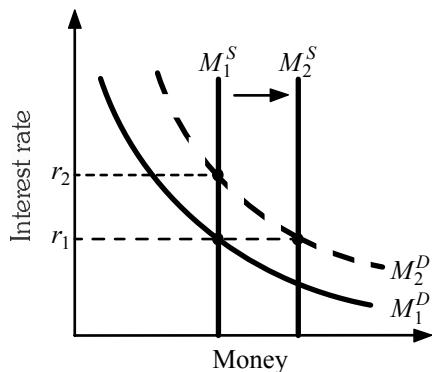


This is close to what happened during the early 1980s. The Reagan administration, with congressional approval, increased government spending (mostly for defense) and lowered taxes, thus creating a large budget deficit. At the same time, Fed chairman Paul Volcker was tightening the money supply in an attempt to fight inflation. The result was skyrocketing interest rates and a severe recession, with the greatest impact in the automobile, housing, and heavy industrial sectors. These sectors began pushing for easier money and lower interest rates. In one public relations campaign, the housing industry convinced citizens to mail to Paul Volcker “the keys to the new house you can’t afford to buy.” Thousands of keys arrived on Volcker’s desk.

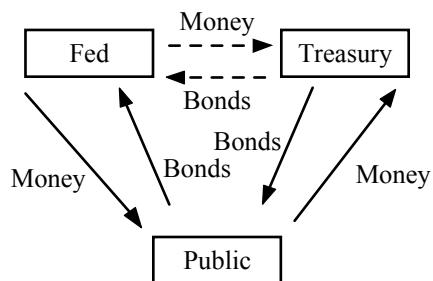
But what makes the Fed respond to this pressure to increase the money supply? Isn’t the Fed an independent agency? The answer is yes, but...the Fed was created by an act of Congress, and it can also be destroyed or altered by an act of Congress. In periods of rising interest rates, it isn’t long before some senator or congressman introduces a bill designed to limit the independence of the U.S. Federal Reserve. Recent proposals have included allowing the U.S. president to appoint the presidents of the Fed’s 12 regional banks; requiring the Federal Open Market Committee (FOMC) to release timely, detailed minutes of its private meetings; requiring the Fed to invite representatives of the U.S. Treasury to FOMC meetings; and even giving the U.S. secretary of the Treasury an automatic seat on the Fed board of governors.

Another approach that has been taken from time to time is raising legal issues surrounding the Federal Reserve Act itself. Many constitutional scholars believe the Federal Reserve Act is unconstitutional. The U.S. Constitution gives Congress the power to “coin money.” In the Federal Reserve Act Congress has delegated this authority to the Fed. Other similar situations have been declared unconstitutional by the Supreme Court. No test case has made it to the Supreme Court (so far). It will be interesting to see what the Court decides if such a case ever is appealed to them.

Fed officials view their independence as the key to keeping inflation rates low in the United States. Thus, even though they know that increasing the money supply in an inflationary economy will likely exacerbate the inflation, they sometimes succumb to pressure. This is illustrated in the diagram following, where the money supply curve shifts rightward (from M_1^S to M_2^S), bringing the interest rate back down to r_1 , and thus preventing any crowding out in interest-sensitive sectors of the economy.



When the Fed increases the money supply to purchase part of the new debt caused by a current government budget deficit they are “monetizing the deficit.” In many ways, the final result of monetization is very similar to what happens in less-developed countries, where the link between the deficit and money creation is more direct. To see this similarity, recall from Chapter 10 [23] that the Fed’s chief tool for changing the money supply is open market operations. In this case, to increase the money supply the Fed would purchase government bonds from the public and replace them with reserves (money). These government bonds are the very same bonds that the U.S. Treasury issued to finance its deficit! The process is illustrated in the next diagram.



To finance its deficit, the U.S. Treasury has sold bonds to the public in exchange for money. To monetize the deficit, the Fed now buys back these bonds from the public in exchange for money. In the diagram, these actual exchanges are shown with solid arrows. But the net result is that the Treasury’s bonds end up at the Fed, and the money created by the Fed ends up at the Treasury. It is almost as if the Treasury and the Fed—two parts of the government—simply made the exchange with each other. This “as if” result is illustrated with dashed arrows in the diagram.

To conclude, an increase in the budget deficit does indeed often lead to an increase in the money supply. But in developed countries like the United States, the process is not as simple as “the government printing additional money to finance its deficit.” First, only a portion of the government’s deficit is typically monetized. Second, the link between budget deficits and the money supply is an indirect one, resulting from the interaction of economic, institutional, and political forces.

Policy Effects and Costs Shocks in the AS/AD Model

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Fiscal Policy Effects *p. 247*

Fiscal Policy Effects in the Long Run

Monetary Policy Effects *p. 253*

Long-Run Aggregate Supply and Policy Effects

Causes of Inflation *p. 249*

The Fed's Response to the Z Factors

Shape of the *AD* Curve When the Fed Cares More About the Price Level than Output

What Happens When There is a Zero Interest Rate Bound?

Shocks to the System *p. 252*

Cost Shocks

Demand Side Shocks

Expectations

Monetary Policy since 1970 *p. 255*

Inflation Targeting

Looking Ahead *p. 257*

DETAILED CHAPTER OUTLINE

- I. Introduction, page 247
 - A. Debates in Congress about the government budget are often based on ideology.
 - B. Nevertheless, Congressional decisions have real impacts on the economy.
- II. Fiscal Policy Effects, pages 247-250
 - A. In Chapter 12 we learned about the effects of government spending (G) and net taxes (T) on the economy.
 - 1. The tax multiplier is smaller than the government spending multiplier.
 - 2. An increase in G or a decrease in T both shift the AD curve to the right.
 - 3. Any expansionary fiscal policy will increase both output and the price level. The issue is how much each will increase. That depends critically on where the economy is on the AS curve.
 - 4. Expansionary fiscal policy works well on the flatter portion of the AS curve, but not so well on the steep part.
 - TEACHING TIP: If the government engages in expansionary policy when the economy is near full employment, the government has made a major mistake. However, this has happened before. In the early 1970's President Lyndon Johnson increased spending for both his "war on poverty" and the actual war in Vietnam. By the time he decided to increase taxes, it was too late. The economy was already overheating. ◀
 - B. Fiscal Policy Effects in the Long Run
 - 1. Most economists believe the long run AS curve is vertical. That implies fiscal policy has no long run effect on the economy.
 - 2. However, there is a great deal of disagreement about the exact number of years it takes for an economy to get to long-run equilibrium on its own.
 - 3. Some economists believe the economy can remain at an equilibrium below full employment for many, many years.
 - TEACHING TIP: The standard classroom experiment begins with an economy in equilibrium at full employment. An expansionary fiscal policy then pushes the economy to above full employment. Eventually wages adjust and the economy returns to full employment. However, if the economy is not initially at full employment, fiscal policy may reduce the time it takes to reach potential GDP. ◀
- III. Monetary Policy Effects, pages 250-253
 - A. Introduction
 - 1. The Fed controls monetary policy following the Fed rule.
 - 2. The interest rate the Fed chooses (r) depends on output (Y), the price level (P), and other factors (Z).
 - B. The Fed's Response to the Z Factors
 - 1. An increase in Z (such as a favorable cost shock) will cause the Fed to tighten monetary policy to keep the economy from overheating.
 - 2. Expansionary and contractionary monetary policies in response to changes in Z have the same issues as changes in G or T .

C. Shape of the *AD* Curve When the Fed Cares More About the Price Level than Output

1. Recall the Fed rule:

$$r = \alpha Y + \beta P + \gamma Z$$

2. If α is large compared to β the *AD* curve will be fairly flat (Figure 13.3[28.3]).
3. A central bank that uses inflation targeting is (in effect) assigning a value of zero to β .

***Economics in Practice: Alternative Tools for the Federal Reserve,
page 251***

Even when interest rates are at the zero bound, there are still things the Fed has done to stimulate the economy. First, they purchased government bonds with longer maturities. Second, they began issuing "forward guidance," basically a statement about what policies they expect to follow in the future.

C. What Happens When There is a Zero Interest Rate Bound?

1. The *zero interest rate bound* means the interest rate cannot go below zero.
2. Since 2008 the Fed has maintained an interest rate of zero. But the real economy remains below full employment with sluggish growth. That suggests the markets may be calling for a negative interest rate.
3. A *binding situation* describes the state of the economy in which the Fed rule calls for a negative interest rate.
4. In a binding situation the *AD* curve becomes vertical. Monetary policy (in its simplest form) can no longer affect real output.
5. However, changes in government spending and/or net taxes will shift the *AD* curve.
6. It is technically impossible for a vertical *AD* curve to exist in the neighborhood of the vertical part of the *AS* curve.

IV. Shocks to the System, pages 253-256

A. Cost Shocks

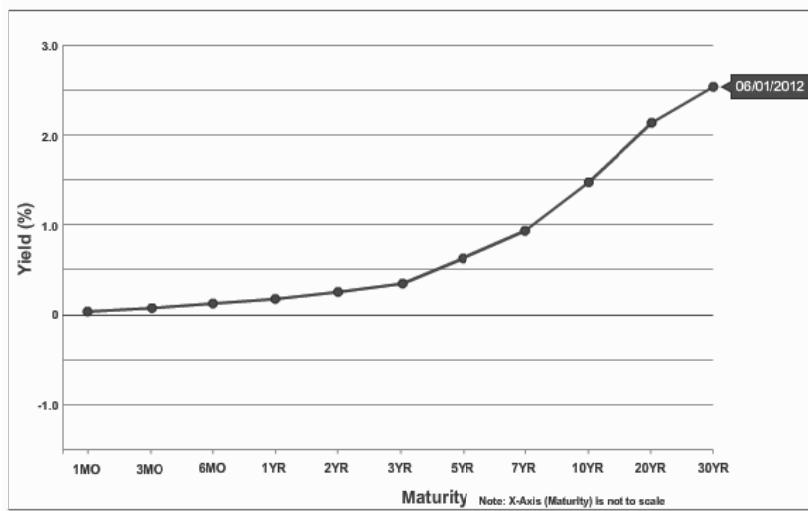
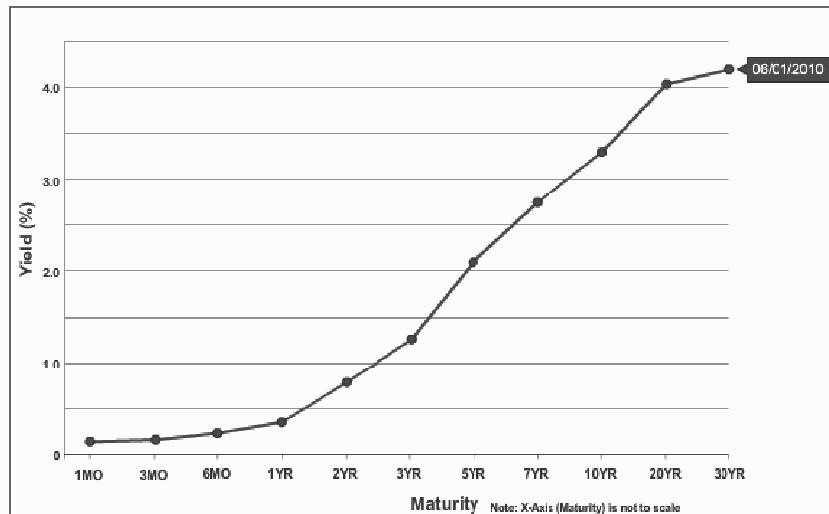
1. Suppose an adverse cost shock hits the economy. This shifts the *AS* curve to the left. The economy is in a state of stagflation.
2. The Fed rule determines whether the Fed will fight the output decrease (α is large relative to β) or the inflation (β is large relative to α).
3. If the economy is in a binding situation an adverse cost shock will affect only the price level.
4. *Cost-push inflation (supply-side inflation)* is inflation caused by an increase in costs. This leads to *stagflation* with output falling and prices rising.

Unique Economics in Practice

The Excel workbook for this chapter includes the Fed's H.4.1 report for January 30, 2013. Look at row 21. The Fed has shifted completely out of T-bills (maturities less than one year) and into notes and bonds (maturities greater than one year).

Question: Has the Fed's policy of lengthening the maturity structure of its government bond portfolio worked?

Answer: Comparing the yield curves for June, 2010 and June, 2012, the 30 year yield fell by 1.5 percentage points (150 basis points). The yield curve itself was noticeably flatter. The Fed's policy seems to have worked in that long-term interest rates were reduced.



B. Demand-Side Shocks

1. *Demand-pull inflation* is inflation that is initiated by an increase in aggregate demand.
2. Unlike cost-push inflation, demand-pull inflation causes higher inflation and greater output.
3. Demand shocks can be caused by factors other than fiscal or monetary policy. Changes in expectations are a good example.

Economics in Practice: A Bad Monsoon Season Fuels Indian Inflation,
page 255

In 2012 Indian monsoons produced less rain than usual. The rice crop fell dramatically, causing a large price increase. Rice is a staple of the Indian diet. With inflation already at 10 percent, the Indian government struggled to manage this supply shock..

C. Expectations

1. Expectations have important impacts on the economy. But they are difficult to quantify and even harder to forecast.
2. If inflation has been 10 percent per year for several years, people and businesses probably expect 10 percent inflation next year. *Adaptive expectations* can increase the time it takes for contractionary policies to reduce the inflation rate.
3. Central banks regularly conduct surveys to determine inflation expectations.

V. Monetary Policy since 1970, pages 256-258

TEACHING TIP: The data and graph for Figure 13.7 [28.7] are included in the Excel workbook for this chapter..

A. Introduction

1. Since 1970 there have been five recessions and two periods of high inflation.
2. The periods of recession and inflation overlap during the late 1970s and early 1980s. This is the period of stagflation in the U.S.
 - a. During periods of high inflation the Fed generally raised interest rates.
 - b. The interest rate rose to about 15 percent in mid-1980. This high interest rate was engineered by the Fed (specifically Paul Volcker) to get rid of the persistent inflation of the 1970s. When the unemployment rate approached 10 percent, the Fed realized their policy had been too contractionary and they opened the monetary floodgates. The result was a decline in interest rates despite the Reagan tax cuts. There was no crowding out.
3. The Fed generally had high interest rates in the 1970s and early 1980s as it fought inflation. Since 1983, inflation has been low by historical standards, and the Fed focused in this period on trying to smooth fluctuations in output.
4. Beginning in 2008 IV the Fed reduced U.S. interest rates to near zero. That meant their best tool to fight the recession was exhausted.

5. But the Fed had also been buying large quantities of mortgage-backed securities, hoping the banks would lend these newly-created reserves. Unfortunately, banks decided to hold vast quantities of excess reserves instead.

Unique *Economics in Practice*

Interest rates are zero. Banks are holding huge quantities of excess reserves. And the Fed chairman, Ben Bernanke, is notable for the creative policies he has invented during this episode.

Question: What creative policies might Dr. Bernanke follow to induce banks to lend?

Answer: The answer depends on what you believe is the cause of the lack of lending. If the problem is the supply side (banks are not willing to lend), then a policy such as negative interest rates on bank reserves (a tax on reserves) might do some good. However, banks might elect to simply hold most of their reserves as cash. At the very least the Fed should reduce any interest it pays on reserve deposits to zero.

On the other hand if the problem is lack of loan demand, there's really not much more the Fed can do at this point.

B. Inflation Targeting

1. *Inflation targeting* occurs when a monetary authority chooses its interest rate values with the aim of keeping the inflation rate within some specified band over some specified horizon.
2. Inflation targeting is a special case of monetary policy in which all the weight is on the inflation rate and no weight is assigned to output. In other words, α is zero in the Fed rule.
3. Inflation targeting became an issue in 2006. Then newly-appointed Fed chairman Ben Bernanke had published a number of papers advocating inflation targeting. As the text correctly notes, Dr. Bernanke has been much more pragmatic now that he is head of the central bank of the U.S.

TOPIC FOR CLASS DISCUSSION:

Many students do not know that businesses employ quite a few economists. One source for information about the various roles these economists play is the National Association for Business Economics (NABE, <http://www.nabe.com>). As of November, 2010, NABE had 2,400 members. Among other activities, NABE members can join one (or more) roundtable groups. A list is available on the web site. Divide the class into groups, assign each group a roundtable, and have them look for some of the interesting jobs economists in that group hold. ■

VIII. Looking Ahead, page 258

We now need to add the labor market to our analysis.

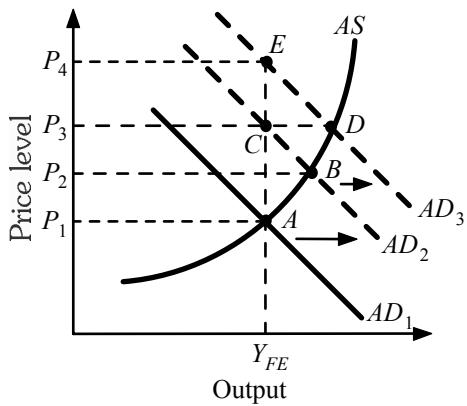
Extended Applications

Application 1: Federal Reserve Dilemmas

Once students have grasped the basics of the *AS-AD* model—which shows how prices change—they are in a position to appreciate more fully the dilemmas faced by the Federal Reserve. This application is an extension of the application in Chapter 12 [27] but it can also be presented independently.

For a variety of reasons, including tradition, internal culture, and governmental division of labor, the Fed seems to regard controlling inflation as its primary responsibility. To do so often requires compromising other important goals, such as full employment, a high growth rate, and a stable dollar.

Consider first the case of an aggregate demand shock, say, an increase in government spending in an economy already at full employment. In the following diagram, the AD curve shifts rightward (from AD_1 to AD_2) and in the short run the economy moves from point A to point B , with the price level rising from P_1 to P_2 . The Fed's choices can be simplified to the following three: (a) do nothing; (b) prevent any rise in the interest rate; or (c) prevent inflation.

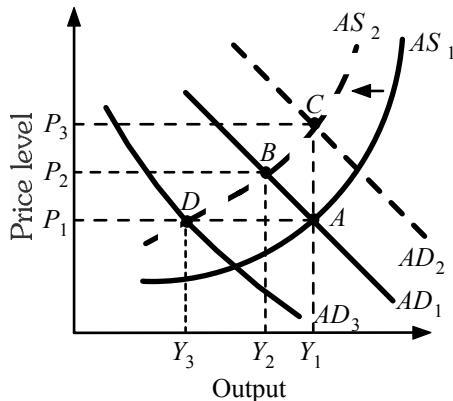


Because at point B the economy is beyond full employment output, choice (a)—which leaves the AD curve at AD_2 —will lead to rising costs in the long run, and the economy will move to point C as the AS curve shifts leftward and the economy returns to full employment. Thus choice (a) leads not only to the initial price rise (from P_1 to P_2) but to a further price rise in the long run (from P_2 to P_3 .)

To maintain a high level of investment and a high growth rate for the economy, the Fed might be tempted (or pressured) to make choice (b) and prevent the interest rate from rising. But this requires an increase in the money supply (see the application in Chapter 12 [27], which causes a further rightward shift, of the AD curve (to AD_2). Now the economy will move from point A to point D in the short run, and to point E in the long run. Note that the rise in the price level is now greater, both in the short run (from P_1 to P_3) and over the long run (from P_3 to P_4).

Finally, choice (c) requires the Fed to reduce the money supply to prevent any inflation from occurring. This will shift the AD curve back to its original position (AD_1). But the decrease in the money supply will force up the interest rate even more than in choice (a), causing more crowding out of investment spending. This not only causes unemployment and pain in interest-sensitive sectors of the economy, but also restrains growth in the capital stock and output.

The dilemma is even worse in the case of an adverse supply shock, say, a rise in oil prices. Now the AS curve shifts left (from AS_1 to AS_2). In the diagram below, the economy moves from point A to point B , with both rising prices and falling output. Once again, the Fed has three choices: (a) do nothing; (b) prevent the fall in output; (3) prevent inflation.



Choice (a) requires the Fed to accept a (perhaps modest) rise in both prices and unemployment. Choice (b) requires the Fed to increase the money supply and shift the AD curve to the right (from AD_1 to AD_2) causing the price level to rise further to P_3 . Finally, choice (c) requires the Fed to decrease the money supply, shifting the AD curve leftward (from AD_1 to AD_3), moving the economy from point B to point D and worsening the fall in output. At the same time, choice (c) results in a higher interest rate, and therefore lower investment and slower growth.

An understanding of the inflationary consequences of AD and AS shifts—and the further output and price level effects of Fed policies—helps us see why the Fed has so often been in conflict with the president, Congress, and various interest groups.

Application 2: A Numerical Example of the AS-AD Model

This example requires some compromises in the interest of manageability. In a realistic model, the aggregate demand and supply curves would be nonlinear. Also, the effects of the price level on aggregate demand would enter through several channels, as in the $IS-LM$ model. The following simple linear model—which can be presented in class or assigned as homework—avoids all of these difficulties.

Give students the following behavioral equations for aggregate expenditure:

$$C = 100 + 0.9Y_d - 20P$$

$$I_p = 400 - 40P$$

$$G = 300$$

$$T = 100$$

An increase in the price level causes a drop in both investment and consumption expenditures. The terms $-20P$ and $-40P$ summarize the effect of the price level on total spending, via the interest rate and real wealth effects discussed in the text.

Solve for equilibrium Y (which will depend on the price level) as follows:

$$\begin{aligned}E_p &= C + I_p + G \\E_p &= [100 + 0.9(Y - 100) - 20P] + [400 - 40P] + 300 \\E_p &= 710 + 0.9Y - 60P \\\text{Equilibrium means } E_p &= Y = Y_e \\Y_e &= (10)(710 - 60P) \\Y_e &= 7,100 - 600P\end{aligned}$$

This is the equation for the AD curve. It shows that each one-unit rise in the price level causes output to fall by \$600 billion.

Next, present the following equation for the AS curve:

$$P = 1.41 + 0.0001Y$$

Substitute the AS equation for P in the AD equation and solve:

$$\begin{aligned}Y &= 7,100 - 600(1.41 + 0.0001Y) \\Y &= 7,100 - 846 - 0.06Y \\1.06Y &= 6,254 \\Y &= 5,900\end{aligned}$$

Substitute 5,900 into the AS curve to obtain:

$$P = 1.41 + 0.0001(5,900) = 2.0$$

Next, solve for the components of GDP: C , I , and G . From the consumption equation, $C = 100 + 0.9(5,900 - 100) - 20(2.0) = 5,280$. From the investment equation, $I = 400 - 40(2.0) = 320$. Government spending is 300. As a check, sum C , I , and G to obtain equilibrium output: $5,280 + 320 + 300 = 5,900$.

Finally, explore the consequences of a rise in government spending from 300 to 400. The aggregate demand equation now becomes:

$$\begin{aligned}E_p &= C + I_p + G \\E_p &= [100 + 0.9(Y - 100) - 20P] + [400 - 40P] + 400 \\E_p &= 810 + 0.9Y - 60P \\\text{Equilibrium means } E_p &= Y = Y_e \\Y_e &= (10)(810 - 60P) \\Y_e &= 8,100 - 600P\end{aligned}$$

Once again, substitute the *AS* equation for P in the *AD* equation and solve:

$$Y = 8,100 - 600(1.41 + 0.0001Y)$$

$$Y = 8,100 - 846 - 0.06Y$$

$$1.06Y = 7,254$$

$$Y = 6,843.40$$

Substitute 6,843.40 into the *AS* curve to obtain:

$$P = 1.41 + 0.0001(6,843.40) = 2.094$$

Next, solve for the components of GDP: C , I , and G . From the consumption equation, $C = 100 + 0.9(6,834.40 - 100) - 20(2.094) = 6,119.08$. From the investment equation, $I = 400 - 40(2.094) = 316.24$. Government spending is 400.

Government spending is now 400. As a check, again sum C , I , and G to obtain equilibrium output: $6,119.08 + 316.24 + 400 = 6,835.32$ (slight difference due to rounding). Observe that although the increase in government spending has increased output (from 5,900 to 6,843.40), it has crowded out investment spending (which declined from 320 to 316.24). Consumption spending, on the other hand, has increased (from 5,280 to 6,127.18); although the rise in the price level works to decrease consumption spending, the rise in income works to increase it, and the latter effect was dominant in this case.

The Labor Market in the Macroeconomy

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Labor Market: Basic Concepts p. 263

The Classical View of the Labor Market p. 264

The Classical Labor Market and the Aggregate Supply Curve
The Unemployment Rate and the Classical View

Explaining the Existence of Unemployment p. 266

Sticky Wages
Efficiency Wage Theory
Imperfect Information
Minimum Wage Laws
An Open Question

The Short-Run Relationship Between the Unemployment Rate and Inflation p. 270

The Phillips Curve: A Historical Perspective
Aggregate Supply and Aggregate Demand Analysis and the Phillips Curve
Expectations and the Phillips Curve
Inflation and Aggregate Demand

The Long-Run Aggregate Supply Curve, Potential GDP, and the Natural Rate of Unemployment p. 275

The Nonaccelerating Inflation Rate of Unemployment (NAIRU)

Looking Ahead p. 277

DETAILED CHAPTER OUTLINE

- I. Introduction, page 263
 - A. Wages and the *AS* curve
 - 1. Sticky wages cause the short-run *AS* curve to slope upward.
 - b. If wages are completely flexible and synchronized with the price level, the short-run *AS* curve will be vertical.
 - B. Remember, unemployment is one of the main concerns of macroeconomics. Therefore labor markets are the focus of a lot of our research.
- II. The Labor Market: Basic Concepts, pages 263-264
 - A. Basic Definitions and Unemployment
 - 1. On the first Friday of every month the BLS releases the employment and unemployment report for the previous month. This report includes data on each of the variables defined here.
 - 2. The labor force (*LF*) equals the number of people employed (*E*) plus the number of people unemployed (*U*): $LF = E + U$
 - 3. The *unemployment rate* is the number of people unemployed as a percentage of the labor force (*U/LF*).
 - 4. To be unemployed a person must be out of a job and actively looking for work. When people stop looking for work they are no longer in the labor force (discouraged workers and others marginally attached to the labor force).
 - 5. Frictional unemployment and structural unemployment are inevitable and in many ways desirable. Movement among jobs is a sign the economy is functioning well.
 - a. *Frictional unemployment* is the portion of unemployment that is due to the normal working of the labor market; used to denote short-run job/skill matching problems.
 - b. *Structural unemployment* is the portion of unemployment that is due to changes in the structure of the economy that result in a significant loss of jobs in certain industries.
 - c. *Cyclical unemployment* is the increase in unemployment that occurs during recessions and depressions.
 - 6. We are most concerned with cyclical unemployment.
 - B. Employment
 - 1. Employment tends to fall when aggregate output falls and to rise when aggregate output rises.
 - 2. A decline in the demand for labor does not necessarily mean that unemployment will rise. If the quantity of labor demanded and the quantity of labor supplied are brought into equilibrium by rising and falling real wage rates there should be no persistent unemployment above the frictional and structural amount. This was the classical view.

3. Virtually every economist believed the classical model of the labor market before 1930. Even today you can find a number of economists who still subscribe to the classical doctrine.

TOPIC FOR CLASS DISCUSSION:

Ask students to imagine they have just been laid off or fired. Then ask them to list the reasons this happened. Their list will probably include some of the following:

- Marketing didn't understand the product.
- Sales didn't know how to sell the features.
- Engineering didn't bother to ask customers what they wanted.
- Management was incompetent.
- Foreign firms started producing the same good and sold it here at a lower price.

Ask them how many of them would immediately take a lower-paying job because they realized they had been laid off due to an inward shift of the demand for labor curve caused by a decrease in aggregate demand. Probably not many will raise their hands; watch for smiles on the faces of those who do. Point out that the time they spend unemployed and gathering information about the causes of their unemployment is one reason cyclical unemployment persists for such a long time. ■

III. The Classical View of the Labor Market, pages 264-266

A. Introduction

1. The wage rate adjusts quickly to make the quantity of labor demanded equal the quantity of labor supplied. Therefore cyclical unemployment cannot exist.
2. The *labor demand curve* is a graph that illustrates the amount of labor that firms want to employ at each given wage rate.
3. The *labor supply curve* is a graph that illustrates the amount of labor that households want to supply at each given wage rate.
4. Like any other market, the labor market will achieve the socially optimal result if left to its own devices.
 - a. Individuals who stay out of the labor force place a higher value on their time than do potential employers.
 - b. There is always full employment in the sense that the quantity of labor demanded will equal the quantity supplied.

B. The Classical Labor Market and the Aggregate Supply Curve

1. Wages respond quickly to price changes.
2. The short-run AS curve is therefore vertical (or almost vertical).
3. Monetary and fiscal policies have little or no effect on output and employment.

C. The Unemployment Rate and the Classical View

1. How do classical economists explain long periods of high unemployment?
 - a. The unemployment rate may not be a good measure of how well labor markets are working.
 - b. Classical economists argue that virtually all unemployment is voluntary.

2. According to the classical view cyclical unemployment is caused by the stubborn refusal of workers to accept lower-paying jobs quickly.
 3. Unfortunately, classical economists have to deal with the facts of the Great Depression. When the unemployment rate is 25 percent it's very hard to argue that high unemployment is caused by workers' reluctance to accept lower wage offers.
- TEACHING TIP:** It is difficult to determine whether a given instance of unemployment should be regarded as "voluntary" or "involuntary." The fact that someone is looking for work and has not yet found it does not necessarily mean his or her unemployment is involuntary. Reasonable people can disagree about the proper classification. Suppose—as in job-search unemployment—that someone turns down a job offer in hopes of an even better one later? Suppose the job offer is located in a different part of the country, but the individual does not want to move? Suppose the individual has an unrealistic idea of his value to a firm and holds out for an unrealistically high wage offer? Ask students for their opinions in each case, and point out to them the extent of the disagreement among them. This will suggest some of the difficulties involved in interpreting the official "unemployment rate" as a measure of involuntary unemployment.

But make sure you read the Unique *Economics in Practice* below. ◀

Unique *Economics in Practice*

The July 6, 2010 edition of the New York Times included an article titled "American Dream Is Elusive for New Generation" (<http://www.nytimes.com/2010/07/07/business/economy/07generation.html>). The case of Scott Nicholson sitting home alone in his parents' Grafton, Massachusetts, house was intended to illustrate the plight of recent college graduates. Mr. Nicholson, 24, had recently graduated from Colgate University with several academic distinctions. After mailing four or five resumés a week for five months, he got an offer from the Hanover Insurance Group. The job was assistant claims adjuster, paying \$40,000 per year. Mr. Nicholson believed this was a "dead-end job" and turned it down.

Question: Was Mr. Nicholson involuntarily unemployed?

Answer: Read the entire article. It's difficult to call this involuntary unemployment.

IV. Explaining the Existence of Unemployment, pages 266-269

- A. Unemployment is a problem.
 1. Many economists agree that high unemployment is a major problem.
 2. We need to understand the reasons for high unemployment so we can be sure our policy prescriptions will actually address the cause of the problem.
- B. *Sticky Wages* is the term economists use to describe the downward rigidity of wages as an explanation for the existence of unemployment.
 1. Wages tend to be sticky downward. This explains unemployment because wages will not adjust quickly to clear the labor market.
 2. However, there is no clear explanation as to why wages are sticky. Some possibilities:
 - a. *Social or Implicit Contracts* are unspoken agreements between workers and firms that firms will not cut wages. A related argument is the *relative-wage explanation of unemployment*, an explanation for sticky

wages (and therefore unemployment): If workers are concerned about their wages relative to other workers in other firms and industries, they may be unwilling to accept a wage cut unless they know that all other workers are receiving similar cuts.

- b. *Explicit Contracts* are employment contracts that stipulate workers' wages, usually for a period of 1 to 3 years. Wages set in this way do not fluctuate. Firms and workers are willing to bind themselves because the cost of negotiating wages is high. Some contracts include *cost of living adjustment (COLA)* clauses tying wages to changes in the cost of living. The greater the inflation rate, the more wages are raised.

***Economics in Practice: Congress Extends Unemployment Insurance,
page 268***

Unemployment compensation cushions the shock of unexpected unemployment, providing temporary income to people recently laid off. It is an important automatic stabilizer. Standard benefits typically last for 26 weeks. But during the 2008-2009 recession Congress extended the covered time period to as much as 47 weeks. Naturally, there are also incentive effects. Someone receiving unemployment compensation has less incentive to search for a job. Economists who have studied this issue have come down on both sides. But it seems clear that, when the economy is in a deep recession, few unemployed people are turning down jobs just because they are getting unemployment benefits.

- C. *Efficiency Wage Theory* is an explanation for unemployment that holds that the productivity of workers increases with the wage rate. If this is so, firms may have an incentive to pay wages above the market-clearing rate.

1. Efficiency wages are wage rates employers pay to workers above the market-clearing wage.
2. Efficiency wages are actually efficient given these costs because the higher wage rate reduces labor turnover, improves morale, and reduces "shirking."
3. While the efficiency wage theory is attractive, it is unlikely to account for much of the observed large cyclical fluctuations in unemployment over time.

TEACHING TIP: Another reason for paying efficiency wages is to prevent labor turnover. This has been observed in labor markets during recessions. Firms rarely lay off as many workers as neoclassical theory would suggest. This, in turn, causes the procyclical behavior of productivity. ◀

- D. Imperfect Information

1. Firms and workers do not know the actual current labor demand and supply curves, so they do not know the current equilibrium wage.
2. Since wages are set by trial and error the current wage may not be the equilibrium wage.
3. In this view, unemployment is merely an efficient means for gathering information about the state of the labor market.

***Economics in Practice: The Longer You are Unemployed,
the Harder it is to Get a Job, page 269***

Recent research seems to support the intuitively appealing idea that the longer someone is out of work the more difficult it becomes to get a job—or even an interview. It's reasonable to believe that employers were using the long period of unemployment to infer low worker quality.

E. *Minimum Wage Laws* set a floor for wage rates – that is, a minimum hourly rate for any kind of labor.

1. Minimum wage laws explain some fraction of unemployment, especially among teenagers.
2. If the minimum wage is \$7.25 but the marginal revenue product of labor of a job-seeker is \$6.90, no one will hire the applicant. People with low MRP_L include teenagers who have dropped out of school, anyone with few skills, and some recent immigrants.

TEACHING TIP: the minimum wage in the United States is set in nominal terms. Inflation reduces the real minimum wage. The minimum wage only affects the labor market if the real minimum wage is above equilibrium. This may not always be true. (See Extended Application 1 on page 177 for data on the nominal and real minimum wage in the U.S.)

F. An Open Question

1. There are many possible explanations of high unemployment.
2. It seems likely that each of the theories contributes somewhat to high unemployment. The theories are complements not substitutes.

V. The Short-Run Relationship Between the Unemployment Rate and Inflation,
pages 270-274

A. Unemployment and Inflation

1. The relationship (if any) between these two variables has been debated for over 50 years. Most macroeconomists are now convinced that there is a short-run tradeoff between the unemployment rate and inflation.
2. In the short run a lower unemployment rate can only be achieved by accepting a higher inflation. However, the definition of “short run” depends strongly on the speed of adjustment of inflation expectations.

3. Output and Unemployment

- a. An increase in output (Y) usually means an increase in employment.
- b. More employment means less unemployment. The unemployment rate (U) usually falls when output rises.

4. Output and the Price Level

- a. The upward sloping short-run AS curve implies output rises when the price level rises.
- b. The slope of the AS curve depends on how close the economy was to full employment at the current position of the AD curve. The slope of AS determines how much of a given shift in AD will go to increased output and how much to a higher price level.

- c. As output increases the unemployment rate falls. Therefore, an increase in the price level should be associated with a decrease in the unemployment rate.
- d. Reminder: The *inflation rate* is the percentage change in the price level; it is not the price level itself.

Unique *Economics in Practice*

Two recent studies of the minimum wage have largely settled the questions of whether and how the minimum wage affects employment. In a survey article, David Neumark and William Wascher (National Bureau of Economic Research, Inc, NBER Working Papers: 12663, 2006) summarize the results of 102 empirical studies of the impact of the minimum wage on employment. These studies were all done after 1990. Of the 33 studies the authors selected as being the “most credible” 85 percent found a significant negative impact of a higher minimum wage on employment. William Even and David Macpherson have also published an extensive study that focuses on the impact on members of the labor force between 18 and 24 who are not high school graduates. They looked at a sample of about 600,000 males between 16 and 24 years old without a high school diploma. They examine the impact on three groups: whites, Hispanic, and African-American. Among white males in this group, the authors find that each 10 percent increase in a federal or state minimum wage decreased employment by 2.5 percent; for Hispanic males, the figure is 1.2 percent. But among African-American males in this group, each 10 percent increase in the minimum wage decreased employment by 6.5 percent.

Question: Do the results for African-American men prove there is racism in hiring?

Answer: No, this is not evidence of racism. The job choices made by each of the groups account for most of the differences.

TOPIC FOR CLASS DISCUSSION:

Frictional (or “job-search”) unemployment is responsible for much of the unemployment included in the “natural rate.” Discussing frictional unemployment in class provides an opportunity to bring the highly theoretical material of this chapter down to earth. Use examples to which students can relate. To begin the discussion, ask students: How would they proceed in their own job search? In this discussion it will become apparent that searching for a job takes time and money and is carried out with a tremendous amount of uncertainty. The first step in the job-search process involves determining the geographic area or market in which the job seeker wants to be employed. Many students will enter the national job market and are willing to relocate depending on the job. The next step would involve acquiring information about potential job offers in that market, then contacting a potential employer to secure an interview. A series of interviews is carried out and wage offers are made, and then either accepted or turned down. If the job is accepted, the search is over. If it is turned down, the search continues. From this discussion we see that finding a job is not costless; the labor market does not operate without “friction.”

To help students see that the natural rate of unemployment is not carved in stone, but rather depends on culture, institutions, and economic policy, ask how each of the following would affect the length of search time:

1. Job searchers are given more information (about job market conditions in differing localities, about specific job openings and potential salaries, etc.).
2. The costs of searching are subsidized in some way. (Most state governments have employment and training departments.)

3. Moving expenses are subsidized in some way. (Under the current U.S. tax code moving expenses are often tax deductible expenses.)
4. Transportation within a metropolitan area is improved.
5. Unemployment insurance benefits are reduced.
6. Unemployment insurance is available over a shorter time frame.

Numbers 1, 3, 4, 5, and 6 would tend to lower the opportunity cost of accepting a job offer, and hence lower the natural rate. Because subsidizing search costs lowers the opportunity cost of not accepting a job offer, subsidized individuals will tend to remain unemployed for a longer period of time, and the natural rate of unemployment will rise. ■

5. Unemployment and Inflation

- a. So far we have derived a relationship between the unemployment rate and the price level.
- b. However we wanted a relationship between unemployment and inflation. The *Phillips Curve* is a graph showing the relationship between the inflation rate and the unemployment rate.

B. The Phillips Curve: A Historical Perspective

1. In the 1950s and 1960s there was a remarkably smooth negative relationship between the unemployment rate and the inflation rate.
2. The apparently stable relationship between inflation and unemployment became unstable in the 1970s and 1980s.

TEACHING TIP: It's fun to show the class Figure 14.6 [29.6]. Give into temptation and draw the line through the points. Then show them Figure 14.7 [29.7]. Until 1970 economists believed the first figure. To say that we had to go back to the drawing board to explain the second is a vast understatement. The data and graphs for both figures are included in the Excel workbook for this chapter. ◀

C. Aggregate Supply and Aggregate Demand Analysis and the Phillips Curve

1. The relationship between the unemployment rate and the inflation rate is affected by whether it is the *AD* curve shifting along *AS* or *AS* shifting along *AD*. If both shift then there is no systematic relationship.
2. The Role of Import Prices: Changes in the price of imports (especially oil and certain other raw materials) can shift *AS*.
 - a. During the 1950s and 1960s input prices remained fairly constant. Since it was mainly the *AD* curve shifting, the Phillips Curve sloped downward and was stable.
 - b. During the 1970s and 1980s both *AD* and *AS* shifted frequently causing the Phillips "curve" to become a jumbled line.

TEACHING TIP: The data and graphs for Figure 14.9 [29.9] are included in the Excel workbook for this chapter. ◀

Unique Economics in Practice

This is a good place for a little history of economic thought. Point out that the events of the 1970s and 1980s sent macroeconomists back to the drawing board to develop and test new theories. Once the economists got to work they discovered something remarkable: there was no theoretical basis for the Phillips Curve beyond a few *ad hoc* models. Those “models” were pretty much along the lines suggested so far, but without even an *AS* curve to bolster them. The original Phillips Curve was largely an empirical creature. A. W. Phillips was originally an electrician, but he later graduated from the London School of Economics, eventually becoming a professor at that institution. He developed the Phillips Curve largely as an early application of statistical methods to economics. Note that the original Phillips Curve related the unemployment rate to the percentage change in the wage rate.

In the United States, Robert A. Gordon at Brookings applied the Phillips Curve to the U.S. economy. He is also usually credited with substituting the inflation rate for wage growth on the vertical axis. But the fact remains that the Phillips Curve was built on a foundation of data and sand. When the economic tides shifted it was not surprising that the sand washed away, leaving new data that contradicted the earlier data.❶

Question: If the theoretical foundation for the Phillips Curve was so shaky why did economists continue to use it?

Answer: Good economists are lazy. Lazy people find the efficient way to solve a problem. The Phillips Curve worked well, so no one bothered examining it closely. When the model stopped predicting reality, economists began to rethink their ideas.

E. Expectations and the Phillips Curve

1. Expectations can be self-fulfilling. If firms expect prices to rise they may raise prices today to beat the rest of the market.

TEACHING TIP: Note, however, that the firms must be in markets that are not highly competitive for this to work. This is consistent with the common macroeconomic assumption that prices are set in monopolistically competitive markets.❷

2. The Phillips Curve shifts when inflation expectations change.
 - a. Inflation expectations were very stable in the 1950s and 1960s because the inflation rate itself was low and stable.
 - b. When inflation began to heat up in the 1970s people and businesses became sensitized to inflation. They began to adjust their expectations more frequently, causing the Phillips Curve to shift more frequently.

F. Inflation and Aggregate Demand

1. Changes in *AD* still affect the inflation rate.
2. What we've learned over the last 40 years is the importance of other factors that influence short-run inflation.

TEACHING TIP: The larger point from this period is that macroeconomists need to be flexible and aware of changes in the economy. This is especially true of events that don't happen very often. Those are the events most likely to be forgotten. Economists who manage to remember them will produce better forecasts than those who forget.❸

VI. The Long-Run Aggregate Supply Curve, Potential Output, and the Natural Rate of Unemployment, pages 275-277

A. Introduction

1. If the AS curve is vertical at potential GDP in the long run, logic dictates that the long-run Phillips Curve is also vertical at the natural rate of unemployment (the rate of unemployment that is consistent with the notion of a fixed long-run output at potential GDP).
2. The *natural rate of unemployment* is unemployment that occurs as a normal part of the functioning of the economy. It is sometimes taken as the sum of frictional unemployment and structural unemployment.

B. The Nonaccelerating Inflation Rate of Unemployment (NAIRU)

1. *NAIRU* is the unemployment rate that keeps the inflation rate constant. In Figure 14.11 [29.11] the NAIRU is the unemployment rate where the PP curve intersects the x-axis.
2. In the late 1990s economists frequently revised their estimates of NAIRU. This led others to ask what good the theory was if a key part had to be changed often. This issue remains unresolved.

TEACHING TIP: As the footnote on page 273 correctly notes, the NAIRU is misnamed. It is the price level that is accelerating, not the inflation rate. An accelerating inflation rate would imply the inflation rate was rising month after month, year after year. That's clearly not what NAIRU is about. ◀

VII. Looking Ahead, page 283

- A. This chapter is the last of those describing the macroeconomic model.
- B. In the next chapter we use what we have learned to consider important policy issues.

Extended Applications

Application 1: The Minimum Wage and Inflation

Inflation has important effects on the minimum wage, and the minimum wage has important effects on inflation. In discussing the former, point out that the minimum wage law establishes a nominal wage floor in the labor market. A formal decrease in the nominal minimum wage is always politically unpopular (it has never occurred) but in practice, the real minimum wage has been cut several times via inflation. During the 1980s the nominal minimum wage remained at \$3.35 per hour for nearly 10 years, although inflation averaged 5 percent to 6 percent per year over the period.

The table on the following page and the graph on the page after that—which may be distributed to students in class—shows how inflation can erode the real minimum wage.

The minimum wage itself contributes to inflation in two ways. First, hikes in the minimum wage directly raise labor costs to firms paying this wage rate. Second, many of those earning more than the minimum wage before the law was passed will want their wages adjusted to achieve the previous relative difference in wages. (Imagine how a college graduate earning \$20,000 a year, which is less than \$10 per hour, would feel if he or she saw an unskilled inexperienced 16-year-old getting \$7 per hour for flipping burgers.) Both of these effects cause an increase in firms' labor costs, which will ultimately be passed on to consumers in the form of higher prices.

The text focuses on the macroeconomics effects of the minimum wages, but you may also want to disaggregate a bit and explore how these effects would be distributed across the country and across demographic groups.

The impact of a minimum wage hike in a particular area depends on the area's market wage for traditionally minimum-wage jobs. On the East Coast of the United States, where the cost of living is much higher than in many other parts of the country, the current market wage for entry-level unskilled labor is above the minimum. There would be very little effect on employment (thus, it is a bill that looks good politically but does not hurt anyone in these areas). In other areas of the country—especially economically depressed areas—the market wage for many jobs is at or below the current minimum wage. Here, the proposed legislation would cause more unemployment. Minimum wage hikes compound the unemployment problems of already depressed areas while not affecting areas that are growing economically and thus tend to pay above minimum wages.

California is one of a number of states that imposes a statewide minimum wage higher than the federal minimum wage. This is undoubtedly a contributing factor to California's historically high unemployment rate.

| Year | Nominal Minimum Wage | CPI (1982 – 1984 = 100) | Real Minimum Wage |
|------|----------------------|----------------------------|-------------------|
| 1938 | \$0.25 | 14.1 | \$1.77 |
| 1944 | \$0.25 | 17.6 | \$1.42 |
| 1945 | \$0.40 | 18.0 | \$2.22 |
| 1949 | \$0.40 | 23.8 | \$1.68 |
| 1950 | \$0.75 | 24.1 | \$3.11 |
| 1955 | \$0.75 | 26.8 | \$2.80 |
| 1956 | \$1.00 | 27.2 | \$3.68 |
| 1960 | \$1.00 | 29.6 | \$3.38 |
| 1961 | \$1.15 | 29.9 | \$3.85 |
| 1962 | \$1.25 | 30.2 | \$4.14 |
| 1966 | \$1.25 | 32.4 | \$3.86 |
| 1967 | \$1.40 | 33.4 | \$4.19 |
| 1968 | \$1.60 | 34.8 | \$4.60 |
| 1973 | \$1.60 | 44.4 | \$3.60 |
| 1974 | \$2.00 | 49.3 | \$4.06 |
| 1976 | \$2.30 | 56.9 | \$4.04 |
| 1978 | \$2.65 | 65.2 | \$4.06 |
| 1979 | \$2.90 | 72.6 | \$3.99 |
| 1980 | \$3.10 | 82.4 | \$3.76 |
| 1981 | \$3.35 | 90.9 | \$3.69 |
| 1989 | \$3.35 | 124.0 | \$2.70 |
| 1990 | \$3.80 | 130.7 | \$2.91 |
| 1991 | \$4.25 | 136.2 | \$3.12 |
| 1992 | \$4.25 | 140.3 | \$3.03 |
| 1993 | \$4.25 | 144.5 | \$2.94 |
| 1994 | \$4.25 | 148.2 | \$2.87 |
| 1995 | \$4.25 | 152.4 | \$2.79 |
| 1996 | \$4.75 | 156.9 | \$3.03 |
| 1997 | \$5.15 | 160.5 | \$3.21 |

| Year | Nominal Minimum Wage | CPI (1982 – 1984 = 100) | Real Minimum Wage |
|-------------|-----------------------------|------------------------------------|--------------------------|
| 1998 | \$5.15 | 163.0 | \$3.16 |
| 1999 | \$5.15 | 166.6 | \$3.09 |
| 2000 | \$5.15 | 172.2 | \$2.99 |
| 2001 | \$5.15 | 177.0 | \$2.91 |
| 2002 | \$5.15 | 179.9 | \$2.86 |
| 2003 | \$5.15 | 184.0 | \$2.80 |
| 2004 | \$5.15 | 188.9 | \$2.73 |
| 2005 | \$5.15 | 195.3 | \$2.64 |
| 2006 | \$5.15 | 201.6 | \$2.56 |
| 2007 | \$5.46 | 207.3 | \$2.63 |
| 2008 | \$6.16 | 215.3 | \$2.86 |
| 2009 | \$6.86 | 214.6 | \$3.20 |
| 2010 | \$7.25 | 218.1 | \$3.32 |
| 2011 | \$7.25 | 224.9 | \$3.22 |
| 2012 | \$7.25 | 229.6 | \$3.16 |

Note: minimum wage was raised from \$5.15 to \$5.85 effective July 24, 2007. Similar increases occurred on July 24, 2008 and July 24, 2009. The figures shown for each of those three years is weighted average based on number of days each wage was in effect. See <ftp://ftp.bls.gov/pub/special.requests/lf/aat44.txt>. Actual data available in the Excel workbook for this chapter. Minimum wage data from <http://www.dol.gov/whd/minwage/chart.htm>. CPI data from <http://www.bls.gov>.



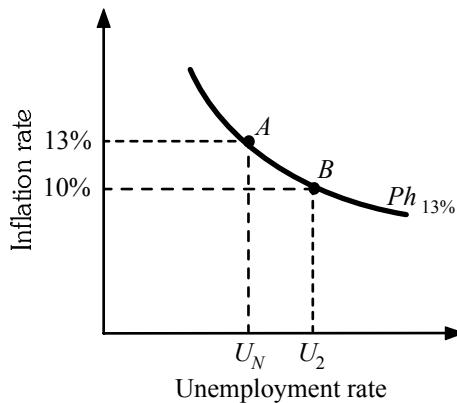
Application 2: Squeezing Inflation Out of the Economy

The text briefly discusses the impact of inflation expectations on the Phillips Curve, but does not develop the analytics. This can be done easily enough in class, and helps students understand why policy-induced recessions are used to lower the rate of inflation. (You will notice that some hand waving is necessary to avoid bringing in the equation of exchange, which is not introduced until later in the text. The application similarly avoids spelling out any formal equation for the Phillips Curve.)

Consider an economy in which inflation has been steady at 13 percent per year for several years. Assuming that firms and households form their expectations on the basis of past experience (adaptive or backward-looking expectations), everyone will expect inflation for the coming year to be 13 percent. Thus, labor negotiations will ensure a 13 percent rise in wages. Firms expect their input costs to rise by 13 percent so they will raise their prices by 13 percent as well. Because prices are rising by 13 percent, so too is the demand for money. Therefore, the Fed must be increasing the money supply 13 percent per year as well. (This ignores the well-known fact that the income elasticity of money demand is less than 1.0. It's not a serious flaw in the example.) In this scenario, inflation has no effect on output or employment: Both will be the same as in a noninflationary economy where everyone expects an inflation rate of zero. In both scenarios inflation has no effect on relative prices. The economy will tend to produce at full employment output and the unemployment rate will gravitate toward the natural rate.

Now, suppose the Fed wishes to break this cost-price spiral and bring down the rate of inflation. The only way to induce firms to raise prices by less than 13 percent is to create a situation where they are unable to sell all of their output at currently planned prices. Similarly, the only way to induce workers to accept less than a 13 percent rise in their wages is to create excess supply in the labor market, so that competition for scarce jobs will lead to a slower rate of wage growth. These conditions for price and wage restraint are exactly what occur in a recession. To create the recession, the Fed needs only to cut the growth rate of the money supply below 13 percent. Initially, with prices still rising at 13 percent, the demand for money will be rising faster than the supply of money causing the interest rate to rise and investment to fall. The result is a decline in aggregate expenditure and a decline in output, together with a slowing down of wage and price increases.

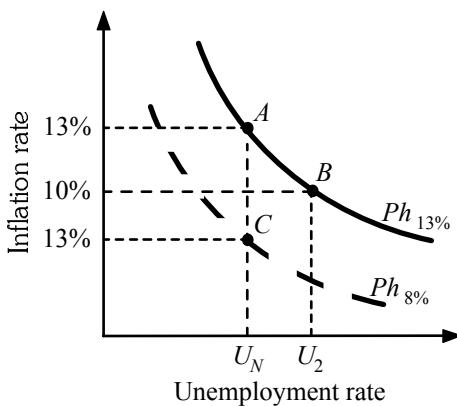
This is illustrated in the following diagram. Initially, the economy is at Point A, with the unemployment rate at U_N (the natural rate) and an inflation rate of 13 percent. Now the Fed slows the growth rate of the money supply, say, to 8 percent. The resulting rise in the interest rate (not shown) causes output to fall. The economy moves to Point B, where the unemployment rate increases to U_2 and the inflation rate drops to 10 percent. The economy has moved down along the “short-run Phillips Curve” marked $Ph_{13\%}$, that shows the trade-off between unemployment and inflation for an economy in which individuals expect inflation of 13 percent.



In the above diagram even though monetary growth has slowed to 8 percent, the actual inflation rate remains above this, at 10 percent. Remember that individuals are still expecting inflation of 13 percent. They believe that only by increasing their own prices and wages by 13 percent will they keep up with price hikes elsewhere in the economy. This in itself puts upward pressure on wages and prices. It is the recession—not a lowering of expectations—that brings about a lower rate of inflation in the short run. As long as individuals still expect inflation of 13 percent, prices and wages will continue to rise faster than the rate at which the money supply is growing.

Over time, however, if the recession endures and the inflation rate remains at 10 percent, individuals and firms will lower their expectations of inflation. They will then accept smaller increases in prices and wages, and this will bring down the actual rate of inflation. As the rate of inflation decreases, expectations of inflation will adjust downward once again. This downward spiral of lower inflation and lower expectations continues until the actual inflation rate comes down to the rate of money-supply growth, or 8 percent in this example. At this point, with the actual inflation rate equal to the rate that everyone expects, and wages and prices rising at 8 percent, the demand rate for money is growing at the same rate as the supply of money, so the economy can return to full employment output and its natural rate of unemployment, U_N . This is shown as Point C in the diagram following.

Now that everyone expects inflation of 8 percent, and the actual inflation rate is 8 percent, the Fed can once again slow the rate of monetary growth to, say, 5 percent and the entire process will be repeated. This time, the economy will move along the short-run Phillips Curve marked $P_h 8\%$, as individuals and firms now expect inflation of 8 percent.



In summary, inflation can be squeezed out of the economy by slowing the rate of money growth, engineering a recession, and bringing down the actual rate of inflation. In the short run inflation expectations remain constant. This moves the economy along a short-run Phillips Curve. Over the long run, as inflationary expectations decline, the short-term Phillips Curve shifts downward, and the economy returns to full employment with a lower rate of inflation.

One last point should be made here: Engineering a recession is certainly one way to squeeze inflation out of the economy, and it seems to be the method most often used in the United States and other market economies. (The most recent U.S. experience was in the early 1980s, when the Fed brought the rate of inflation down from 13 percent to 6 percent with a severe recession that brought the rate of unemployment up to a high of 10.8 percent.) Debate continues over the fairness of this method for “curing” inflation. Some believe that this method is unfair because the burden falls more heavily on those who lose their jobs, even though they are not responsible for causing the inflation in the first place. They believe that there are other cures for inflation, less painful and more equitable. Wage and price controls, designed to force price and wage restraint without necessitating a recession, have not been successful in the United States. There are other, as of yet, untried options. One of these options, called “tax-based income policies,” would use the tax system to reward those who show price and wage restraint and penalize those who do not. Whether this policy could be effective or not remains an open question. In the meantime, recession seems to be the method of choice for bringing down the rate of inflation.

Financial Crises, Stabilization, and Deficits

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Stock Market, the Housing Market, and Financial Crises, p. 282

- Stocks and Bonds
- Determining the Price of a Stock
- The Stock Market Since 1948
- Housing Prices Since 1952
- Household Wealth Effects on the Economy
- Financial Crises and the 2008 Bailout
- Asset Markets and Policy Makers

Time Lags Regarding Monetary and Fiscal Policy p. 287

- Stabilization
- Recognition Lags
- Implementation Lags
- Response Lags
- Summary

Government Deficit Issues, p. 291

- Deficit Targeting

DETAILED CHAPTER OUTLINE

Part IV [VI]: Further Macroeconomic Issues, page 281

TEACHING TIP: This section is “special topics in macroeconomics.” You should feel free to pick and choose among the topics presented. However, give careful consideration to the material in this chapter. Students are very aware of what happened to the world economy in 2008. Omitting any discussion of this topic will leave them feeling like the course was incomplete. ◉

I. Introduction, page 281-282

- A. This chapter answers the question, “Why haven’t macroeconomic policymakers done a better job of managing the economy?”
- B. By looking specifically at the stock market, the housing market, and their impact on household wealth, the authors identify some of the causes of macroeconomic fluctuations in the 21st century.

II. The Stock Market, the Housing Market, and Financial Crises, pages 282-287

A. Introduction

1. As recently as two decades ago macroeconomics could ignore the stock and housing markets because their impact on the economy was small (particularly in the short run).
2. The stock market boom of 1995–2000 contributed to the overall rapid economic growth, and the brief recession that followed.
3. Similarly, the sharp increase in house prices in 2002-2007 contributed to that expansion and the deep recession that followed.
4. This chapter will explore how the stock market and the housing market affect the economy.

TEACHING TIP: If you’re looking for material to lighten up the course, this section is a good source. It’s a good introduction to financial and real assets as well as their relationship to the macroeconomy. ◉

B. Stocks and Bonds

1. Business Investment and Finance
 - a. Planned investment spending includes nonresidential fixed investment, business equipment, and residential fixed investment.
 - b. Investment projects are usually very large, often requiring external financing. Internal financing means payment out of retained earnings. External financing means some sort of instrument(s) must be issued to raise additional funds.
 - c. Types of external financing include bank loans, issuing bonds, and issuing stock.
 - i. For all three sources of funds, the basic idea is the same: the firm hopes the rate of return on the investment project will be higher than the interest rate on the external financing instrument. If those hopes are realized, the firm’s profits will increase as a result of the investment.

- ii. If the firm borrows from a bank, the loan will be used to pay for some or all of the initial cost of the investment project. Naturally, the firm will have to repay the loan over time.
- iii. Bonds were discussed at the beginning of chapter 11 [26].
- iv. A *stock* is a certificate that certifies ownership of a certain portion of a firm. If the price of a stock increases since the stockholder bought it, the stockholder has a *capital gain*, an increase in the value of an asset. Capital gains exist only on paper. A *realized capital gain* is the gain that occurs when the owner of an asset actually sells it for more than he or she paid for it.

TEACHING TIP: Students remain fascinated by stocks and the stock market. One excellent source of data is Yahoo! (<http://finance.yahoo.com/>). For example, Microsoft has 8.56 billion shares outstanding. If you happen to own 100 shares, you own 0.000001 percent of the Microsoft Corporation. Bill Gates and Steve Ballmer can still outvote you. In fact, 12.1 percent of Microsoft stock is owned by insiders - many of whom are current or former Microsoft employees. ■

TOPIC FOR CLASS DISCUSSION:

There are all kinds of screwball stock market theories. Divide the class into teams. Each team should find one stock market theory that seems a little odd, and then gather some data to test it. Three popular examples are the Super Bowl theory, the hemline theory, and the “greater fool” theory. The Super Bowl theory says the stock market will go up in years when the NFC wins the Super Bowl. The hemline theory says the higher the hemline on skirts, the higher the stock market will rise. And the “greater fool” theory says that, even if I pay too high a price for a stock today (making me a fool), there will be someone even more foolish willing to pay an even higher price tomorrow (the greater fool). Understanding the greater fool theory is a good basis for understanding bubbles. All three have a small bit of empirical support. Of course relying on any of them is a good way to turn your retirement savings into nothing. ■

TEACHING TIP: If your class is especially interested in the stock market here are a few additional details that you may want to include. (1) Common stock is not guaranteed any cash income. While many stocks pay *dividends* and have paid them for a number of years, the payments are always made on the recommendation of the board of directors. (2) Most shares of stock are bought and sold in the *secondary market*, meaning the shares were not purchased directly from the company that issued them. These previously owned shares form the basis for most of the daily trading volume on the stock exchanges. The main participants in the secondary market are brokers and dealers. (3) If a firm wants to issue additional stock to help finance a project, that stock is sold in the *primary market*. The main participants in the primary market are investment banks. (4) Most firms are started as small enterprises with few stockholders. Stock in these firms is not available for sale to the public. Instead these high-risk shares are sold to sophisticated investors, venture capitalists, and others who can afford the loss. If a small firm is successful they may be able to go public with an *initial public offering (IPO)*. The reason IPOs are so popular is because shares of stock almost always sell for a multiple of earnings per share. Only by selling stock to the public can the original owners participate in this multiple. ■

C. Determining the Price of a Stock

1. The only economic basis for determining a stock price is the dividend discount theory: The price of a share of stock today should equal the present value of expected future dividends. Stocks that pay no dividends today will pay them some day.
2. Since the time horizon is very long, small changes in expectations can cause large changes in a stock’s price.
3. The discount rate used for the dividends must reflect the underlying risk of the company’s business.

4. Like any market in which small changes in expectations can cause large changes in today's price, the stock market is subject to bubbles. Identifying a bubble in any market can be difficult (at least during the time the bubble is happening) because people tend to get caught up in the fervor.

TOPIC FOR CLASS DISCUSSION:

The years 1995-2000 are replete with various articles and books promoting the stock market. Although many authors would be happy if their writing was forgotten forever, libraries and the internet guarantee their continued existence. Divide the class into groups and have each group go out to see what written material they can find from this period that contributed to the bubble. Award a prize for the most outrageous claim. One good candidate is the book *Dow 36,000: The New Strategy for Profiting From the Coming Rise in the Stock Market* by James K. Glassman and Kevin A. Hassett (Times Books, September, 1999). ■

D. The Stock Market Since 1948

1. Stock Market Indexes: The most widely followed market indexes are the Dow-Jones Industrial Average and the NASDAQ Composite index.

- a. The *Dow Jones Industrial Average* is an index based on the stock prices of 30 actively traded large companies. The oldest and most widely followed index of stock market performance.
- b. The *NASDAQ Composite* is an index based on the stock prices of over 5,000 companies traded on the NASDAQ Stock Market. The NASDAQ market takes its name from the National Association of Securities Dealers Automated Quotation System.
- c. The *Standard and Poor's 500 (S&P 500)* is an index based on the stock prices 500 of the largest firms by market value.

TEACHING TIP: The data and graph for Figure 15.1 [30.1] is included in the Excel workbook for this chapter. ◀

- d. Of the three, the S&P 500 is the best index. However, 500 stocks is still not very many.

TEACHING TIP: There is no perfect stock market index. The index you choose should reflect your objectives. But there are some obvious criticisms that you should point out. The Dow has many problems. Its 30 stocks are far too small a sample to be meaningful. This is especially true because even those 30 stocks are not randomly selected. Instead, stocks are added and deleted according to the Dow theory of investment (See) The NASDAQ includes more stocks and is a market value weighted index, both improvements over the Dow. But the NASDAQ only covers stocks traded on that exchange. That ignores the New York Stock Exchange, foreign exchanges, the various regional markets, and the over-the-counter market. Even the S&P 500 is probably too small a sample, as evidenced by the fact that the price of a stock that has just been added to the index will rise noticeably as index funds adjust their portfolios. ◀

2. The Boom of the 1990s

- a. Between December 31, 1994, and March 31, 2000, the S&P 500 rose 226 percent, an annual growth rate of 25 percent.
- b. This was the largest stock market boom in U.S. history.
- c. The runup in stock prices added about \$14 trillion to household wealth (about \$2.5 trillion per year).

TEACHING TIP: The data and graph for Figure 15.2 [30.2] is included in the Excel workbook for this chapter. ◀

Unique Economics in Practice

There are many stock market indexes. Probably the most inclusive is the Russell 3000®. This index measures the performance of the 3,000 largest publicly traded U.S. companies based on market capitalization. About 98 percent of total U.S. stock market capitalization is included in the Russell 3000®.

The Russell 3000® index is produced by the Frank Russell Company (<http://www.russell.com>). The index is a registered trademark of that company. The Frank Russell Company also produces several other U.S. market indexes including 1,000 or 2,000 companies.

Question: Why are there so many stock market indexes?

Answer: The cynical answer is that mutual fund managers want to be able to pick the market index that makes the performance of their fund look best. A more likely reason is that different mutual funds have different objectives. Choosing an index that reflects the fund's objectives as one basis for comparison seems like a pretty good idea.

3. Causes of the 1995–2000 Boom

- a. There's nothing unusual about the economic data.
- b. Possibly stocks were perceived as less risky for some reason.
- c. Most likely the cause was expectations feeding on themselves in a positive feedback loop. In other words people started believing the "greater fool" theory of investing. (See the "Topic for Class Discussion" on page 185 for details.)
- d. It wasn't just the dot-com companies whose share prices went through the roof. The *entire* S&P 500 rose 25 percent per year. In retrospect it's clear this was a market bubble. But, as many economists know, asset bubbles are only easy to identify in the rear view mirror. Knowing when an increase in asset prices is, in fact, a bubble is very difficult while the bubble is occurring.

TEACHING TIP: There are other stories as well. Some people put their life savings into the market, buying late in the bubble only to lose most of their savings when the bubble collapsed. A few people were once worth hundreds of millions of dollars on paper and are now working at office jobs to survive. Some people took early retirement, basing their calculations on their belief that the market would continue to rise 25 percent per year forever. They are now working for a living again. A few people managed to cash out of the boom near the peak. Probably the most notable is Mark Cuban, owner of the Dallas Mavericks (a team in the National Basketball Association). Cuban founded broadcast.com and later sold it to Yahoo! for about \$1.3 billion in stock. He liquidated his stock holdings, spent a few hundred million to acquire the Mavericks and has been having fun ever since. People like him are rare but they do exist. ◀

E. Housing Prices Since 1952

TEACHING TIP: The data and graph for Figure 15.3 [30.3] from 2000:I through 2013:I is included in the Excel workbook for this chapter. ¶

1. The real price of housing in the U.S. grew \$500 billion per quarter between 2000 I and 2006 I. The total increase in housing wealth was \$13 trillion.
2. Between 2006 II and 2009 I, \$7 trillion (over half) of the increase was lost, about \$600 billion per quarter.
3. It's difficult to identify any economic reason for these changes.

F. Household Wealth Effects on the Economy

1. One of the factors that affect consumption is wealth. Two of the main components of household wealth are the value of the stocks they hold and the market value of houses they own. Empirical research shows that for every \$1.00 change in stock value, planned spending changes by \$0.03 to \$0.04.
2. Unpredictable and large changes in wealth cause unpredictable changes in consumption spending and unpredictable changes in GDP.

TEACHING TIP: Most people own some stocks indirectly as part of pension funds or other mutual funds. Even those who own stocks indirectly are affected by their value because they receive regular reports about the value of their pension funds. If stock prices rise rapidly and the market value of their pension fund shoots up they may decide to reduce their saving and spend more out of current income. That's very close to what happened in 1995-2000. If a firm's stock price rises, the equity cost of capital to the firm falls. Reducing the cost of capital will often induce the firm to issue more stock and expand their investment spending.

One big difference between the stock market bubble and the housing bubble was leverage. Even buying stocks completely on margin can only result in a leverage ratio of 3:1. (The lowest margin requirement for U.S. stocks is about 1/3.) But houses are very highly leveraged with mortgages. When stock prices fall, a few investors may get margin calls. But when housing prices fell, many who had recently purchased a house found they were underwater - the market value of their house was less than the outstanding balance on their mortgage. This led to many foreclosures. Those, in turn, kept housing prices depressed in some areas as banks that owned foreclosed properties were eager to liquidate them at any price.

As of this writing, the outcome of the current housing crisis and the accompanying recession remain unknown. But houses are fundamentally different from stocks. A stock market bubble and crash involves paper assets and therefore the adjustment should be fairly rapid. (In fact, the 2002 recession was mainly the downside of a classic capital stock adjustment process.) Houses last a long time - much longer than the computer hardware that was the basis for the capital stock adjustment business cycle. It seems safe to predict that the current recession will persist quite a while. ¶

G. Financial Crises and the 2008 Bailout

1. Both the stock market boom and the housing boom caused business cycles.
2. The root cause was the household wealth effect. (The stock market boom also contributed to an investment boom, exacerbating the magnitude of the expansion as well as the recession.)
3. The sharp drop in housing prices began near the end of 2006. There were many causes.
 - a. Lax government regulations allowed mortgage lending standards to deteriorate.

- b. Some people bought houses using mortgages that could only be viable with continuously increasing housing prices.
 - c. Many large financial institutions had issued mortgage-backed securities that implicitly bet on ever-rising housing prices (and the viability of the underlying mortgages).
4. The U.S. government bailed out many financial institutions with a \$700 billion fund established in October, 2008.
- a. The sole exception was Lehman Brothers which was allowed to go bankrupt.
 - b. Old, one-respected Wall Street companies including Goldman Sachs, Citigroup, Morgan Stanley, J.P. Morgan Chase, and AIG were all recipients of bailout funds.
 - c. However distasteful, the bailout and Federal Reserve actions almost certainly made the economic situation better than it would have been otherwise.

TEACHING TIP: Warn your students to avoid confusing the bailout of financial institutions with the ARRA stimulus package.¶

- d. But there remain negative effects. Those who benefited from the bailout were at the worst high income. And many were quite wealthy. The perception of average taxpayers bailing out the upper segments of the income and wealth distributions has probably damaged U.S. politics for quite a few years.

TEACHING TIP: Students may not easily see the link between the value of stock holdings and spending. It might be useful to explain this in terms of a typical consumer saving for retirement; as the value of his or her portfolio grows he or she can save less of current income and therefore spend more.¶

H. Asset Markets and Policy Makers

- 1. The problem is that forecasting housing prices is difficult. Forecasting the stock market is probably impossible.
- 2. Since policymakers can only react to asset price bubbles after the fact, their ability to stabilize the economy is considerably restricted.
- 3. One thing the government and Fed should have done was practice more strict oversight of mortgage lending standards.

TEACHING TIP: This is a good opportunity to emphasize how international concerns influence policy. For example, in the period 1998-2000 while the Fed may have wanted to raise interest rates due to domestic concerns about inflation, doing so may have attracted foreign investment to the United States and in particular from Japan, which may have pushed that economy over the edge. Students may wonder why that would be of great concern, so ask them to consider all the ways in which serious economic downturns in other countries could have negative repercussions for the United States. And remember the Mundell effect - a capital inflow would have partially offset the contractionary monetary policy.¶

***Economics in Practice: Depositors in Cyprus End Up as Shareholders!,
page 288***

Cyprus is a small, sunny island off the coast of Greece. Cyprus is also a Euro Zone member. Cyprus banks had become parking places for large quantities of Russian wealth. Possible reasons include tax evasion, money laundering, and other activities ranging from ethically questionable to completely illegal. When the Greek economy hit the skids, many loans the Cyprus banks had made to Greek businesses went into default. Compounding the problem, the Cyprus banks had large positions in Greek sovereign debt. When the EU forced Greece to restructure that debt, the Cyprus banks took a large haircut. The European Central Bank was prohibited from acting as lender of last resort. Ultimately, account balances in excess of 100,000 euros took a 40 percent haircut. The euro deposits were replaced with stock in the Bank of Cyprus. *Caveat depositor.*

III. Time Lags Regarding Monetary and Fiscal Policy, pages 287-291

A. Stabilization

1. *Stabilization policy* describes both monetary and fiscal policy, the goals of which are to smooth out fluctuations in output and employment and to keep prices as stable as possible.
2. A stabilization policy can use either monetary or fiscal policy (or both).

TEACHING TIP: Here's an alternative definition: The goal of stabilization policy is to reduce the magnitude and duration of business cycles. ◀

3. One of the main problems economic policymakers face is time lags.
 - a. *Time lags* are delays in the economy's response to stabilization policies.
 - b. It's useful to discuss three kinds of lags: recognition lags, implementation lags, and response lags.

B. Stabilization

1. In order to successfully use stabilization policy, the policymakers must have an accurate forecast of the economy.
2. Policy responses combined with an inaccurate forecast can destabilize the economy.
3. Critics of stabilization policy argue that policies are typically destabilizing.

C. Recognition Lags

1. The *recognition lag* is the time it takes for policy makers to recognize the existence of a boom or a slump.
2. National income data is available only once a quarter. In addition, there are three different estimates of each quarter's economic performance.
 - a. The advance estimate is released about one month after the end of the quarter.
 - b. The second estimate is released about two months after the end of the quarter.
 - c. The third estimate is released about three months after the end of the quarter.

- d. Even the third estimate is subject to future revisions as more data becomes available.

TOPIC FOR CLASS DISCUSSION:

Divide the class into teams of about five students each. Ask each team to find some data on the advance, second, and third estimates of GDP for a recent quarter. Have the teams present their findings and discuss the implications of the revisions for stabilization policy. ■

Unique Economics in Practice

Milton Friedman famously developed the “fool in the shower” analogy to describe how monetary policy might actually destabilize the economy. Someone in the shower finds the water is too cold. They turn the hot water all the way up. Shortly the shower is too hot, so they turn the hot water all the way down. The shower becomes too cold, so they turn the hot up again. (Note that even though this parable is always credited to Friedman, no one seems to be able to cite a precise source.)

Economic policymakers have to be careful not to do the same thing to the economy. Sometimes it’s better to take no action rather than starting a policy that will really hit the economy after the economy has already begun to correct itself (Fig. 15.5 [30.5]).

Question: What does this story imply about the importance of macroeconomic forecasting at the Fed?

Answer: Policy depends strongly on forecasts. Since today’s policy impacts the economy for the next few years, policymakers need to have good forecasts of the state of the economy over the next few years.

D. Implementation Lags

1. The *implementation lag* is the time it takes to put the desired policy into effect once economists and policy makers recognize that the economy is in a boom or a slump.

TEACHING TIP: Taken together the recognition lag and the implementation lag are sometimes called the *inside lag*. ◉

2. Fiscal policy takes some time to start. There are 435 members of the House of Representatives, 100 members of the Senate, and one president. A majority of each house plus the president must agree there is a problem and then agree on what should be done about it. Members of Congress and the president are usually not well trained in economics and finance so it will probably take some time to educate them.
3. Monetary policy is decided by the 12 voting members of the Federal Open Market Committee. Since this group is well-trained and experienced in economics, banking, and finance, they will usually reach an agreement quickly. (It also helps that there are only 12 instead of 536.)
4. For all these reasons, the implementation lag for monetary policy is generally much shorter than for fiscal policy.

E. Response Lags

1. The *response lag* is the time that it takes for the economy to adjust to the new conditions after a new policy is implemented; the lag that occurs because of the operation of the economy itself.

TEACHING TIP: The response lag is sometimes called the *outside lag*. ◀

2. Response Lags for Fiscal Policy

- a. The easiest way to understand response lags for fiscal policy is to simply think about the multiplier process.
- b. The multiplier exists because one group's spending is another group's income. Increases in income are not spent immediately because the timing of income and spending are different.
- c. It takes about a year for a change in fiscal policy to have its full effect on the economy.

TEACHING TIP: Here's a useful example to which many students can relate that helps them understand the different lags. Suppose someone is driving and notices a ball bounce into the road. What steps does the driver then go through? The person may anticipate that a child will chase the ball; the time it takes to do so is recognition lag. The person may then move his or her foot onto the brake pedal (implementation lag). But even if the person hit the brakes hard, the car would not stop instantly (response lag). You can then discuss how changing conditions (i.e., darkness, rain) can affect the durations of the lags. (You might even mention that under some circumstances accelerating would be a better strategy than braking.) A similar example would be a person feeling a headache coming on and taking some medication for it. ◀

Economics in Practice: Social Security Changes: Long, Long Implementation Lags!, page 292

About 20 percent of the federal government budget is spent on Social Security. In 1983, Congress raised the age at which retirees could collect full Social Security benefits. But these changes only affected people born after 1938. Thus the oldest member of this cohort was 45 years old when the law was passed. Congress believed -- and many economists concurred -- that people this age and you

nger would have adequate time to adjust their retirement planning. Similar proposed changes in the cost-of-living-adjustment process will be phased in over many years. It's easy to see why Social Security is not used for short-run fiscal policy.

3. Response Lags for Monetary Policy

- a. Changes in monetary policy change interest rates. The change in interest rates causes changes in planned investment and consumption spending.
- b. It takes quite a while for consumption and planned investment to respond to interest rate changes.

TEACHING TIP: Remind students that investment means putting up new buildings and buying machines to put in those buildings. Investment projects require a lot of planning and analysis. Even after the project is started it may last several years. ◀

- c. It takes about two years for a change in monetary policy to have its full effect on the economy.

4. Summary: stabilization is not easy.

- TEACHING TIP:** The earlier Unique *Economics in Practice* discusses Milton Friedman's "fool-in-the-shower analogy." Here's another amusing analogy for policy lags, which also originates with Friedman, that may also be used in class (another driving scenario!).

Suppose you are driving a car with a special problem: When you turn the steering wheel, there is a five-minute lag before the car responds. Suppose also that you know there is a lag, but don't know how long it is. What is likely to happen when you start to drive? As the car veers to one side, you will start to turn the wheel the other way. When the car doesn't respond, you will turn the wheel more. Finally, the car will begin to respond to your initial effort, but then it will also respond to your further efforts and turn too sharply. You will, of course, begin to turn the wheel in the other direction, repeating the process once more.

We can all imagine how unstable and dangerous it would be to drive such a car, and such are the perils in trying to steer the economy with fiscal and monetary policies. Students may object that eventually an intelligent person would learn to drive such a car, and so too should policy makers learn how to steer the economy. This is a valid point, and progress in understanding the economy can indeed lead to more intelligent steering. But what if the lags themselves keep changing? There is ample evidence that the length of decision lags and response lags are unstable, which means we may never be able to understand the economy well enough to steer it accurately.❶

III. Government Deficit Issues, pages 291-300

A. Introduction

1. Basic concepts and definitions
 - a. When an economy moves into a recession, we expect the government to run a budget deficit – a cyclical deficit.
 - b. Cyclical deficits should be temporary and do not impose any long-run problems, especially if the government runs budget surpluses during economic expansions.
 - c. The structural deficit is the size of the government budget deficit when the economy is at full employment.

2. The U.S. government deficit

- a. The deficit in 2012 was \$1.1 trillion.

- TEACHING TIP:** Review Table 9.5 [24.5] and Figure 9.5 [24.5].❷

- b. The structural deficit was huge.
- c. By 2012:IV the federal government debt was 61% of GDP.
- d. Republicans generally favored spending cuts to reduce the deficit, while Democrats usually favored tax increases.
- e. There was a small tax increase in a deal reached at the end of 2012 as the Bush era tax cuts for "wealthy" individuals were removed. A far more serious tax increase was the expiration of the payroll tax cut.

3. Surpluses, deficits, and the government debt.

- a. To finance deficits the government must sell debt: T-bills, T-bonds, and so on.
- b. One option is for the Fed to "monetize the deficit" by purchasing those newly-issued securities. That is not viable in the long run because it would lead to hyperinflation.

- c. Markets may require a higher interest rate on U.S. government debt if they perceive increased risk. Higher interest rates mean higher interest payments, increasing the current budget deficit.
- d. Another concern is the stock market. If the market starts to expect higher interest rates, higher taxes, and/or lower government spending, the present value of future dividends will be lower, driving stock prices down and causing a negative wealth effect. Thus, the assets markets could force the government to get its budget under control. But the style of the enforcement will not be very enjoyable for anyone.

TEACHING TIP: Students are not always clear about the difference between the deficit and the debt. A useful analogy to use is a student taking out loans for each of four years of college; how much debt is accumulated by the end of the four years?◀

B. Deficit Targeting

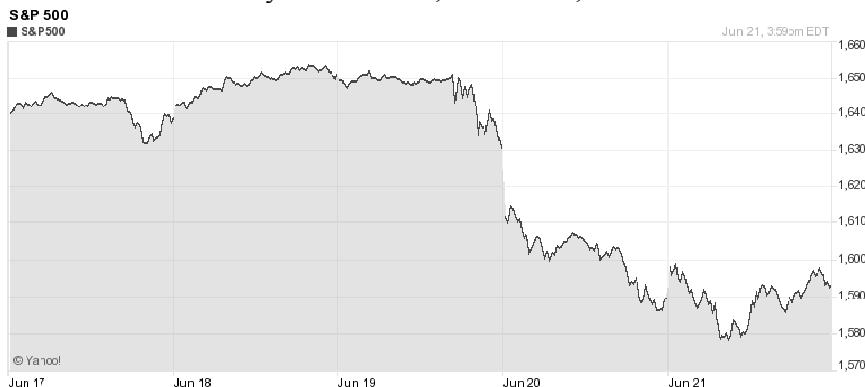
1. The *Gramm-Rudman-Hollings Act* (GRH, 1986) was passed by the U.S. Congress and signed by President Reagan in 1986. This law set out to reduce the federal deficit by \$36 billion per year, with a deficit of zero slated for 1991.
 - a. If Congress passed a budget that exceeded the target for the deficit for that year, all government spending programs were cut by the appropriate proportion.
 - b. The Supreme Court declared GRH unconstitutional. Congress passed another version that tried to fix the problems.
2. In reality the deficit never came close to the target for any year. Targets were revised, the target date for a balanced budget was shifted into the future and, by the end of the 1980s, the GRH legislation was no longer taken seriously.
3. Lowering the deficit by any given amount is likely to require a cut in government spending larger than that amount.
 - a. Deficit targeting can also adversely affect the way the economy responds to a variety of stimuli.
 - a. A negative demand shock is something that causes a negative shift in consumption or investment schedules or that leads to a decrease in U.S. exports. If a negative demand shock occurred and the deficit is not allowed to rise, the contraction in the economy will be larger than it would have been without deficit targeting.
 - b. *Automatic stabilizers* are revenue and expenditure items in the federal budget that automatically change with the economy in such a way as to stabilize GDP.
 - c. Deficit targeting is an *automatic destabilizer*, revenue and expenditure items in the federal budget that automatically change with the economy in such a way as to destabilize GDP.
4. Summary: The GRH legislation, the balanced-budget amendment, and similar deficit-targeting measures all have some undesirable macroeconomic consequences.

Unique Economics in Practice

On Wednesday, June 19, 2013, Fed chairman Ben Bernanke held his customary post-FOMC press conference. Here's a small part of what he said:

"Although the Committee left the pace of purchases unchanged at today's meeting, it has stated that it may vary the pace of purchases as economic conditions evolve. Any such change will reflect the incoming data and their implications for the outlook, as well as the cumulative progress made toward the Committee's objectives ... the economic outcomes that the Committee sees as most likely involve continuing gains in labor markets, supported by moderate growth that picks up over the next several quarters ... We also see inflation moving back toward our 2 percent objective over time. If the incoming data are ... consistent with this forecast, the Committee ... anticipates that it would be appropriate to moderate the monthly pace of purchases later this year; and if the subsequent data remain ... aligned with our current expectations ... we would continue to reduce the pace of purchases ... through the first half of next year, ending purchases around midyear. In this scenario, when asset purchases ultimately come to an end, the unemployment rate would likely be in the vicinity of 7 percent, with solid economic growth supporting further job gains, a substantial improvement from the 8.1 percent unemployment rate that prevailed when the Committee announced this program."

In response to this paragraph, between the market opening Wednesday, June 19 to the close Friday, June 21 the S&P 500 fell by 3.7% from 1,651.83 to 1,592.43:



That vertical break in the index occurred at almost exactly the same time Dr. Bernanke was reading the above paragraph. Other stock market indices were equally negative.

Question: Did the market overreact?

Answer: It's hard to reach any other conclusion. "If the incoming data are ... consistent with this forecast, the Committee ... anticipates that it would be appropriate to moderate the monthly pace of purchases later this year ..." is about as clear as it gets. On the other hand, if the markets really believed the Fed would keep interest rates near zero forever, they were bound to be disappointed some day.

Sources: Board of Governors of the Federal Reserve System, (marked Preliminary) "Transcript of Chairman Bernanke's Press Conference," June 19, 2013, pages 4-5. Available at <http://www.federalreserve.gov/mediacenter/files/FOMCpresconf20130619.pdf> accessed June 22, 2013.

Yahoo Finance <http://finance.yahoo.com/q/bc?s=%5EGSPC&t=5d&l=on&z=l&q=l&c=> accessed June 22, 2013.

Extended Applications

Application 1: Interesting Pro- and Con-Deficit Arguments

The following arguments have been made in favor of and against deficits. You may want to present these in class. Alternatively, have students research and debate the issues using these arguments as a starting point. Another possibility would be to have students choose a side and write a paper in support of their position.

The Pro-Deficit Argument

A small (but growing) minority of economists, including Robert Heilbroner and Robert Eisner, believe that the U.S. budget deficit may be about the “right” size, or only slightly too large. This pro-deficit argument is based on an analogy with successful corporations in the United States. An analysis of these corporations’ balance sheets often shows a continually rising level of debt. This is responsible behavior because the corporation borrows to finance capital investment projects that will enhance future profits and thus increase the ability to pay interest on the debt. As the debt increases, so does the value of corporate assets. These corporations could pay off their debts by selling off their assets, but this would not be good business, as it is these very assets that enable firms to earn profits for their owners. Thus, it is often in the owners’ interest to allow the firm’s debts to grow and grow, continually issuing new debt to pay back the old. No one suggests that firms are irresponsible when they behave this way.

In many ways, the government is behaving in a similar fashion. True, the government’s debt is continually increasing. But some of this borrowing pays for government spending that enhances the productivity and incomes of U.S. citizens. Much of the expenditure on education, infrastructure, and research and development would fall into this category. With higher incomes, citizens can afford to pay higher taxes, from which the government pays interest on the debt. What about the ability to pay back the debt? The value of the federal government’s assets (federal buildings, real estate, national parks, and mineral reserves) far exceeds the national debt. If the “owners” of the federal government (we, the public) wanted the government to pay back the national debt by selling off all these government assets, it could be done. But this would not be “good business,” as these government assets provide useful services to us, in the same way that a firm’s assets provide profits to its owners.

This argument does not imply that current U.S. deficits are the right size, but rather that some level of deficit spending may be socially optimal, especially if it finances income-enhancing government programs. Reasonable people can disagree about whether the current level of deficit spending exceeds the socially optimal level.

The Anti-Deficit Arguments

To employ countercyclical fiscal policy efficiently, the government must be (and has been) given the right to run occasional budget deficits. But the evidence is that such freedom is abused. Anti-deficit proponents cite three abuses that arise with government discretion over the deficit, and these make for interesting lecture material.

First is the political business cycle. There is theoretical and empirical evidence to support the view that government officials can and do manipulate the economy to the benefit of the incumbent party. Deficit spending is one way that this is accomplished. An interesting discussion centers around the 3.2 percent rule. Since the days of Herbert Hoover, whenever disposable income has risen by more than 3.2 percent during the year preceding the election, the incumbent party has won the presidency; every time disposable income has risen by less than 3.2 percent, the incumbent party has lost. Of course, manipulating the economy to achieve high growth in disposable income during the election year might necessitate overstimulating the economy, or

engineering a recession in the early years of an administration to ensure a recovery during election year. This is certainly an abuse of the freedom to run deficits.

A second form of abuse concerns bureaucratic inertia. Countercyclical fiscal policy requires changes in government spending and taxes. But any expansion of government spending involves the creation of new programs or an expansion of existing programs. Either way, the bureaucracy grows, and government bureaucrats will not want to give up their jobs when the need for fiscal stimulus has passed, neither will others who benefit from government programs want to give back their benefits. Thus, temporary increase in government spending (and deficits) can easily become permanent increases, leaving a bloated government and large deficits even after the economy recovers. A similar argument can be made about tax cuts—those who benefit from lower tax rates will lobby to maintain these benefits, and raising taxes again when the economy recovers will be politically difficult at best.

The last type of abuse concerns “cost shifting” by members of Congress. To help students understand this point, make the following analogy. Ask students to imagine what would happen if the entire class went out to dinner at _____ (substitute the most expensive restaurant in your town), and every student got a separate check. (Chances are, everyone would order very little.) Now, ask them how their behavior might change if everyone’s order were placed on a single check and everyone paid an equal share. (No doubt, everyone would order more.) Under which of the two assumptions—separate checks or equal payments—would they be better off? (Under separate checks, because under equal payments every student overorders, and everyone is worse off as a result.) Point out that the overordering comes about because each student is able to shift most of the cost of their own meal onto others in the group. If there are 50 students in the class, and you order another \$50 worth of food, you will have to pay only an extra dollar. Of course, when everyone does this together then everyone must pay an additional \$50, and everyone is worse off.

Now draw the analogy to Congress. If you are able to secure a federal project that benefits your district (say, a military base, a hydroelectric power plant, or a research facility), the benefits will accrue mostly to your constituents, but the costs will be shifted onto the taxpayers of all districts. This leads every member of Congress to “overorder,” and when the “bill” comes due, all citizens are worse off.

Now back to the restaurant example. Suppose everyone has overordered, and the bill arrives, and now the waiter offers you a choice: Pay the bill now, or else have your (as-yet unborn) grandchildren pay it later on. Such is the choice offered to members of the Congress. The result is bloated government budgets financed in part by deficits that are too large.

Application 2: The Problem with Simple Balanced-Budget Requirements (and a Better Solution)

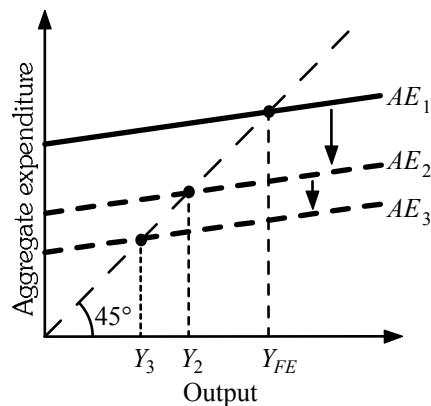
Many ways for reducing the deficit have been discussed recently. One of the most talked-about ways of doing this is a balanced-budget amendment to the U.S. Constitution. In its most primitive form, such an amendment would simply make it illegal for the government to spend more than it receives in taxes. Although the balanced-budget amendment was defeated by one vote in the Senate in 1995, it is likely that some sort of balanced-budget restrictions will remain on the table for discussion.

To recognize the dangers inherent in balanced-budget restrictions, remember that net tax revenue (tax revenue minus transfer payments) varies positively with GDP. This is true for several reasons: (1) A rise in output causes household incomes to rise, so personal income tax and social security tax payments will rise as well; (2) higher output usually means greater corporate profits, so corporate tax revenues will rise; and (3) higher output usually implies a reduction in the

number of persons unemployed, so that unemployment insurance and other transfer payments will generally decline.

Because government spending on goods and services responds very little to changes in output, and the deficit is defined as government spending (G) minus net tax revenues (T), the following will result: Increases in output cause the budget deficit to fall; decreases in output cause the budget deficit to rise.

In the diagram that follows, suppose the economy begins at full employment output (Y_{FE}), and that the budget is in balance ($G = T$). Then, investment spending (or consumption spending) declines, causing a downward shift in the aggregate expenditure line (from AE_1 to AE_2). As a result, equilibrium output decreases (from Y_{FE} to Y_2), and tax revenue declines as well. Now the budget is in deficit. If a balanced-budget requirement is in place, the government must either decrease spending or increase taxes. But either of these policies will shift down the aggregate expenditure line once again (from AE_2 to AE_3), causing a further decline in income to Y_3 and bringing the budget once again into deficit. In other words, a strict balanced-budget requirement is a policy that requires the government to “kick the economy when it’s down.” In the words of the text, it acts as an “automatic destabilizer.”



This seems to suggest a dilemma: Either the government must be left free to run discretionary budget deficits—with the expectation that such freedom will be abused and deficits will be too large—or deficits must be outlawed entirely and policies must be pursued that exacerbate recessions and destabilize the economy.

But there is a third alternative, favored by many macroeconomists. To understand this third way, recognize that any budget deficit can be divided into two components. The cyclical deficit is the part that is caused by unusually low tax revenues in a recession; the structural deficit is the remaining part. The cyclical deficit, by definition, would become zero if the economy recovered and achieved full employment output. The structural deficit, however, would remain even at full employment output. The proposed guideline for the government can now be stated as follows: The government would not be allowed to run a structural deficit. Cyclical deficits, however, would be allowed.

Returning to the diagram, when the AE line shifts downward (from AE_1 to AE_2) and output declines (from Y_{FE} to Y_2), the deficit that results is entirely cyclical—it is due to lower tax revenues at a lower level of output and income. The government would not be required to eliminate this deficit, so it would not have to increase taxes or decrease spending. Although the government's inaction would not help the economy recover, neither would it hurt the economy and make things worse. Preventing the government from running a structural deficit thus has a cost: The lost ability to stimulate the economy with fiscal policy in times of recession. But at least some control is gained over irresponsibly large deficits without destabilizing the economy.

Household and Firm Behavior in the Macroeconomy: A Further Look

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Households: Consumption and Labor Supply Decisions p. 299

- The Life-Cycle Theory of Consumption
- The Labor Supply Decision
- Interest Rate Effects on Consumption
- Government Effects on Consumption and Labor Supply: Taxes and Transfers
- A Possible Employment Constraint on Households
- A Summary of Household Behavior
- The Household Sector Since 1970

Firms: Investment and Employment Decisions p. 307

- Expectations and Animal Spirits
- Excess Labor and Excess Capital Effects
- Inventory Investment
- A Summary of Firm Behavior
- The Firm Sector Since 1970

Productivity and the Business Cycle p. 313

The Short-Run Relationship Between Output and Unemployment p. 314

The Size of the Multiplier p. 315

DETAILED CHAPTER OUTLINE

- I. Introduction, page 299
 - A. The footnote on page 303 [615] is instructive: "This chapter is somewhat more advanced, but it contains a lot of interesting information!"
 - B. This chapter relaxes some of the simplifying assumptions made earlier. Doing this gives a more realistic picture of the influences on households' consumption and labor supply decisions. It also leads to better understanding of how firms make investment and employment decisions.
 - C. The chapter covers the two main theories of consumption, namely the life-cycle and permanent income models.
 - D. The chapter next expands the theory of investment to include capital stock adjustment models and models of inventory investment.
 - E. The chapter concludes with discussions of the behavior of productivity over the business cycle, the relationship between output and unemployment and the size of the multiplier.
- II. Households: Consumption and Labor Supply Decisions, pages 299-307
 - TEACHING TIP: It's helpful to briefly review the Keynesian model of consumption at this point. Consumption depends on income. The relationship is positive, and higher-income groups have a smaller average propensity to consume. The average propensity to consume (APC) is the fraction of total disposable income spent on consumption.¶
 - A. The Life-Cycle Theory of Consumption
 - 1. The *life-cycle theory of consumption* is a theory of household consumption: Households make lifetime consumption decisions based on their expectations of lifetime income.
 - 2. Fluctuations in wealth are an important component of the theory. It is saving and dissaving that allow individuals to maintain a relatively constant rate of consumption even faced with the normal lifetime pattern of income.
 - 3. The key difference from Keynes' theory is that consumption and saving decisions are based not just on current income but on expectations of future income as well.
 - a. The life-cycle model explicitly incorporates the relationship between income and saving flows and the stock of wealth.
 - b. The model also rationalizes saving as future consumption.
 - 4. The term *permanent income* is sometimes used to refer to the average level of a person's expected future income stream.
 - a. This has important implications for policy: temporary changes in taxes are unlikely to have much impact on the economy.
 - b. Research continues to show this is true.

TOPIC FOR CLASS DISCUSSION:

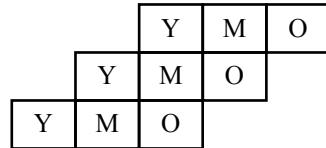
Apparently the folks in Washington, D.C., are incapable of learning this simple fact about temporary changes in taxes. Former President Lyndon B. Johnson was reluctant to raise taxes despite fighting his "war on poverty" and the war in Vietnam. Under pressure from his economic advisers he agreed to a ten percent income tax surcharge that would last for one year. This bill was signed into law in 1968. Have your students do some research to see what impact this temporary tax change had on the economy.

History source:

<http://www.taxhistory.org/thp/readings.nsf/cf7c9c870b600b9585256df80075b9dd/6b24abb33fe1996c852570d200756a5d?OpenDocument>. ■



TEACHING TIP: The life-cycle model does a good job of describing consumption behavior over an individual's lifetime. In its simple form, however, it says nothing about the aggregate consumption and saving behavior in the current period. This can be remedied by postulating a society of consumers at different stages in the life cycle. The easiest way to do this is to assume three overlapping generations—young, middle, and old. Each cohort is of equal size. At any point in time, all three generations exist. The following diagram should help your students visualize this idea.



The middle generation, which consumes less than its current income, is saving. This saving is loaned to the younger generation, which tends to spend more than its income. The members of the older generation finance current consumption by depleting the wealth accumulated during their middle years.

There are several advantages to using this model. First, it demonstrates the circular nature of income. Students are able to see that savings do not disappear, but rather are circulated back to other generations. Second, it demonstrates how the consumption/saving decisions of one generation affect the consumption/saving decisions of other generations. Third, it provides a framework for analyzing transfer-payment schemes like Social Security, particularly how demographic changes, such as the aging of the "baby boom" generation, can cause problems for these intergenerational-transfer schemes.

It is relatively easy to extend this model to include unequal cohorts and thus explain some behavior of asset prices as demographics change. For example, consider how the "baby boomers" progressed through economies. They entered the labor force beginning in the 1970s. From about 1970 - 1990 the younger of the three cohorts was larger than the middle or older. That increased the demand for loans relative to supply putting upward pressure on interest rates and downward pressure on asset prices. From 1990 - 2008 the boomers are in the middle cohort. There was a large supply of loans relative to demand, putting downward pressure on interest rates and upward pressure on asset prices. After 2008 there will once again be upward pressure on interest rates and downward pressure on asset prices. ◀

B.

The Labor Supply Decision

1. The size of the labor force is important. More workers mean more output. The quantity of labor can increase via population growth (births plus net immigration) and a higher labor force participation rate.
2. Households make decisions about whether to work and how much to work. These are tied to consumption decisions.

3. The quantity of labor supplied is determined by:

- a. The Wage Rate: Whether the effect is positive or negative is ambiguous. An increase in the wage rate makes work more attractive relative to leisure (the *substitution effect of a wage rate increase*), and it also increases income, which leads to a choice for more leisure (the *income effect of a wage rate increase*). The ultimate effect of a wage increase depends on which of the two is stronger. For the entire economy, however, the substitution effect seems to dominate.
- b. Prices also play a role. Deflating the nominal wage rate gives the real wage rate. It's the real wage that matters to workers because the real wage is their purchasing power. The *nominal wage rate* is the wage rate in current dollars while the *real wage rate* is the amount the nominal wage rate can buy in terms of goods and services.

TEACHING TIP: See Extended Application 1 in chapter 14 (p. 191) for an example of using the CPI to deflate the minimum wage.¶

- c. Wealth and Nonlabor Income have positive impacts on consumption. *Nonlabor (nonwage) income* is any income received from sources other than working — inheritances, interest, dividends, transfer payments, and so on. An unexpected increase in wealth or nonlabor income will lead to a *decrease* in labor supply.

C. Interest Rate Effects on Consumption

1. A fall in the interest rate lowers the reward to saving, increasing consumption (the substitution effect).
2. But it also means a decrease in interest income, leading to more saving (the income effect).
3. The data suggest that the interest rate has a negative net effect on consumption. But there is also some evidence that the income effect is becoming larger over time.

TEACHING TIP: See Extended Application 1 in chapter 14 (p. 191) for an example of using the CPI to deflate the minimum wage.¶

TEACHING TIP: See Extended Application 3 (p. 214) for an empirical example showing the impact of real interest rates on real automobile spending. The data and results for this model are included in the Excel workbook for this chapter. In addition, there is an SPSS version of the dataset as well as an SPSS viewer file with the basic results.¶

D. Government Effects on Consumption and Labor Supply: Taxes and Transfers

1. An increase in tax rates decreases consumption through its impact on disposable personal income.
2. An increase in tax rates also lowers labor supply.
3. An increase in *transfer payments* such as Social Security benefits, veterans' benefits, and welfare benefits will have a positive effect on consumption and a negative effect on labor supply.

E. A Possible Employment Constraint on Households

1. In recessions and depressions households may not be able to work as many hours as they would like.

2. Households may consume less and pay for consumption by borrowing or selling assets (dissaving).
3. The amount a household would like to work within a given period at the current wage rate if it could find the work, is called its *unconstrained supply of labor*. The amount that it actually works in a given period at the current wage rate is called its *constrained supply of labor*.
4. Keynesian Theory Revisited
 - a. The above theory tells us consumption and labor supply decisions are made jointly. Both depend on the real wage.
 - b. During recessions labor supply decisions become largely irrelevant because the supply of labor is constrained. Labor demand by firms determines employment. Therefore Keynes was correct in his assertion that income is the main determinant of consumption – at least during recessions.

F. A Summary of Household Behavior

1. The factors that affect household consumption and labor supply decisions are:
 - a. Current and expected future real wage rates
 - b. Initial value of wealth
 - c. Current and expected future nonlabor income
 - d. Interest rates
 - e. Current and expected future tax rates and transfer payments
2. If households are constrained in their labor supply decisions income is directly determined by firms' hiring decisions.

G. The Household Sector Since 1970

1. Consumption
 - a. Personal consumption expenditures were 70.3 percent of GDP in 2007.
 - b. There are three major categories of consumption expenditures: durable goods, nondurable goods, and services.
 - c. Expenditures on durable goods have fluctuated more than those on nondurables and services. Purchases of new durable goods can be postponed by fixing up, e.g., your old car. As income fluctuates, spending on consumer durables fluctuates to a greater extent.

TEACHING TIP: The data and graph for Figure 16.2 [31.2] are included in the Excel workbook for this chapter from 1995:I through 2013:I. ◀

2. Housing Investment fluctuates a lot and changes in ways that make the business cycle worse. Housing investment is the most postponable of all household expenditures because there is a lower-cost substitute: renting.

TEACHING TIP: The data and graph for Figure 16.3 [31.3] are included in the Excel workbook for this chapter from 1995:I through 2013:I. ◀

3. Labor Supply: Labor force participation rates vary for different groups. The *labor force participation rate* is the ratio of the labor force to the working-age population – those over 16 years of age.

TEACHING TIP: The data and graph for Figure 16.4 [31.4] are included in the Excel workbook for this chapter. Underlying workbooks are available on request. ◀

Unique Economics in Practice

The role of expected future tax rates in portfolio and saving decisions can be made clear by discussing the lack of popularity of the Roth IRA. In the U.S. a Roth IRA allows individuals to make contributions to an IRA (individual retirement account) out of after-tax income. There is no tax deduction from income in the year in which the contribution is made. Instead a Roth IRA promises that all withdrawals from the account made after retirement will be tax-exempt. Many in the financial community have expressed astonishment at the lack of popularity of Roth IRAs among individuals. But the reason is clear. The Roth IRA plan backloads “tax expenditures” onto future legislatures. Those future lawmakers will most probably not like this loss of tax revenue very much. Savers are avoiding Roth IRAs today because of their suspicion that the promised low future tax rate will be revoked by a future Congress.

A recent study by Laurence J. Kotlikoff, Ben Marx, and David Rapson of Boston University looks at a different tax issue. Recently Congress authorized Roth 401(k) accounts as an alternative to the regular 401(k). Kotlikoff, *et. al.* consider the possibility of a shift to a future consumption tax, replacing the individual income tax. In that case, conventional 401(k) accounts would have the dual advantages of tax deductibility today *and* paying no consumption taxes on withdrawal.

Question: Is political risk a valid subject for economic discussions?

Answer: Certainly.

Source: Laurence J. Kotlikoff, Ben Marx, and David Rapson (2008). “To Roth or Not? – That is the Question.” NBER Working Paper 13763, National Bureau of Economic Research, Cambridge, MA, January, 2008.

Economics in Practice: Measuring Housing Price Changes, *page 306*

Karl Case and Robert Shiller developed an index of housing prices (now the S&P Case-Shiller Housing Price Index) that compensates for differences among houses. By looking only at houses that have sold multiple times they bypass some of the difficulties presented by the unique characteristics of the housing market.

TEACHING TIP: Point out that consumer durables behave very much like any other capital stock adjustment model. Consumers have a desired stock of a particular variable (say cars). They gradually adjust their actual number of cars to the desired stock. The speed of adjustment depends on current and expected future income, interest rates, and tastes and preferences.

An easy way for students to grasp this is to point out that most households have good substitutes for purchasing a new car, namely fixing up the existing family car to keep it running for a few more years. Used cars are also a substitute. That makes spending on new automobiles even more volatile than most other consumer durables. ◀

III. Firms: Investment and Employment Decisions, pages 307-313

A. Introduction

1. The microeconomic theory of investment can help us understand macroeconomic behavior.
2. In a market economy, the decisions of firms determine output, labor demand, and investment.

B. Expectations and Animal Spirits

1. Firms' expectations about the future play a role in investment and employment decisions because investment projects usually have a long time horizon. As the text puts it, "Time is a key factor in investment decisions."
 - a. New capital will yield services over a long time period.
 - b. Firms consider the demand for their products, their competitors' plans, and the macroeconomy's overall health.
 - c. Keynes concluded that much investment activity depends on psychology, what he called "animal spirits." *Animal spirits of entrepreneurs* is a term coined by Keynes to describe investors' feelings.
 - d. Because expectations are so volatile, investment is, in turn, a volatile component of GDP.

TOPIC FOR CLASS DISCUSSION:

"Prediction is difficult, especially when it's about the future." Ask the class to identify the person who said that. Many will guess baseball legend Yogi Berra. In fact, the quotation is from Danish physicist and Nobel prize winner Nils Bohr.

For authentication see <http://www1.secam.ex.ac.uk/famous-forecasting-quotes.dhtml>. ■

TEACHING TIP: Today we call "animal spirits" by their correct name - expectations of future profits and the expected future interest rate. ◉

2. The Accelerator Effect

- a. If expectations are affected by aggregate output, then there is an accelerator effect: investment increases as Y increases and vice versa, causing greater increases or decreases in Y .
- b. The *accelerator effect* is the tendency for investment to increase when aggregate output increases and to decrease when aggregate output decreases, accelerating the growth or decline of output.
- c. Therefore investment is a volatile and pro-cyclical component of GDP.

TEACHING TIP: Students usually find the accelerator mechanism quite interesting because it is the only model they encounter that explains how economic fluctuations can arise endogenously. In the text the accelerator effect arises from the dependence of investment on expected future sales. A slight variation—where investment arises because an increase in current output requires more capital—can enable you to present a very simple numerical example to students.

Let K^* be the aggregate capital stock desired by all firms in the economy. Assume that K^* is some multiple of total output, say, $K^* = 4Y$. This says that to produce a dollar's worth of output, firms need \$4 worth of capital on hand. When output is changing, each one-dollar rise in output will cause a four-dollar rise in the desired capital stock: $\Delta K^* = 4\Delta Y$. If there are no adjustment costs, firms will immediately adjust the capital stock to its desired level, so that the change in the actual capital stock will be equal to the change in the desired capital stock. The change in the actual capital stock (ignoring depreciation) is simply investment expenditures for the year: $I = \Delta K = \Delta K^* = 4\Delta Y$.

It is possible to show that current investment expenditure depends on the change in output during the year. Each different growth path for output will imply a different growth path of investment spending. One such path is illustrated in the following table.

Note that the level of output is either stable or rising in the left column. Output never falls. But investment spending first rises and then falls. To have a constant level of investment, output would have to grow by a constant amount (as it does between years 3 and 6). To have rising investment spending (as between years 6 and 8) the growth rate of output must rise.]

| Year | Y | ΔY | $I = 4\Delta Y$ |
|------|-----|------------|-----------------|
| 1 | 100 | — | — |
| 2 | 100 | 0 | 0 |
| 3 | 100 | 0 | 0 |
| 4 | 110 | 10 | 40 |
| 5 | 120 | 10 | 40 |
| 6 | 130 | 10 | 40 |
| 7 | 150 | 20 | 80 |
| 8 | 180 | 30 | 120 |
| 9 | 200 | 20 | 80 |
| 10 | 210 | 10 | 40 |
| 11 | 210 | 0 | 0 |
| 12 | 210 | 0 | 0 |

Now that students can see how a given output path leads to a given investment path, it is a small step to bring the multiplier into the discussion. Each rise or fall in investment spending will have a multiplier impact on output. For example, as output rises at an increasing rate between years 3 and 8, investment spending rises as well. This rise in investment spending will feed back to output, causing an even faster rise in output than indicated in the columns, which in turn will bring forth a further rise in investment, and so on.

Similarly, between years 8 and 11 output is still rising, but at a slower and slower rate. This decline in the growth rate of output causes a decrease in investment spending, which will slow down the growth rate of output even more (and might even cause output to decline), causing a further decline in investment spending, and so on. Thus, the accelerator effect discussed in this chapter, along with the multiplier effect presented in previous chapters, can explain how a smooth output growth path can become a fluctuating output growth path. This demonstrates how business cycles can arise endogenously from economic growth.❶

C. Excess Labor and Excess Capital Effects

1. Firms may choose to hold excess labor and/or excess capital.
 - a. *Excess labor* is labor not needed to produce the firm's current level of output.
 - b. *Excess capital* is capital not needed to produce the firm's current level of output.
2. Excess capital and/or excess labor may be the result of a sudden, temporary decrease in sales.

3. Firms may choose to apparently hold excess labor or capital when, in fact, they are holding the quantities that maximize long-term profits.
 - a. Decreasing the workforce and/or capital stock quickly is usually costly to the firm.
 - b. Adjustment costs can be large enough that a firm will hold excess amounts of labor and/or capital (even though holding them also has costs). *Adjustment costs* are the costs that a firm incurs when it changes its production level — for example, the administration costs of laying off employees or the training costs of hiring new workers. Adjustment costs usually include layoff costs (decrease in demand) or hiring and training costs (increase in demand).
 - c. A firm currently experiencing a decline in sales, but expecting its business to turn around in the near future, may decide to hoard labor instead of always employing exactly the number of workers to maximize short-term profits. Hoarding labor and capital lead to excess labor and capital.
 - d. Capital is another story. Once capital is built it only is destroyed by economic depreciation. Firms rarely tear down existing buildings solely to reduce their capital stock.

TEACHING TIP: An interesting question to pose to students is the following: If firms continue to use more and more capital for production, what will happen to the employment of labor? The majority will say that employment will fall and unemployment will rise. Congratulate them for being such good Marxists. Their analysis is based on a partial equilibrium analysis with some very restrictive assumptions about the relationship between capital and labor in production.

There are several reasons why this partial equilibrium view is not likely to hold in the real world. First, students typically forget that an increased use of capital often requires an increase in labor as well (try running a new factory without any additional labor). If capital and labor are used in fixed proportions, an increase in capital will always lead to an increase in labor, which will decrease unemployment. Also in the short run the increased investment has a multiplied effect on income, creating more jobs (not fewer).

Second, even if the new capital is a substitute for labor so that labor use decreases in one sector of the economy, labor use must be increasing in the capital-producing sector, so the effect on aggregate employment is indeterminate. For example, the use of computers may have caused a decrease in the employment of clerical workers, but this decrease has likely been overwhelmed by the number of jobs created in the computer industry (product developers, assembly-line workers, computer programmers, computer repair personnel, etc.).

TEACHING TIP (continued)

Third, as the text discusses, the use of capital and labor is based on relative costs. If unemployment did occur, wages would be bid down, making labor relatively more attractive and causing firms to substitute labor for capital. The lower wages will hurt those workers who are not also capital owners, but growth will not cause a long-run unemployment problem.

Fourth, “labor-saving” capital often allows labor to be reallocated to perform other tasks that were previously left undone or of lower priority. For example, if excess labor were freed up, the government could hire more workers and expand environmental cleanup efforts.

Finally, investment in new technologies leads to development of new products and services that may never have been imagined by the previous generation. For example, 50 percent of current capital expenditures are for computer equipment. How would Karl Marx respond to automobiles, airplanes, televisions, VCRs, telephones, computers, and so forth? Great amounts of labor are needed to produce, sell, and distribute these products in the marketplace. Capital accumulation allows an economy to produce more goods and services in successive years. This in turn allows society to improve its standard of living over time. Even though certain sectors of the economy go through severe adjustments and the wages of those unable or unwilling to be retrained will decrease, in the long run, as the economy grows and more capital is put in place, benefits to society are substantial.¶

D. Inventory Investment

1. The Role of Inventories

- a. *Inventory investment* is the change in the stock of inventories.
- b. Inventories allow a firm to sell a different quantity than the quantity it produces during a period.

$$\text{Stock of inventories (end of period)} = \text{Stock of inventories (beginning of period)} + \text{Production} - \text{Sales}$$
- c. Inventories also allow a firm to produce a relatively stable quantity from month to month even though sales fluctuate over the same period.

2. The Optimal Inventory Policy

- a. The *desired (optimal) level of inventories* is the level of inventory at which the extra cost (in lost sales) from lowering inventories by a small amount is just equal to the extra gain (in interest revenue and decreased storage costs).
- b. An unexpected increase in inventories has a negative effect on future production, and vice versa.
- c. Current production depends on expected future sales.

E. A Summary of Firm Behavior

1. Firms' investment and employment decisions are affected by:

- a. Firms' expectations of future output.
- b. Wage rate and cost of capital (The interest rate is an important component of the cost of capital.)
- c. The amount of excess labor and excess capital on hand.

2. The relationship among production, sales, and inventory investment is important.

- a. Inventory investment – that is, the net change in the stock of inventories – equals production minus sales during a given period.
- b. An unplanned increase in inventories tends to have a negative effect on future production.

- c. Current production depends on expected future sales.

F. The Firm Sector Since 1970

1. Plant and Equipment Investment

TEACHING TIP: The data and graph for Figure 16.5 [31.5] are included in the Excel workbook for this chapter.¶

- a. In each of the five recessions since 1970 investment fell.
- b. Investment fluctuates a great deal.
- c. Housing investment fluctuates more than plant and equipment investment.

2. Employment

TEACHING TIP: The data and graph for Figure 16.6 [31.6] are included in the Excel workbook for this chapter.¶

- a. In each of the five recessions since 1970 employment fell.
- b. This is almost a truism since the definition of a recession includes changes in employment.

3. Inventory Investment

TEACHING TIP: The data and graph for Figure 16.7 [31.7] are included in the Excel workbook for this chapter.¶

- a. *Inventory investment*, the difference between the level of output and the level of sales, is particularly volatile.
- b. Some of the volatility in inventories is caused by unplanned changes in inventories.
- c. One important measure of inventories is the *inventory/sales ratio*, the stock of inventories divided by the current rate of sales. This ratio tells you how many days' sales are currently held as inventories. When the ratio is high the actual stock of inventories is likely to be greater than desired. Look for businesses to cut production. When the ratio is low, actual inventories are likely to be less than desired. Expect businesses to increase production.
- d. The inventory/sales ratio has been declining over time because businesses are becoming more adept at managing their inventories.

TEACHING TIP: Another reason for the declining inventory/sales ratio is the long-term shift toward services and away from manufacturing in the U.S. That shift also implies inventories have become less important since services, almost by definition, cannot be held in inventory. To quote a saying from the hotel industry, "Our product is very perishable."¶

IV. Productivity and the Business Cycle, pages 313

- A. *Labor productivity (productivity)* is output per worker hour; the amount of output produced by an average worker in 1 hour.
- B. Productivity fluctuates over the business cycle, usually rising during expansions and falling in contractions.
- C. Various labor hoarding and excess labor theories explain this behavior. During a recession, workers with jobs are not as fully employed as they were during the previous boom.

V. The Short-Run Relationship Between Output and Unemployment, pages 318-319

- A. At one time it was believed that the relationship between output and unemployment was fairly stable. This idea reached its ultimate expression in *Okun's Law*, the theory, put forth by Arthur Okun, that in the short run the unemployment rate decreases about 1 percentage point for every 3 percent increase in real GDP. Later research and data have shown that the relationship between output and unemployment is not as stable as Okun's "Law" predicts.
1. The first slippage is between the change in output and the change in the number of jobs in the economy. When the economy expands jobs do not rise proportionately to the increase in GDP because firms meet some of the increase in output by increasing the number of hours worked by the current labor force. Since many firms have excess labor when the increased demand for labor occurs, part of the increase will come from putting excess labor back to work.
 2. The second slippage is between the change in the number of jobs and the change in the number of people employed. People can hold two jobs, so there can be more jobs than the number of people employed. Also, when the number of jobs increases some of the new jobs are taken by people who already have other jobs. The increase in the number of people employed is less than the increase in the number of jobs.
 3. The third slippage is the response of the labor force to an increase in output. When output increases, some formerly discouraged workers may reenter the labor force and so the unemployment rate does not fall as much as one might expect. And when output decreases the unemployment rate may not rise as much as expected if many workers become discouraged and drop out of the labor force. The *discouraged-worker effect* is the decline in the measured unemployment rate that results when people who want to work but cannot find work grow discouraged and stop looking, dropping out of the ranks of the unemployed and the labor force.
- B. Therefore, the relationship between output and unemployment depends on the state of the economy at the time of the output change.

Unique Economics in Practice

In 2000 the labor force participation rate was 67.1%. By 2012 it had declined to 63.7%. The table below includes data on the civilian noninstitutional population and total civilian employment. Suppose the labor force participation rate in 2012 had been 67.1% and employment was 142,469,000 as originally reported.

| Year | Assumed LFPR | Population | Labor Force | Employed | Unemployed (calc.) | Unemployment Rate (calc) |
|------|--------------|-------------|-------------|-------------|--------------------|--------------------------|
| 2000 | 67.07% | 212,577,000 | 142,586,000 | 136,901,000 | 5,685,000 | 3.99% |
| 2012 | 67.07% | 243,284,000 | Calculated | 142,469,000 | Calculated | Calculated |

Question: What would the unemployment rate in 2012 have been with the assumed labor force participation rate?

Answer: 12.7%. The Excel workbook for this chapter contains the data and calculations.

VI. The Size of the Multiplier, page 319

A. The real-world multiplier is smaller than in the simple derivations because:

1. There are *automatic stabilizers*. As the economy expands, taxes increase, which offsets some of the expansion; the reverse is true for a decrease in GDP.
2. The *interest rate* rises when the economy expands. This causes crowding out and reduces the value of the multiplier.
3. The *price level* rises somewhat when the economy expands. This reduces the multiplier.
4. *Excess capital* and *excess labor* mean less of an increase in investment and consumption as the economy expands and so a smaller multiplier.
5. Some of the increase in sales will draw down *inventories* instead of increasing production.
6. The life-cycle permanent income model of consumption and *expectations* mean people respond less to temporary changes in income than to permanent ones.

B. The Size of the Multiplier in Practice is about 2.0 for the U.S., reaching that value three or four quarters after a change in fiscal policy.



TOPIC FOR CLASS DISCUSSION:

Friedman's model of consumption states that permanent consumption expenditures are a function of permanent income. Economists have understood this for half a century. Despite this, there is a long tradition of trying to use one-time tax rebates to stimulate the economy. These have been almost uniform failures. The table below shows some of the tax rebate programs enacted during the last 20 years. Divide the class into teams and ask each team to see if they can find any noticeable impact on real GDP during the four quarters after the rebates were issued.

| Date | Rebate details | Impact and citation |
|-----------------------|---|---|
| May, 2008 | Maximum: \$600 for individuals, \$1,200 for couples filing jointly. Minimum: \$300 per person | About 1/3 of rebate was spent. See NBER working papers 14753 (http://www.nber.org/papers/w14753) and 15421 (http://www.nber.org/papers/w15421). |
| May - September, 2001 | \$300 or \$600. | Between 20 and 40 percent spent. See NBER working paper 10784 or the summary at http://www.nber.org/digest/apr05/w10784.html . Also Johnson, David S., Jonathan A. Parker and Nicholas S. Souleles. 2006. "Household Expenditure and the Income Tax Rebates of 2001," <u>American Economic Review</u> 96(5), December. |
| April 15, 1975 | Ten percent of tax liability to a maximum of \$200. | Between 10 and 30 percent of the rebate was spent. Blinder, Alan S. 1981. "Temporary Income Taxes and Consumer Spending," <u>The Journal of Political Economy</u> 89(1), 26-53. Blinder, Alan S. and Angus Deaton. 1985. "The Time-Series Consumption Function Revisited." <u>Brookings Papers on Economic Activity</u> , 1985(2): 465-521. Washington: Brookings Institution. Poterba, James M. 1988. "Are Consumers Forward-Looking? Evidence from Fiscal Experiments," <u>American Economic Review</u> 78(2), May, 413-418 |

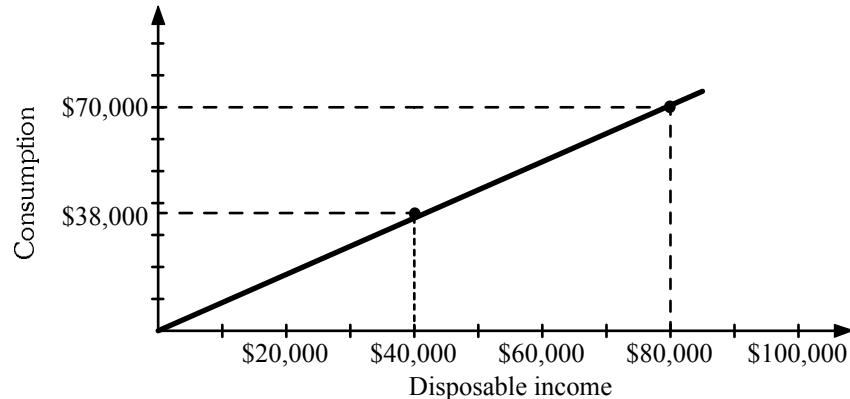
For your convenience, here are some citations that examined each rebate program. A great overall summary is in Alan J. Auerbach and William G. Gale, "Activist Fiscal Policy To Stabilize Economic Activity." NBER Working Paper 15407, October, 2009. Available at <http://www.nber.org/papers/w15407>. ■

Extended Applications

Application 1: A Common Confusion: APC Versus MPC

The text discusses the distinction between the average propensity to consume (APC) and the marginal propensity to consume (MPC). While the APC is the proportion of income currently spent on consumption, the MPC is the proportion of additional income that will be spent on consumption. These two proportions need not be, and usually are not, the same. But discussions of macro policy in the media often confuse the two.

To see the difference visually, draw the diagram following, which shows consumption spending at different levels of income. This is a cross-section diagram. The disposable income levels on the horizontal axis represent different income groups in the population; the consumption levels on the vertical axis are average levels of consumption for each income group. The consumption line plotted has the equation: $C = \$6,000 + 0.8Y_d$. In the diagram, as in empirical studies, consumption varies linearly with income. Another way of saying this is that the *MPC* (the slope of the line) is approximately the same for all income groups, and equal to 0.8 in our example. Giving a low-income household an additional \$1,000 in disposable income will increase its consumption by \$800, and giving a high-income family an additional \$1,000 in disposable income will increase its consumption by the same \$800.



But this does not mean that high- and low-income families spend the same proportions of their total disposable income. On the contrary, low-income families have a higher *APC* than high-income families. In the diagram, a typical family with disposable income of \$40,000 will spend $C = \$6,000 + 0.8(\$40,000) = \$38,000$.

The *APC* for this family is $\$38,000/\$40,000 = 0.95$. A typical family with disposable income of \$80,000 will spend $C = \$6,000 + 0.8(\$80,000) = \$70,000$. The *APC* in this case is $\$70,000/\$80,000 = 0.875$.

A check of other income groups will show that the higher the disposable income level, the lower the *APC*. In other words, the higher the income, the lower the portion of income spent on consumption. Disposable income not spent is saved, which leads to the oft-stated observation that "the rich save a higher proportion of their incomes than the poor."

Confusion arises, however, when this conclusion is applied to policy matters. An historical example occurred after World War II. American soldiers were returning from overseas by the

millions, and there was great concern that unless consumer spending increased, the economy would not be able to generate enough jobs for these veterans. A decision was reached to reduce taxes to stimulate consumer spending, increase production, and create additional jobs. But who would get the tax cut? For reasons of equity, it was decided to give the greatest tax cut to the lowest-income segments of the population. But to justify this on nonequity grounds, it was argued that because the poor spend more of their incomes (have a higher *APC*) than the rich, giving more of the tax cut to the poor would cause a greater increase in aggregate consumption spending.

Was this true? No. Because the poor and the rich have similar *MPCs*, and because a tax cut provides additional income, the tax cut would cause the same increase in consumer spending regardless of which income strata received it. In the example, where the *MPC* for all families is 0.8, giving a tax cut of \$50 billion to low-income families would increase their aggregate consumption by $0.8(\$50 \text{ billion}) = \40 billion . The same tax cut given to high-income families would cause the identical increase in aggregate consumption: \$40 billion. Thus, on purely macroeconomics grounds, it made little difference who received the tax cut. It is the *MPC*, rather than the *APC*, that is relevant when discussing policies that change disposable income.

A similar confusion arose in the early 1980s, when the Reagan administration wanted to cut taxes. This time, the goal was to increase household savings, the opposite goal from that after World War II. In the media, and in many political speeches, it was argued that because the rich save a higher proportion of their incomes (have a lower *APC*), they should get more of the tax cut, and in the end, this is exactly what was done. Once again, the discussion confused *APC*—which is irrelevant here—with *MPC*. The *APCs* for the different groups differ, but the *MPCs* are approximately the same. If the goal is to generate more saving, it makes no difference who gets the tax cut. In our example, a cut of \$100 billion given to those with high incomes will increase aggregate consumption by \$80 billion and aggregate saving by \$20 billion. But giving the same \$100 billion tax cut to the poor would generate the same increase in aggregate consumption and saving! (In the case of low-income families, much of the increased saving comes about when debts are repaid. For example, each \$1 in tax cuts might lead a poor family to pay back \$0.20 worth of debts. But this \$0.20 can now be lent to someone else, so it increases the pool of available savings as much as would an additional \$0.20 saved by a high-income household.)

One proviso should be added here: The stated main goal of the Reagan tax cuts was to increase incentives to work and invest. The fact that the *MPCs* are similar for different income groups says nothing about how these incentive effects may differ among them. Thus, even if the savings argument was fallacious, there may still have been “supply-side” justifications for aiming the tax cuts toward high-income households. (Supply-side economics is discussed in Chapter 18 [33].)

Application 2: Liquidity Constraints

Although the text discusses the possibility that households may be constrained in supplying the desired amount of labor, another potential household constraint involves the ability to borrow in order to spread consumption expenditures optimally over one’s life. If a household is unable to borrow despite being able to pay back the loan out of future income, it is *liquidity constrained*. We might think that those with little education and a bleak economic future are most likely to be liquidity constrained, but that is not the case. Those with a flat income profile also have a flat optimal consumption path that closely mirrors their income. It is those who expect much higher incomes in the future who would like their current consumption to exceed current income and are therefore most likely to be liquidity constrained. Students, for example, are often highly liquidity constrained. After college their incomes will rise considerably, but they are often unable to borrow against this future income.

Liquidity constrained individuals will have a consumption path that closely follows their fluctuating income path. What are the implications for policy? First, it may make monetary policy

less effective. If the Fed lowers the interest rate in an attempt to expand the economy, the result would normally be an increase in investment and consumption. However, if households (and possibly firms) are liquidity constrained, they will not be able to borrow the additional funds needed to finance consumption (and investment) expenditures. The economy will not expand as much as it otherwise would have.

Second, it may make fiscal policy more effective. According to the life-cycle hypothesis, a decrease in taxes or an increase in transfer payments will lead to a substantial increase in consumption only if the policy action is perceived as permanent. A transitory policy action would have only a small effect on lifetime or permanent income and would not have much of an impact on current consumption. But if households are liquidity constrained they would like their current consumption to be higher than it is, given their future income profile. In this case, if the government reduces taxes or increases transfers, households will consume much more of their additional disposable income.

As an example students will easily understand, suppose a college student who is currently able to borrow all he or she wants is suddenly given a grant from the government to cover all college expenses. This person could use the grant money to pay for schooling and reduce borrowing dollar for dollar, thereby leaving total spending unchanged. Consequently, this transfer payment will not increase total consumption. But now consider someone who is liquidity constrained, unable to borrow, and therefore unable to attend college. Receiving the government grant enables this person to attend college, thereby increasing total spending (whatever spending he or she was doing before, plus the additional spending for college). As a result, this type of fiscal action is more effective when individuals are liquidity constrained. (Similar results would be obtained if, instead of college financing, the financing of housing purchases were considered.)

Application 3: Interest Rates and Consumption Spending

Interest rates usually have a significant impact on one consumer durable in particular: cars. The Excel workbook for this chapter includes data from the FRED database at the St. Louis Fed on several variables including real disposable income, real spending on automobiles, the automobile finance rate, the CPI inflation rate, and the (calculated) real interest rate. If you have students that have a quantitative leaning, try handing this data over to them. (For your convenience, there is also an SPSS dataset version.)

The results of a quick-and-dirty linear regression of real auto sales on real disposable income and the real interest rate is shown below. These results are also included as both an SPSS viewer file and an Excel worksheet in the Excel workbook.

| Model Summary | | | | | | |
|---|-------------------|-----------------------------|-------------------|----------------------------|--------|-------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | | |
| 1 | .619 ^a | .383 | .365 | 39.2774 | | |
| a. Predictors: (Constant), RealInterestRate, RealYd | | | | | | |
| | | | | | | |
| ANOVA^b | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 66162.215 | 2 | 33081.108 | 21.443 | .000 ^a |
| | Residual | 106447.451 | 69 | 1542.717 | | |
| | Total | 172609.667 | 71 | | | |
| a. Predictors: (Constant), RealInterestRate, RealYd | | | | | | |
| b. Dependent Variable: RealAutoSpending | | | | | | |
| | | | | | | |
| Coefficients^a | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 187.832 | 44.734 | | 4.199 | .000 |
| | RealYd | .021 | .004 | .508 | 4.814 | .000 |
| | RealInterestRate | -3.992 | 2.182 | -.193 | -1.830 | .072 |
| a. Dependent Variable: RealAutoSpending | | | | | | |

Long-Run Growth

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Growth Process: From Agriculture to Industry *p. 322*

Sources of Economic Growth *p. 323*

Increase in Labor Supply

Increases in Physical Capital

Increases in the Quality of the Labor Supply (Human Capital)

Increases in the Quality of Capital ()

Disembodied Technical Change

More on Technical Change

U.S. Labor Productivity: 1952:I–2012:IV

Growth and the Environment and Issues of Sustainability *p. 330*

DETAILED CHAPTER OUTLINE

- I. Introduction, page 321
 - A. *Output growth* is the growth rate of the output of the entire economy.
 - B. *Per-capita output growth* is the growth rate of output per person in the economy.
 - C. *Labor productivity growth* is the growth rate of output per worker.
 - TEACHING TIP:** Remind students that output equals income. Income per capita is a big part of their standard of living.
- II. The Growth Process: From Agriculture to Industry, pages 322-323
 1. In Chapter 2 Colleen and Bill were stranded on a deserted island. Their GDP was whatever the two of them could produce (mainly food and shelter).
 - a. Over time the two accumulated capital by clearing land, making tools, improving their dwelling, and so on.
 - b. They accumulated both physical capital and human capital.
 - c. But at any time they are still constrained by the PPF. Fig. 17.1 [32.1] shows how their PPF shifts over time.
 2. From Agriculture to Industry: The Industrial Revolution
 - a. Before the Industrial Revolution every society in the world was agrarian. People mainly lived in small villages.
 - b. Technical change, innovation, and capital production increased productivity. Initially these improvements influenced agriculture and textiles.
 - i. It was no longer possible to make a living as a peasant farmer. Improvements in agricultural production created economies of scale. The efficient farm became larger.
 - ii. Cities grew as workers moved to areas near the sites of the new textile mills. This was the only real alternative available to those who could no longer make a living in agriculture.
 3. Growth in a Modern Society
 - a. Economic growth in modern industrial societies follows much the same pattern.
 - b. But the basic building blocks of growth remain the same: more workers with better education and training using more and better tools.

TOPIC FOR CLASS DISCUSSION:

Tools and information available on the Internet allow rapid searches for information using distant databases and other specialized sources of information. Today's *knowledge workers* are considerably more productive because of their skills using the World Wide Web and other computer-based search tools. Ask the class to discuss ways in which work has changed because of the world-wide web. You can start things rolling by pointing out how much more efficient your research has become with the advent of online databases such as EconLit and JSTOR. ■

4. Growth Patterns and the Possibility of Catch-Up

- a. As Table 17.1 [32.1] shows the economies of China (10.1%) and India (6.9%) grew rapidly between 1993 and 2012.

TEACHING TIP: A complete and updated version of Table 17.1[32.1] including all data in the Economic Report of the President 2013 Table B-112 is included in the Excel workbook for this chapter. ▶

- b. Convergence theory suggests that gaps in national incomes tend to close over time.
- c. *Catch-up* is the theory stating that the growth rates of less developed countries will exceed the growth rates of developed countries, allowing the less developed countries to catch up.
- d. While China and India provide examples supporting this theory, other countries have not fared so well. Understanding this discrepancy is the subject of considerable interest.

III. Sources of Economic Growth, pages 323-330

A. Introduction

- 1. Assume a simple economy with homogeneous labor and capital. Each worker is identical to all other workers and each machine is identical to all other machines.
- 2. The *aggregate production function* is a mathematical relationship stating that total GDP (output) depends on the total amount of labor used and the total amount of capital used.

Economics in Practice: Government Strategy for Growth, page 324

Suppose a country's economy is far removed from the PPFs of the developed economies. In that case, industrial policies that encourage use of the "correct" technology help the economy catch up. But once the economy's PPF is close to those of the developed economies, the government's strategy should change in the direction of supporting incentives, encouraging risk-taking by entrepreneurs, and improving capital markets. Research suggests that governments often make the shift in strategy too late, leading to stagnation rather than continued development.

TOPIC FOR CLASS DISCUSSION:

The *Economics in Practice: Government Strategy for Growth* discusses the transition from industrial policy to encouraging entrepreneurship as a key element of continuing economic growth. Ask your students where along this timeline protection of property rights (especially intellectual property) become relevant. Point out that "property" includes items as elementary as land. Even agrarian economies can stagnate if, say, there is a *res nullius* regime for owning land. ■

B. An Increase in Labor Supply

TEACHING TIP: The data and calculations in Table 17.2 [32.2] is included in the Excel workbook for this chapter. ▶

- 1. More labor usually increases the quantity of output produced.
- 2. This may not increase output per capita if the capital stock remains fixed while labor increases.

TEACHING TIP: This is a good place to remind students of the law of diminishing marginal productivity. When we increase the labor supply with a fixed capital stock we expect the marginal product of labor to decline. ■

3. The decrease in labor productivity is caused by *diminishing returns*, a major source of concern to Malthus, Ricardo, and other early economists.
 - a. Malthus and Ricardo were concerned that the fixed supply of land would lead to diminishing returns.
 - b. With diminishing returns the standard of living will eventually begin to decline.
 - c. Both economists failed to foresee technological improvements.

4. The U.S. population, labor force, and employment have grown over time.

TEACHING TIP: The data and calculations in Table 17.3 [32.3] updated to 2012 is included in the Excel workbook for this chapter. Note that the labor force as a percentage of population (column D) is the labor force participation rate. ■



TOPIC FOR CLASS DISCUSSION:

Have the students form teams. Each team should find a forecast from 5 or 10 years ago made by the Club of Rome model (Dennis Meadows's *Limits to Growth*), Paul Ehrlich, or some other well-known prophet of economic doom and gloom. The team should come to class prepared to discuss the content of the forecast and the reason(s) it was so drastically incorrect. ■

C. Increases in Physical Capital

TEACHING TIP: The data and calculations in Table 17.4 [32.4] is included in the Excel workbook for this chapter. ■

1. More capital per worker probably will increase worker productivity.
 - a. To Colleen and Bill producing capital in one year means increased production in future years.
 - b. Today's workers using modern computers can accomplish in an hour tasks it once took a dozen workers a week to perform.
 - c. Capital both enhances the productivity of labor and directly provides valuable services.

TEACHING TIP: Consider three simple examples. The first is spreadsheet software we all take for granted today. Students probably don't even know that the term "spreadsheet" once meant a large piece of paper. Imagine the time it took to recalculate one of those old spreadsheets when an assumption changed!

The second is word processing software. Once upon a time there were pieces of machinery called "typewriters." Whenever a change had to be made to something that was typed it meant typing the entire document over again. In a nutshell word processing means never having to retype an entire document.

TEACHING TIP (continued)

The third example, dear to the hearts of economists, is statistical software. Today SAS will run on your desktop computer. As recently as the mid-1980s SAS would only run on a mainframe computer. ■

TEACHING TIP: Table 17.5 [32.5] shows estimates of the size of the U.S. capital stock over time. Point out to students that this contributes to the future increase in output the economy will be able to produce. This table, as well as the underlying BEA table, is included in the Excel workbook for this chapter. ■

2. The U.S. capital stock has grown over time, contributing to output growth. Equipment [and software] has grown 4.2% per year, while nonresidential structures have grown 2.4% per year.
 3. The U.S. stock of capital has grown faster than the quantity of labor. Giving each worker more and better tools contributes to rising U.S. productivity.
 4. In today's modern open economy, capital can be created from either domestic or foreign saving. Foreign saving is called *foreign direct investment (FDI)*, investment in enterprises made in a country by residents outside that country.
 5. LaPorta, *et. al.* argue that countries with English common law origins (as opposed to French) provide the strongest protection for shareholders, less corrupt governments, and better court systems. These institutions promote growth by encouraging capital investment.
 6. Countries with poor institutions, corruption, and inadequate protection for lenders and investors struggle to attract capital. The World Bank calls countries with weak institutions *fragile countries*. Many of these fragile countries are in sub-Saharan Africa.
 7. Strong U.S. institutions and laws facilitate and encourage foreign direct investment from other countries..
- D. Increases in the Quality of the Labor Supply (Human Capital)
- TEACHING TIP:** The data for Table 17.6 [32.6] as well as one underlying table from the *Statistical Abstract* (2012, Table 229) are included in the Excel workbook for this chapter. ◉
1. Improvements in health, skills, and training increase the productivity of workers.
 2. Human capital is produced in many ways, including going to college or vocational school, on-the-job training, and government programs to provide education and training.
 3. In sub-Saharan Africa, the high incidence of HIV and other diseases is a major barrier to developing human capital. Workers who are ill are obviously less productive than those who are not.
 4. A quick glance at Table 17.6 [32.6] will convince anyone that the level of educational attainment in the U.S. has increased substantially since 1940.
- E. Increase in the Quality of Capital (Embodied Technical Change)
1. *Embodied technical change* results in an improvement of the quality of capital.
 2. Embodied technical change often means replacing older machines with newer machines. However, in some cases (commercial aircraft) the newer technology can replace components in an existing piece of capital.
 3. An increase in the quality of capital increases labor productivity.

Unique Economics in Practice

Today's \$1,000 computer has a CPU that runs at 1.86 gigahertz. (Gigahertz and megahertz are measures of the speed at which the CPU processes data.) The earliest desktop computers (about 1978) cost about \$10,000. Their CPU chips ran at 4.5 megahertz. With a price equal to 10 percent of the 1978 price and performance 413 times as powerful, measuring productivity is tricky indeed. But if we look at the cost per megahertz we can get some idea. Today, $\$1,000/1,860 = \0.81 per mhz. In 1978 the cost was \$2,222 per mhz. A quick way of measuring the productivity improvement is to look at the ratio of the cost per mhz. That's an improvement of 2,755.6 times or 275,560 percent. (This data is included in the Excel workbook Ch17Examples.xls.)

Question: The productivity improvement calculated above only measures productivity of the computer itself. How do you think that productivity improvement has affected productivity in other non-computer fields?

Answer: One example: today textbooks rarely are printed on paper before they are published. Without 1.86 ghz CPU chips, we'd still be using blue pencils on paper manuscripts.

Sources:

1. <http://www.computerhistory.org> has a great deal of valuable information.
2. <http://www.intel.com> has chip specific information.

F. Disembodied Technical Change

1. *Disembodied technical change* results in a change in the production process.
2. Disembodied technical change describes improvements in the production process not related to specific changes in capital.
 - a. Some improvements are related to the organization of the production process itself.
 - b. Other improvements may be related to using information technology to speed the flow of information throughout an organization.
3. Hu and Khan attribute much of the gains in Chinese productivity to simply shifting much of the economy to private markets.
4. Disembodied technical change can be either positive or negative. A negative technical change might be caused by new environmental regulations, for example.

Economics in Practice: German Jewish Émigrés Contribute to U.S. Growth, page 328

In the late 1930s and early 1940s over 133,000 Jewish émigrés entered the U.S. They included thousands of academics, many of whom were scientists. Recent research by Moser, Voena, and Waldinger seems to show that in the field of chemistry alone these new U.S. citizens may have increased the rate of patents being issued by over 30%.

G. More on Technical Change

1. Technical change usually requires two stages: invention and innovation.
 - a. An *invention* is an advance in knowledge.
 - b. An *innovation* is the use of new knowledge to produce a new product or to produce an existing product more efficiently.
2. One rough measure of invention is the fraction of GDP spent on research. In 2011 the U.S. spent 2.7% of GDP on research, down slightly from the 2.9% average during the 1990s.
 - a. In 2006 the U.S. ranked seventh among the OECD countries in R&D spending as a percentage of GDP.
 - b. But U.S. inventors are the leading source of patent applications.

H. U.S. Labor Productivity: 1952:I to 2012:IV

1. Figure 7.2 [22.2] is a graph of labor productivity for this period. This figure is repeated as 17.2 [32.2].
2. During the 1970s and 1980s economists talked about the “productivity problem.”
 - a. The problem was the slowdown in productivity growth during this period.
 - b. Many explanations were offered at the time, including the low rate of saving in the United States, increased environmental and government regulation of U.S. business, insufficient spending on research and development, and the fact that high energy costs in that period resulted in investment spending designed to save energy rather than to enhance productivity.
 - c. More recently productivity growth rates have increased, perhaps due to the development of the Internet. Between 1990:I and 2012:IV productivity grew at 1.9 percent per year.
 - d. Will the explosive growth of the internet lead to another productivity boom? The only way to find out for sure is to wait.



TEACHING TIP: It is important to point out that the productivity statistics examined in the text are hotly debated. Indeed, economists for years have talked about the “missing” productivity associated with increased use of computers and have suspected that measurement problems may be the cause.

Moreover, because GDP is the best available measure of output, it is used as the basis for all growth rates and productivity figures. However, there are many problems with GDP that makes it at best imperfect and at worst misleading for measuring and analyzing growth issues. For example, if the proportion of output produced in the underground economy rises over time, then GDP figures—which ignore the underground economy—will underestimate the growth rate. Similarly, if GDP increases because of an increase in work hours or the labor force participation rate (both of which imply a decrease in leisure), then some would argue that we have “growth” but no improvement in the overall standard of living.

Robert J. Gordon has done an excellent job of dissecting productivity growth and inflation in recent years. See, for example,
<http://faculty-web.at.northwestern.edu/economics/gordon/NBERPaper.pdf>.

TEACHING TIP: Students may not see much difference in the numbers cited for growth rates; they may wonder if there is really a big difference between a 3 percent and a 2 percent rate of growth, for example. Point out that in a single year the difference may not be great, but over time the difference becomes significant due to compounding. For example, 10 years from now, at 2 percent growth, GDP would be 21.9 percent higher than currently; at 3 percent growth it would be 34.4 percent higher. The difference is even clearer over a 25-year horizon: at 2 percent growth, GDP would be 64.1 percent higher; at 3 percent growth, it would be 109.4 percent higher.

Another way to make the same point is to compare the length of time it takes for GDP to double. With 3 percent growth, GDP would double in 23.45 years; with 2 percent growth it would take 35 years. ◉

IV. Growth and the Environment and Issues of Sustainability, pages 330-333

A. Introduction

1. The U.N.'s Millennium Development Goals (2000) sets quantifiable, time-based targets for developing countries.
 - a. Measures of education, mortality and income growth were obviously included.
 - b. This framework also included a set of environmental goals, including clean air, clean water, and conservation management.
2. Connections between economic growth and the environment are complex.
 - a. Grossman and Krueger (1995) found that the relationship between per capita income and pollution was an inverted U shape.
 - b. Above about \$6,000 GDP per capita (1985 dollars), the median concentration of smoke in cities begins to decline. This pattern is followed by other pollutants (although the level of GDP per capita at which pollution begins to decline varies with different pollutants.)
 - c. This result depends critically on the extent to which the government responds to its citizens' wishes.
 - d. Clean air and clean water are *normal goods* and respond to rising income just as economics would predict.
3. Some pollutants are mobile. Air pollution is a notorious example.

TEACHING TIP: The text uses the example of carbon emissions and global warming. Before this was an issue there was "acid rain." Sulfur dioxide emissions from coal-burning U.S. power plants circulated over the North Pole and were absorbed by rain clouds. This formed a weak solution of sulfuric acid. The rain fell on Germany and other northern European countries, causing considerable damage to their forests. ◉

B. Sustainability of Resource Extraction Growth Strategies

1. Some less-developed countries rely on mineral extraction for their export income.
 - a. Nigeria produces oil, South Africa produces diamonds.
 - b. The extraction process can cause environmental damage.
 - c. A second issue is what the country will do when the resource stock is depleted.

- d. Obviously revenue from the depletable resource should at least partially be used to develop other parts of the economy. Public infrastructure investment is especially important. Education is also quite important.
- 2. Growth Means the Rapid Depletion of a Finite Quantity of Resources
 - a. *The Limits to Growth* (D.L. Meadows, et. al., Washington, DC: Potomac Associates, 1972) predicted the world economy would collapse shortly after the year 2000.
 - b. This collapse is triggered by the exhaustion of depletable resources.
 - c. This argument is very similar to what Thomas Malthus said 200 years earlier.
- C. Summary: No Right Answers
 - 1. There are no right answers; there are trade-offs that must be considered.
 - 2. As long as these trade-offs exist people will disagree about growth.

Extended Applications

Application 1: The Role of Financial Intermediaries

The text makes clear that saving is an important determinant of capital accumulation and economic growth. A higher saving rate, *ceteris paribus*, should lead to a higher growth rate. But the process through which savings are translated into capital accumulation is not explored in the text.

Individuals save for a variety of reasons: for a specific future expenditure (like a car, a trip to Hawaii, a house, or a college education fund), to ensure a decent standard of living after retirement, or to provide a cushion of funds in case of adversity (like a serious illness or the loss of a job). Of these motives for saving, only one—retirement—is conducive to saving in forms that are illiquid (tied up for a long period of time). In general, households want their savings to be liquid—convertible into cash at low cost. When business firms undertake investment projects, however, it may be many years before they can pay back the principal of the loan from the higher profits generated by the project. Business firms, therefore, want long-term loans.

If it were up to business firms and households to come to agreements by themselves, there would be a problem. The household would want the right to obtain its funds on short notice, whereas the business firm would want a long-term commitment of the funds. This incompatibility would limit the recycling of savings into investment, and very little investment would take place.

Enter the financial intermediary—an institution that allows households to save in liquid form while at the same time allowing business firms to borrow on a long-term basis. Consider a bank. Households deposit their savings into the bank and the bank allows each household to withdraw its savings on short notice. The bank then lends the money to a business firm for an extended period of time. The bank can do this because it knows that, on any given day, the flow of new savings coming into the bank will approximately match the withdrawals made by those who wish to withdraw their money. Thus the bank converts the liquid savings of households into long-term loans for businesses. Households are much more willing to make their savings available for investment when they can stay “liquid” in this way, and the result is more savings made available for investment, greater capital accumulation, and a higher growth rate.

Many people mistakenly believe that financial intermediaries manufacture all the missing liquidity. It's a truism that banks borrow short and lend long. However, like all deposit

intermediaries, banks are subject to runs. Ultimately it is the central bank that supplies the missing liquidity in its role as lender of last resort. (Recommended reading: *Bailout: An Insider's Account of Bank Failures and Rescues* by Irvine H. Sprague, Beard Group, December, 2000. Pay special attention to the chapter on the Continental Illinois collapse.)

Other financial intermediaries accomplish the same purpose, but in different ways. For example, when firms issue shares of stock to raise funds for capital investment projects, they keep the funds for an indefinite period of time. The individual who buys the stock, however, regards it as a liquid asset because he or she knows that there are plenty of potential buyers and that the stock can be resold on short notice (this is called the secondary market). The same is true of bonds and the bond market.

Once students understand the importance of financial intermediaries in translating liquid savings into long-term investment projects, they will understand why the nations in transition are so desperate to develop financial intermediaries and financial markets of their own. Bankers and stock market officials from countries like the United States are traveling to such countries to help establish these institutions where they haven't existed for more than half a century.

Application 2: How Much Health Care Spending is Too Much?

In a thoughtful essay in the New York Times (November 4, 2007), Harvard economist Gregory Mankiw explored the meaning of a simple fact. In the U.S. health care expenditures are an increasing fraction of American incomes. In 1950 we spent about 5 percent of our income on health care. In 2007 the fraction was 16 percent. It's widely believed that this means the U.S. is spending "too much" on health care.

Mankiw argues that health care is, to some extent, a product that is income elastic. One obvious source of the increase in spending is cosmetic surgery and other elective procedures. But it's more insidious than that. Citing work by Charles I. Jones and Robert E. Hall, Mankiw quotes "As we grow older and richer, which is more valuable: a third car, yet another television, more clothing — or an extra year of life?"

Good question.

Sources: N. Gregory Mankiw, "Beyond Those Health Care Numbers." New York Times, November 4, 2007. Available at http://www.nytimes.com/2007/11/04/business/04view.html?_r=1&sq=Mankiw%20health&st=cse&adxnnl=1&coref=slogin&scp=1&adxnnlx=1219429691-7YfpR0UF/GbulLFRPQmWEw. Accessed August 22, 2008.

Charles I. Jones and Robert E. Hall, "The Value of Life and the Rise in Health Spending." Quarterly Journal of Economics 122:1 (February, 2007), pages 39-72.

Application 3: Disembodied Technical Change and the Learning Curve

The learning curve (also called learning by doing) is a phenomenon observed in many industries. The semiconductor industry is most often cited, but the original work was in airplane production. In either case, as the cumulative total production increases the average variable cost of production declines. Chung (2001) finds that the learning curve for Korean semiconductor manufacturers a learning ratio of 17% for 64K DRAMs and 9% for 256K DRAMs. Gruber (1992) estimates a 78% learning ratio, but also finds that different types of chips exhibit different learning curve characteristics. In a subsequent paper (Gruber, 1994) he estimates a 72% learning ratio across all semiconductor types. Finally, in 1995 he looks at the special problems presented by EPROMs (erasable programmable read-only memory chips).

However, the seminal work was by Wright (1936) who found that doubling the cumulative output of airframes reduced direct labor unit cost by 20%. To say that this finding helped the U.S. in World War II would be a vast understatement.

There are two basic functional forms for the learning curve. The first relates some measure of unit cost (hopefully average variable cost, C) to cumulative output (X):

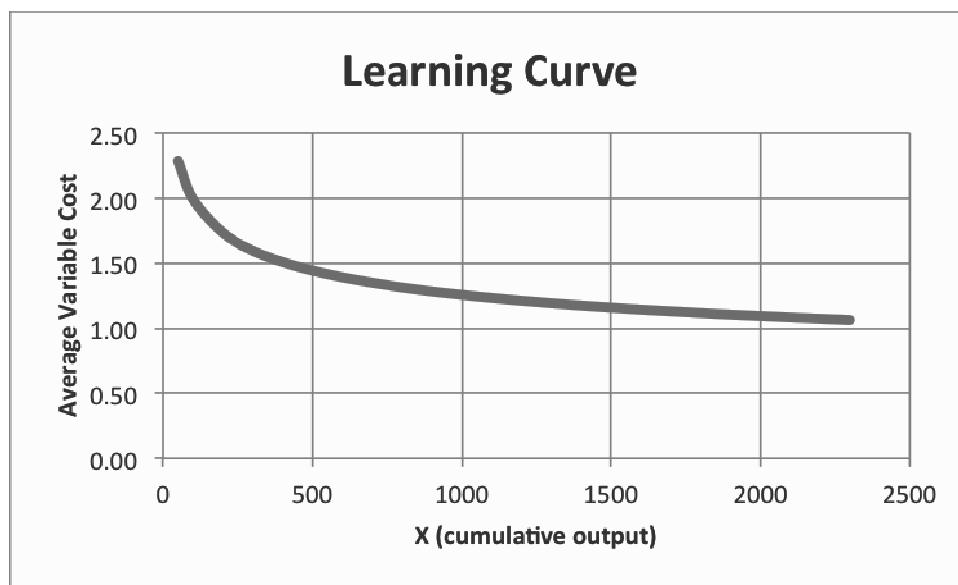
$$C = AX^b$$

The second functional form uses the plant capacity factor (y) instead of unit cost. The best description of this form is in Chung (2001). This formulation is useful for situations in which marginal costs may be low or market price data may not be available (viz., a regulated utility). It also allows estimation of both supplier learning and operator learning.

$$y = Ag(x)^{e_u}$$

where $g(x)$ describes the operators' learning process.

The Excel workbook for this chapter includes a simple learning curve that uses the first functional form. You may want to distribute this worksheet to your class to let them experience "learning by doing." Here's the graph for $A = 5$ and $b = -0.2$:



Sources:

Chung, Sangho (2001). "The Learning Curve and the Yield Factor: The Case of Korea's Semiconductor Industry." Applied Economics, March 2001, v. 33, iss. 4, pp. 473-83

Gruber, Harald (1992). "The Learning Curve in the Production of Semiconductor Memory Chips" Applied Economics, August 1992, v. 24, iss. 8, pp. 885-94

Gruber, Harald (1994). "The Yield Factor and the Learning Curve in Semiconductor Production" Applied Economics, August 1994, v. 26, iss. 8, pp. 837-43

Gruber, Harald (1995) "Market Structure, Learning and Product Innovation: Evidence for the EPROM Market" International Journal of the Economics of Business, 1995, v. 2, iss. 1, pp. 87-101

T. P. Wright, T.P. (1936) "Factors Affecting the Cost of Airplanes", Journal of the Aeronautical Sciences (Institute of the Aeronautical Sciences), Vol. 3, No. 4 (1936), pp. 122-128.

Alternative Views in Macroeconomics

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Keynesian Economics p. 337

Monetarism p. 338

- The Velocity of Money
- The Quantity Theory of Money
- Inflation as a Purely Monetary Phenomenon
- The Keynesian/Monetarist Debate

Supply-Side Economics p. 341

- The Laffer Curve
- Evaluating Supply-Side Economics

New Classical Macroeconomics p. 342

- The Development of New Classical Macroeconomics
- Rational Expectations
- Real Business Cycle Theory and New Keynesian Economics
- Evaluating the Rational Expectations Assumption

Testing Alternative Macroeconomic Models p. 347

DETAILED CHAPTER OUTLINE

- I. Introduction, page 337
 - A. There are many disagreements and unsettled questions in macroeconomics.
 - 1. Is the AS curve vertical? In the short or long run? Or both? Or is the AS curve even a useful macroeconomic concept?
 - 2. Is cyclical unemployment a problem that should be addressed by macroeconomic policy? If so, is fiscal or monetary policy the more appropriate tool to use?
 - B. In this chapter we discuss in more detail a number of alternative views of how the macroeconomy works.
- II. Keynesian Economics, page 337
 - A. Keynesian economics is the foundation of all macroeconomics.
 - 1. Keynes was the first to stress aggregate demand and the links between the money market and the goods market.
 - 2. He stressed the possible problem of sticky wages and believed in an activist federal government.
 - 3. The word “Keynesian” has come to be used to refer to economists who advocate active government intervention in the macroeconomy.
 - B. Events of the 1970s and 1980s forced macroeconomists to revise the standard Keynesian model to explain events Keynes ignored. After all, adverse supply shocks were not much of a problem during the Great Depression.
- III. Monetarism, pages 338-340
 - A. The Velocity of Money
 - 1. The *velocity of money* is the number of times a dollar bill changes hands on average during a year; the ratio of nominal GDP to the stock of money.
 - 2. Monetarists write $V \equiv GDP/M$. They then rewrite this so $MV \equiv PY$. Merely rearranging the terms in an identity doesn't give you much behavioral information.
 - 3. To give monetarism some economic content, monetarists developed the *quantity theory of money* which assumes V is constant in $MV \equiv PY$.
 - TEACHING TIP:** As noted in the footnote the definition of velocity in the text is the income velocity of money, the number of times the stock of money would change hands if money were only used to purchase the goods and services included in GDP. In fact, money is used for many other transactions including buying and selling previously owned goods, assets, and intermediate goods. A broader definition, the transactions velocity of money, is defined as the total money volume of transactions in the economy divided by the money stock. Unfortunately economists have not been able to find a way to measure the total volume of transactions so this definition of velocity remains purely theoretical. However, this distinction does make the important point that money is used to buy and sell many products not included in GDP. ¶
 - B. The Quantity Theory of Money
 - 1. Introduction
 - a. Since velocity is assumed constant, the equation is written as a behavioral equation: $M \times \bar{V} = P \times Y$.

- b. Therefore changes in the money supply cause equal percentage changes in nominal GDP.
- c. The issue for monetarists is how a given change in nominal GDP will be divided between real GDP and the price level.
- d. The true issue is whether velocity is really constant. If velocity is constant it's easy to show the demand for money will depend only on nominal income and not the interest rate. Many tests of the quantity theory have looked at the interest elasticity of the demand for money.
- e. One question is what the M in the quantity theory equation means? Is it money supply? Money demand? Are quantity theorists assuming the money market is in equilibrium?
- f. If M refers to money demand, there's something missing: the interest rate.

TEACHING TIP: $MV = PY$. In equilibrium, $M = PL$ where L is the demand for real money balances. Therefore $PLV = PY$ or $LV = Y$. Since V is constant L is only a function of Y . Note that $V = (1/L)Y$ leading to the interpretation of $(1/L)$ as the (constant) fraction of real income that households and businesses want to hold as real money balances. ◀

2. Testing the Quantity Theory of Money

- a. The key question is whether the demand for money is a function of the interest rate.
- b. Most empirical tests have shown the interest rate is a statistically significant variable in the money demand function.
- c. Another test is to examine the behavior of velocity over time; the data show that it is far from constant.
- d. The debate is more subtle, however. There are many definitions of the money supply, and there may be a time lag between a change in the money supply and its effects on nominal GDP.

TEACHING TIP: Illustrate the quantity theory of money using the AS/AD framework by drawing a vertical AS curve. Increases in the money supply result in a change in P and no change in Y . Extend this example following the suggestion in the text. Show that a long-term inflation caused by increases in government spending must eventually drive the interest rate so high as to cause complete crowding out. ◀

- e. It may be possible to find a combination of money supply measure and spending measure that makes V constant. But we haven't found it yet.

TEACHING TIP: Distribute data on nominal GDP and $M1$ and $M2$. Have students compute two alternative measures of velocity (V) and plot them over time. Note that the velocity of $M2$ is much more stable than $M1$ velocity. (Data from 1959 I to 2010 III for nominal GDP, $M1$, and $M2$ is included in the Excel workbook for this chapter. Also included are graphs of $M1$ and $M2$ velocity.) ◀

C. The Keynesian/Monetarist Debate

1. Most monetarists blame much of the instability in the economy on fiscal and monetary policy.
 - a. Time lags associated with policy make it likely that conscious attempts to stimulate and contract the economy will sometimes make the economy less stable.

- b. Remember the recognition, implementation, and response lags.
- 2. Many Keynesians advocate the application of coordinated monetary and fiscal policy tools to reduce instability in the economy, but not all of them advocate an activist federal government.
- 3. After the events of the 1970s economists concluded that monetary and fiscal policy tools are not suitable for “fine tuning.”

TEACHING TIP: To help students understand the policy implications of the quantity theory ($MV = PY$), translate the equation into percentage changes: $\%ΔM + \%ΔV = \%ΔP + \%ΔY$. With velocity constant ($\%ΔV = 0$), the equation reduces to $\%ΔM = \%ΔP + \%ΔY$.

From here, it is easy to see the relationship between money supply growth and inflation rate. If output is constant ($\%ΔY = 0$), then the percentage growth rate of the money supply will equal the rate of inflation ($\%ΔM = \%ΔP$). Alternatively, if output grows by, say, 3 percent per year, then the money supply can also grow by 3 percent without causing inflation. This is the basis for Milton Friedman’s oft-cited monetary growth rule: Set the growth rate of the money supply equal to the long-run growth rate of output.❶

TEACHING TIP: Share these amusing anecdotes with students.

Milton Friedman has long advocated a constant money supply growth rule to help stabilize the economy and avoid inflation (see previous teaching tip). However, at various times he has favored different specific growth rates. In one article he argued that a growth rate of -2 percent per year would make the rate of return on holding money competitive with other real interest rates. In another article he favored +2 percent per year, the average growth rate of real GDP. In still other articles he has said it really doesn’t matter what the growth rate of M is as long as it is constant.

In addition, Friedman has always argued that markets would operate more efficiently if the growth rate of the money supply were set very low to produce little or no inflation. For years, whenever he was asked what the nation should do to solve its economic problems, his response was always the same: “Reduce the growth rate of the money supply.” He made this statement so often and in so many contexts that it became almost a slogan. A story—which may or not be apocryphal—is told that in his graduate macroeconomics course at the University of Chicago, Friedman noticed a student in the back row who had fallen asleep. He awakened the student and tried to embarrass him. “Excuse me, young man,” Friedman said. “Can you answer the question I just asked?” The sleepy student replied, “I’m sorry, Professor Friedman. I didn’t hear the question. But the answer is: ‘Reduce the growth rate of the money supply.’”❷

III. Supply-Side Economics, pages 341-342

A. Introduction

- 1. Supply-side economics argues that all the attention to demand in orthodox macro theory distracted our attention from the real problem with the U.S. economy, which was high tax rates and heavy regulation.
- 2. Taken together high tax rates and heavy regulation reduced the incentive to work, to save, and to invest.
- 3. What is needed is better incentives to stimulate supply.

B. The Laffer Curve (Figure 18.2 [33.2])

- 1. With the tax rate measured on the vertical axis and tax revenue measured on the horizontal axis, the *Laffer curve* shows that there is some tax rate beyond which the supply response is large enough to lead to a decrease in tax revenue for further increases in the tax rate.
- 2. During the 1980s there was considerable debate about where the U.S. economy lies – above or below the peak.

TEACHING TIP: Prof. Don Fullerton of Princeton University tested the Laffer Curve using data from the U.S. economy. His work on this subject is revealing. See Extended Application 1 at the end of this chapter for more information about Prof. Fullerton's work. ■

C. Evaluating Supply-Side Economics

1. Supporters claim that the policies were successful in stimulating the economy in the early 1980s.
2. Critics suggest that the policies had demand side effects that actually created the stimulus.
3. In general, even if tax cuts have significant impacts on short-run aggregate supply, the impact on aggregate demand occurs first (and well before any shift in AS).

IV. New Classical Macroeconomics, pages 342-347

A. The Development of New Classical Macroeconomics

1. New classical macroeconomics developed from theoretical and empirical critiques of existing macroeconomics.
 - a. There was dissatisfaction with the theoretical treatment of expectations.
 - b. Empirical models developed before the early 1970s could not explain stagflation or the associated breakdown of the simple inflation-unemployment relationship.
2. Until the 1970s macroeconomic models had assumed that inflation expectations were based on current and/or recent past actual inflation.
 - a. These models of expectations formation are called adaptive expectations or backward-looking expectations.
 - b. The problem with such models is that they don't take all available information into account.
3. Stagflation combines high unemployment with high inflation.
 - a. Most macroeconomic models in use in 1970 were based on aggregate demand with little attention to aggregate supply.
 - b. Those models failed to forecast inflation and unemployment accurately during the 1970s and 1980s.



TOPIC FOR CLASS DISCUSSION:

Have the class form teams. Each team is to find a macroeconomic forecast made immediately after the first OPEC price shock, and then compare that forecast with the actual values. Teams should focus on inflation and unemployment forecasts. ■

B. Rational Expectations

1. Introduction
 - a. The *rational expectations hypothesis* states that people know the "true model" of the economy and that they use this model to form their expectations of the future

TEACHING TIP: A weaker form of the rational expectations hypothesis that people use all available information in forming their expectations. The similarity between versions of the rational expectations hypothesis and various forms of the efficient markets hypothesis is useful if your class is advanced enough to understand the analogy. ■

2. Rational Expectations and Market Clearing

- a. If firms have rational expectations and set prices and wages using these expectations, on average they will set market clearing wages and prices.
- b. Any disequilibrium is temporary and is the result of random unpredictable shocks.
- c. Therefore, if there is disequilibrium in the labor market it cannot be caused by errors firms make in forecasting.

TEACHING TIP: Remind your students what rational expectations is really assuming: that everyone in the economy has taken this course (and probably intermediate macroeconomics, too), understood it, and uses what they learned. If only part of the population (individuals and firms) uses rational expectations and the other part uses adaptive expectations, the economy will not stay at equilibrium. ¶

Economics in Practice: How Are Expectations Formed? page 344

A current debate is how people form expectations about future inflation. If people expect higher inflation and then, because of these expectations, demand higher wages, there will, in fact, be higher inflation. In 2010, some economists began to wonder whether inflationary expectations were rising. These fears were largely stimulated by the huge federal government budget deficit.

A recent paper by Ronnie Driver and Richard Windram (Bank of England) seems to indicate that consumers use backward-looking expectations rather than forward-looking expectations. Since 1999, the Bank of England has done a survey four times a year of 2,000 British consumers about their views of future inflation and future interest rates. The survey results suggest that consumers tend to expect future inflation to be what they perceive past inflation to have been. Consumers are more influenced by their own experience than by actual government numbers and their expectations of the future are based on their past experiences. Consumers mostly expect the future to look the way they perceive the past to have looked. Two factors that appear to be important in influencing consumer perceptions of inflation are gas prices and the attention the media pays to price increases.

3. The Lucas Supply Function

- a. Named after Robert E. Lucas (University of Chicago).
- b. The *Lucas supply function* hypothesizes that output (Y) depends on the difference between the actual price level and the expected price level ($P - P^e$).
 - i. Lucas first assumes firms and individuals are specialists in production but generalists in consumption.
 - ii. If the actual price level turns out to be different from the price level expected for that period, there is a *price surprise*, measured as the difference between the actual price level and the expected price level.
 - iii. Firms observe the price of their output increasing. Individuals observe their wage rates increasing. Both assume the relative prices of what they supply have risen and increase the quantity supplied.

iv. This means firms will supply more output and workers will supply more labor when the price level is unexpectedly higher than expected.

4. Policy Implications of the Lucas Supply Function

- a. The Lucas supply function implies that anticipated policy changes have no effect on real output.
- b. Government policy can affect real output only if it surprises people.

TEACHING TIP: An interesting implication of rational expectations is that only “bad” economic policy can affect changes in the macroeconomy. As discussed in the text, if one accepts the rational-expectations hypothesis, then one must conclude that only a policy unknown to the public can affect output and employment. This seems to imply that if the government could keep its policies secret, it could still manage the economy.

Aside from the practical and ideological difficulties of keeping secret government policy in a democracy, there is another problem. Under rational expectations, individuals would anticipate government policy moves, and an anticipated policy is as good as a known policy in forming expectations. For example, if output declines, and it is known that the Fed will most likely increase the money supply to stimulate the economy, then an increase in the money supply will become the “known” government policy that individuals will use to form their expectations. In a world where the government tries to “do the right thing,” people will learn to anticipate a stimulative policy in times of recession and a contractionary policy in times of overexpansion. When the government pursues its policy, even in secrecy, it can have no effect: The policy is anticipated and is therefore “known.”

What role does this leave for government policy? Because only an unanticipated policy can affect output and employment, and the “good” policy is always anticipated, we come to an ironic conclusion: The only policy that will affect the economy is a “bad” policy. The only way government can surprise market participants is by “doing the wrong thing!” For example, not changing the money supply, or even contracting it, during a recession would indeed surprise the public and affect output and employment. But because this would worsen the recession, no government would want to do this. This supports the contention that government macro policy should not be used to manage the economy.❶

TEACHING TIP: To improve students’ understanding of how inflation fighting by the Fed is related to credible policy announcements, tell your students the following story. Under rational expectations, economic agents are forward-looking. An implication of this is that the Fed might be able to fight inflation merely by announcing its intention to reduce the growth rate of the money supply. If the announcement is believed, the inflation rate will come down without necessitating a recession. (In other words, the short-run Phillips Curve will shift downward immediately, so the inflation rate decreases without an increase in the unemployment rate.)

In the early 1980s, Federal Reserve Chairman Paul Volcker adopted such a policy to break the inflation “psychology” caused by the high inflation rates of the late 1970s. He announced that the money supply growth rate would be reduced, and then proceeded to do it. The result was the most severe recession since the Second World War. Was this evidence that rational expectations and forward-looking behavior are invalid?

No, replied the new classical economists. The problem was that the announcement of future tight monetary policy was not credible. They argued that tight money policies were announced several times during the late 1970s to fight inflation, but when unemployment worsened or interest rates rose, the Fed backed off from its announced policy actions. Consequently, when Volcker took over, such announcements had lost all credibility in the private sector. Economic agents had adopted a show-me attitude, and the Fed had to establish a reputation for being serious about fighting inflation before the private sector would believe it. The Fed thus had to prove that it would stick to its guns even if the economy went into a recession. Once it proved itself, inflation expectations would be lowered and the wage/price spiral was broken. The Fed’s credibility enabled the U.S. economy to grow rapidly for several years afterward while maintaining low inflation rates.

The moral of the story is that policy makers should never announce policies that will be pursued only halfheartedly. Otherwise, the costs of regaining credibility may be great.❶

C. Real Business Cycle Theory and New Keynesian Economics

1. *Real business cycle theory* is an attempt to explain business-cycle fluctuations under the assumptions of complete price and wage flexibility and rational expectations. It emphasizes shocks to technology and other shocks.
 - a. Since prices and wages are assumed completely flexible, the *AS* curve must be vertical. Therefore, real output should not fluctuate. However, in reality, output does fluctuate.
 - b. Under the same assumption, all unemployment is frictional, voluntary unemployment. But with unemployment well above 9 percent in 2010, it's hard to argue that all of those currently unemployed are voluntarily out of work.
 - c. Early real business cycle theorists emphasized shocks to production technology. The theory did not fare well when it was discovered that the size of the shocks required to explain observed movements of the labor supply curve was unrealistically large.
2. *New Keynesian economics* is a field in which models are developed under the assumptions of rational expectations and sticky prices and wages.
 - a. These economists cite menu costs as a source of sticky prices. If it is costly to change prices, then prices will not be changed frequently enough to maintain equilibrium in all markets. Sticky wages are justified based on some of the models in chapter 14 [29].

TEACHING TIP: The term *menu costs* is used to describe the problem restaurants once faced: in order to change one or two prices, a new set of menus had to be printed. In the distant past this was costly. Today many restaurants print their own menus. Better examples are department stores and supermarkets where changing a price may mean changing shelf tags and altering computer data. Nevertheless, the term menu costs has persisted.❷

- b. Using dynamic stochastic general equilibrium models, researchers have found that monetary policy can affect real output.

E. Evaluating the Rational-Expectations Assumption

1. One key question is how realistic its assumptions are.
 - a. Rational expectations theory requires households and firms to obtain and process a great deal of information.
 - b. In addition, they must process this information correctly. (Fairly often even trained economists can't do this.)
 - c. The hypothesis may be unrealistic.
2. A second question is empirical tests.
 - a. By and large the rational expectations hypothesis has not fared well when tested empirically.
 - b. Incorporating rational expectations into forecasting models also does not seem to improve the forecasts.

VI. Testing Alternative Macroeconomic Models, page 348

- A. It is hard to test the models against each other to see which works best because the models differ in ways that are hard to standardize.
 - 1. For example, any test of rational expectations is a joint test of both the expectations model and whether the model itself is the “true” one.
 - B. Another problem is the amount of data available. Even going back to 1950, there are 244 quarterly observations available. There is not enough variation in most macroeconomic time series to allow statistical sorting out. And there were only eight recession periods.
 - C. It is difficult for economists to perform controlled experiments.
- TEACHING TIP:** Economic forecasts have long been the butt of jokes because they are so often wrong and because economists’ forecasts disagree so much with each other. Many conclude that economists don’t really understand how the economy works; otherwise, their forecasts would be more accurate. This critique of economic science ignores the distinction between conditional and unconditional forecasts.

A conditional forecast predicts important economic variables (GDP, unemployment, inflation) under possible alternative scenarios for government policy, weather patterns, and international political events. An unconditional forecast predicts economic variables based on “best guesses” about government policy, weather, and politics.

To help students understand the difference between conditional and unconditional forecasts, ask them to imagine that economists knew exactly how the economy worked; that is, imagine that economists had a “perfect model” enabling them to predict exactly how different policy measures would affect the economy. A conditional forecast would predict what would happen under each of several different assumptions: alternative levels of government spending and taxes, alternative monetary policies by the Fed, and so forth. Under the “perfect model” assumption, once the government’s policies were put in place, the appropriate forecast would always be correct. But now suppose that economists must come up with an unconditional forecast for, say, GDP. This requires selecting one of several possible assumptions about government policy, a “best guess.” As time passes, actual government policies usually deviate from this “best guess,” and the forecast will be substantially in error. But this predictive failure does not mean that economists don’t understand the economy. Rather, it means they are unable to predict which policies the government will choose (or what the weather will be, or what other countries will do in the international arena).

- TEACHING TIP (continued):**

Part of the reason for inaccurate economic forecasts is, indeed, a lack of understanding of the economy: We do not, in fact, have the perfect model, and there remains substantial disagreement and controversy about how the economy works. But another reason for the inaccuracy is that the media prefer unconditional forecasts to conditional ones. One cannot report conditional forecasts with their alternative policy scenarios in a 10-second sound bite on the evening news, or in three paragraphs of a column in the *New York Times*. The result is that inaccurate political forecasting creates errors, which are then attributed to lack of economic understanding.❶

Extended Applications

Application 1: The Laffer Curve

Students of all generations (not just those who followed the Reagan-era tax cuts) are fascinated with the idea that cutting tax rates could, in theory, actually increase tax revenues. If this were true in practice, it would be one of the few known cases of the proverbial “free lunch”—an economic policy that actually increased funds available for government programs while harming no one (and actually benefiting taxpayers).

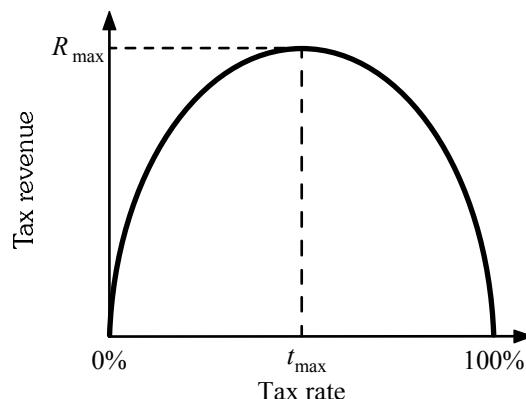
To motivate the discussion, present the basic supply-side principle behind the Laffer Curve: The more we tax any activity, the less of it there will be. A dramatic example of this principle is found in medieval European castles. The windows in these castles are usually very small, mainly because tax assessors used “total window space” as an indication of “castle-size” to determine property taxes. To avoid high taxes, castle owners bricked in most of their window space. Effect: Windows were taxed, so they became smaller.

Next, ask: What is being taxed in the United States? (Mostly income, which in turn derives from labor and capital. We tax income from land, too, but we don’t get any less of that as a consequence!) It stands to reason, then, that the higher the tax rate on income from capital and labor, the lower the supplies of capital and labor will be.

The next step in the analysis is to define the concept of a “tax base” and present the basic equation for tax revenues: TOTAL REVENUE = TAXBASE x TAXRATE.

The supply-side principle discussed previously suggests that raising the tax rate will reduce the tax base. For example, if raising the tax rate on labor income reduces labor hours by 10 percentage but wages remain the same, then the tax base decreases by 10 percent. What happens to tax revenue depends on which of the two multiplicands (the tax base or the tax rate) changes by a greater factor. If doubling the tax rate reduces the tax base by 50 percent, tax revenues remain unchanged. But if doubling the tax rate more than halves the tax base, tax revenues go down.

Finally, to the Laffer Curve; draw a pair of axes, with TAX RATE on the horizontal and TAX REVENUE on the vertical. Before drawing the actual curve, ask students the following questions: If the tax rate is 0 percent, how much revenue will be collected? (Zero.) If the tax rate is 100 percent, how much revenue will be collected? (A reasonable answer is zero.) Because tax revenue begins and ends at zero, but is positive somewhere in between, it follows that the tax-revenue curve must rise and then fall, and therefore it must have a maximum point (R_{\max}). Given the behavior of taxpayers, it is impossible to collect any more than R_{\max} in taxes, and therefore t_{\max} is the tax rate that yields the highest possible revenue.



Clearly, if the tax rate is to the right of t_{\max} , raising it further will decrease tax revenues. Ask: What is happening in the background to bring about this decrease in tax revenues? (The rise in the tax rate reduces the tax base by an even greater proportion, so that the product of the two declines.) For the same reason, a decrease in tax rates must increase tax revenue. At this point, instructors who are sympathetic to supply-side economics can use any of the 50 or so articles that appear in the *Wall Street Journal* each year, which support (with data) the idea that U.S. tax rates are indeed beyond t_{\max} . Those less sympathetic can point out that, in the early 1980s, it was assumed by the Reagan administration that U.S. tax rates were beyond t_{\max} , and the problems caused by this assumption can be discussed here.

Empirical analysis by Dr. Don Fullerton seems to indicate two characteristics of the U.S. economy. First, the peak of the curve is around a 76 percent tax rate. The curve is skewed to the right. Second, the average U.S. tax rate is around 20 percent. These two facts make any sort of supply-side impact from a general tax cut highly unlikely. (Fullerton, Don, "On the possibility of an inverse relationship between tax rates and government revenues." Journal of Public Economics, 19:1 (October, 1982), pp. 3 – 22.)

Application 2: Macroeconomic Policy

At this point, students may well ask why they studied macroeconomics anyway. After all, one of the few things economists seem able to agree on is that the economy will return to full employment on its own without any sort of fiscal or monetary policy intervention. Further, given the lags in the two policies, it may seem to them that macroeconomic policy is more likely to do harm than good.

Here at the beginning of the twenty first century we can tell our students the truth. Fiscal and monetary policy should be used judiciously, usually when there is a serious problem with the economy. However, the purpose of these policies is not to get the economy back to full employment. That will happen (eventually) anyway. Their purpose is to get the economy back to full employment faster than it would get there on its own.

Remind students that during a recession every year's lost output is gone for good. If fiscal or monetary policy can get the economy back to full employment even a year earlier, that much more output will be produced. The cost, of course, is the higher price level that is part and parcel of using demand management policies.

International Trade, Comparative Advantage, and Protectionism

by Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Trade Surpluses and Deficits *p. 352*

The Economic Basis for Trade: Comparative Advantage *p. 353*

Absolute Advantage versus Comparative Advantage

Terms of Trade

Exchange Rates

The Sources of Comparative Advantage *p. 360*

The Heckscher-Ohlin Theorem

Other Explanations for Observed Trade Flows

Trade Barriers: Tariffs, Export Subsidies, and Quotas *p. 365*

U.S. Trade Policies, GATT, and the WTO

Free Trade or Protection? *p. 365*

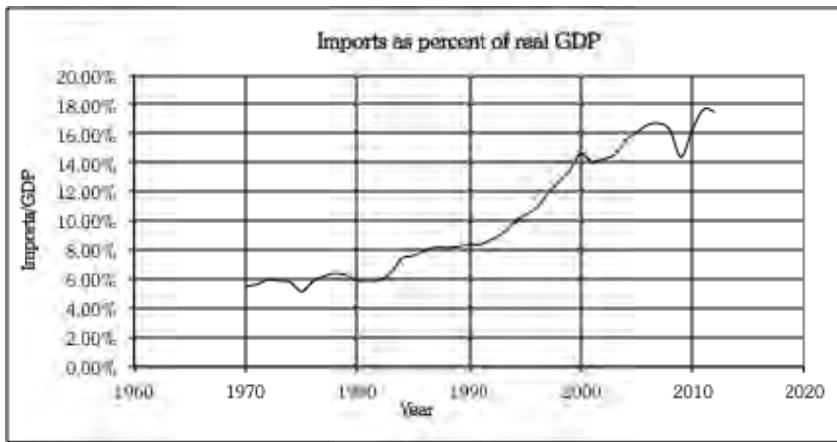
The Case for Free Trade

The Case for Protection

An Economic Consensus *p. 370*

DETAILED CHAPTER OUTLINE

- I. Introduction, pages 351-352
- Before 1970 macroeconomics courses in the United States were often taught from the perspective of a closed economy. Since then, international trade and finance have both become vital parts of the study of economics.
 - In 1970 imports were about 5 percent of U.S. GDP. Today the fraction is almost 18 percent.
 - TEACHING TIP:** Imports as a percentage of GDP have fluctuated around a steady upward trend since about 1980. In 1980 imports were 5.9% of GDP. In 2009 that fraction had increased to 14.4%. By 2012 imports had risen to 17.7% of GDP. (These figures and the calculations, as well as the graph shown below, are in the Excel workbook for this chapter.).



- It's difficult to find a product that doesn't contain some value added created in another country. Apple's iPod contains 451 parts from many countries including Korea, Japan, China, and the U.S. Honda started producing motorcycles in Marysville, Ohio in 1977 with 64 employees. Honda now employs over 12,000 workers at four Ohio locations.
- The U.S. is a major exporter of services, especially education, financial services and consulting. With globalization has come more outsourcing, moving certain classes of jobs to other countries. The Internet and modern telecommunications systems have made outsourcing many services feasible.
- TEACHING TIP:** The following point (E) will only be useful to those teaching macroeconomics.❶
- The basic IS-LM AD-AS model developed in this text includes some aspects of international trade and finance.
 - Net exports are included in planned spending. They affect equilibrium GDP three ways:
 - Exports are an injection that increases autonomous planned spending.
 - Autonomous imports are a leakage that reduces increases autonomous planned spending.
 - Induced imports lower the value of the income-expenditure multiplier.

2. The relationship between the balance of trade and capital flows helped define the sources and uses of funds in the economy. Specifically the fundamental equation of macroeconomics ($S + T + IM = I + G + EX$) shows how injections and leakages must balance.

TEACHING TIP: You may want to have the class review *Economics in Practice* in chapter 1 (page 5). ◉

II. Trade Surpluses and Deficits, page 352

TEACHING TIP: The data in Table 19.1 [34.1] is included in the Excel workbook for this chapter. Also included is the complete GDP table from 1929 through 2012. ◉

- A. When a country exports more than it imports it has a *trade surplus*. When a country imports more than it exports it runs a *trade deficit*. The difference between exports and imports is called net exports (the balance of trade).



TOPIC FOR CLASS DISCUSSION:

What is the present international situation of the United States? What are net exports, the balance on current account, the balance on capital account, and the balance of payments? What countries are the major trading partners of the United States? What are the main imports and exports?

Also, the United States exports a lot of services. How can a service be exported? (Students will find it helpful to find out exactly which services the United States exports in quantity.)

A good place to begin is the Bureau of Economic Analysis Web site (www.bea.gov). Look for links to data on international transactions at the top of the right column. ■

TEACHING TIP: For those who want to include more details about international accounting, the following may be helpful.

The *current account balance* includes net exports, net international transfer payments and net international interest payments. The current account balance must roughly equal the capital and financial account balance (net capital and financial flows). An economy experiences a *capital (or financial) inflow* when a foreigner purchases a domestic asset. A *capital (or financial) outflow* occurs when a domestic resident purchases a foreign asset. The *balance of payments* is the current account balance plus the capital account balance plus net government intervention plus the statistical discrepancy. Net government or central bank intervention is net purchases of domestic currency by the government in the foreign exchange market.

The statistical discrepancy is rarely mentioned but its magnitude is often very large. Part of the reason for the size of the discrepancy is suggested by some work done by Paul Krugman. Prof. Krugman analyzed world trade by adding up total world exports and total world imports. Those two numbers should be the same. In fact he found total world exports were far greater than imports. His conclusion? The excess exports were being purchased by aliens from outer space. (We think he was joking.)

Krugman's economic point is that governments place tariffs and trade restrictions on imports. This gives importers an incentive to understate the volume of imports. Apparently they do this rather well. (There are few similar incentives to underreport exports.) This contributes to the statistical discrepancy. ◉

III. The Economic Basis for Trade: Comparative Advantage, pages 353-360

A. History

1. In the early 19th century the British Parliament debated free trade.

- a. The *Corn Laws* were tariffs, subsidies, and restrictions enacted by the British Parliament in the early nineteenth century to discourage imports and encourage exports of grain.

- b. The Corn Laws kept food prices high, benefitting the wealthy landowners.
 - 2. The Industrial Revolution produced a new group of wealthy industrial capitalists. This group needed to pay workers enough to keep them alive. High food prices meant higher wages for their workers. Eventually the new capitalists dominated the debate and the Corn Laws were repealed in 1848.
 - 3. One supporter of repeal was David Ricardo. His *theory of comparative advantage* stated that specialization and free trade will benefit all trading partners (real wages will rise), even those that may be absolutely less efficient producers.
 - 4. Trade enables countries to specialize in producing the goods and services they produce most efficiently.
 - a. Specialization will increase production of all goods and services.
 - b. Trade will therefore benefit all trading partners (David Ricardo).
- B. Absolute Advantage versus Comparative Advantage
- 1. *Absolute advantage* is the advantage in the production of a good enjoyed by one country over another when it uses fewer resources to produce that good than the other country does.
 - 2. *Comparative advantage* is the advantage in the production of a good enjoyed by one country over another when that good can be produced at lower cost in terms of other goods than it could be in the other country.

TEACHING TIP: Students will have an easier time with the mechanics of comparative advantage if they first grasp the simple intuition behind it. Here's one possible story.

Consider the case of a top-notch attorney who is also an expert typist. In fact, the attorney is a faster typist than her secretary. Stress that the attorney has an absolute advantage in both legal work and typing. Should the attorney type some of her own letters? (No.) Why not? (Answers will vary, but wait for a student to say something like, "The attorney may be better at both, but probably she is a better attorney than she is a typist.") Point out that this summarizes comparative advantage in a nutshell.

A numerical example always helps. Suppose the attorney can prepare a brief in 60 minutes and type a letter in 5 minutes. The secretary can prepare a brief in 180 minutes and type a letter in 10 minutes. Arrange these figures on the board in a 2-by-2 matrix. What is the opportunity cost for the attorney to type a letter? (One-twelfth of a brief.) What is the opportunity cost for the secretary to type a letter? (One-eighteenth of a brief.) Because the secretary can type a letter with lower opportunity cost, she has a comparative advantage in letters, whereas the attorney has a comparative advantage in briefs. More letters and more briefs can be produced when each specializes according to comparative advantage.❶

- 3. Gains from Mutual Absolute Advantage seem obvious.
 - a. Consider New Zealand and Australia. Table 19.2 [34.2] shows the yield per acre of wheat and cotton in each country.

TABLE 19.2 Yield per Acre of Wheat and Cotton

| | New Zealand | Australia |
|--------|-------------|-----------|
| Wheat | 6 bushels | 2 bushels |
| Cotton | 2 bales | 6 bales |

TEACHING TIP: The data in Table 19.2 [34.2] is included in the Excel workbook for this chapter.❷

- b. If each country has 100 acres of land, consumes only what it produces, and wants to consume equal quantities of wheat and cotton, they will each produce 150 bales of cotton and 150 bushels of wheat.

TEACHING TIP: Autarky describes a country that does not engage in transactions with the rest of the world. This is a useful word for students to learn..

TEACHING TIP: The data in Tables 19.3 [34.3] and 19.4 [34.4] as well as Figure 19.1 [34.1] are included in the Excel workbook for this chapter. All numbers except productivities and available land are calculated..

- c. New Zealand has a comparative advantage at wheat production while Australia's comparative advantage lies in cotton production. If each country completely specializes in the product where its comparative advantage lies, total output will be 600 bales of cotton and 600 bushels of wheat. Total output has doubled, making both countries better off.

4. Gains from Comparative Advantage result when one country can produce one good at a lower opportunity cost than the other. Mutually beneficial trade can result.

TEACHING TIP: The second example in the text (beginning with Table 19.5 [34.5]) gives New Zealand an absolute advantage at production of both goods. The important point being made here is that there is still a viable economic basis for specialization and trade, improving the welfare of each country. The data and calculations (as well as the new PPF for each country) are included in the Excel workbook for this chapter..

5. Why Does Ricardo's Plan Work?

- a. Specialization and trade are mutually beneficial because the combined output is larger than autarky. Autarky is a system in which each country produces everything it consumes.
- b. The text says it best: “The real cost of producing cotton is the wheat that must be sacrificed to produce it. *When we think of cost this way, it is less costly to produce cotton in Australia than to produce it in New Zealand, even though an acre of land produces more cotton in New Zealand.*” (page 357 [669])). Figure 19.3 [34.3] is very useful explaining this:

| Opportunity "cost" of wheat | | Opportunity "cost" of cotton | | |
|--|---|---|--|---|
| | Bales of cotton given up | Bushels of wheat gained | Bushels of wheat given up | |
| New Zealand |  →  | 1 |  →  | 3 |
| Australia |  →  | 3 |  →  | 1 |
| New Zealand has a comparative advantage in wheat production | | Australia has a comparative advantage in cotton production | | |

DDD TEACHING TIP: Comparative advantage is a direct result of the laws of algebra. In New Zealand the opportunity cost of one more bushel of wheat is $6/6 =$ one more bale of cotton. That means the opportunity cost of one more bale of cotton must equal the reciprocal of the opportunity cost of one more bushel of wheat ($1/1 = 1$ which makes this case uninteresting). Similarly for Australia the the opportunity cost of one more bushel of wheat is $3/1 =$ three bales of cotton. That means the opportunity cost of one more bale of cotton must equal the reciprocal of the opportunity cost of one more bushel of wheat ($1/3 = 0.33$). Except in the rare case where the costs are equal in the two countries, each country must have a comparative advantage at producing one good.❶

D. Terms of Trade

1. The *terms of trade* is the ratio at which a country can trade domestic products for imported products.
2. The terms of trade determine how the gains from trade are distributed.

DDD TEACHING TIP: The example on p. 357 [669] is excellent and can be extended to make it even more interesting. In the example, the terms of trade (1 bushel of wheat for 2 bales of cotton) is more productive for each country than shifting land to produce more of the good at which it has a comparative disadvantage. Thus trade in goods substitutes for trade in factors of production.❶

E. Exchange Rates

1. An *exchange rate* is the ratio at which two currencies are traded. The price of one currency in terms of another.
 - a. Since the exchange rate is a price it must be determined by supply and demand.
 - b. In this case the supply and demand curves are derived from the underlying demand for foreign trade and international borrowing and lending.

DDD TEACHING TIP: A good website for exchange rates is <http://www.oanda.com>.❶

2. Trade and Exchange Rates in a Two-Country/Two-Good World
 - a. In this simple world the exchange rate will settle at a level at which trade flows in both directions.
 - b. Each country will specialize in production of the product for which it has a comparative advantage. This does not necessarily mean complete specialization, however.

DDD TEACHING TIP: The data in Tables 19.8 and 19.9 [34.8 and 34.9] and the analysis on page 359 [671] are included in the Excel workbook for this chapter. This worksheet lets you enter an exchange rate and will automatically tell you which country exports each good (as well as giving "No Trade" if the prices are equal in the two countries).❶

Unique Economics in Practice

Hawaii once grew many pineapples. Factor endowment was the obvious explanation. Hawaii has lots of sunshine, rain, and soil that is well-suited to pineapple production. However, land in Hawaii is much more valuable for tourism. Today Hawaii's share of the global market is 0.13% (400 million out of a global total of 300 billion). What happened?

Between 1930 and 1940 Hawaii dominated the pineapple market. But beginning after World War II other countries began to look into this high-value crop. At the same time, many soldiers had discovered that Hawaii's delights extended well beyond pineapple. Hawaii land had much higher value in tourism than it had in pineapples.

Pineapple requires a fairly unique combination of sunshine, rain, and volcanic soil. Hawaii is not alone in having these factors. Today, major pineapple production is in the Phillipines, Thailand, Brazil, Costa Rica, Mexico, and other tropical, volcanic countries -- but with considerably lower labor costs than Hawaii.

Question: Craig and Lisa Bowden and their friend Tom Menezes run Hawaiian Crown, a small independent pineapple grower in Hawaii (<http://www.hawaiiancrown.com/>). They have had some success in local farmers' markets and are getting some distribution in supermarkets. What accounts for their success?

Answer: The Bowdens are not competing on price. They -- and their customers -- believe their pineapples have unique characteristics that make them worth what is undoubtedly a premium price.

Sources:

1. Jesse Rhodes, "It's Pineapple Season, But Does Your Fruit Come From Hawaii?" Food & Think blog, *Smithsonian Magazine*, March 20, 2013. Available at <http://blogs.smithsonianmag.com/food/2013/03/its-pineapple-season-but-does-your-fruit-come-from-hawaii/> accessed May 31, 2013.
2. U.S. Department of Agriculture, "Pineapples: U.S. import-eligible countries; world production and exports." This table is included in the Excel workbook for this chapter. Available for download in Excel 2003 format only at http://www.ers.usda.gov/datafiles/Phytosanitary_Regulation/Individual_Commodity_Files/Fruits/fr-pineapples.xls

3. Exchange Rates and Comparative Advantage

- a. If exchange rates end up in the right ranges, the free market will drive each country to shift resources into those sectors in which it enjoys a comparative advantage.
- b. Exchange rates will adjust in this way if the foreign exchange market operates freely without government interference, markets in both countries are used for voluntary exchange, and markets are competitive.

IV. The Sources of Comparative Advantage, pages 360-361

- A. Most economists look to factor endowments as the principal sources of comparative advantage; they seem to explain a significant portion of actual world trade patterns. *Factor endowments* are the quantity and quality of labor, land and natural resources of a country.
- B. The *Heckscher-Ohlin theorem* is a theory that explains the existence of a country's comparative advantage by its factor endowments: A country has a comparative advantage in the production of a product if that country is relatively well endowed with inputs used intensively in the production of that product.
- C. Other Explanations for Observed Trade Flows
 - 1. Many countries both import and export the same kinds of goods because of product differentiation.

TEACHING TIP: See the Unique Economics in Practice on page 246. ◉

- 2. There may also be economies of scale from producing for a world market.
- 3. Firms and countries can *acquire comparative advantage* in a number of ways. Volvo, the Swedish auto maker, has established a reputation for safety and quality over the years, acquiring a comparative advantage in that segment of the car market. This contrasts with *natural comparative advantage* based on opportunity costs and resource endowments.

V. Trade Barriers: Tariffs, Export Subsidies, and Quotas, pages 361-364

- A. Trade barriers (obstacles to trade) are forms of *protection*, the practice of shielding a sector of the economy from foreign competition.
 - 1. *Protection* is the practice of shielding a sector of the economy from foreign competition.
 - 2. A *tariff* is a tax on imports.
 - 3. *Export subsidies* are government payments made to domestic firms to encourage exports.
 - a. Farm subsidies in developed countries remain in place today.
 - b. Cheap food exports to less developed countries make it difficult -- if not impossible -- for local farmers to survive.
 - 4. *Dumping* occurs when a firm or industry sells its products on the world market at prices below its own cost of production.

TOPIC FOR CLASS DISCUSSION:

If some of the students have a background in accounting or microeconomics, ask them to discuss what "costs" are appropriate for anti-dumping laws to be invoked. Steer the discussion in the direction of fixed and variable costs. Make sure the class gets the point that courts usually declare average total cost to be the relevant measure, while economists would argue in favor of marginal cost. If you have the time, divide the class into groups and have each investigate how U.S. anti-dumping laws work in practice. They'll be amazed at what they discover. ■

- 5. A *quota* is a limit on the quantity of imports. They can be mandatory or voluntary.

TEACHING TIP: The word "voluntary" in this context is something of a euphemism. ◉

***Economics in Practice: Globalization Improves Firm Productivity,
page 362 [674]***

Opening an economy to international trade not only lowers prices paid by consumers, it reduces costs in two ways. First, as firms grow they may benefit from economies of scale. Second, firms that cannot compete globally will exit the market. Removing these low productivity firms raises the overall productivity of the economy, reducing costs even more.

B. U.S. Trade Policies, GATT, and the WTO

1. Through much of its history the United States was a high tariff country.
 - a. The infamous *Smoot-Hawley Tariff* was the U.S. tariff law of the 1930s, which set the highest tariffs in U.S. history (60 percent).
 - b. It set off an international trade war and caused the decline in trade that is often considered one of the causes of the worldwide depression of the 1930s.
2. Since the 1940s the United States has been part of global efforts to reduce and eliminate tariffs and other trade obstacles.
 - a. The *General Agreement on Tariffs and Trade (GATT)* is an international agreement signed by the United States and 22 other countries in 1947 to promote the liberalization of foreign trade. While GATT was initially thought of as a one-time agreement it has evolved into an ongoing process of trade liberalization through repeated rounds of negotiations.
 - b. The *World Trade Organization (WTO)* is a negotiating forum dealing with rules of trade across nations.
 - c. The *Doha Development Agenda* is an initiative of the World Trade Organization focused on issues of trade and development.

- TEACHING TIP: As of May 31, 2013 the Doha Round seems to have collapsed. For the latest information from the WTO see http://www.wto.org/english/tratop_e/dda_e/dda_e.htm.
- d. Every president in the last 50 years has philosophically supported free trade while simultaneously taking actions to protect one sector or another against foreign competition.

***Economics in Practice: What Happens When We Lift a Quota?,
page 421 [675]***

When the U.S. removed its quota on imports of textiles and clothing from China, the quantity of imports naturally increased. But, surprisingly, many of the firms producing these products were new entrants to the industry in China. Apparently the U.S. quotas had subsidized inefficient production in China.

- TEACHING TIP: The internet is a great source of information about the European Union and the Eurozone. Start with the official websites. The European Union is at http://europa.eu/index_en.htm and the European Central Bank at <http://www.ecb.int/home/html/index.en.html>.

C. Economic Integration

1. *Economic integration* occurs when two or more nations join to form a free-trade zone. Examples are the European Union, the U.S. – Canadian Free Trade Agreement, and the North American Free Trade Agreement (NAFTA).
 - a. The *European Union (EU)* is the European trading bloc composed of 27 countries (of the 27 countries in the EU, 17 have the same currency – the euro).
 - b. The *U.S. - Canadian Free Trade Agreement* is an agreement in which the United States and Canada agreed to eliminate all barriers to trade between the two countries by 1998.
 - c. The *North American Free Trade Agreement (NAFTA)* is an agreement signed by the United States, Mexico, and Canada in which the three countries agreed to establish all North America as a free-trade zone.
2. Despite the rather obvious benefits of international trade some countries seem determined to limit free trade. This is often caused by political agitation by groups who will be hurt by free trade.

VI. Free Trade or Protection? pages 365-370

A. The Case for Free Trade

1. Comparative advantage forms the basis for arguments in favor of free trade.
 - a. Trade has potential benefits for all nations. The benefit often takes form of lower prices for consumers.
 - b. Tariffs and other trade barriers result in a loss of efficiency (the deadweight loss).

B. The Case for Protection

1. Protection Saves Jobs.
 - a. Exposing a previously protected industry to free trade will cause dislocations, including a loss of jobs.
 - b. But the new jobs created by trade will be in higher-productivity industries, meaning higher wages.
 - c. New England once had a thriving textile industry. Today textiles are produced in less-developed countries such as Bangladesh. New England now produces high-tech items, taking advantage of the university cluster located in the area (Harvard, M.I.T., and Boston University to name just three).

Unique Economics in Practice

In September, 2009, the U.S. imposed a tariff of 35 percent on tires made in China. Prof. Tom Prusa of Rutgers University analyzed the impact of this tariff on the U.S. economy. To understand his analysis, we need to learn a little bit about the U.S. tire market.

There are three tiers of tires sold in the U.S., mainly differentiated by quality. Tier 1 includez Michelin, Bridgestone, and Goodyear. Tier 2 companies are BF Goodrich, Firestone, and Uniroyal. Tier 3 tires are mainly produced by smaller “private label” companies – and imported from China. Most U.S. manufacturers that sell tier 3 tires import them.

Here's a summary of Prof. Prusa's results:

1. Tire imports from China will fall by about 2/3 (30 million fewer tires per year).
2. Tire imports from other countries will increase by about 8 million tires in the first year, more in subsequent years.
3. Domestic U.S. tire production will rise by about 2 million tires per year.
4. There will be a net decrease in tires purchased of about 7 percent (20 million tires per year).
5. About 1,000 U.S. tire jobs will be saved, but about 20,000 downstream jobs in tire-related industries will be lost.
6. The estimated cost to the U.S. economy per job saved is over \$330,000.

Question: U.S. tire manufacturers sell tier 3 tires imported from China. They have no particular interest in this tariff. Who brought the dumping complaint to the government?

Answer: The complaint was brought by the United Steelworkers Union which represents many tire workers in the U.S.

Source: Thomas J. Prusa, “Estimated Economic Effects of the Proposed Import Tariff on Passenger Vehicle and Light Truck Tires from China” Rutgers University, New Brunswick, NJ. July 26, 2009. Analysis of the 35 percent tariff was performed by Prof. Prusa at my request and communicated to me in a personal e-mail. A more complete summary is available at http://www.cbe.csueastbay.edu/~alima/COURSES/2301/AdditionalReading/USTireTariffs_Oct2010.pdf

2. Some Countries Engage in Unfair Trade Practices and sometimes we have to fight back.
 - a. Under WTO rules, if there is a decision against a country's trade practice and the country in question refuses to alter the practice, the appealing country has the right to impose tariffs on imports from the offending country. The irony will not escape you.
 - b. Two wrongs do not make a right. A country's citizens benefit from free trade even if other countries engage in "unfair" trade practices.
3. Cheap Foreign Labor Makes Competition Unfair.
 - a. U.S. wages are high because our productivity is high.
 - b. A profit-maximizing firm will equate MP_L/w with MP_K/r . It's the ratio of productivity to input price that counts, not just the input's price.

Economics in Practice: A Petition 367 [679]

This is, of course, Bastiat's "petition of the candlemakers," long a favorite of those who teach economics. The candlemakers complain of unfair competition from the sun who "is waging war on us so mercilessly we suspect he is being stirred up against us by perfidious Albion (excellent diplomacy nowadays!), particularly because he has for that haughty island a respect that he does not show for us. [A reference to Britain's reputation as a foggy island.]"

TOPIC FOR CLASS DISCUSSION:

There are numerous published estimates of the cost to consumers per job saved. Divide the class into teams. Assign each team a recent trade restriction imposed by the United States. Have them find one or two articles about the cost of the restriction. Class presentations can be brief; the discussion that ensues will probably be lively. Extended Application 2 at the end of this chapter shows another approach to this and includes an excellent source of data. ■

Unique Economics in Practice

The price of sugar in the U.S. is about double the world price. A system of tariffs and quotas on imported sugar keeps the price of this commodity artificially high. The "sugar lobby" is so powerful that there is an exception written into NAFTA that prohibits trans-shipment of sugar through Mexico or Canada into the U.S.

Sugar is an important factor of production in some industries. Two such industries are soft drinks (soda) and candy. Both those products must compete with imported soda and candy – and there is no tariff on imports of those products.

Question: If you were running a candy manufacturing company in the U.S. how would you respond to this situation?

Answer: Exactly the way many U.S. candy companies have responded. They have moved their production to Mexico and Canada, taking U.S. jobs with them.

A good source for information is

<http://www.ers.usda.gov/topics/crops/sugar-sweeteners/data.aspx#.UalGFuBko80>.

4. Protection Safeguards National Security
 - a. There is little doubt that some industries are indeed vital for national defense and security.
 - b. As always, the problem is choosing the relevant industries. As the text notes, "Virtually no industry has ever asked for protection without invoking the national defense argument."
5. Protection Discourages Dependency.
6. Environmental Concerns
7. Protection Safeguards Infant Industries until they can compete on their own.
 - a. An *infant industry* is a young industry that may need temporary protection from competition from the established industries of other countries to develop an acquired comparative advantage.

- b. In July 1991 the United States imposed a 62.67 percent tariff on imports of active matrix liquid crystal display screens (mainly used in notebook computers). U.S. producers responded by moving their notebook computer production facilities outside the U.S. to avoid the tariff.

VII. An Economic Consensus, page 428

- A. Most economists favor free trade.
- B. Protectionist legislation usually has its roots in special interest politics.

Extended Application

Application 1: Potential Trade Between Egypt and Israel

The potential for trade between Egypt and Israel is a rich example to use as an illustration of the basic principles of international trade and comparative advantage. These nations signed a peace treaty in the late 1970s. While there is some trade between them, continuing political difficulties have prevented large-scale trade flows. Here is a realistic case where free trade could create a dramatic rise in living standards, but has not been permitted to do so.

Consider two goods currently produced by both countries: cotton and oranges. Point out that Israel—with higher per capita quantities of both human and physical capital—would probably have an absolute advantage in producing both goods. Nevertheless, it would probably have more of an advantage in oranges (which require more capital-intensive irrigation techniques) than it would have in cotton, so there would be opportunities for mutual gain.

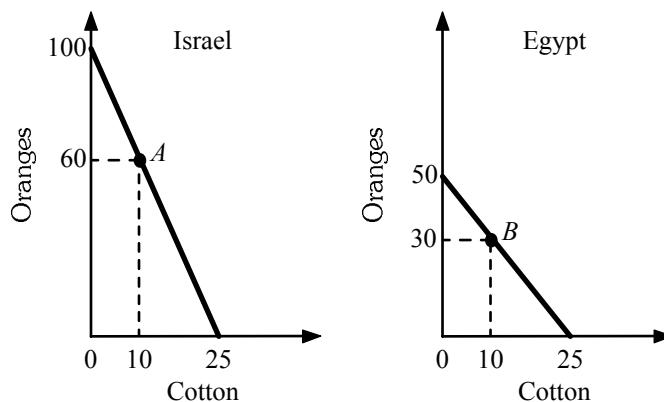
Suppose that the quantity of oranges and cotton that each country can produce on an acre of land is as follows:

| | Israel | Egypt |
|-----------------------|---------------|--------------|
| Oranges (kg) | 200 | 50 |
| Cotton (bales) | 50 | 25 |

Note first Israel's absolute advantage in both goods: It can produce more oranges and more cotton per acre than its neighbor. Now calculate the opportunity cost of one bale of cotton in both Israel and Egypt. (One bale of cotton “costs” 4 kilos of oranges in Israel, and 2 kilos of oranges in Egypt.) Because cotton has a lower opportunity cost in Egypt, conclude that Egypt has a comparative advantage in cotton.

Next, calculate the opportunity cost of one kilo of oranges in the two countries (a quarter of a bale of cotton in Israel; half a bale of cotton in Egypt.) Because Israel can produce oranges at lower opportunity cost than Egypt, Israel has a comparative advantage in oranges.

It is helpful to summarize the forgoing information for students on ppf graphs for each country. To do this, you will have to add one more piece of data: the total number of acres each country has available for producing the two crops. Assume that Egypt has 1 million acres and that Israel has 500,000 acres. Plot the endpoints of Egypt's ppf (50 million kilos of oranges and 25 million bales of cotton) and of Israel's ppf (100 million kilos of oranges and 25 million bales of cotton), and draw the ppfs as shown below.



In the diagram, the initial production in Israel is identified by Point A (10 million cotton, 60 million oranges) and in Egypt by Point B (10 million cotton, 30 million oranges). Explain to students that with no international trade, the production possibilities curve is also the consumption possibilities curve.

Now let the two nations specialize according to comparative advantage. Israel will produce only oranges, and Egypt will produce only cotton. This moves each country to an endpoint on its ppf. The first important result to illustrate in class is the total production of both commodities increases as a result of the specialization, as shown in the table following:

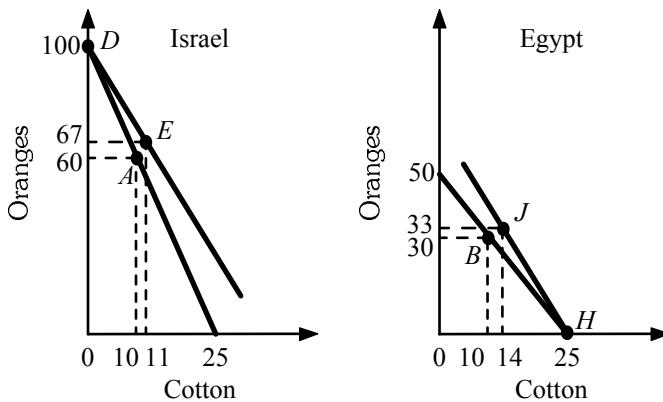
| | Production Before Trade | | Production After Trade | |
|--------|-------------------------|--------|------------------------|--------|
| | Oranges | Cotton | Oranges | Cotton |
| Israel | 60 | 10 | 100 | 0 |
| Egypt | 30 | 10 | 0 | 25 |
| Totals | 90 | 20 | 100 | 25 |

Note that total production of oranges has increased from 90 to 100, and total production of cotton from 20 to 25. The next result to show is how both countries can benefit from this increase in production. Assume the terms of trade are 3 kilos of oranges for 1 bale of cotton. (Point out to students that any terms of trade between 2:1 and 4:1 would work: the actual figure determines only how the gains from trade are distributed between the two nations.) Suppose that, with these terms of trade, Israel exports 33 million kilos of oranges for 11 million bales of cotton. This means that Egypt must be exporting 11 million bales of cotton in exchange for 33 million kilos of oranges. The table following summarizes the final consumption of both goods in the two countries:

| | Consumption After Trade | | |
|---------|-------------------------|-------|--------|
| | Israel | Egypt | Totals |
| Oranges | 67 | 33 | 100 |
| Cotton | 11 | 14 | 25 |

Stress that after trade, consumption of both goods is higher in both countries. In Israel, consumption of oranges rises from 60 to 67 and consumption of cotton rises from 10 to 11. In Egypt, consumption of oranges rises from 30 to 33, and consumption of cotton rises from 10 to 14. This is what economists mean when they say that international trade raises standards of living worldwide.

It is useful to illustrate what has happened on the ppf diagrams for each country. International trade permits a divergence between production and consumption. The new set of consumption possibilities for Egypt and Israel are diagrammed as follows:



Note that, after trade, Israel produces at Point *D* but its consumption possibilities are represented by the flatter line emanating from Point *D*. This line is flatter because the opportunity cost of a bale of cotton obtained through trading (3 kilos of oranges) is lower than that obtained through domestic production (4 kilos of oranges). Similarly, Egypt produces at Point *H*, but its consumption possibilities are along the steeper line emanating from Point *H*. For Egypt, the opportunity cost of a pound of oranges obtained through trading ($\frac{1}{3}$ bale of cotton) is lower than that obtained through domestic production ($\frac{1}{2}$ bale of cotton).

From here, begin a discussion of how these gains might be distributed within each country. The fact that total consumption rises does not mean that every citizen gains in each country. Ask your students who is hurt by the opening of trade, and how? (In Egypt, orange growers are hurt; in Israel, cotton growers. They can eventually be reemployed in the expanding sector, but this adjustment imposes significant costs on them in the short run.) What sort of arguments might the injured parties come up with to prevent free trade? (Dependence on foreign markets and national security should be the major arguments for this example.) Is there any way to make trade benefit everyone? (In theory, yes. Aggregate real income rises in both countries after trade opens up. There must be some way to distribute this higher income so that everyone can benefit. In particular, if those who gain from trade make sufficient “side payments” to those who lose, everyone can come out ahead.)

In practice, of course, such side payments are difficult to arrange. Gainers and losers would be hard to identify, and their gains and losses we often difficult to quantify.

Application 2: The Price of Saving a Job

Count on one or more of your students to bring up the “cheap foreign labor” argument: “If we let in cheap goods from low-wage countries, our highly paid workers will either lose their jobs or be forced to accept low wages.”

There are several ways to respond to this argument. Start by taking this logic to the extreme. If it is beneficial for high-wage Americans to protect themselves against trade with, say, low-wage Mexico, then it must be beneficial for high-wage Californians to protect themselves from low-

wage workers from Tennessee. And why stop there? Surely the high-salaried citizens of Beverly Hills would benefit by cutting themselves off from trade with the rest of the world, which is more poorly paid. Right? At this point, students will get the idea: Beverly Hills' residents would not be better off having to grow their own food and assemble their own television sets. And neither are high-wage Americans made better off by restricting trade with low-wage partners.

Follow this reasoning with a more analytic approach. Remind students why it is that wages in, say, Mexico are lower. (Lower skills, less capital to work with.) Thus, it may be that Mexico has a comparative advantage in goods that make intensive use of low-skilled labor. By importing such goods from Mexico and transferring our own, higher-skilled labor to goods in which we have a comparative advantage, the average standard of living rises in both countries.

Students will sometimes object: But what if Mexico can produce everything more cheaply than the United States? This is a chance for you to remind them of the distinction between absolute and comparative advantage. Even if Mexico could produce everything more cheaply—which is not the case—it would still pay for Mexico to specialize according to its comparative advantage, and mutually beneficial trade would still take place between the two countries.

An important proviso should be added here. Different safety or environmental standards can sometimes be an important source of wage differentials, especially between the United States and third-world countries. Here, there may be grounds for government involvement—even protectionism—because free trade merely shifts the exploitation of workers and the environment—which society may find intolerable—to other nations.

An interesting study estimated the costs of protecting industry employment. The following table provides a sampling of the effects in six different industries of a variety of import restraints in the United States. The figures pertain to 1990 and are based on the assumption that high tariffs are reduced to zero, quantitative restrictions are removed, and low tariffs kept in place in the quota cases. Estimates of this sort require a wide variety of assumptions and are subject to a high margin of error; nevertheless, some of the costs are staggering. Some of these figures are reproduced below:

| | Number of Industry Jobs Saved | Consumer Cost per Job Saved (\$) |
|------------------------------------|----------------------------------|-------------------------------------|
| Benzoid chemicals | 216 | 1,000,000 |
| Costume jewelry | 1,067 | 96,532 |
| Frozen concentrated orange juice | 609 | 461,412 |
| Glassware | 1,477 | 180,095 |
| Rubber footwear | 1,701 | 122,281 |
| Woman's footwear (except athletic) | 3,702 | 101,567 |

Clearly, in these cases, the costs of protectionism far exceed the gains to workers whose jobs are saved. This suggests that policies to compensate or retrain potential job losers would be very cost effective.

For a more complete listing, see Gary C. Hufbauer and Kimberly A. Elliott, *Measuring the Costs of Protection in the United States* (Washington, DC: Institute for International Economics, 1994, pp. 12–13, Appendix I, II).

Open-Economy Macroeconomics: The Balance of Payments and Exchange Rates

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

The Balance of Payments *p. 376*

- The Current Account
- The Capital Account
- The United States as a Debtor Nation

Equilibrium Output (Income) in an Open Economy *p. 380*

- The International Sector and Planned Aggregate Expenditure
- Imports and Exports and the Trade Feedback Effect
- Import and Export Prices and the Price Feedback Effect

The Open Economy with Flexible Exchange Rates *p. 384*

- The Market for Foreign Exchange
- Factors That Affect Exchange Rates
- The Effects of Exchange Rates on the Economy

An Interdependent World Economy *p. 394*

Appendix: World Monetary Systems Since 1900 *p. 397*

DETAILED CHAPTER OUTLINE

- I. Introduction, pages 375-376
 - A. The economies of the world have become increasingly interdependent over the last four decades. International trade is a major part of today's world economy.
 - B. From a macroeconomic point of view, the main difference between an international transaction and a domestic transaction is that domestic transactions use a single currency while international transactions use several different currencies.
 - TEACHING TIP:** Why doesn't California worry about its balance of trade with Oklahoma? Because both use U.S. dollars. This is a useful analogy to help students understand the importance of a single currency (and fixed exchange rates). You might use this to lead into a discussion of the euro.
 A second way to introduce this subject is to ask the students why foreign exchange markets exist at all. Why does anyone want to use U.S. dollars to purchase yen, euros, or any other currency? The discussion will quickly conclude that there is no demand for or supply of foreign exchange *per se*. Just as the demand for labor and other factors of production is derived from the demand for the output they produce, the demand for foreign exchange is derived from the underlying demands for international trade and international capital flows.
 In a nutshell, foreign exchange markets exist because one country's money (say the Swiss franc) is not money in other countries.❶
 - C. The price of one country's currency in terms of another country's currency is the *exchange rate*, the ratio at which two currencies are traded for each other.
 - 1. Before 1971 the world operated on a fixed exchange rate system. Devaluations were infrequent but traumatic.
 - 2. Since 1971 these exchange rates are no longer fixed but are determined essentially by supply and demand. This chapter explores "open-economy macroeconomics" in more detail.
- II. The Balance of Payments, pages 376-380
 - A. The *balance of payments* is the record of a country's transactions in goods, services, and assets with the rest of the world; also the record of a country's sources (supply) and uses (demand) of foreign exchange.
 - 1. *Foreign exchange* is all currencies other than the domestic currency of a given country.
 - 2. The supply of a country's currency on the foreign exchange market is determined by the quantity of foreign-produced goods, services, and assets its residents purchase. The demand for a country's currency is determined by the quantity of that country's domestically produced goods, services, and assets purchased by foreigners. (The demand for a country's currency is equal to the total supply of foreign currencies used to purchase domestic goods, services, and assets.)
 - TEACHING TIP:** The U.S. balance of payments from 1960 I to 2010 II (annual and quarterly) is included in the Excel workbook for this chapter.
 - B. The Current Account
 - 1. The current account includes trade in merchandise, services, investment income, and net transfer payments and other.

TOPIC FOR CLASS DISCUSSION:

What is the present international situation of the United States? What are net exports, the balance on current account, the balance on capital account, and the balance of payments? What countries are the major trading partners of the United States? What are the main imports and exports?

Also, the United States exports a lot of services. How can a service be exported? (Students will find it helpful to find out exactly which services the United States exports in quantity.)

A good place to begin is the Bureau of Economic Analysis Web site (www.bea.gov). Look for links to data on international transactions at the top of the right column. The Excel workbook for this chapter includes quarterly and annual balance of payments tables since 1960, as well as detailed tables with data on trade in services. ■

2. The *balance of trade* equals a country's exports of goods and services minus its imports of goods and services.
 - a. In other words, the balance of trade is the difference between exports and imports. (The balance of trade is also called *net exports*.)
 - b. A *trade deficit* occurs when a country's exports of goods and services are less than its imports of goods and services in a given period. (A trade surplus occurs when a country exports more goods and services than it imports.)
 - c. Exports earn foreign exchange and are a credit (+) item on the current account. Imports use up foreign exchange and are a debit (-) item on the current account.

TEACHING TIP: An export of a good or service is roughly equivalent to importing the foreign income used to pay for it. Similarly, an import of a good or service causes an export of domestic income. ◀

3. The *balance on current account* is net exports of goods plus net exports of services plus net investment income plus net transfer payments. The balance on current account shows how much a nation has spent on foreign goods, services, and transfers relative to how much it has earned from other countries.
4. A nation settles its accounts with the rest of the world through its capital account.

TEACHING TIP: The Excel workbook for this chapter contains the data in Table 20.1 [35.1]. Data for 2011 and 2012 is included, as well as the underlying BEA table. ◀

C. The Capital Account

1. The capital account records the nation's capital inflows and outflows.
2. In the United States the *balance on capital account* is the sum of the following (measured in a given period): the change in private U.S. assets abroad, the change in foreign private assets in the United States, the change in U.S. government assets abroad, and the change in foreign government assets in the United States. The balance on capital account includes changes in ownership of both private and government assets.

TEACHING TIP: When a foreigner purchases a domestic asset the transaction creates a capital inflow. When a domestic resident purchases a foreign asset the transaction creates a capital outflow. ◀

TEACHING TIP: The statistical discrepancy is an error of measurement required to make the two parts equal. The statistical discrepancy is often large relative to either the balance on capital account or the balance on current account. ◀

Economics in Practice: The Composition of Trade Gaps, page 379 [691]

A trade gap is another name for a trade deficit. Sometimes specific traded items can have a big impact on the trade gap. The article discusses three specific goods and countries that contributed to the balance of trade. Denmark runs a trade surplus with Japan because of exports of Legos. Norway exports fish and crude oil, with the latter making the country's balance of trade fairly volatile because of fluctuating oil prices. Energy prices are also a key to the trade deficit in France which imports most of its oil. And the U.S. is a major exporter of agricultural products.

D. The United States as a Debtor Nation

1. When foreign holdings of domestic assets in the United States increase faster than domestic holdings of foreign assets, the U.S. debt to the rest of the world increases.
2. The net wealth of the United States vis-à-vis the rest of the world is the sum of all its past current account balances.
3. The United States is currently the largest debtor nation in the world.

Unique Economics in Practice

The Excel workbook for this chapter includes detailed tables of data on U.S. trade in services. In 2012 the U.S. exported \$126.2 billion in travel services, \$124.2 billion in royalties and license fees (including exports of intellectual property), and \$294.5 billion in "other private services" (including consulting, financial services, and educational services). In that same year the only import category of those magnitudes was \$201.2 billion in "other private services." Surprisingly, travel imports were only \$83.4 billion.

Question: What do the imports and exports of travel services mean?

Answer: The U.S. exports travel services when foreign tourists visit the U.S. The U.S. imports travel services when U.S. tourists visit other countries. Apparently U.S. tourists are staying home more.

III. Equilibrium Output (Income) in an Open Economy, pages 380-384

TEACHING TIP: As the text notes, this section assumes fixed exchange rates. ◀

A. The International Sector and Planned Aggregate Expenditure

1. Planned aggregate expenditure becomes $AE = C + I + G + EX - IM$ where I is planned investment spending.
2. *Net exports of goods and services (EX - IM)* is the difference between a country's total exports and total imports.
3. Determining the Level of Imports
 - a. We assume exports are completely autonomous and imports are a constant fraction m of Y ($IM = mY$) and $0 \leq m < 1.0$.
 - b. The *marginal propensity to import (MPM)* is the change in imports caused by a \$1 change in income. The marginal propensity to import is m in the previous equation.

- c. Making imports a function of Y adds another induced leakage to the spending stream. (The other two leakages are induced saving and income taxes.)

3. Solving for Equilibrium

TEACHING TIP: Figure 20.1 [35.1] illustrates planned aggregate expenditure without imports ($C + I + G + EX$) and with imports included ($C + I + G + EX - IM$), and shows that the two lines will have different slopes. The authors illustrate why this is true using a numerical example showing the amounts of imports being subtracted at different levels of Y . You may also wish to show the difference in the equation of the line algebraically as a lead in to the discussion of the multiplier.

The example as well as the graphs are included in the Excel workbook for this chapter.¶

- 4. The Open Economy Multiplier shows that some of the increased income is used to purchase imports, and thus there is less impact on the domestic economy. We can also calculate the open-economy multiplier

$$\text{open-economy multiplier} = \frac{1}{1 - (MPC - MPM)}$$

B. Imports and Exports and the Trade Feedback Effect

- 1. The Determinants of Imports
 - a. Imports depend on income.
 - b. Imports also depend on all the factors that affect consumption and investment.
 - c. An additional factor is the *relative prices* of imports (foreign produced products) compared to domestically produced products.
- 2. The Determinants of Exports
 - a. Exports depend on income in the rest of the world and exchange rates.
 - b. Suppose we had a complete model of the world economy including models of individual countries exports of each country would equal the sum of imports from that country. Exports would be endogenous in such a model.
- 3. The *Trade Feedback Effect* is the tendency for an increase in the economic activity of one country to lead to a worldwide increase in economic activity, which then feeds back to the first country.
 - a. The trade feedback effect only becomes significant if the economy whose activity is expanding is big enough to affect the world economy.
 - b. Smaller economies are more likely to be heavily influenced by the world economy than to have much impact on it themselves.

TEACHING TIP: Some students may need a clarification of the change in the assumptions here. The assumption that exports are fixed is relaxed but they are still exogenous. The distinction often confuses students.¶

TEACHING TIP: Useful saying that might entertain your class: “When the U.S. sneezes the rest of the world catches a cold.”¶

***Economics in Practice: The Recession Takes Its Toll on Trade,
page 383 [695]***

During recessions, voters become more protectionist, trying to protect jobs by restricting imports. The trade feedback effect makes the decrease in trade even larger. As the graph shows, the sharp recession of 2008-2009 caused trade to decline by about 20 percent. (The Excel workbook for this chapter includes OECD annual data since 1995 as well as a version of the graph.)

Unique Economics in Practice

The table below shows the extent of the decline in U.S. international trade because of the Great Recession. Between 2007 and 2009, exports fell by 13 percent while imports decreased by a whopping 22%. (Data is in the Excel workbook for this chapter.)

| (millions of dollars) | 2006 | 2007 | 2008 | 2009 |
|---|----------|----------|----------|----------|
| Current account | -802636 | -718094 | -668854 | -378432 |
| Exports of goods and services and income receipts | 2135004 | 2478267 | 2635540 | 2159000 |
| Imports of goods and services and income payments | -2846159 | -3080813 | -3182368 | -2412489 |
| Unilateral current transfers, net | -91481 | -115548 | -122026 | -124943 |

Question: Why did net transfers increase?

Answer: Other countries were in even worse shape than the U.S.

C. Import and Export Prices and the Price Feedback Effect

1. The prices of imports to the United States depend on the prices of the goods abroad and the rate of inflation abroad.
2. The *Price Feedback Effect* is the process by which a domestic price increase in one country can feed back on itself through export and import prices. An increase in the price level in one country can drive up prices in other countries. This in turn further increases the price level in the first country. There are at least two mechanisms that facilitate this.
 - a. An increase in the prices of imported inputs can shift the short-run *AS* curve to the left, a negative supply shock. This can lead to stagflation.

TEACHING TIP: Prices of imported factors of production change all the time. But the short-run *AS* curve doesn't seem to shift very much. The idea is simple: the input has to make up a significant fraction of variable production costs across a number of industries before it will have a noticeable macroeconomic impact. That's why the oil shocks of the 1970s had such an adverse impact on the U.S. (and global) economy.❶

- b. An increase in import prices can induce consumers to shift toward purchases of domestic goods, putting upward pressure on the prices of those goods.
3. In practice the price feedback effect is likely to be small. To be significant, the economies in question would have to be about the same size and very open to international trade. Also, remember that the price feedback effect works only because we have continued to assume fixed exchange rates.

TEACHING TIP: In the next section exchange rates will be allowed to change. It may be helpful to introduce students to the concept of flexible exchange rates using simple supply-and-demand analysis. It is important to make clear to them that only one set of supply-and-demand curves

are needed to explain the exchange between any two currencies; this can be accomplished by considering a consumer who wishes to “exchange” American dollars for, say, Japanese yen. The person is simultaneously supplying dollars to the market and demanding yen.❶

IV. The Open Economy with Flexible Exchange Rates, pages 384-394

❷ TEACHING TIP: On a Windows computer there are two ways to enter foreign currency symbols. One is to use the application’s Insert/Symbol menu. But it’s far more entertaining to enter them from the keyboard. To type a £ sign hold down the Alt key and type 0163 *on the numeric keypad*. To type a € sign hold Alt and type 0128. For more information about the euro and Windows, see <http://www.microsoft.com/typography/EuroSymbolFAQ.mspx>.

For Mac users, OS X supports a number of shortcuts. Here are some examples: Opt+3 = £; Opt+4 = ¢; Opt+Y = ¥; and Shift-Opt-2 = €. Source: <https://discussions.apple.com/message/1456689#1456689> ❸

A. Flexible exchange rates complicate the analysis.

1. *Floating, or market-determined, exchange rates* are determined by the unregulated forces of supply and demand.
2. Exchange rates largely determine the domestic price of imported goods and can have significant effects on the quantities of both imports and exports.
3. Exchange rates also have a large impact on international financial and capital flows.

❷ TEACHING TIP: Students, especially those who have not traveled abroad, may have a difficult time getting a “feel” for international economic institutions and policies. The more you can bring this material down to earth, the better they will understand it. Often, their first source of difficulty is the idea of the “foreign exchange market” itself.

Stress that this market, unlike many other markets, is highly decentralized geographically. Any location where you can exchange one currency for another is part of this market. If your local bank allows you to exchange dollars for foreign currencies it is part of this market.

Students who have traveled may be able to describe the exchange booths in airports; some may even have encountered people on the street of a foreign country looking for American dollars. This is a good opportunity to introduce the “black market” in currency and discuss how much U.S. currency is “missing” when we compare the money statistics to people’s actual money holdings.❹

B. The Market for Foreign Exchange

2. The Supply of, and Demand for, Pounds

- a. Some people and institutions want foreign exchange to buy products produced in other countries, or the assets of other countries. Others hold foreign currency balances for speculative reasons. When exchange rates are allowed to float the exchange rate for any currency is determined by supply and demand. An excess demand causes a currency to appreciate and an excess supply causes it to depreciate.
- b. The demand for pounds is created by those who hold foreign currency and want to use it to buy pounds.
- c. The supply of pounds is created by those who hold pounds but want to buy foreign currency.
- d. Demand for domestic currency is created by exports of goods and services, and capital inflows. The supply of domestic currency to the foreign exchange market is created by imports of goods and services, as well as capital outflows.

TEACHING TIP: The text makes an excellent point worth repeating here: make sure students don't confuse supply and demand in foreign exchange markets with the overall money supply. Point out to them that not everyone who holds dollars wants to use them to purchase pounds.

Also spend a few minutes in class with Table 20.2 [35.2]. Students learn this material better when they have specific examples. ◀

3. The Equilibrium Exchange Rate

- a. *Appreciation* of a currency is the rise in value of one currency relative to another.
- b. *Depreciation* of a currency is the fall in value of one currency relative to another.

TEACHING TIP: Students who read the newspaper may wonder why a decline in the value of a currency is sometimes called a "devaluation" and at other times called a "depreciation." Explain that "depreciation" refers to a decrease in the value of a currency whose exchange rate floats, whereas "devaluation" is a term reserved for a decision by a government to decrease the fixed exchange rate of its currency against foreign currencies. Similarly, "appreciation" is an increase in the value of a floating currency whereas "revaluation" is an increase in the fixed rate. ◀

TEACHING TIP: You may want to also use these definitions. Currency A *appreciates* vis-à-vis currency B if, after a change in the exchange rate, currency A will buy more units of currency B. Currency X *depreciates* vis-à-vis currency Y if, after a change in the exchange rate, currency X will buy fewer units of currency Y. ◀

C. Factors That Affect Exchange Rates

1. Purchasing Power Parity: The Law of One Price

- a. The *law of one price* says if the costs of transportation are small, the price of the same good in different countries should be roughly the same. ()

TEACHING TIP: If the prices in the two countries are different there is a profit potential via arbitrage. Market efficiency buttresses the law of one price. ◀

- b. The *purchasing power parity theory* is a theory of international exchange holding that exchange rates are set so that the price of similar goods in different countries is the same.

TEACHING TIP: The text uses this excellent example. Consider Canada and the United States. If the price of a basketball were \$10 in the United States and \$12 in Canada, the U.S.-Canada exchange rate would have to be \$1 U.S. per \$1.20 Canadian. If the rate were instead one-to-one, it would pay people to buy the balls in the United States and sell them in Canada. This would increase the demand for U.S. dollars in Canada, thereby driving up their price in terms of Canadian dollars to \$1 U.S. per \$1.20 Canadian, at which point no one could make a profit shipping basketballs across international lines and the process would cease. ◀

- c. The price of a good in the United States that is imported from Switzerland should be about its price in Swiss francs times the exchange rate (U.S. dollars per Swiss franc).

- d. In practice, there can be differences in prices between the two countries. These may be caused by significant transportation costs, insurance, storage, and/or tariffs.

- e. A high rate of inflation in one country relative to another puts pressure on the exchange rate between the two countries. There is a general tendency for the currencies of relatively high inflation countries to depreciate.

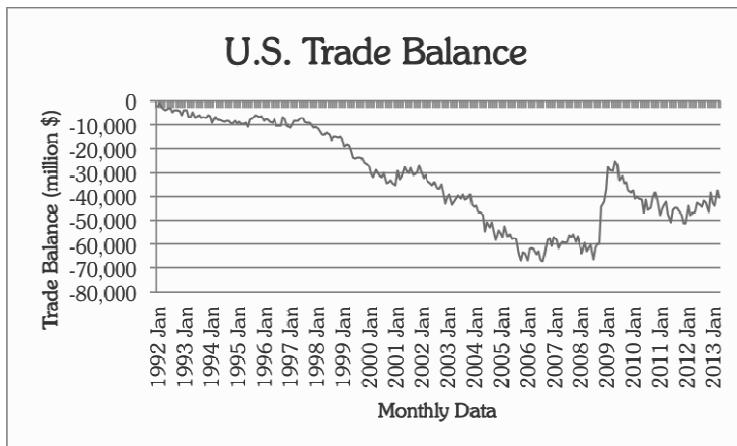
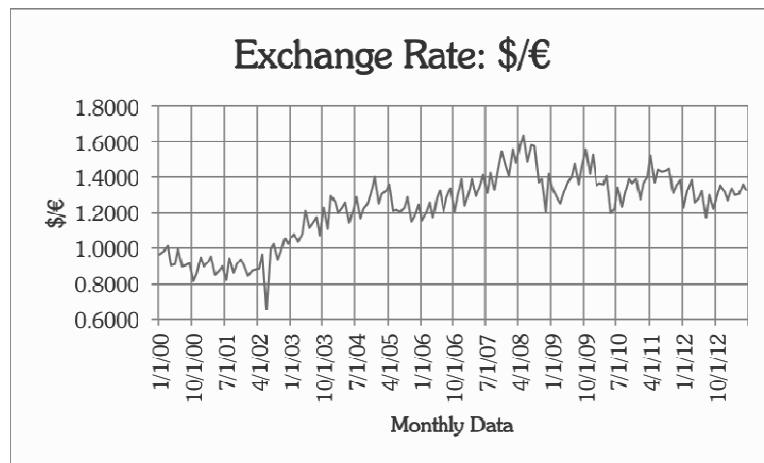
2. Relative Interest Rates

- a. Relative interest rates affect people's demand for securities of different countries.
- b. Funds tend to flow toward the highest yielding securities and affect the demand for currencies.
- c. Changes in relative interest rates (corrected for inflation expectations and risk) will cause flows of short-term capital to change.

TEACHING TIP: Figure 20.6 [35.6] uses the \$/€ exchange rate on the vertical axis. This has become the conventional way of using exchange rates: home currency per unit of foreign currency. Point out that an increase in this exchange rate means the dollar has depreciated vis-à-vis the euro. A decrease in this exchange rate means the dollar has appreciated. This is somewhat counterintuitive. Remind students of this fact regularly. ¶

Unique Economics in Practice

The internet makes it easy to gather and analyze data. The Excel workbook for this chapter includes worksheets that go with this exercise. This workbook contains data on the exchange rate (dollars per euro)¹ and the U.S. balance of trade. The data is monthly from January 1, 2000 through May 31, 2013. Here are graphs of the two time series:



Question: Why does a depreciation of the exchange rate seem to be associated with a worsening of the balance of trade?

Answer: There are many, many correct answers to this question. First, the model is much too simple to reflect reality. Make a list of factors that affect the balance of trade, then ask how many are included in the regression? The answer, of course, is one. Second, it's very naïve to think that exports and imports respond immediately to changes in the exchange rate. We would expect that a change in the exchange rate this month might affect trade a month or two in the future – perhaps even longer.

¹ Exchange rate data is actually given as daily data. It was converted to monthly data by simple averaging. Weekends and dates for which no data was available have been omitted.

D. The Effects of Exchange Rates on the Economy

1. The level of imports and exports depends on exchange rates.
 - a. This affects GDP and the price level.
 - b. Policies that affect interest rates also affect exchange rates.
2. Exchange Rate Effects on Imports, Exports, and Real GDP
 - a. When a country's currency depreciates, its import prices rise and its export prices fall.
 - b. This can serve as a stimulus to the economy. It will likely cause an increase in GDP.
3. Exchange Rates and the Balance of Trade: The J Curve
 - a. The *J-curve effect* says that following a currency depreciation, a country's balance of trade may get worse before it gets better. The graph showing this effect is shaped like the letter *J*, hence the name J-curve effect.
 - b. Because a depreciating currency tends to increase exports and decrease imports you might think it would reduce a trade deficit, but the effect is ambiguous.
 - c. Following a depreciation the balance of trade may actually worsen for a while before it then improves. This is because the prices of exports and imports are affected as well as their quantities.

TEACHING TIP: The J-curve effect is the sometimes observed tendency for the trade deficit to become larger immediately after a depreciation or devaluation. It can be clarified by writing down the expression for the trade balance:

$$\text{Trade balance} = (\$ \text{ price of exports}) \times (\text{quantity of exports}) \\ - (\$ \text{ price of imports}) \times (\text{quantity of imports})$$

The key to the J-curve is the sequence of events following depreciation. Take the dollar-yen market. When the dollar depreciates, the immediate impact is a rise in the dollar price of imports. (Goods will cost the same in yen but it will take more dollars to buy those yen.) Initially, the dollar price of U.S. exports will remain the same, and the quantity of imports and exports will (for some time) respond very little if at all. This is because it takes time for customers to switch from imported goods to domestic alternatives. Firms that are importing inputs, for example, may have established relationships or contracts with foreign suppliers, and they do not want to risk breaking these ties until they are sure that the price change is permanent.

Also, it takes some time to establish new relationships with domestic suppliers. In some cases, consumers may already have committed themselves (psychologically or otherwise) to purchase an import, and the rise in price may not change their decision. A simple example of this is a U.S.

citizen planning a trip to Japan. If the plane ticket is bought and the hotel rooms already booked, the trip cannot be cancelled. But the depreciation of the dollar means that more will be spent on meals, local transportation, and entertainment, all of which are considered “imports” in defining the trade deficit.

After a few months U.S. firms will adjust their behavior, establishing new relationships with domestic suppliers. U.S. tourists, hearing how expensive Japan is for Americans, will plan fewer trips to Japan. Similarly, many Japanese firms and consumers will switch to the (now cheaper) U.S. goods. Thus, U.S. imports from Japan will decrease, and U.S. exports to Japan will increase, shrinking the trade deficit. ◀

Economics in Practice: China’s Increased Flexibility, page 391 /703

China has historically pegged the yuan exchange rate to the U.S. dollar. Other countries (especially the U.S.) have pressured China to allow their exchange rate to appreciate. In spring, 2010 that pressure appeared to pay off as China announced it would make the exchange rate more flexible. Between 2005 and 2011 the yuan appreciated 28%.

4. Exchange Rates and Prices

- a. When a country’s currency depreciates its price level tends to increase.
- b. This is caused by the increased demand for exports (by the rest of the world) and for domestic production (by domestic residents who substitute cheaper domestic products for the now more expensive imports).
- c. In addition, of course, the prices of imported goods themselves have increased.

TEACHING TIP: Remind students that imports are actually subtracted when GDP is being added up using the expenditure approach. That means import prices are also subtracted from the GDP deflator. This is consistent because we are trying to measure the average price of output, not spending. However, increases in import prices will only be reflected in the consumer price index, the producer price index, or the deflators for the three major components of spending: consumption, investment, and government. ◀

5. Monetary Policy with Flexible Exchange Rates

- a. Lower interest rates cause a capital outflow. As foreigners purchase fewer U.S. assets the demand for dollars falls. As U.S. residents purchase more foreign assets the supply of dollars rises. The dollar will depreciate vis-à-vis other currencies.
- b. This causes exports to rise and imports to fall, making the stimulus that much more potent.
- c. Higher interest rates cause the dollar to appreciate. The reduction in the price of imports helps to fight the inflation.

TEACHING TIP: In the summer of 2000 the Fed was concerned about the economy “overheating,” which would result in inflation. At the same time the trade deficit soared to new record heights. Use this “real-world” example to have students explain how including a consideration of trade and exchange rates has made the analysis of Fed policy making more complicated than in earlier chapters. ◀

Economics in Practice: Losing Monetary Policy Control, page 393 [705]

The euro zone includes countries that differ widely in their economic structures. One big difference is government budget deficits and debts. Harvard professor Martin Feldstein said, “When interest and principal on the British government debt come due, the British Government can always create additional pounds to meet those obligations. By contrast, the French government and the French central bank cannot create euros.... If France cannot borrow to finance that deficit, France will be forced to default.”

E. Fiscal Policy with Flexible Exchange Rates

1. Fiscal stimulus loses some impact because some of the added income is spent on imports.
2. Spending on imports does not increase domestic income.

F. Monetary Policy with Fixed Exchange Rates

1. If a country tries to maintain a stable exchange rate it loses the ability to use monetary policy to stabilize the domestic economy.
2. Basically the exchange rate has become a policy target. As is well known with any single policy instrument only one target can be hit (unless the policy maker is very, very lucky).
3. In the case of monetary policy any attempt to use expansionary monetary policy will lower the domestic interest rate temporarily. However, this will cause a capital outflow until the domestic interest rate is once again equal to the world interest rate. The amount of the capital outflow will equal the increase in the domestic money supply.
4. Even though the world doesn't run on fixed exchange rates today, this example explains why members of the European Monetary Union had to agree to give up their monetary policies before they could use the euro.

Unique Economics in Practice

Greece is a socialist country. The government runs the entire pension system. Since Greece's retirement system has become something of a symbol of the eurozone's difficulties, it's instructive to look at some of its details.

Under Greek law, at least 580 professions (including hairdressers) involve working with hazardous materials. Workers in those jobs are entitled to retire at age 50 with full benefits.

“...Greece has promised early retirement to about 700,000 employees, or 14 percent of its work force, giving it an average retirement age of 61, one of the lowest in Europe ... The law includes dangerous jobs like coal mining and bomb disposal. But it also covers radio and television presenters, who are thought to be at risk from the bacteria on their microphones, and musicians playing wind instruments, who must contend with gastric reflux as they puff and blow.”*

Question: Why are so many occupations included in the “hazardous” category?

Answer: Public employee unions in Greece have pushed for expansion of the definition of hazardous jobs.

* “Patchwork Pension Plan Adds to Greek Debt Woes.” New York Times, March 11, 2010. Available at http://www.nytimes.com/2010/03/12/business/global/12pension.html?_r=1.

- V. An Interdependent World Economy, page 394
- Globalization has made the problems facing policy makers more difficult.
 - At the same time globalization has been good for consumers, allowing them to purchase a greater variety of goods and services at lower prices than would have otherwise been the case.

APPENDIX: WORLD MONETARY SYSTEMS SINCE 1900

TEACHING TIP: The Euro has been around since about 1997. Some students may not be familiar with the previous currencies. You might want to mention French francs, Italian lire, and German deutschemarks (among others). ◀

The gold standard was the major system of exchange rate determination before 1914. But there were two major problems with the gold standard. First, it implied that a country had little control over its money supply (the money supply was in a fixed ratio to the country's supply of gold, set by the parity). Second, prices and incomes rose and fell with gold discoveries, putting tremendous power in the hands of gold-producing nations (and gold mining companies).

As World War II drew to a close a new set of rules for exchange rate determination were designed. Since the meetings were held in Bretton Woods, New Hampshire, the treaty became known as the Bretton Woods system. Countries' exchange rates remained fixed unless there was a fundamental disequilibrium in their balance of payments. The flaws in this system led to its abandonment in 1971. These flaws included a basic asymmetry built into the system: countries with deficits had to devalue while countries with surpluses did not have to revalue. Also, devaluations were permitted only if the deficit was "chronic," which meant that the devaluations could be predicted far in advance and had to be large; this made it tempting for speculators to attack those currencies in search of profits.

Since the demise of Bretton Woods the world's exchange rate system is a managed floating one. Although exchange rates float, governments intervene if the changes are not desirable. However, this has not meant that changes have not sometimes been quite large.

Extended Applications

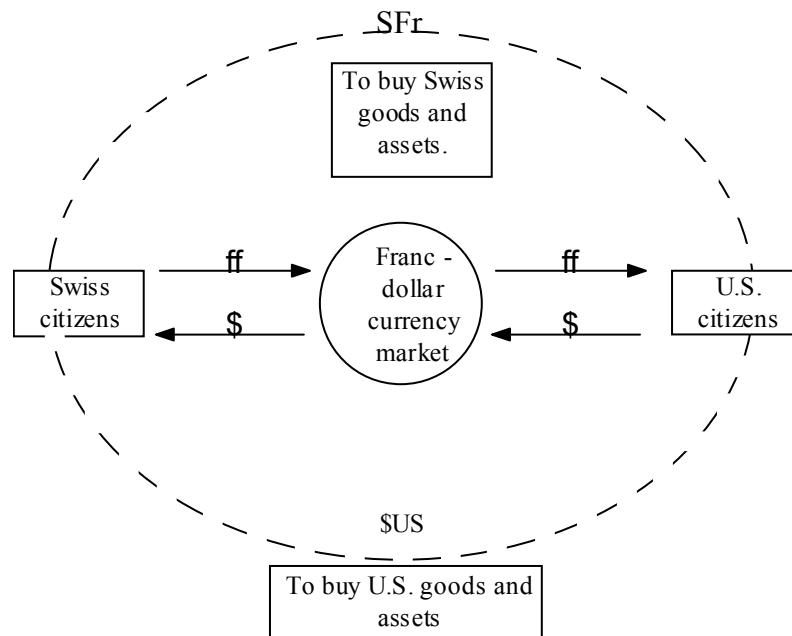
Application 1: Dispelling Confusion Over Terminology

There is a potential for student confusion between the terms the "dollar supply" and the "money supply." Remind students that "dollar supply" is a term relating to the foreign exchange market, not the money supply. It refers to the dollars that people bring to a particular market (the foreign exchange market) to obtain foreign currency with which to buy non-U.S. goods or services or non-U.S. assets. When the "dollar supply" or supply of dollars increases, people are simply bringing more U.S. dollars to this particular market; it does not mean that the U.S. money supply (the number of dollars in circulation) has increased.

To further stress this point, you may want to draw the following diagram, which shows how the supply of dollars can increase with no change in the domestic money supply. The figure shows the exchange between the U.S. dollar and the Swiss franc. (It is helpful to point out to students that one must be careful to name the countries because more than one country can have a currency called a "dollar" or a "franc," and they are not the same.)

When U.S. citizens supply more dollars to the dollar-franc market, the Swiss obtain more dollars. What will they do with these dollars? They will buy more goods and services and/or more assets

from U.S. citizens, so the dollars will find their way back to the United States. (The possibility of an increase in foreign dollar holdings is ignored here, as is the use of the U.S. dollar as a “vehicle currency” for trades not involving the United States.) However, there is no reason to think that the U.S. money supply (dollars in circulation in the United States) will rise as a result. Thus, an increase in the flow of dollars to the foreign currency market is distinct from an increase in the stock of money (or supply of money) circulating in the United States.



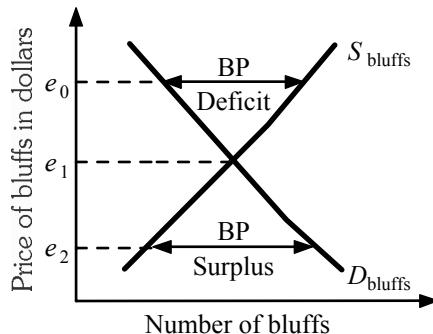
This application is also useful in explaining the concept that the United States can only continue to run trade deficits if other countries are willing to take U.S. dollars.

Application 2: The Causes and Consequences of a Balance-of-Payments Problem

Many countries (especially small ones) still fix their exchange rates. (A look at the foreign exchange table in the *Wall Street Journal* will show that the exchange rate for such a currency does not change from day to day.) Because many of these countries develop balance-of-payments problems it is worthwhile to examine this situation in class.

Begin by defining a balance-of-payments surplus as an excess demand for a nation’s currency in the foreign exchange markets. Similarly, a balance-of-payments deficit (a negative surplus) is an excess supply of a nation’s currency in the foreign exchange markets. (Be sure to distinguish between a balance-of-payments deficit and a trade deficit.) In the two-country case, the analysis is quite simple.

Invent an imaginary country (Bluffaland) and its equally imaginary currency (the bluff). Draw the supply and demand curves for bluffs in the bluff-dollar market. A balance-of-payments surplus or deficit for Bluffaland is simply the horizontal distance between the supply and demand curves, as illustrated.



Students can immediately see that under a system of floating rates, a balance-of-payments deficit or surplus for Bluffaland vis-à-vis the United States is impossible, as the exchange rate (labeled “price of bluffs in dollars” on the vertical axis) will adjust until the supply of and demand for bluffs are equal. They can also see that a balance-of-payments deficit would arise when Bluffaland fixes the value of its currency “too high,” meaning a price of bluffs in terms of dollars that is greater than the equilibrium value.

Why would Bluffaland set the value of its currency so high? There are several advantages for a country to do so. First, an artificially high value for the currency makes imports cheaper (a “strong” currency, one with a high value in terms of other countries, can be seen as having a lot of buying power). This can enable citizens to buy more imported goods and will also contribute to a lower domestic price level (particularly because many imports are inputs in domestic production). Second, if a country owed debts to, say, the United States that were denominated in dollars, it could now pay back those debts with fewer units of its currency. (This is the motive for many developing countries whose debts are in fact denominated in dollars.) Third, for some nations, a currency with a high value is a matter of national pride.

Explain that for a country like Bluffaland to fix its exchange rate above the equilibrium value, it must somehow prevent the excess supply of bluffs from forcing the exchange rate down. Bluffaland’s government must intervene in the foreign exchange markets, buying up the excess bluffs itself (and in the process, supplying dollars). You may wish to point out that every nation keeps stocks of foreign currency on hand for interventions such as this.

If the balance-of-payments deficit is chronic, Bluffaland will have a problem because it will eventually run out of U.S. dollars (and it is not allowed to print them!). At this point, the country would have several choices:

1. Sell gold or other assets in exchange for dollars. This would replenish its stock of dollars and allow it to continue to intervene to “support” the bluff. But this is only temporary, for once it runs out of gold or other assets, it will be back to where it started but with less wealth.
2. Protectionism. By using tariffs, quotas, or other restraints to trade, the country can make it harder for its citizens to import U.S. goods. This means that the government will cause the supply curve of its currency to shift left, closing the gap and eliminating the balance-of-payments deficit. This will lower standards of living in both Bluffaland and the United States, as it interferes with trade according to the principle of comparative advantage. It also contradicts one of the motivations for fixing the value of the bluff above equilibrium in the first place (i.e., the ability to afford more U.S. goods). It is also inconsistent with the worldwide movement toward freer trade (that has been going on since about the end of World War II).

3. Capital controls. Preventing domestic citizens from buying U.S. assets or from bringing bluffs out of the country would cause the supply of bluffs to shift leftward, once again closing the gap and eliminating the balance-of-payments deficit. This is a serious interference with economic freedom, which is unacceptable in most market economies. (It was, however, a standard procedure in the former Soviet-bloc countries.)
4. Engineer a recession. By lowering domestic incomes, citizens will buy fewer imports, once again shifting the supply of bluffs to the left. The social cost (and political unpopularity!) of this policy is obvious.
5. Devalue the currency. Lowering the value of the bluff closer to the equilibrium value can eliminate most or all of the balance-of-payments deficit. The problem here is that domestic citizens who were holding bluffs will suddenly find that their bluffs buy fewer dollars. They will feel cheated, and the next time they suspect the government is about to devalue, they will try to acquire dollars in advance. This would shift the supply curve of bluffs rightward, exacerbating any future balance-of-payments deficit.

It is easy to see that virtually all of the options for dealing with a balance-of-payments deficit have high social costs. This is why most economists favor floating rates.

Economic Growth in Developing and Transitional Economies

by Prof. Tony Lima, California State University, East Bay, Hayward, CA

BRIEF CHAPTER OUTLINE

Life in the Developing Nations: Population and Poverty p. 402

Economic Development: Sources and Strategies p. 403

The Sources of Economic Development

Strategies for Economic Development

Two Examples of Development: China and India

Development Interventions p. 411

Random and Natural Experiments: Some New Techniques in Economic Development

Educational Ideas

Health Improvements

Population Issues

The Transition to a Market Economy p. 415

Six Basic Requirements for Successful Transition

DETAILED CHAPTER OUTLINE

- I. Introduction, pages 401-402
 - A. The same economic principles that have been studied through the text apply to less-developed countries.
 - 1. Scarcity is universal.
 - 2. This makes economic analysis relevant to all nations, regardless of their level of material well-being or ruling political ideology.
 - B. Instruments of Economic Management
 - 1. The United States can effectively use monetary and fiscal policy.
 - 2. External and/or internal constraints may prevent less-developed economies from using either or both of these instruments.
- II. Life in the Developing Nations: Population and Poverty, pages 402-403
 - A. Population
 - 1. In 2012 the world population reached 7 billion people.
 - 2. Of the more than 200 countries, most are developing economies. Those countries contain about 75 percent of total population (about 5.25 billion people).
 - TEACHING TIP: Table 21.1 [36.1] is included in the Excel workbook for this chapter. Underlying details from the IBRD database are also included as separate worksheets.
 - B. Early 1960s Classifications
 - 1. The *developed countries* included most of Europe, North America, Japan, Australia, and New Zealand.
 - 2. The *developing countries (Third World countries)* included the rest of the world.
 - 3. *First World* countries were the Western industrialized nations, while *Second World* countries included those formerly in the Soviet Union's domain.
 - C. The 2010 Classifications
 - 1. Rapid economic progress brought some developing countries to near-developed status.
 - 2. The middle-income (newly industrialized) countries include the formerly developing countries that have developed. These include Argentina and Chile.
 - 3. *Fourth World* countries have actually regressed economically, falling even further behind. These include much of sub-Saharan Africa and some of South Asia.
 - 4. China and India, while technically still developing, are rapidly becoming economic superpowers.
 - 5. The countries that used to make up the Soviet Union have developed at varying rates.

- TEACHING TIP: The Excel workbook for this chapter includes a table showing the economic performance of the newly-emerging democracies of eastern Europe. Here are a few highlights.

Some have declined to the point where they are now developing countries. Albania, Bosnia and Herzegovina, Kyrgyzstan, Moldova, Tajikistan, and Uzbekistan still have low per-capita incomes. In some of these countries, the combination of low real income and high inflation makes life particularly uncomfortable.

Others have made remarkable economic progress. These include the Czech Republic, Estonia, Hungary, Slovakia, and Slovenia. In 2007 and 2008 rising energy prices fueled an economic boom in Russia and other energy-rich countries. ■

TOPIC FOR CLASS DISCUSSION:

The CIA World Fact Book is available for downloading at <http://www.cia.gov/cia/download.html>. (If that URL doesn't work, start at <http://www.cia.gov/> and look for the link). The Fact Book contains a wealth of information about countries of the world, including economic data. Divide the class into teams, assign each team to a country and have them prepare a short presentation summarizing how that country has progressed economically during the last 10 years. Then they should give one or two theories about why their country has done well or badly.

For starters, Extended Application 2 at the end of this chapter of the Instructor's Resource Guide includes some data about the former countries of the Soviet Union. ■

- D. Developing Countries and Developed Countries: Developing countries continue to be separated from developed countries by some common factors.
1. Economists use gross national income (GNI) to compare income levels in different countries. GNI uses a more accurate way of converting purchasing power among currencies. (See Unique *Economics in Practice* page 273.) Using GNI as the basis for comparison, developed countries have higher average levels of material well-being (including food, clothing, and shelter).
 2. Developed countries also have better health and education than developing countries.
 3. Although difficult to quantify, there is general agreement that citizens of developed countries generally have greater political and personal freedom than those living in developing countries.
 4. Life in developing countries is very difficult.
 - a. Most meals are only the country's staple crop (rice, wheat, or corn).
 - b. Shelter is primitive with many people sharing a small room.
 - c. Small family farms with crude capital keep productivity low.
 - d. Illiteracy remains chronic.
 - e. Infant mortality is 10 times the rate in the United States. There is only one physician per 5,000 people.
 - g. Civil and external wars are common.
 5. Poverty dominates the developing world.

Unique Economics in Practice

Most economists will assume GNI is calculated using purchasing power parity (PPP) methodology. But the World Bank actually uses a different technique, the Atlas method. This technique calculates the weighted average of a country's exchange rate using official and "best estimate" market rates. The weights are approximately the assessment of World Bank experts about the validity of the official rate. Here's what the World Bank says about their methodology:

"In calculating gross national income (GNI—formerly referred to as GNP) and GNI per capita in U.S. dollars for certain operational purposes, the World Bank uses the Atlas conversion factor. The purpose of the Atlas conversion factor is to reduce the impact of exchange rate fluctuations in the cross-country comparison of national incomes."

The Atlas conversion factor for any year is the average of a country's exchange rate (or alternative conversion factor) for that year and its exchange rates for the two preceding years, adjusted for the difference between the rate of inflation in the country, and through 2000, that in the G-5 countries (France, Germany, Japan, the United Kingdom, and the United States). For 2001 onwards, these countries include the Euro Zone, Japan, the United Kingdom, and the United States. A country's inflation rate is measured by the change in its GDP deflator."

(Source: <http://data.worldbank.org/about/country-classifications/world-bank-atlas-method> accessed June 30, 2013.)

Question: A large majority of economists agree that PPP is the correct way to calculate GNI when doing inter-country comparisons. Why doesn't the World Bank do this?

Answer: The World Bank has one valid concern: currencies for which there is no good market-based exchange rate. But their concerns about "exchange rate fluctuations" could be easily fixed using simple moving averages. (In fact, that's what the Atlas method does. See the above link for details.) Recent research seems to indicate that PPP is correct in the long run. And there is a lingering suspicion that the Atlas methodology is an attempt to tilt the decision-making process.

Source: The paper testing the PPP hypothesis mentioned above is Pesaran, M. Hashem, Smith, Ron P., Yamagata, Takashi and Hvozdyk, Lyudmyla (2009) 'Pairwise Tests of Purchasing Power Parity', *Econometric Reviews*, 28: 6, 495–521.

E. Developed Countries

1. Even though developed countries have one-quarter of the world's population they consume about three-quarters of the world's output. (They also *produce* about three-quarters of the output.)
2. That leaves developing countries with three quarters of the population and one quarter of the output.
3. Income distribution
 - a. Worldwide the poorest 20 percent receive about 0.5 percent of total income while the highest 20 percent earn 79 percent of total income.
 - b. That means the income distribution must be severely skewed in developing countries.

III. Economic Development: Sources and Strategies, pages 403-411

A. Background

1. Economists have been trying to understand economic growth and development since the beginnings of the subject (Adam Smith and David Ricardo).

2. The actual study of economic growth as it applies to developing countries began after World War II.
 3. Economic development as a field of economics asks one simple question: Why are some countries poor while others are rich?
- B. The Sources of Economic Development:
1. Capital Formation
 - a. Developing countries have insufficient quantities of necessary inputs.
 - b. The *vicious-circle-of-poverty hypothesis* suggests that poverty is self-perpetuating because poor nations are unable to save and invest enough to accumulate the capital stock that would help them grow. Thus, there is virtually no saving and low levels of investment.
 - c. If the vicious circle hypothesis were universally true no nation would ever develop. Poverty alone cannot explain capital shortages. Poverty is not necessarily self-perpetuating.
 - d. Poverty may be caused more by a lack of incentives to save and invest productively. *Capital flight* is the tendency for both human capital and financial capital to leave developing nations in search of higher expected rates of return elsewhere with less risk.
 - e. Government policies may also tend to discourage investment activity by encouraging capital flight. Policies such as price ceilings, import controls, and expropriation of private property "tend to discourage investment." (Textbook p. 404 [716]).

TEACHING TIP: The authors' ability to understate the case is clear from the quoted text above.

- f. Quoting the text, "Whatever the causes of capital shortages, it is clear that the absence of productive capital prevents income from rising in any economy. The availability of capital is a necessary, but not sufficient, condition for economic growth. The landscape of the developing countries is littered with idle factories and abandoned machinery. Other ingredients are required to achieve economic progress." (page 404 [716])
2. Human Resources and Entrepreneurial Ability
- a. Capital does no good without labor.
 - b. Although there tends to be high rates of population growth, the quality of labor may pose a constraint on the growth of income. A productive workforce must be healthy. Disease is one of the major threats to development today. In 2011 over 2 million people died of AIDS. Another 1 million died of malaria. Most of those deaths were in Africa.
 - c. Beyond disease, health and nutrition are essential. Programs that encourage health and nutrition are investments in human capital.
 - d. The *brain drain* is the tendency for talented people from developing countries to become educated in a developed country and remain there after graduation.
 - e. Even when working in another country many educated workers send *remittances* to their families in their home country.

- f. Entrepreneurial activity also seems to be lacking. Often such activity is discouraged by political systems that do not enforce property rights. There is little incentive to be an entrepreneur if the state will take the results of your success by force.

Economics in Practice: Corruption, page 405 /683

One important barrier to economic development is government corruption and inefficiency. Ray Fisman came up with a unique methodology to measure the way in which political connections interfere with the workings of the market in Indonesia.

From 1967 to 1998, Indonesia was ruled by President Suharto. While Suharto ruled, his children and longtime allies were affiliated with a number of Indonesian companies. Fisman had the clever idea of looking at what happened to the stock market prices of those firms connected to the Suharto clan relative to unaffiliated firms when Suharto unexpectedly fell ill. Fisman found a large and significant reduction in the value of those affiliated firms on rumors of illness. What does this tell us? A firm's stock price reflects investors' views of what earnings the firm can expect to have. In the case of firms connected to Suharto, the decline in their stock prices tells us that a large part of the reason investors think that those firms are doing well is because of the family connection rather than the firm's inherent efficiency. One reason corruption is bad for an economy is that it often leads to the wrong firms, the less efficient firms, producing the goods and services in the society.

The chart shows the World Bank's rating of corruption levels in a number of countries around the world. The countries are ranked from those with the strongest controls on corruption – Germany, France, Japan and the U.S. — to those with the lowest controls – Russia, Indonesia, Pakistan and Nigeria.

3. Social Overhead Capital

- a. Also called *infrastructure* projects, *social overhead capital* includes basic infrastructure projects such as roads, power generation, and irrigation systems.
- b. Social overhead capital needs to be produced by the government because the projects are too large for the private sector or there is no way for a private agent to capture enough of the returns to make the project profitable. The free rider problem is also an important factor.
- c. If government takes no action in this area, economic development may be curtailed.

C. Strategies for Economic Development

- 1. No one development strategy is likely to succeed in all nations. Each strategy involves trade-offs.
- 2. Governments or Markets?
 - a. A country must decide how its economy will be directed. The basic choice is between markets and central planning. In the 1950s and 1960s development strategies relying on central planning were popular. Even the United States supported some central planning.
 - b. The economic appeal of planning lies theoretically in its ability to channel savings into productive investment and to coordinate economic

activities that private actors in the economy might not otherwise undertake.

- c. The reality is that central planning is technically difficult, highly politicized, and a nightmare to administer. Central planners rarely know which sectors of the economy offer the highest rates of return on investment. Even worse the central planners are political creatures, meaning they can sometimes be bribed to channel funds to an area in which rates of return are low.
- d. The failure of many central planning efforts has brought increasing calls for less government intervention and more market orientation in developing countries. These are frequently recommended by the International Monetary Fund and the World Bank. The *International Monetary Fund (IMF)* is an international agency whose primary goals are to stabilize international exchange rates and to lend money to countries that have problems financing their international transactions. The *World Bank* is an international agency that lends money to individual countries for projects that promote economic development.
- e. *Industrial policy* is a policy in which governments actively pick industries to support as a basis for economic development. Most developing countries engage in some degree of industrial policy.

3. Agriculture or Industry?

TEACHING TIP: Table 21.2 [36.2] is included in the Excel workbook for this chapter. Underlying details from the IBRD database are also included as a separate worksheet with data from 2008 through 2012.

- a. Industrialization has several attractive features as a development strategy. Building factories is an obvious way to increase a country's capital stock. As countries develop, the share of GDP originating in the agricultural sector declines. This also encourages industrialization strategies.
- b. Unfortunately in many countries industrialization has been either unsuccessful or disappointing. Apparently just trying to replicate the structure of developed economies is not enough to guarantee or even promote successful development.
- c. Agriculture has received more attention since the early 1970s. It's possible that the transition from a less-developed, agrarian economy to a developed, industrial economy causes industrialization. Thus, adopting a policy of industrialization puts the cart before the horse.
- d. Some balance between the two seems to lead to the best outcome.

***Economics in Practice: Who You Marry May Depend on the Rain,
page 407 [719]***

Building embankments to prevent flooding in Bangladesh made the farmers protected by the embankment wealthier than those whose land was unprotected. Marriage in Bangladesh requires a dowry paid by the bride's family. Poor farmers cannot afford the dowry, so they often marry a cousin since promised future payments can be extracted more easily among members of the groom's extended family. Building embankments allowed the now-wealthy farmers to stop marrying cousins, but the poorer farmers continued this practice. There are well-known adverse genetic consequences to marrying cousins, implying that the poorer farmers are likely to be less healthy in the future.

4. Exports or Import Substitution?
 - a. As part of a development strategy a country must choose which of two trade strategies to use.
 - b. An *import substitution* strategy favors developing local industries that can manufacture goods to replace imports. These policies often fail, creating major economic inefficiencies and encouraging capital-intensive production, which limits jobs.
 - c. An *export promotion* policy encourages exports. Export promotion has seemed to result in higher rates of growth. Japan, Hong Kong, Singapore, Korea, and Taiwan have all pursued such strategies fairly successfully. Such strategies often include keeping the exchange rate low so export prices remain low.
5. Microfinance is the practice of lending very small amounts of money, with no collateral, and accepting very small savings deposits.
 - a. Muhammad Yunus created the Grameen Bank and invented microfinance. He received the Nobel Peace Prize in 2006 for his work.
 - b. Microfinance relies on social pressure instead of collateral. Within a village, people who are interested in borrowing money to start businesses are asked to join lending groups of five people. Loans are then made to two of the potential borrowers, later to a second two, and finally to the last. As long as everyone is repaying their loans, the next group receives theirs.

TOPIC FOR CLASS DISCUSSION:

Ask the class what other peer pressure strategies might work. To get things started, here's another lending method used by the Grameen Bank. Loans are made to each member of a group of five women. Before any member of the group can receive additional loans, each member must repay the original loan. ■

Unique Economics in Practice

Many of the microlending examples specifically refer to loans to groups of women.

Question: What's so special about that half of the human race? Why are loans to women different from loans to men?

Answer: Women can bear children. If they stay in school longer and/or have a productive job they will usually postpone the age at which they have their first child. This reduces population growth. It also contributes to GDP growth as their businesses grow.

***Economics in Practice: Cell Phones Increase Profits for Fishermen in India,
page 410 [722]***

Kerala is a poor state in a region of India. The fishing industry employs more than one million people. Every day fishing boats go out; and when they return, the captain of the ship needs to decide where to take the fish to sell. There is much uncertainty in this decision: How much fish will they catch; what other boats will come to a particular location; how many buyers will there be at a location? Moreover, fuel costs are high and timing is difficult, so that once a boat comes ashore, it does not pay for the fishermen to search for a better marketplace. In a recent study of this area, Robert Jensen found on a Tuesday morning in November 1997, 11 fishermen in Badagara were dumping their load of fish because they faced no buyers at the dock. However, unbeknownst to them, 15 kilometers away, 27 buyers were leaving their marketplace empty-handed, with unsatisfied demand for fish.

By 2001, the majority of the fishing fleet had mobile phones, which they use to call various vendors ashore to confirm where the buyers are. Waste, which had averaged 5 to 8 percent of the total catch, was virtually eliminated. Moreover, just as we would have predicted from the simple laws of supply and demand, the prices of fish across the various villages along the fishing market route were closer to each other than they were before. Jensen found that with less waste fishermen's profits rose on average by 8 percent, while the average price of fish fell by 4 percent.

D. Two Examples of Development: China and India

1. Between 1978 and 2003 China's economy grew 9 percent per year. During the last eight years, India's economy has grown 6 to 8 percent per year.
 - a. Measures of the current standard of living in both countries still place them in the "developing" category. But their rapid growth warrants special attention.
 - b. China's growth has been fueled by manufacturing. India's has focused on services, specifically software and telephone technical support.
2. These contrasting examples show once again that no single strategy for economic development will work in every case.

IV. Development Intervention, pages 411-415

Growth does not necessarily lead to development. Growth can leave the lower parts of the income distribution behind. Economists have increasingly focused on which microeconomic interventions are most helpful to those at the bottom of the income distribution.

A. Random and Natural Experiments: Some New Techniques in Economic Development

1. Selection bias is a constant issue in social science research.
2. To avoid selection bias, social scientists are increasingly using *random experiments* in which outcomes of specific interventions are determined by using the intervention in a randomly selected subset of a sample and then comparing outcomes from the exposed and control groups. (These are also called randomized experiments.)
3. If random assignment is not possible, experimenters try to use *natural experiments* in which selection of a control versus experimental group in testing

the outcome of an intervention is made as a result of an exogenous event outside the experiment itself and unrelated to it.

B. Educational Ideas

1. As economies grow, returns to education also typically grow. Research has focused on the specifics of education in less-developed countries.
2. A major problem is teacher absenteeism. In one experiment, teachers were paid for every class in which they were photographed with their students.
3. Student absenteeism is also a major issue. Some countries, including Mexico, make cash payments to parents for school attendance. There is some evidence that this improves attendance.

C. Health Improvements

1. Charging user fees for vaccinations and other treatments, even low fees, dramatically reduces treatment rates. Demand is very elastic.
2. As the population of a village increased, lowering the risk of contagion, fewer people accepted treatment, indicating sensitivity to cost and benefit calculations.
3. Health education didn't seem to make much of a difference.

D. Population Issues

1. Population growth is a major problem for developing countries.
2. Economists have been worrying about population growth at least 200 years. Thomas Malthus is usually credited with being the first to study this problem.
3. The basic theory is simple. Population growth is exponential because a constant growth rate implies an exponentially growing level. However, the law of diminishing returns says food supplies should grow more slowly. Therefore mass starvation must result.
4. Malthus failed to take technological improvements into account. Even today technological change continues to improve productivity so that output grows faster than population.
5. Some countries have managed to reduce the number of children per family by persuading parents that they will be able to provide a better education for each child if there are fewer of them. Economists call this substituting quality for quantity.
6. But there are other parts of the world where population growth remains high and per-capita income low. Uganda, with per-capita GDP of \$300 per year, saw its population grow 3.1 percent in 2012.
7. While large families may increase economic security for the family, they impose external costs on society in the form of more spending on education and health.

TOPIC FOR CLASS DISCUSSION:

The previous discussion of the economic theory of population growth gives you one more chance to reinforce basic lessons. In this case, large families impose external costs on society in the form of more spending on education and health. Since those two activities are subsidized by the government in most countries, parents do not bear the full marginal cost of a child. As is always the case, when marginal social cost is greater than marginal private cost, more output is produced than is efficient. In this case the output is children. Lead the class through this analysis. ■

- TEACHING TIP: Malthus's ideas have been replicated many times since he first proposed them. One of the most interesting is the "limits to growth" model developed by Dennis Meadows and sponsored by the Club of Rome. Students might enjoy a brief presentation on this subject. Start with <http://www.clubofrome.org/?p=326>, the entry page on the Club of Rome website. A 2011 update is available at <http://cassandralegacy.blogspot.com/2011/06/limits-to-growth-revisited.html>. Be sure to read the critique by Lomborg and Rubin in Foreign Policy (available at http://www.foreignpolicy.com/articles/2002/11/01/the_dustbin_of_history_limits_to_growth/ or in the November-December, 2002 printed issue).◆
- TEACHING TIP: Prof. Lawrence Summers has estimated the rate of return on educating a woman in a developing country is over 20 percent. Part of that stems from the smaller family size educated households produce. The rest is increased productivity caused by more human capital.◆

V. The Transition to a Market Economy, pages 415-419

- A. Six Basic Requirements for Successful Transition: (1) Macroeconomic stabilization, (2) deregulation of prices and liberalization of trade, (3) privatization of state-owned enterprises and development of new private industry, (4) establishment of market-supporting institutions that support property rights and contract laws, (5) a social safety net to deal with unemployment and poverty, and (6) external assistance.
- B. Macroeconomic Stabilization
1. Inflation has been a problem in each of the countries of the former Soviet Union. The temptation to finance government spending by printing money proved irresistible.
 2. Russia experienced a near hyperinflation in 1992. Even today, some of these countries have double-digit inflation.
- TEACHING TIP: Extended Application 3 at the end of this chapter of the Instructor's Resource Guide includes information about inflation rates in each of these countries. The data is also available in the Excel workbook for this chapter.◆
3. The government must find a way to stabilize the money supply and balance their budget.
- C. Deregulation of Prices and Liberalization of Trade
1. Individual prices must be deregulated so they can serve as signals to buyers and sellers.
 2. Trade barriers must also be removed, including eliminating tariffs and subsidies.
- D. Privatization
1. Private ownership provides a strong incentive for efficient operation, innovation, and hard work.
 - a. The *tragedy of the commons* is the idea that collective ownership of a resource may not provide the proper private incentives for efficiency because individuals do not bear the full costs of their own decisions but do enjoy the full benefits.
 - b. This is an extreme example of what can happen when a resource is commonly owned.
 2. Privatization also creates an environment in which entrepreneurship can thrive.

E. Market-Supporting Institutions

1. Markets require many supporting institutions including banks, stock and bond markets, and brokerage houses.
2. There must be other institutions that support private property. These include courts and other aspects of the legal system.
3. Laws must provide for the enforcement of contracts and the protection of intellectual property.
4. Having a set of accounting principles is also necessary.
5. Insurance is also required to hedge some risks.

F. Social Safety Net

1. Some workers will end up unemployed.
2. There must be a safety net (probably including unemployment insurance) to help these workers until they can find new jobs.

G. External Assistance

1. A newly freed economy will lack people with knowledge and experience in markets and capitalist institutions. Most people agree that it's good to help countries with this through education and training.
2. The extent to which financial assistance should be given is another issue. Some economists believe it is essential to encouraging reform, while others say it is pouring money into a black hole.

H. Shock Therapy or Gradualism?

1. Much debate exists about the sequence and timing of specific reforms.
2. *Shock therapy* is the approach to transition from socialism to market capitalism that advocates rapid deregulation of prices, liberalization of trade, and privatization.
 - a. Those who favor this approach say the pain will be severe but at least it will be over quickly.
 - b. They point to the success of Poland.
3. Gradualists believe the best course is to build market institutions first, then gradually decontrol prices. "Privatize only the most efficient government enterprises first," they urge.

TEACHING TIP: Government authorities attempting to move their economy from central planning to a market-based system often fall into the transition trap of continually subsidizing enterprise by running budget deficits and rapid monetary growth. Such policy leads to inflation. Some transitioning economies have different experiences than Russia and other CIS (Commonwealth of Independent States) nations. The following statistics might be of interest. The money supply data are from the International Monetary Fund, International Financial Statistics. The inflation-rate data are from the European Bank for Reconstruction and Development, Annual Economic Outlook, September 1993. The budget deficit data are from the "Statistical Tables," The Economics of Transition 1, 4 (1993).

| Country | Year | | | | |
|---------------------------------|------|------|-------|------|-----------|
| | 1989 | 1990 | 1991 | 1992 | 1993 |
| Russia | | | | | |
| Budget deficit as share of GDP | NA* | NA | -21.2 | -4.3 | -10 to 15 |
| Annual money supply growth rate | 14 | 18 | 99 | 610 | NA |
| Inflation rate | 2 | 6 | 93 | 1354 | 900 |
| Czech Republic | | | | | |
| Budget deficit as share of GDP | -2.4 | 0.1 | -2.0 | -3.3 | 0.0 |
| Annual money supply growth rate | 5 | 0 | 4 | 26 | 24 |
| Inflation rate | 1 | 10 | 58 | 11 | 21 |
| Poland | | | | | |
| Budget deficit as share of GDP | -7.4 | 3.5 | -6.2 | -7.0 | -4.8 |
| Annual money supply growth rate | 137 | 556 | 66 | 31 | 20 |
| Inflation rate | 251 | 566 | 70 | 43 | 35 |

*NA = Not available

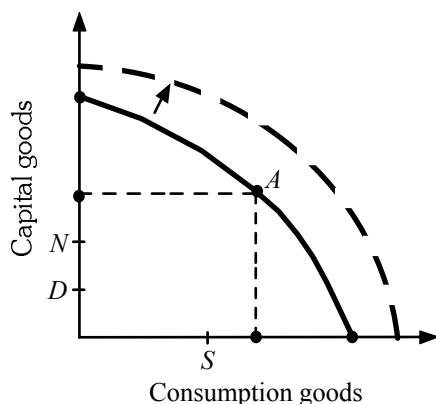
TEACHING TIP: World history has provided a quasi “controlled experiment” for the economic performance of Soviet-type socialism. In 1939, there were actually four Baltic States: Lithuania, Latvia, Estonia, and Finland. All of these “states” had approximately the same income per capita. Lithuania, Latvia, and Estonia were absorbed into the Soviet Union during World War II, whereas Finland was able to chart its own economic course, which included significant elements of market capitalism. By 1989, the output per capita of Finland was six times greater than that of any of its three neighbors.

Extended Applications

Application 1: Illustrating Development Problems with ppfs

Production possibilities frontiers (ppf) can help students visualize the problems associated with economic development in the developing nations and provide a unifying theme to your lecture.

Draw the diagram below, with “consumption goods” measured along the horizontal axis, “capital goods” along the vertical axis, and a ppf with standard curvature.



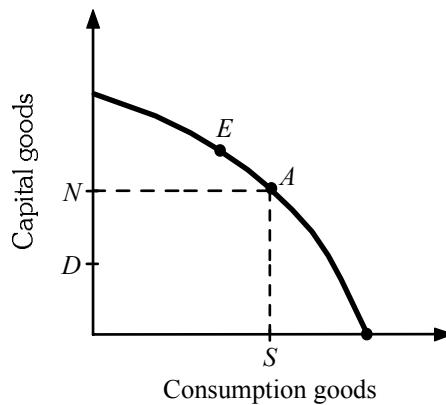
Three points on the axes need to be stressed here. Point D (depreciation) on the vertical axis shows the level of capital production needed just to replace the capital that wears out each year. When capital production falls short of Point D , the capital stock will shrink over time, and the production function will shift inward. When capital production exceeds Point D , the capital stock grows and the production function shifts outward over time, as shown in the diagram. But the fact that the production function shifts outward does not guarantee a rise in living standards because population is growing as well.

Point N shows the level of capital production needed to increase productivity (and therefore living standards) with a growing population or workforce. If the workforce is growing at 10 percent per year, then the capital stock must grow by 10 percent per year just to keep the level of productivity constant. When capital production exceeds N , the production function shifts out faster than the population is growing, so living standards rise.

Finally Point S represents the level of consumption goods needed for the survival of the population.

A developed economy (like that in the diagram) has a large capital stock and consequently a highly productive workforce, so its ppf lies far from the origin. Such an economy can produce consumption goods well in excess of Point S and still produce capital goods well beyond Point N . Thus, the production function of developed economies shifts out faster than the growth in the population, and living standards continue to rise.

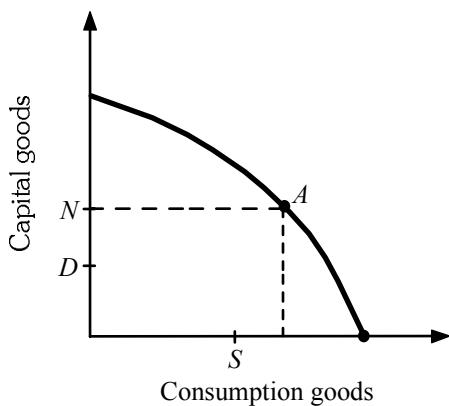
In the “vicious circle” view, the problem faced by some developing nations is that, with such a small capital stock to begin with, production possibilities are very limited (the ppf is close to the origin), as shown in the following diagram.



Pushing capital production above Point N would require moving along the ppf to a point like E , which means pulling resources out of consumption goods industries and dropping below Point S on the horizontal axis. This would be morally and politically intolerable.

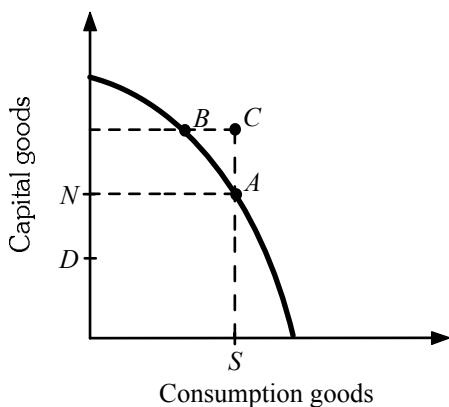
You might want to mention that Stalin—who was not bothered by moral implications and was able to crush his political opponents—simply moved the USSR along its ppf from Point A to Point E during the 1930s. In practice, this was accomplished by organizing farmers into low-consumption collectives and confiscating their crops in order to feed capital-producing workers in the cities. In the process, millions of rural Soviets starved to death or were executed outright.

Critics of the vicious circle view point out that many developing nations are able to produce consumption goods beyond Point S with enough resources left over for capital production beyond Point N , but that this additional capital production never takes place. These critics stress the lack of incentives for domestic investment. This, too, can be illustrated on a ppf diagram:



Here, production of consumption goods exceeds S and capital production is stuck at N —the level that just maintains productivity and living standards—because of a lack of incentive to create domestic capital. The excess consumption goes to provide luxury goods for the wealthiest members of society, whereas any saving goes abroad, where it finances capital growth in other countries.

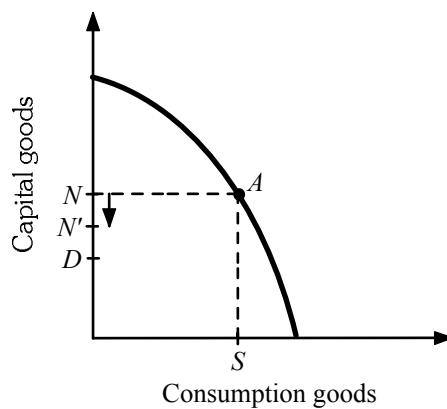
Consider the options for development. There are two basic types of assistance from the West. In the first type the developed world provides consumption goods so that developing nations can shift resources into the production of capital and still provide for the basic-consumption necessities. This is a common feature of U.S. aid to developing nations that consists heavily of food shipments. The key point is that Western aid enables a developing country's production to differ from its “absorption” of the two types of goods. In the diagram below, the developing nations moves production from Point A to Point B . Absorption, however, moves from Point A to Point C . The horizontal distance from B to C represents consumption goods provided by the West.



The second type of assistance, commonly provided by the World Bank and other international institutions, is funding for capital. Here, production continues at Point A (so the nation is producing its own consumption goods), but absorption once again moves to Point C . In this case, the vertical distance between Points A and C represents capital goods provided by outside assistance.

With either of these two types of assistance, the addition to the domestic capital stock (it is hoped) is greater than N , so the production function shifts outward at a pace faster than the population is growing. Ideally, the production function will also shift out fast enough for the

developing country to pay interest on loans from developed countries and still leave room for an improvement in living standards.



Finally, an important step that developing nations can take on their own is limiting population growth. This moves Point N vertically downward, from N to N' in the diagram, signifying that in the long run the same level of capital production can be used to increase capital per worker, because the workforce will eventually grow more slowly. Production remains at Point A , but now living standards can rise.

Application 2: The Countries of the Former Soviet Union

As noted in the text and previously, the countries formerly part of the Soviet Union have varied widely in their responses to market capitalism. The table following is drawn from the CIA World Fact Book 2013 (available for downloading at <http://www.cia.gov>).

Countries that have done well under independence include the Czech Republic, Estonia, and Hungary as well as several others. Countries that have fared poorly include Albania, Bosnia and Herzegovina, Tajikistan, and Uzbekistan.

You may want to make this data available to your class to encourage discussion.

Many students overestimate the size and strength of China's economy. I've added that country to the table for comparison purposes.

| Country | Population growth rate | Real GDP growth rate | Real GDP per capita growth | Real GDP per capita (\$, PPP basis) | Inflation Rate | Government type |
|------------------------|------------------------|----------------------|----------------------------|-------------------------------------|----------------|--|
| Albania | 0.29% | 0.50% | 0.21% | \$8,000 | 2.00% | Parliamentary democracy |
| Azerbaijan | 1.01% | 3.80% | 2.79% | \$10,700 | 7.40% | Republic |
| Belarus | -0.18% | 4.30% | 4.48% | \$16,000 | 70.00% | Dictatorship |
| Bosnia and Herzegovina | -0.10% | 0.00% | 0.10% | \$8,300 | 2.20% | Emerging federal democratic republic |
| Bulgaria | -0.81% | 1.00% | 1.81% | \$14,200 | 2.40% | Parliamentary democracy |
| Croatia | -0.11% | -1.80% | -1.69% | \$18,100 | 4.70% | Parliamentary democracy (and the newest member of the European Union as of July 1, 2013 -- but they do not use the euro currency.) |

| Country | Population growth rate | Real GDP growth rate | Real GDP per capita growth | Real GDP per capita (\$, PPP basis) | Inflation Rate | Government type |
|----------------|-------------------------------|-----------------------------|-----------------------------------|--|-----------------------|--|
| Czech Republic | -0.15% | -1.00% | -0.85% | \$27,200 | 3.30% | Parliamentary democracy |
| Estonia | -0.66% | 2.40% | 3.06% | \$21,200 | 3.30% | Parliamentary republic |
| Georgia | -0.33% | 6.10% | 6.43% | \$5,900 | -0.90% | Republic |
| Hungary | -0.20% | -1.70% | -1.50% | \$19,800 | 5.70% | Parliamentary democracy |
| Kazakhstan | 1.20% | 5.00% | 3.80% | \$13,900 | 5.20% | Republic; authoritarian presidential rule, with little power outside the executive branch |
| Kyrgyzstan | 0.97% | 1.00% | 0.03% | \$2,400 | 4.00% | Republic |
| Latvia | -0.61% | 4.50% | 5.11% | \$18,100 | 2.50% | Parliamentary democracy |
| Lithuania | -0.28% | 3.50% | 3.78% | \$20,100 | 3.40% | Parliamentary democracy |
| Moldova | -1.02% | 0.30% | 1.32% | \$3,500 | 4.50% | Republic |
| Montenegro | -0.56% | 0.50% | 1.06% | \$11,700 | 4.00% | Republic |
| Poland | -0.09% | 2.00% | 2.09% | \$21,000 | 3.70% | Republic |
| Romania | -0.27% | 0.90% | 1.17% | \$12,800 | 5.00% | Republic |
| Russia | -0.02% | 3.40% | 3.42% | \$17,700 | 5.10% | Federation |
| Serbia | -0.46% | -2.00% | -1.54% | \$10,500 | 6.20% | Republic |
| Slovakia | 0.09% | 2.60% | 2.51% | \$24,300 | 3.60% | Parliamentary democracy |
| Slovenia | -0.21% | -2.00% | -1.79% | \$28,600 | 2.60% | Parliamentary republic |
| Tajikistan | 1.79% | 7.50% | 5.71% | \$2,200 | 6.40% | Republic |
| Turkmenistan | 1.15% | 8.00% | 6.85% | \$8,500 | 10.50% | Defines itself as a secular democracy and a presidential republic; in actuality displays authoritarian presidential rule, with power concentrated within the presidential administration |
| Ukraine | -0.63% | 0.20% | 0.83% | \$7,600 | 0.60% | Republic |
| Uzbekistan | 0.94% | 8.20% | 7.27% | \$3,500 | 12.70% | Republic; authoritarian presidential rule, with little power outside the executive branch |
| China | 0.46% | 7.80% | 7.34% | \$9,100 | 2.60% | Communist state |

Solutions to Problems

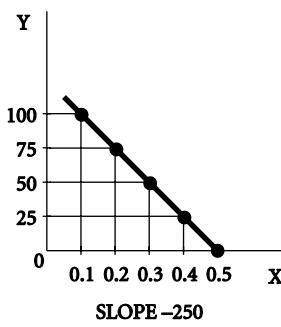
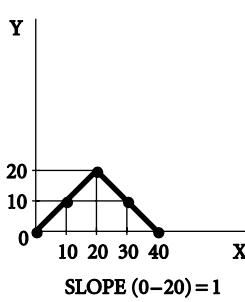
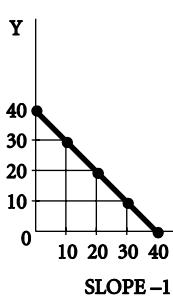
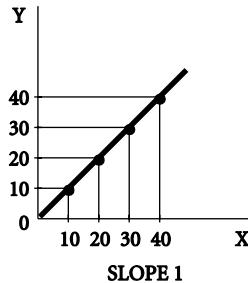
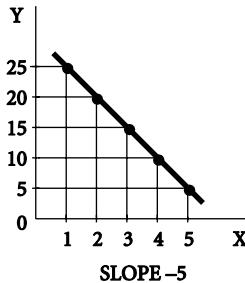
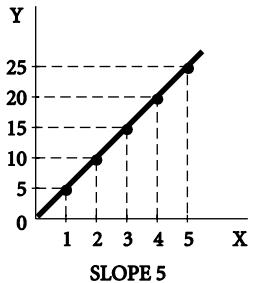
CHAPTER 1

1. Answers will vary, but should include the notion that each activity provides benefits in the form of satisfaction or additional income, but also takes time away from the pursuit of other activities (opportunity cost). Time spent on each activity is limited because the additional benefit of devoting an extra unit of time to any one activity falls as more time is devoted to the activity. Hence, as more and more time is spent on one activity, it will become increasingly attractive to devote the next unit of time to some other activity.
2. Answers will vary.
3. (a) normative
(b) positive
(c) normative
4. The average cost is \$0.84 ($\$15.98 / 19$). The marginal cost is \$0.
5. (a) The state should allow the market to provide what people want. Since gambling is not mandatory, only those who want to gamble will do so. Tax revenues that arise from casino gambling are paid voluntarily.
(b) Some argue that casino gambling is associated with criminal activity that has a cost to the community at large. In addition, gambling can be addictive, and sometimes entices those who can least afford it to participate. These concerns bear on the efficiency argument to the extent that there are costs from gambling not reflected in the price of gambling. These costs could potentially affect the community at large (e.g., more crime, the social cost of addiction) or the individual (to the extent that gambling creates unwanted addiction).
(c) Legalized gambling has a number of fairness issues around it. First, a lot of people want the services that casinos provide. It is clearly entertainment that many people like. (If you don't like Texas Hold'em, you don't have to play.) But many consider gambling to be bad. They think it is fair to tax "sins." A big fairness issue is that people who gamble may be addicted to it. Like many other issues of its kind there are positives and negatives from the fairness side. First, since gamblers tend to be in low and moderate income brackets, gambling taxes and receipts would likely be regressive. That is, higher income households would pay a smaller percent of their income in taxes. Equity arguments are always the subject of disagreement.
(d) Tax revenue would likely fall in those states that had gambling prior to its legalization in all 50 states. For those states that just legalized gambling, tax revenues would likely rise.
6. (a) Tuition (which could have been spent on other things), forgone wages, study time, and so on.
(b) All the money (gas, depreciation of the car, and so on) could have been spent on other items; time spent en route could have been used for other activities.
(c) A better grade, no headache, perhaps admission to a better grad school, a higher-paying job. He has traded off an investment in human capital (staying in to study) for present consumption (going to the party).
(d) The other goods and services that Annie could buy with \$200.
(e) The \$1 million could have been invested in other profit-making ventures or projects, or it could have been put in the bank or loaned to someone else with interest.
(f) From the standpoint of the store, Alex is free. From Alex's standpoint, he gives up other uses of time and wages that could be earned elsewhere.
7. Answers will vary.

8. Answers will vary.
9. (a) This statement is an example of the post hoc fallacy. Just because Jeremy washed his car and the next day it rained, this does not mean that washing the car caused the rain to fall.
- (b) This statement is an example of the fallacy of composition, which is the erroneous belief that what is true for a part is necessarily true for the whole. Requiring all students to attend after-school tutoring would waste resources on those students who do not need tutoring, and would not be a good use of time for those students.
- (c) This statement confuses correlation and causation. There is most likely a correlation between people who drive hybrid automobiles and the amount of trash they recycle, since both are environmentally friendly actions, but the act of recycling trash is not the cause of people driving hybrid automobiles.
10. (a) This is an example of a microeconomic concern since it addresses output for a specific firm in a specific industry.
- (b) This is an example of a macroeconomic concern since it addresses a potential tax that would impact the entire nation.
- (c) This is an example of a macroeconomic concern since it addresses the inflation rate, which impacts the whole economy.
- (d) This is an example of a microeconomic concern since it addresses potential employment growth in a particular industry.
11. Carlos Slim Helu does face scarcity because resources are limited. A person's net worth does not change the fact that everyone faces scarcity. Consider one of our most important resources—time. There are only 24 hours in a day, and everyone, including Helu, must live their lives under this constraint, making decisions about how to spend this time.

CHAPTER 1 APPENDIX

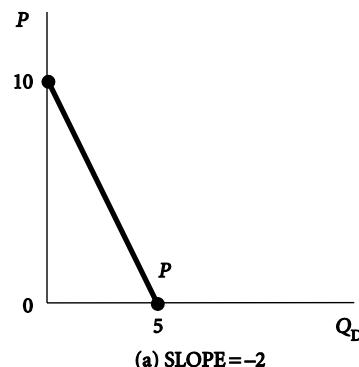
1. The slopes are as follows: line 1: 5; line 2: -5; line 3: 1; line 4: -1; line 5: slope is 1 as X goes from 0 to 20, and -1 as X goes from 20 to 40; line 6: -250.



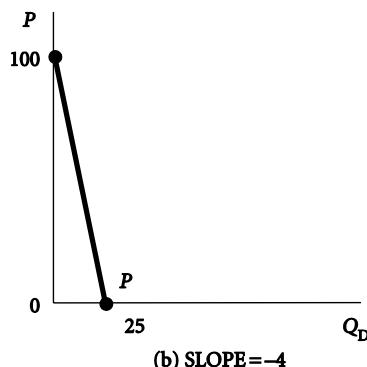
2. Answers will vary.

- Negative slope. As price rises, quantity of apples purchased falls.
- Positive (and declining) slope. As income rises, taxes rise; but the rise in taxes is less at higher incomes than at lower incomes.
- Negative (and declining) slope. As mortgage rates fall, home sales increase, but the increase in home sales is more at lower mortgage rates than at higher mortgage rates.
- Negative, then positive slope. As young children get older, they run faster, but as adults get older (beyond a certain age), they run slower.
- Positive slope. Greater sunshine leads to greater corn yield.
- Positive, then negative slope. Up to a point, more fertilizer increases corn yield, but beyond a certain point, adding more fertilizer actually decreases the yield.

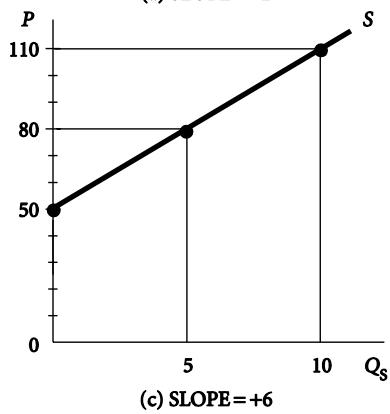
3.



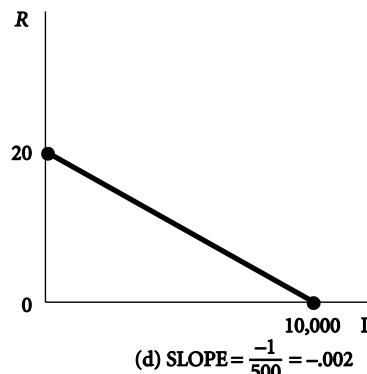
(a) SLOPE = -2



(b) SLOPE = -4

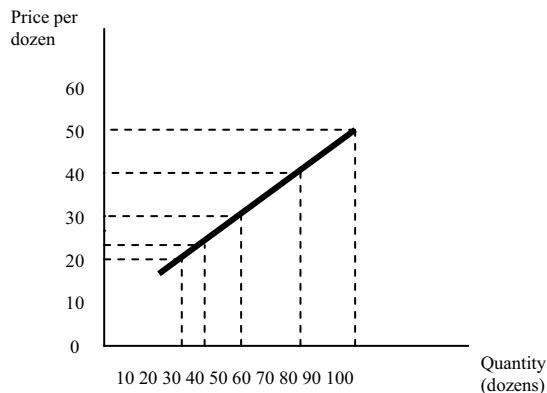


(c) SLOPE = +6

(d) SLOPE = $\frac{-1}{500} = -.002$

4. (a) The relationship between the price of roses and the quantity of roses sold by Fiona's Flowers is a positive relationship because as the price increases, the quantity sold increases.

- (b) The slope of the line is equal to 0.5.



5. At point A, the tangent line runs through the points $(p = 34, q = 20)$ and $(p = 24, q = 45)$. The slope is therefore $(34 - 24) / (20 - 45) = 10 / -25 = -0.4$.

At point B, the tangent line runs through the points $(p = 12, q = 90)$ and $(p = 5, q = 140)$. The slope is therefore $(12 - 5) / (90 - 140) = 7 / -50 = -0.14$.

CHAPTER 2

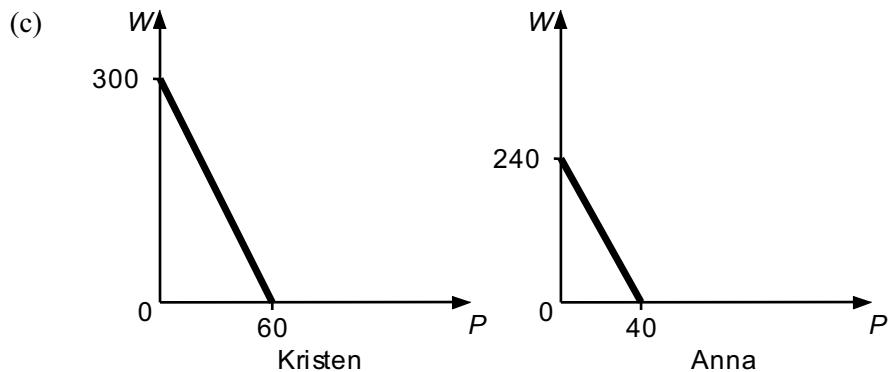
- Answers will vary, but should include:
 - the value of alternative uses of time (studying for other classes, leisure)
 - the value of alternative uses of time (studying, other forms of leisure)
 - the value of the other goods and services that could have been purchased with the money used to purchase the car
 - the value of the goods and services that taxpayers could have purchased with the additional property tax revenue
 - the value of other goods and services that the governments could have purchased with the money used to purchase the space station, or the value of the goods and services that taxpayers could have purchased with the tax revenue used to finance the space station
 - the foregone salary that you would have earned and the value of the alternative uses of time
- Disagree. To be efficient, an economy must produce what people want. This means that in addition to operating on the *ppf* (resources are fully employed, best technology is being used), the economy must be operating at the *right* point on the *ppf*.
- Opportunity costs of building the bridge include the value of other goods and services that the government of Mallsburg could have purchased with \$25 million or the value of the goods and services that taxpayers could have purchased with the tax revenue used to finance the bridge, as well as any inefficiencies created by the income tax by reducing incentives to work. In addition, the construction itself may impose costs—delays, noise, and so on—and presumably shopkeepers located near the older bridge will lose as consumers shift their business toward the main mall.

Benefits of the new bridge include reduced travel time for shoppers and commuting time for workers, increased sales tax revenues for Mallsburg, and gains for shopkeepers located in the main mall.

There may be other quality of life costs and benefits that are difficult to sort out without more information. The bridge may have environmental effects that could be positive (less pollution from idling traffic) or negative (depending on where and how the bridge is constructed). Also, there may be effects on the look and lifestyle of the town. A bridge through the center of the town is likely to affect daily living in any number of ways.

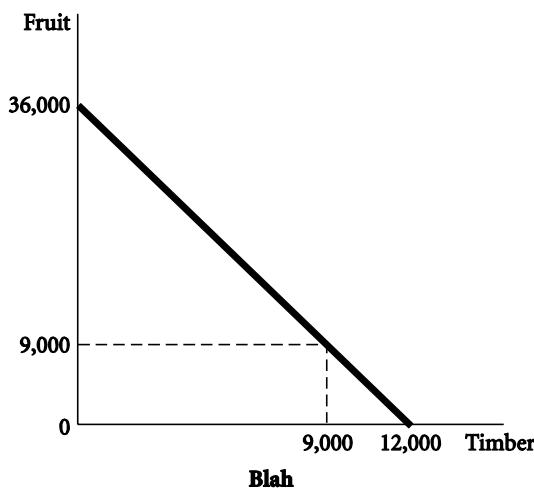
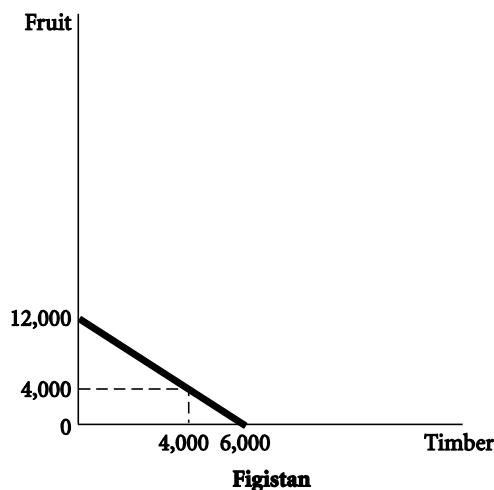
Beyond the costs and benefits, there is always the question of distribution. Is the income tax system of Mallsburg equitable? Are the shopkeepers likely to lose more than those likely to gain? Economists would typically argue for governments to undertake projects whose costs exceed their benefits, and then address any concerns about income distribution separately. To the extent these concerns are not addressed, however, you might consider writing about the income distribution effects of the new bridge.

4. (a) For Kristen, the “cost” of a pot holder is five wristbands; for Anna, the cost of a pot holder is six wristbands. Kristen has a comparative advantage in pot holders.
 (b) Anna has a comparative advantage in the production of wristbands because the opportunity cost ($1/6$ of a pot holder) is lower for Anna than it is for Kristen ($1/5$ of a pot holder).



- (d) Kristen: 150 wristbands and 30 pot holders. Anna: 120 wristbands and 20 pot holders. Total wristbands = 270. Total pot holders = 50.
 (e) 285 wristbands and 51 pot holders.
 (f) Kristen should specialize in pot holder production and earn $60 \times \$5.50 = \330 . Anna should specialize in wristband production and earn $240 \times \$1 = \240 . Maximum combined revenue is \$570.
5. (a) Sherice sacrifices the value of goods and services that could have been purchased with the income from work in order to obtain more leisure today. To the extent that this income will need to be replaced to finance her education, Sherice substitutes future work for present consumption (of leisure). On the other hand, if the time off improves Sherice’s state of mind, she may be a more successful student, which may be pleasant in its own right, and may also provide monetary rewards (better job, better graduate school) in the future.
 (b) For Frank, the opportunity costs are the alternative uses of time spent working out and the forgone pleasure of consuming foods that are not part of the diet. Presumably, the present sacrifice yields a future benefit of better health and more enjoyment of leisure activities.
 (c) Time and money spent today on maintenance is an investment. By reducing resources available for consumption today, more resources will be available for Mei in the future (since repair costs will be lower and breakdowns less frequent).
 (d) Jim may get to work faster, but at the risk of an accident or ticket, which could be costly. Included in the potential cost of this behavior are the monetary, criminal, or psychological penalties (remorse or direct concern about the welfare of others) that Jim will pay if others are harmed.
6. (a) Blah
 Blah
 (b) Blah: fruit
 Figistan: timber

(c)



- (d) Figistan:
 800 workers to timber
 400 workers to fruit
 Produces 4,000 of each
 $(800 \times 5 = 4,000); (400 \times 10 = 4,000)$
 Blah:
 900 workers to timber
 300 workers to fruit
 Produces 9,000 of each
 $(900 \times 10 = 9,000); (300 \times 30 = 9,000)$

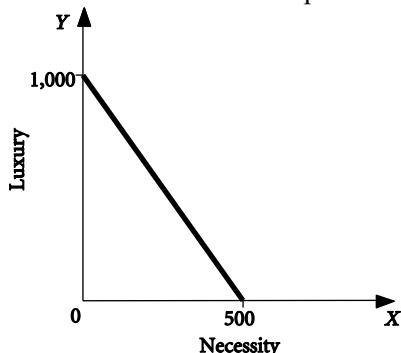
- These production points are shown on the graphs for part c.
 (e) Figistan moves all labor to timber and produces 6,000 board feet.
 Blah moves 450 out of timber into fruit.
 450 in fruit produces 13,500 baskets ($450 \times 30 = 13,500$).
 750 in timber produces 7,500 ft ($750 \times 10 = 7,500$).

Blah trades 4,200 baskets to Figistan for 1,800 board feet.
 Blah ends up with 9,300 of each ($13,500 - 4,200 = 9,300$ baskets of fruit; $7,500 + 1,800 = 9,300$ board feet of timber).

Figistan ends up with 4,200 of each (4,200 baskets of fruit from Blah; $6,000 - 1,800 = 4,200$ board feet of timber).

Both countries move beyond their individual *ppfs*.

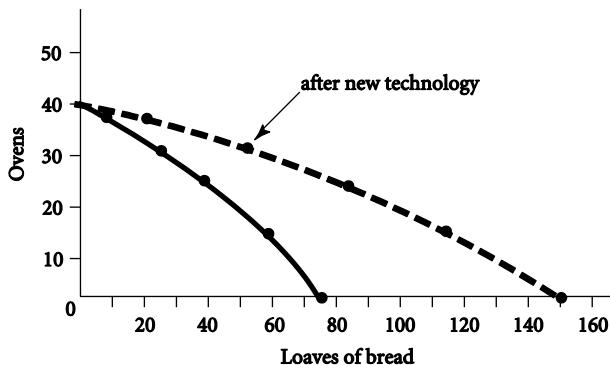
7. (a) The ppf curve is a straight line intersecting the Y-axis at 1,000 units of luxury goods and intersecting the X-axis at 500 units of the necessity goods. These are the limits of production if all resources are used to produce only one good.



- (b) Society's production could be inside the ppf as a result of (i) unemployment or underemployment of labor or (ii) inefficient production with full employment. With only one factor, the possibility of inefficient production means that workers are not using the best available technology to produce one or both goods. To move from inside the ppf to a point on the ppf, the economy would need to move to full employment or to adopt the most efficient production technology.
- (c) Answers will vary, but the decision should be based on the relative value of necessities and luxuries, as well as the degree of concern that enough necessities are produced to meet the needs of the population. Although this part does not address distribution, if too few necessities are produced, some people will not have enough necessities under any distribution scheme.
- (d) If left to the free market, income distribution will depend on some combination of individual effort and chance, where chance includes the possession of valuable abilities, opportunity, and inheritance. Each individual would have to find a job to earn income to command some of the economy's production.

8. (a) c, d, e
 (b) a, b, d, e, f
 (c) d, e (since they prefer meat); could also be c
 (d) e
 (e) b, c, d, e, f
 (f) b

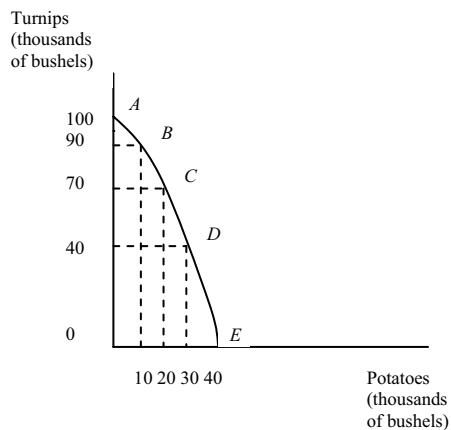
9. (a)



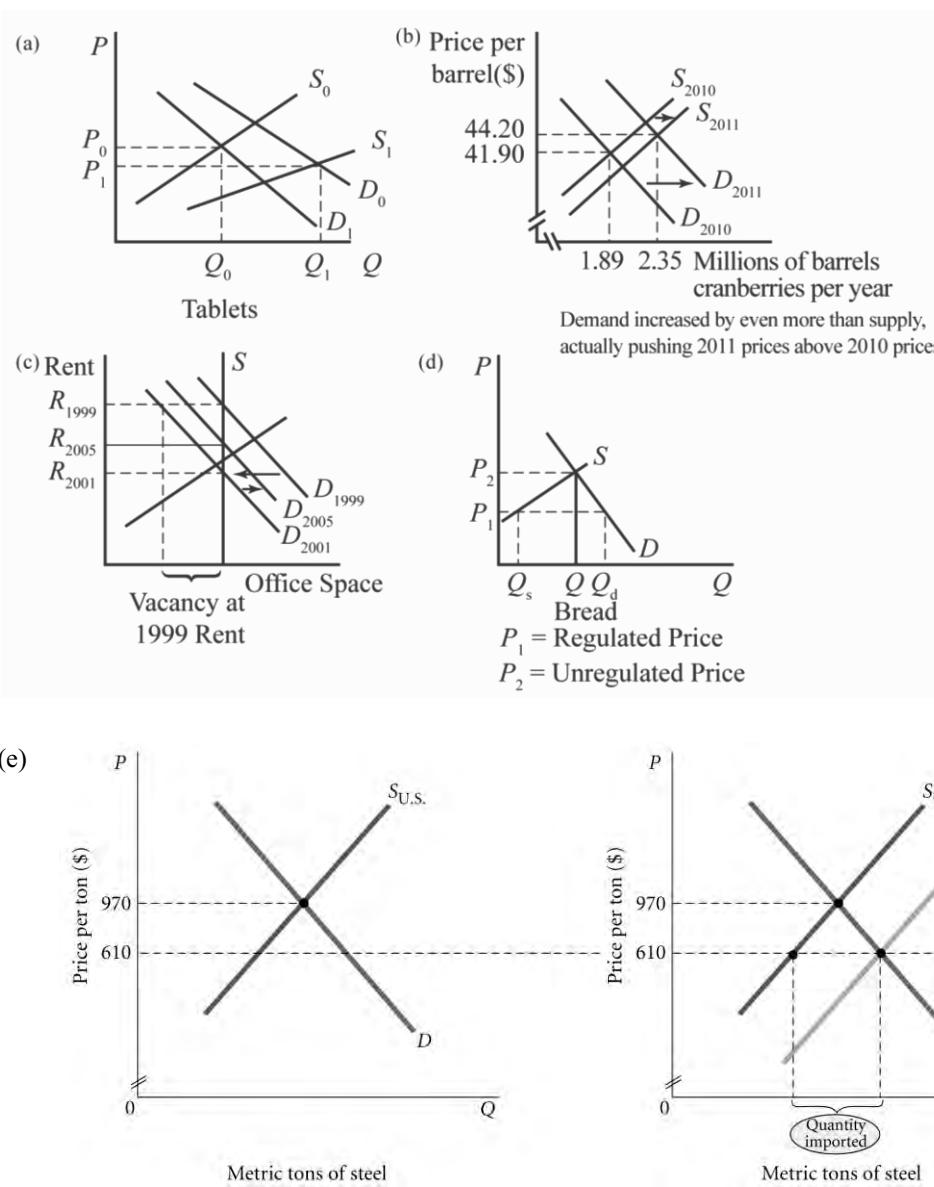
- (b) Yes, increasing opportunity cost applies. The opportunity cost of the first 15 million loaves of bread is 4 ovens; of the next 15 million loaves, 6 ovens; and so on.

- (c) Over time, as the number of ovens increases, the capacity to produce bread with the same quantity of other resources will also increase. Thus, the production possibilities curve will shift out horizontally to the right. The vertical intercept (maximum possible oven production) will remain unchanged, but the horizontal intercept (maximum possible bread production) will increase.
- (d) See graph in part (a) above.
- (e) Before the introduction of the new technology, production of 22 ovens left enough resources to produce 45 loaves of bread. After the introduction of the new technology, production of 30 ovens leaves enough resources to produce 60 loaves of bread.
10. As stated in the *Economics in Practice* feature, producing a meal takes two basic ingredients: food and time. For individuals who work, the opportunity cost of time for preparing meals is high. For retired individuals, the opportunity cost of time shopping and preparing meals is lower. More time spent shopping for bargains will mean that retired individuals are likely to pay less for the same bundle of goods as individuals who work.
11. The key here is the opportunity cost of Dr. Falk's time. Every time Falk fills two cavities, he gives up the chance to whiten someone's teeth (since the cavities take 15 minutes and the whitening 30 minutes). But Falk earns \$150 for the whitening and only nets \$100 for the two cavities. Clearly, when Falk takes on cavity-filling, he has not been paying attention to the opportunity cost of his time in whitening. Falk should either raise the price of filling cavities (we will talk more about price in a later chapter), or concentrate on whitening teeth.
12. Even with winning free tickets to the Ravens' games, you would still experience an opportunity cost each time you went to a game. This opportunity cost would be the highest-valued alternative that you must give up to attend each game.
13. Compared to larger cities and to towns that are geographically closer to larger cities, these towns in West Texas have relatively few entertainment options, so household choice is limited. With high school football being one of the few entertainment choices for the residents of these towns, its popularity is quite large.
14. A command economy is one in which the basic economic questions are answered by a central government. Through a combination of government ownership of state enterprises and central planning, the government, either directly or indirectly, sets output targets, incomes, and prices. A laissez-faire economy is one in which individual people and firms pursue their own self-interest, without any central direction or regulation. A laissez-faire economy implies a complete lack of government involvement, and the central institution through which the basic economic questions are answered is the market, where buyers and sellers interact and engage in exchange. No pure forms of either system exist in the world. In economies where the government plays a major role, individual enterprise still exists and independent choice is still exercised, and no market economies exist without some form of government involvement and government regulation.

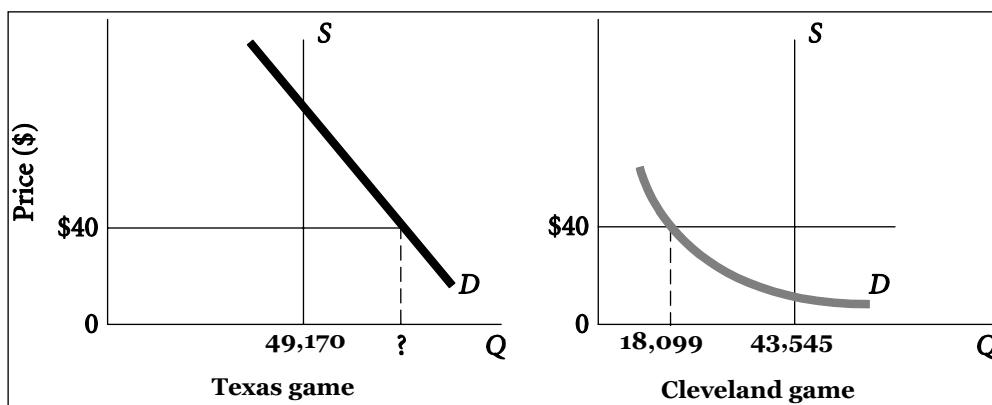
- 15.** Rougarou experiences increasing opportunity costs because for every bushel of potatoes it produces, it must give up increasing amounts of turnips. When Rougarou moves from production alternative *A* to production alternative *B*, it gives up 10,000 bushels of turnips to gain 10,000 bushels of potatoes. When it moves from alternative *B* to alternative *C*, it must give up 20,000 bushels of turnips to gain 10,000 bushels of potatoes. From alternative *C* to *D*, 30,000 bushels of turnips are given up for 10,000 bushels of potatoes, and from *D* to *E*, 40,000 bushels of turnips are given up for 10,000 bushels of potatoes. For each additional 10,000 bushels of potatoes Rougarou gains, the amount of turnips that must be given up increases. The increasing opportunity costs are shown on the graph with the concave production possibilities curve.



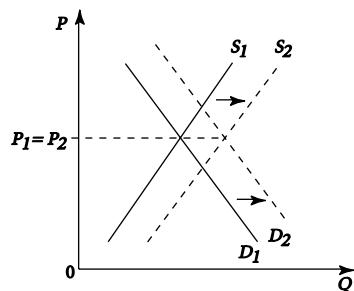
- 16. (a)** Technological innovation allows the nation to produce more with existing resources, so the production possibilities curve would shift up and to the right.
- (b)** An increase in unemployed workers does not change the production possibilities curve, but rather shifts the economy to a point inside the production possibilities curve.
- (c)** A hurricane that destroys productive capacity in the nation will reduce the amount of production possible in the nation, and therefore shift the production possibilities curve down and to the left.
- (d)** As the quality of education improves, so does the productivity of workers. Education can also be thought of as adding “human capital” as an added resource. This moves the production possibilities curve up and to the right.
- (e)** If all employers are required to increase the amount of paid vacation they must give employees, they will not be able to utilize resources as efficiently. The production possibilities curve will not shift, but the nation’s production will move to a point inside the production possibilities curve.

CHAPTER 3**1.**

2. (a)

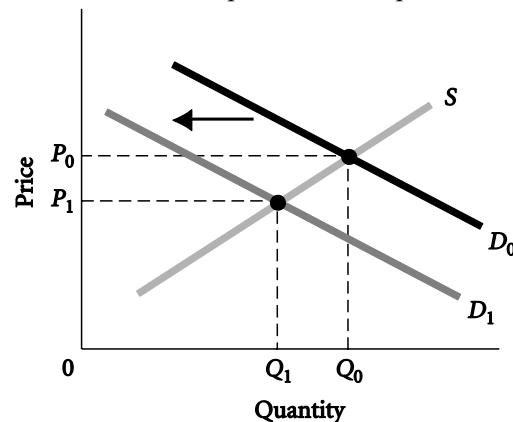


- (b) It depends on whether demand responds to the lower price and by how much. The diagram in (a) suggests that if price was lowered a substantial amount, the stadium would be filled.
- (c) The price system was not allowed to work to ration the Texas tickets. Some other rationing device must have been used. Perhaps people stood in line or queued. Perhaps there was a lottery. In all likelihood, there would be a secondary market for the tickets (scalpers). You could no doubt find the tickets for sale online at a high price.
- 3. If the supply of new homes kept pace with the expanding demand, prices would remain constant. The supply curve shifts to the right at the same rate as the demand curve shifts to the right:



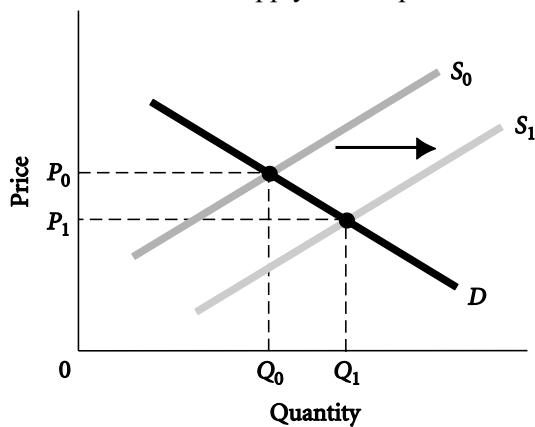
4. (a) Disagree. They are complements.

An increase in the price of a complement for product X causes demand for product X to fall.

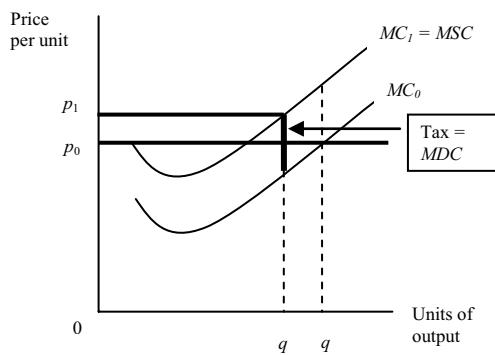


(b) Agree

An increase in supply causes price to fall.

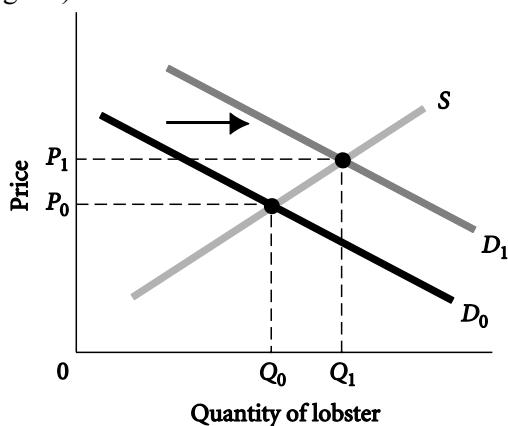


(c) Disagree. A fall in income will cause the demand for inferior goods to rise, pushing prices up

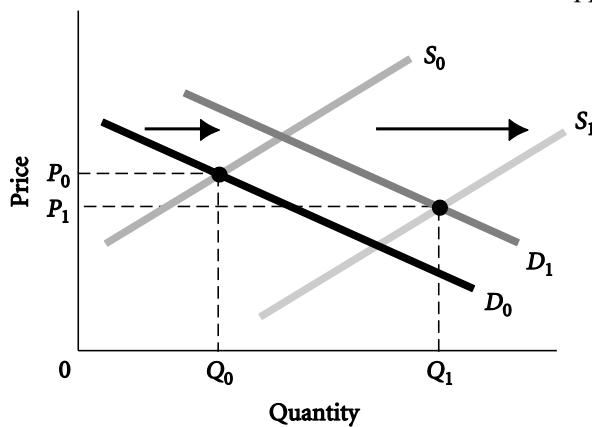


(d) Disagree. Sure they can. Both steak and lobster are normal goods.

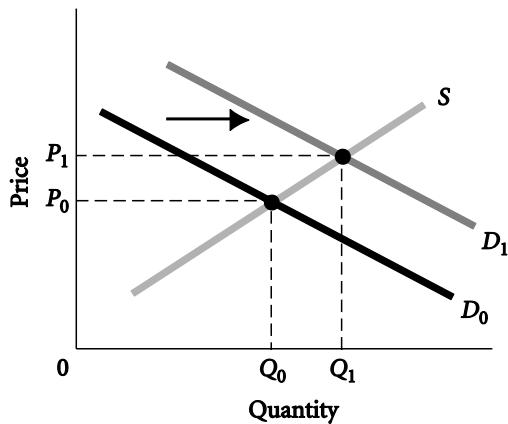
An increase in the price of steak (a normal good) increases the demand for lobster (also a normal good).



- (e) Disagree. Price could go down if the shift of supply was larger than the shift of demand.
 An increase in demand and an increase in supply may cause price to decrease.

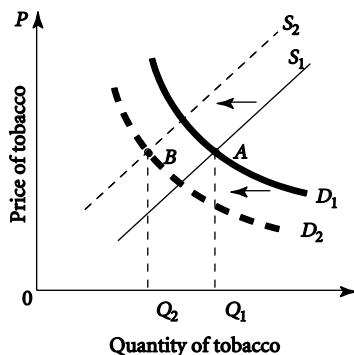


- (f) Agree.
 A decrease in the price of product A increases the demand for a complement (product B), increasing the price of product B.

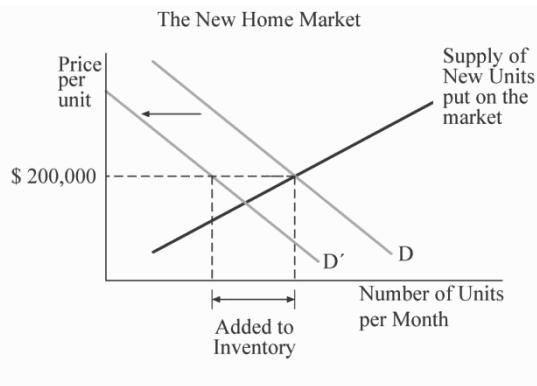


5. Since the jerseys do have slight differences (team name and logo, player name and number, etc.), they would be considered substitutes as opposed to perfect substitutes for each other. For some consumers, other authentic, licensed team merchandise such as t-shirts, or non-licensed team jerseys may be considered substitutes for the authentic jerseys, but other consumers may not consider these as substitutes. This depends on the consumer's taste and preference.

6. If the price of tobacco is supported by limiting land used to grow it, then the supply curve for tobacco shifts to the left. The anti-smoking publicity works to shift the demand curve to the left. Both of these policies work together to reduce consumption of tobacco.



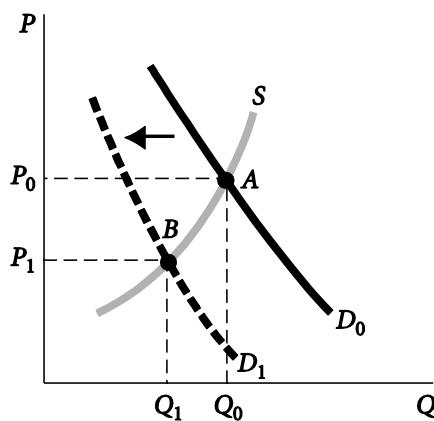
7. (a) See diagram below.
 (b) Price would fall until the quantity demanded and the quantity supplied were equal at some price below \$200,000. In the diagram shown here that would be at \$170,000.
 (c) Quantity demanded would drop but the new units put up for sale would stay the same and the inventory of unsold property would grow. We would see more signs in front of houses. If prices did not fall below \$200,000, what is often called the “sticky price,” supply might begin to shift downward as fewer units are built as the inventory builds. This is often called a “quantity clearing market” instead of a price clearing market.
 (d) The only way that the inventory of unsold new homes will shrink is if more new homes are sold than new homes are produced. Thus, either household formations, the number of new households entering the market, exceeds new housing starts. That can happen if new starts drop sharply or if demand picks up. By late 2010 prices in the U.S. were still sticky and production was at a 50 year low.



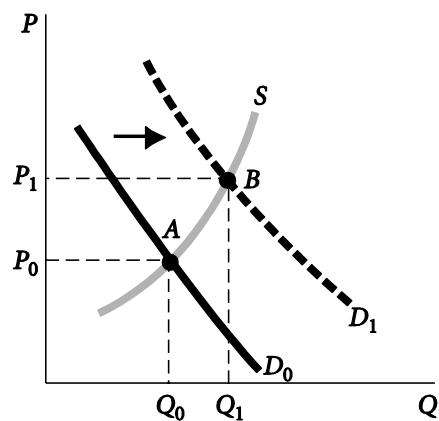
8. (a) This sequence confuses changes in demand (shifts of the demand curve) with changes in quantity demanded (movements along a demand curve). First, a demand shift does cause price to rise. As price rises, the quantity supplied increases along the supply curve, and the quantity demanded declines along the new demand curve as the market moves to reestablish equilibrium. Nothing here suggests that demand shifts back down, or that prices will fall back to their original levels.
 (b) This sequence confuses a change in quantity demanded with a change in demand. When price falls, the quantity demanded increases along the demand curve, but demand does not change.

9.

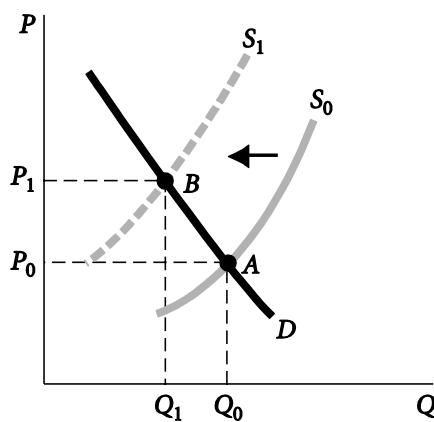
(a) P decreases, Q decreases



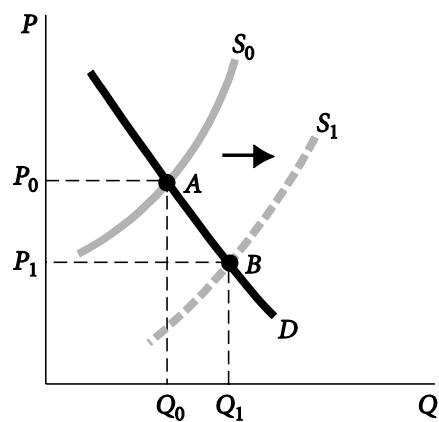
(b, d) P increases, Q increases



(c) P increases, Q decreases



(e) P decreases, Q increases

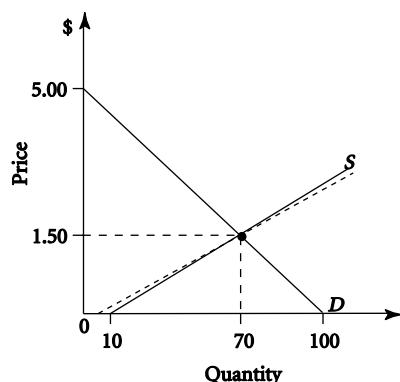


10.

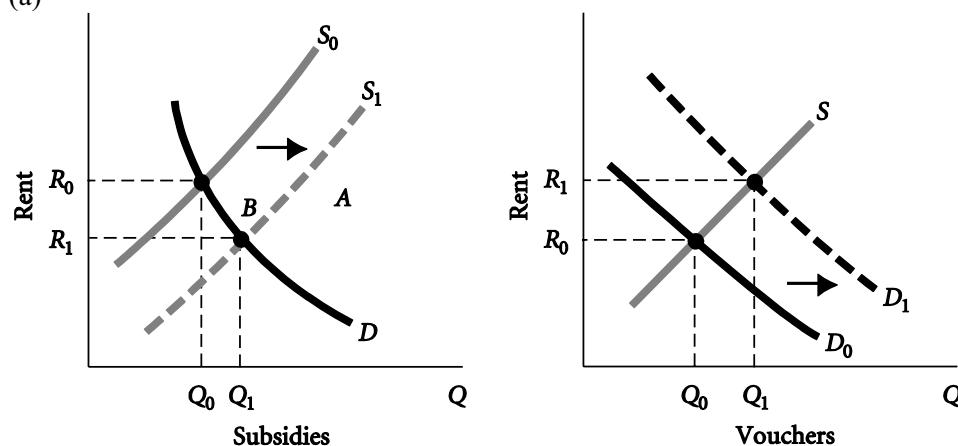
| (a) | Price | Quantity Demanded (in Millions) | Quantity Supplied (in Millions) |
|-----|---------|------------------------------------|------------------------------------|
| | \$.50 | 90 | 30 |
| | \$ 1.00 | 80 | 50 |
| | \$ 1.50 | 70 | 70 |
| | \$ 2.00 | 60 | 90 |
| | \$ 2.50 | 50 | 110 |

(b) Quantity demanded equals quantity supplied at $P = \$1.50$, with quantity = 70 million dozen eggs.

(c)

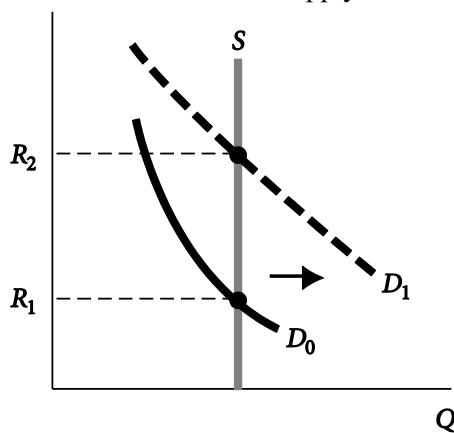


11. (a)

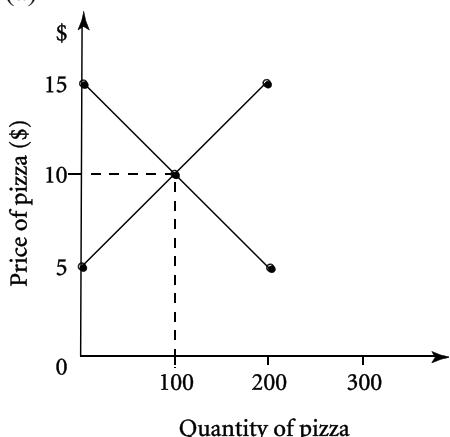


The demand-side strategy (vouchers) results in higher rents.

(b) Critics believe that the supply curve for low-income housing looks like this:

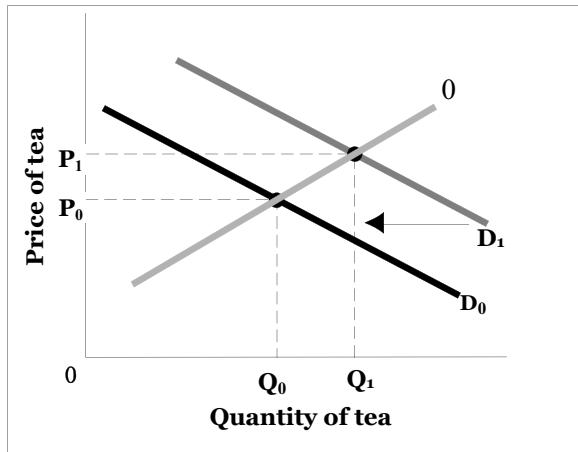


12. (a)



- (b) $Q_d = Q_s \rightarrow 300 - 20P = 20P - 100 \rightarrow P = \10 . Substitute $P = \$10$ into either the demand or supply equation to get $Q = 100$.
- (c) With $P = \$15$, producers would want to supply $20 \times 15 - 100 = 200$ pizzas, but consumers would want to buy $300 - 20 \times 15 = 0$ pizzas. There would be an excess supply of pizzas, which would bring the price down. As the price decreased, quantity supplied would decrease while quantity demanded would increase until both were equal at a price of \$10 and a quantity of 100.
- (d) The new market demand for pizzas would be $Q_d = 600 - 40P$.
- (e) $Q_d = Q_s \rightarrow 600 - 40P = 20P - 100 \rightarrow 700/60 = \11.67 . Substitute $P = \$11.67$ into either the demand or supply equation to get $Q = 133$.

13. The growing demand for coffee has resulted in a decrease in demand for tea, shifting the demand curve for tea to the left (from D_0 to D_1 on the graph). This will lower the equilibrium price and equilibrium quantity for tea. To increase the equilibrium quantity, tea producers could increase the supply of tea but this would further reduce the price. To increase the equilibrium price, tea producers could decrease the supply of tea but this would further reduce the quantity. Therefore, with no change in consumer behavior, it is not possible for tea producers to return both the price and quantity to the initial equilibriums.

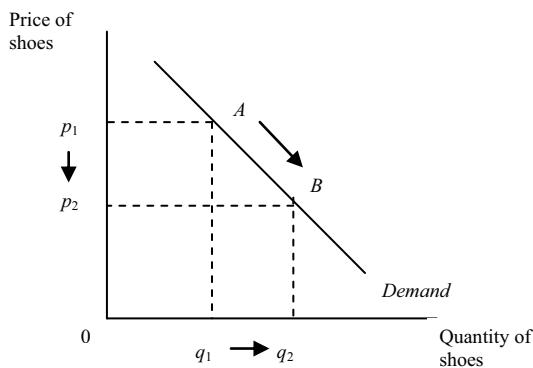


14. The demand curve for newspapers in Baltimore might shift to the right if income levels in the area are rising, since we expect newspapers to be a normal good. Fewer substitutes for newspapers would also shift the curve to the right; perhaps television broadcasting is shifting away from news programs and

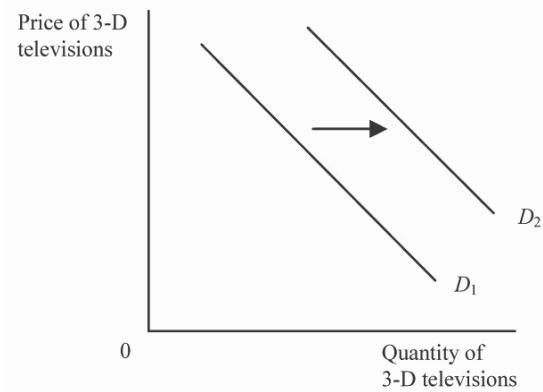
toward reality shows. Finally, if the population of Baltimore is growing, that would also shift the demand curve to the right.

- 15.** (a) When the price of a product changes, the quantity demanded changes. A reduction in the price of shoes would increase the quantity of shoes demanded.
 (b) Clearly for Tabitha 3-D TV is a normal or luxury good. Her income rose and she bought one. But what about market demand? If everybody were like Tabitha, 3D TV's would be a normal or luxury good, but we do not know that from the data given in the problem. A normal good is one where a rise in income among potential demanders leads to an increase in market demand.
 (c) The increase in the price of peaches decreases the quantity of peaches demanded. Since many consumers are now choosing to purchase plums, the increase in the price of peaches has increased the demand for plums, which in this instance are considered a substitute for peaches.
 (d) A change in tastes and preferences changes demand. The potential problem with the braking system of the Galactica has reduced consumers' preference for this automobile, decreasing its demand.
 (e) A change in consumer expectations changes demand. Antonio expects his income may be decreasing in the near future and has chosen to not go on his annual vacation to Hawaii. Therefore, the demand for Hawaiian vacations has decreased.

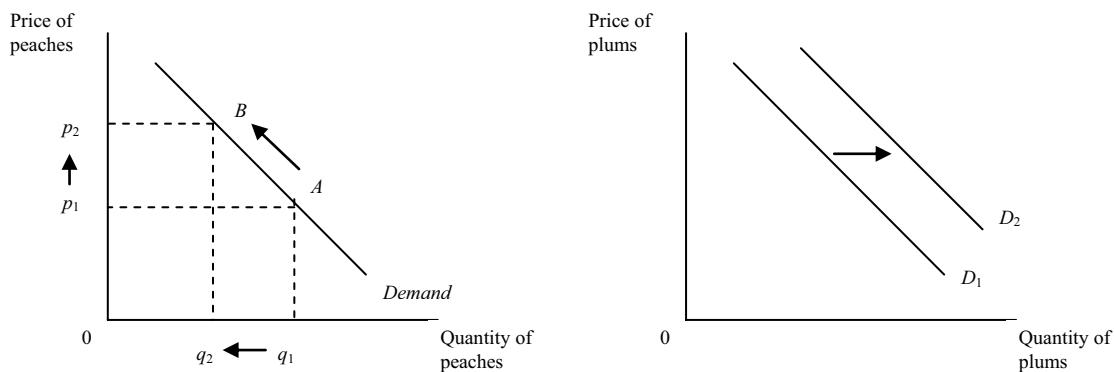
- 16. (a)**



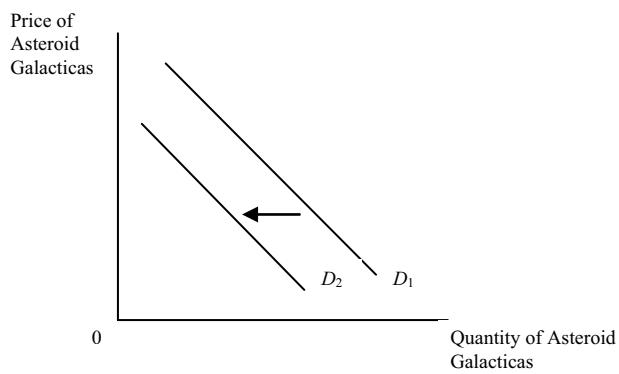
- (b)**



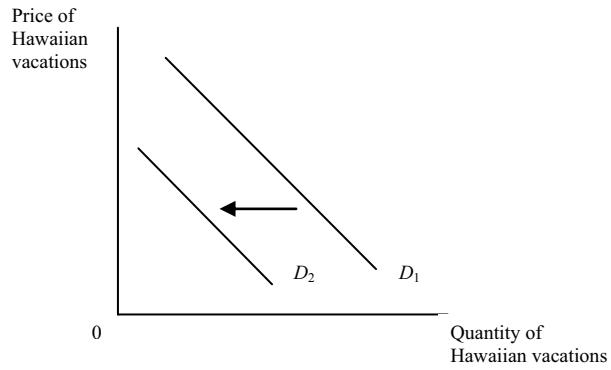
(c)



(d)



(e)



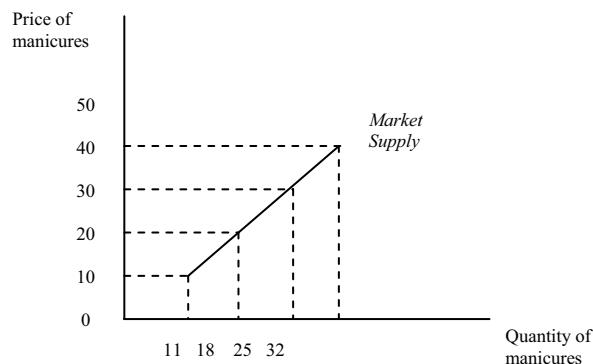
17. The decrease in demand for large trucks and SUVs produced by General Motors was the result of several factors, including falling incomes, lower net worth, and rising oil prices. Falling income levels resulting from the recession gave consumers less income to spend in general, and the relatively expensive large truck and SUV segment of the automobile market definitely fell victim to these income changes. The recession also brought with it a decrease in wealth, or net worth, to many American consumers, and as net worth fell, consumer spending also fell, which impacted the entire market for new automobiles, trucks and SUVs included. Rising oil prices resulted in higher gasoline prices. Gasoline is a complementary good for automobiles, and when gas prices rise, consumers tend to shift away from those vehicles which tend to get relatively low gas mileage, such as large trucks

and SUVs, to vehicles that get higher gas mileage, such as small cars and hybrid vehicles. The combination of falling income, declining net worth, and rising gas prices greatly contributed to the large decline in demand for large trucks and SUVs, and this subsequently led to GM's decision to significantly reduce the production of these vehicles.

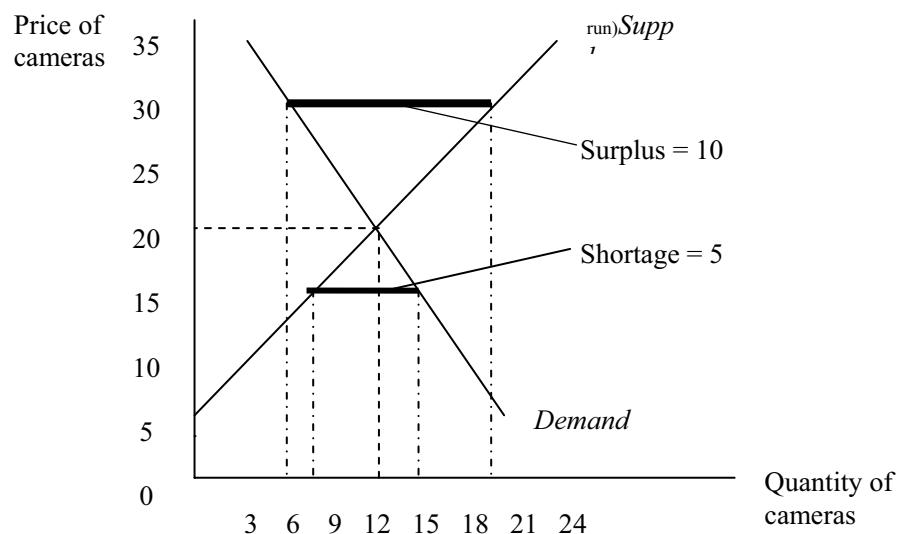
18.

Quantity supplied by:

| Price | Firm A | Firm B | Firm C | Firm D | Firm E | Market |
|-------|--------|--------|--------|--------|--------|-----------|
| \$10 | 3 | 2 | 0 | 2 | 4 | 11 |
| 20 | 4 | 4 | 2 | 3 | 5 | 18 |
| 30 | 5 | 6 | 3 | 4 | 7 | 25 |
| 40 | 6 | 8 | 5 | 5 | 8 | 32 |

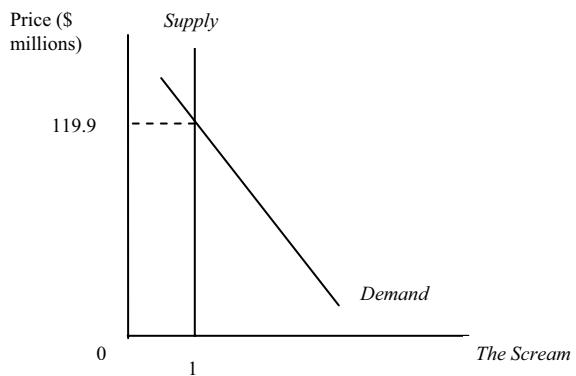


- 19.** The equilibrium price is \$20 and the equilibrium quantity is 9 cameras.
 If the market price is \$30, a surplus of $(15 - 5) = 10$ cameras would occur.
 If the market price is \$15, a shortage of $(11 - 6) = 5$ cameras would occur.

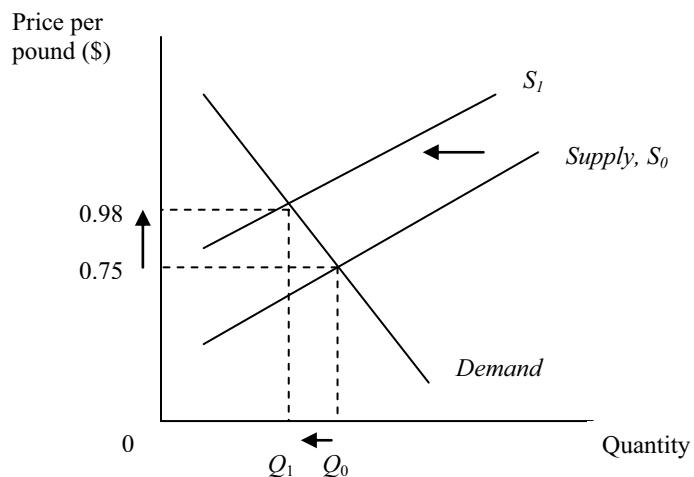


CHAPTER 4

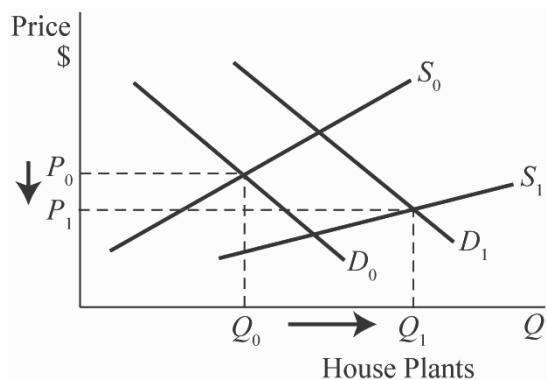
1. (a)



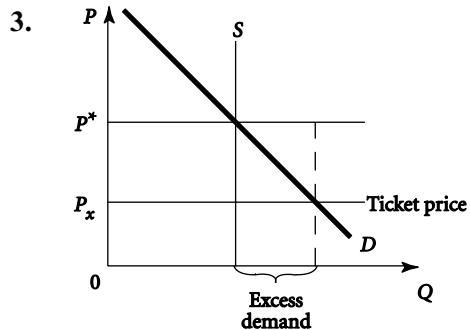
(b)



(c)



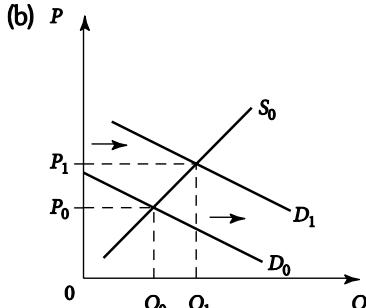
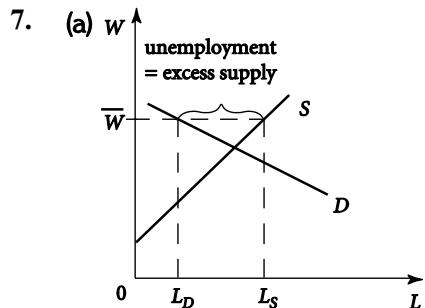
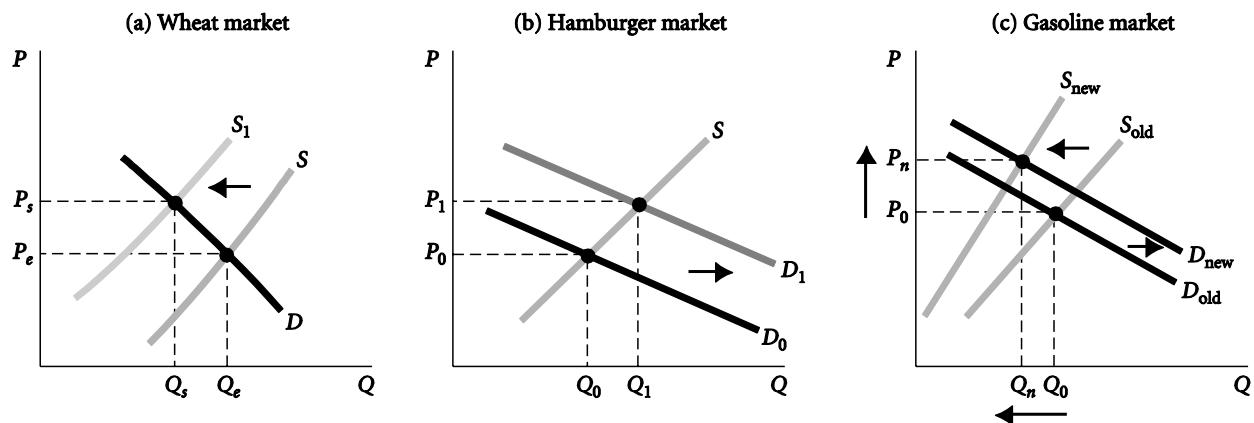
- 2.** Disagree. Every demand curve hits the quantity axis because of diminishing marginal utility—at a price of zero, there is a limit to how much one can or wants to consume. The argument that at some price, demand goes to zero explains why all demand curves hit the price axis.



The diagram shows that some people are willing to pay a very high price (even higher than P^*) for the tickets. Some nonprice rationing system was used to allocate the tickets to people willing to pay as little as P_x . What a scalper does is pay those near P_x more than they paid for the tickets and then sells the tickets to someone nearer or even above P^* . Since both the buyers and sellers engage in the trade voluntarily, both are better off and the exchange is efficient.

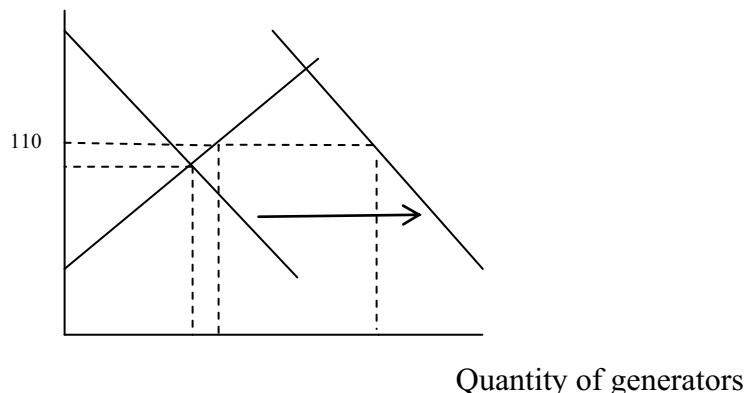
4. The subsidy does increase the “cost” of planting—there is now an opportunity cost. (By planting, the farmers must give up the subsidy.) The subsidy will clearly lead to fewer acres of production and higher farm prices. In effect, it shifts the supply curve to the left.
5. Disagree; this is not hard to explain. The law of demand does say that higher prices should lead to lower demand, but that refers to a change in the quantity demanded, a movement along a demand curve. An increase in demand (a rightward shift of the demand curve) would result in a higher price. Therefore, a sharp increase in the demand for apartments in New York City is entirely consistent with a sharp increase in rent, which is the price of those apartments.

6.

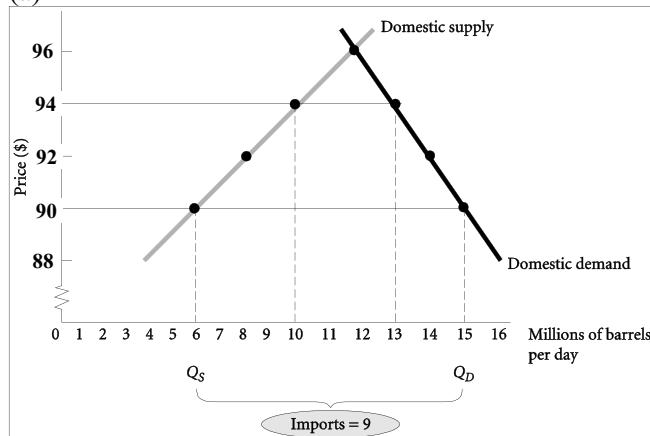


8. The new higher price will most likely not be high enough to meet the increased demand, and this is illustrated in the graph. The market is initially in equilibrium at point *A*. The increase in demand from 200 generators per month to 500 will cause the demand curve to shift from D_0 to D_1 . The 10 percent price increase will cause quantity supplied to move up the supply curve to point *B*. The quantity supplied at point *B* is much less than the 500-unit quantity demanded at point *C*.

Price of generators (\$)

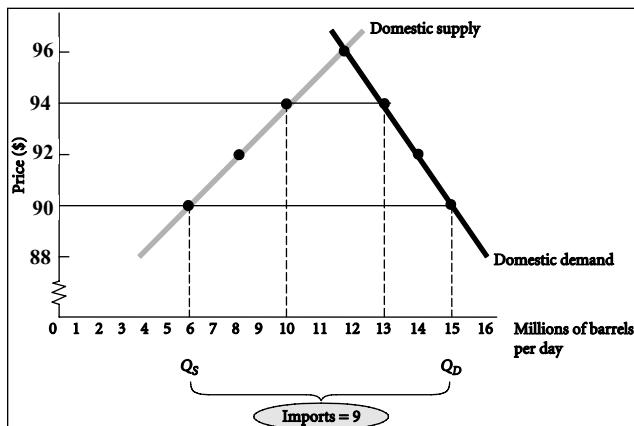


9. (a)

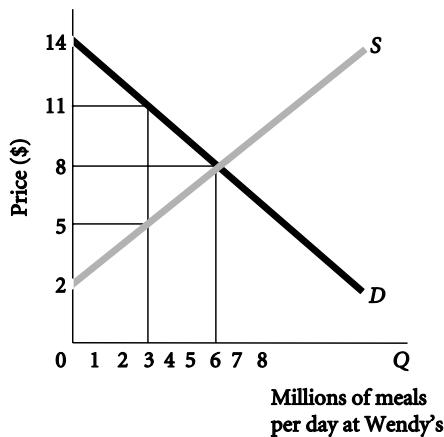


- (b) With free trade in oil, Americans would pay \$90 per barrel. At this price, the U.S. demand schedule shows that Americans would buy 15 million barrels per day. The U.S. supply schedule shows that U.S. producers would supply 6 million barrels per day, with the remainder—9 million barrels—imported from foreign sources.
- (c) With a tax of \$4 per barrel, Americans would have to pay \$94 for imported oil. Quantity demanded would decrease from 15 million to 13 million barrels. Of this, American producers would supply 10 million barrels, whereas imports would be cut back from 9 million to 3 million barrels. The U.S. government would collect a tax of $\$4 \times 3$ million = \$12 million per day.
- (d) American oil consumers are harmed by the tax; they are paying a higher price for oil. American oil producers are helped by the tax; they receive a higher price for oil, and this induces them to produce more oil. Foreign oil producers are harmed because Americans buy less imported oil. Finally, the U.S. government (and the U.S. taxpayer generally) benefit from the tax revenue.

10. (a) Using demand and supply data for the United States only, the equilibrium price is \$96 and the equilibrium quantity is 12 million barrels.



- (b) With a price ceiling of \$94, quantity demanded equals 13 million barrels, while quantity supplied equals 10 million barrels. There is an excess demand of 3 million barrels.
 (c) Quantity supplied will determine the quantity purchased. In a market system, no one can be forced to buy or sell more than he or she wants to. Under conditions of excess demand, suppliers will supply only as much as they want, and some consumer demand will go unsatisfied.
11. At \$8 and 6 million meals: CS = \$18 million; PS = \$18 million; total = \$36 million. At 3 million meals: CS = \$13.5 million; PS = \$13.5 million; total = \$27 million. Deadweight loss = \$9 million

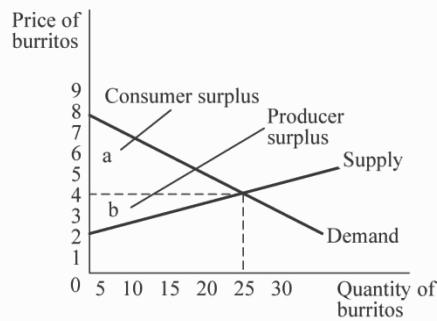


12. Answers will vary based on the actual average price of gasoline throughout 2013 and the price of gasoline in local areas.
13. The demand for 5-day trips is most likely highest for cruises that depart on a Thursday and return on a Monday. People booking these trips can take a “long weekend” and schedule vacation time for only 3 of the 5 days, missing less work than they would by traveling Monday through Friday. Since the supply of cabins on an individual ship is fixed, the higher demand increases the equilibrium price a cruise line is able to charge for these trips, increasing the per-passenger revenue the cruise line receives.

Also, since the demand is most likely higher for these 5-day cruises and the supply of cabins on each ship is fixed, the cruise lines can increase the supply of cabins by providing more ships that offer these trips. Increasing the supply to meet the higher demand increases the overall revenue received by the cruise lines and explains the disproportionate number of cruises offered over these 5 days of the week.

- 14.** First of all, waiting in line is not a very productive use of time. There is an opportunity cost. If tickets are available at a price below equilibrium, there is a shortage or excess demand at the current price. Let's suppose that the tickets are put on sale at \$15 to be "fair" to theater goers. Suppose A who is willing to pay \$50 per ticket has a high time value and, therefore, doesn't buy the ticket. Someone else, B, stands in line and buys the ticket for \$15 which is the maximum he is willing to pay. If A and B could get together, A could pay B \$30 for the ticket. Both would be better off, and no one is worse off. Conversely, A could hire someone to sit in line for him. Generally, waiting in line seems like a bad idea in terms of economic efficiency. Playing music to make it less costly encourages people to stand or sit in line rather than doing something more useful. It is taking resources to subsidize an unproductive activity.

15.



Equilibrium price is calculated as $(40 - 5P = 10P - 20); 60 = 15P; P = 4$.

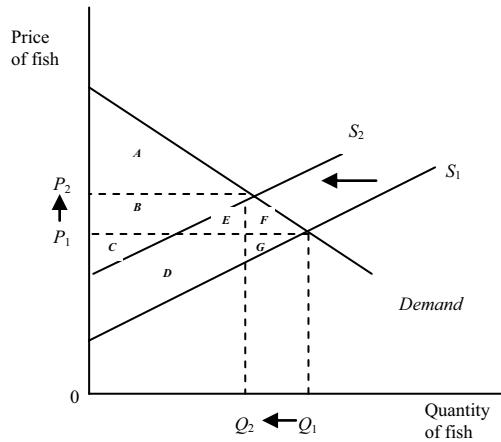
Equilibrium quantity is calculated as $Q_d = 40 - 5(4) = 40 - 20 = 20$;

or $Q_s = 10(4) - 20 = 40 - 20 = 20$, so $Q = 20$.

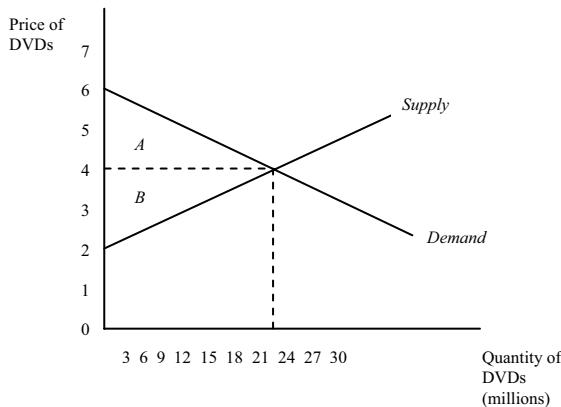
Consumer surplus = $\frac{1}{2} (8 - 4) \times 20 = 40$.

Producer surplus = $\frac{1}{2} (4 - 2) \times 20 = 20$.

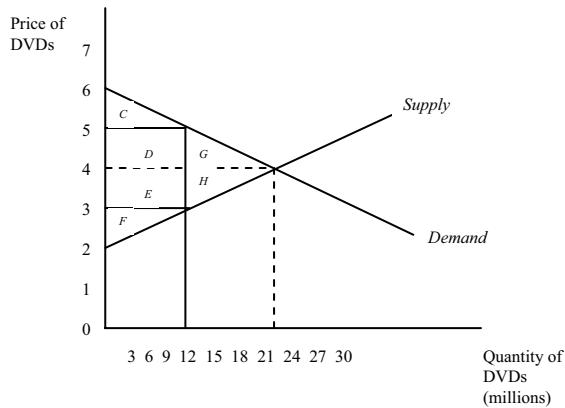
- 16.** The decrease in supply will cause the price to increase and the quantity to decrease. This will reduce consumer surplus. Before the oil spill, consumer surplus was equal to areas $A + B + E + F$. After the oil spill, consumer surplus is reduced to only area A . Because price increased and quantity decreased, the change in producer surplus is uncertain. Prior to the oil spill, producer surplus was equal to the areas $C + D + G$. After the oil spill, producer surplus is equal to the areas $B + C$. If areas $D + G$ are greater than area B , producer surplus will increase. If areas $D + G$ are less than area B , producer surplus will decrease.



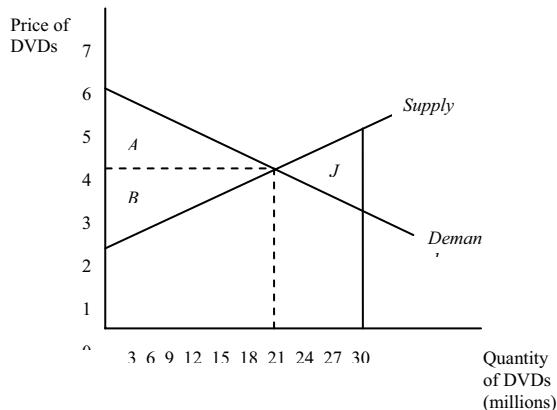
- 17. (a)** Consumer surplus is represented by area A on the graph and is equal to $\frac{1}{2} (6 - 4) \times 18 = \18 million.
Producer surplus is represented by area B on the graph and is equal to $\frac{1}{2} (4 - 2) \times 18 = \18 million.



- (b) With underproduction of 9 million DVDs, consumer surplus is represented by areas *C* + *D*, and is equal to $\frac{1}{2}(6 - 5) \times 9 + (5 - 4) \times 9 = \13.5 million. Producer surplus is now represented by areas *E* + *F*, and is equal to $(4 - 3) \times 9 + \frac{1}{2}(3 - 2) \times 9 = \13.5 million. The deadweight loss is equal to areas *G* + *H*, and is equal to $\frac{1}{2}(5 - 4) \times (18 - 9) + \frac{1}{2}(4 - 3) \times (18 - 9) = \9 million.



- (c) With overproduction of 27 million units, the original amounts of consumer surplus and producer surplus do not change and are still represented by areas *A* and *B*, respectively, with values of \$18 million each. The deadweight loss is now located to the right of equilibrium, and is represented by area *J*, with a value of $\frac{1}{2}(5 - 4) \times (27 - 18) + \frac{1}{2}(4 - 3) \times (27 - 18) = \9 million.

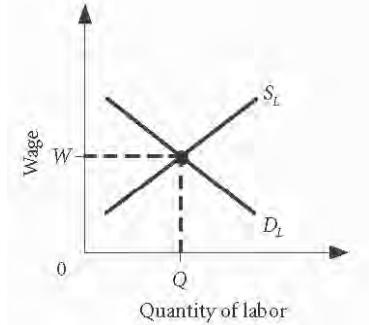


- 18. (a)** If a price ceiling is set at \$10 per bushel, the market price would not be able to rise to its equilibrium price. Quantity demanded would rise to 20 million bushels and quantity supplied would fall to 4 million bushels, resulting in a shortage of $(20 - 4) = 16$ million bushels. If a price ceiling is set at \$30 per bushel, the market would remain at its equilibrium price of \$20 per bushel with an equilibrium quantity of 14 million bushels. A price ceiling set above the equilibrium price will therefore have no impact on the market.

(b) If a price floor is set at \$30 per bushel, the market price would not be able to fall to its equilibrium price. Quantity demanded would fall to 8 million bushels and quantity supplied would rise to 22 million bushels, resulting in a surplus of $(22 - 8) = 14$ million bushels. If a price floor is set at \$10 per bushel, the market would remain at its equilibrium price of \$20 per bushel with an equilibrium quantity of 14 million bushels. A price floor set below the equilibrium price will therefore have no impact on the market.

CHAPTER 5

1. Inflation is an increase in the overall price level. In the simple economy described in the question, you might be tempted to look at the average price of the three goods to see how the overall price level has changed. On January 1, 2012 the average price was $(\$2.50 + \$3.00 + 1.50)/3 = \$2.33$, whereas at the end of the year it was $(\$5.00 + \$2.00 + 1.50)/3 = \$2.83$. From this you can conclude that on average prices are higher. This is a simple version of a price index. A better measure would include information about the relative importance of each of the three goods in consumer's budgets (you could then construct a weighted average as your price index, which is discussed in chapter 7).
2. The unemployed are those who are not working for pay or profit but who have made specific efforts to find a job during the week of the employment survey. In simple terms, it is the excess of labor supplied over labor demanded in the market. The labor demand curve measures the quantity of labor (workers or hours) demanded by firms at each possible wage rate. Firms' demand for labor is derived from the demand for products. Firms will hire workers as long as the product of their labor sells for a price high enough to produce a profit. Thus, the "productivity" of workers is critical. Labor supply reflects the choices made by households to work and how much to work. The alternative to working is leisure or "home production." Home production can include child rearing, subsistence farming, or other unpaid work. The value of leisure and home production is the opportunity cost of working.



3. Answers will depend on what happens in the economy.
4. The productivity of workers must be increasing. If we are producing more output with fewer workers, output per worker is rising.
5. Answers will vary depending on the state(s) in which students live.
6. Macro looks at aggregates in the total economy while micro looks at individual markets and individual economic agents. It is often helpful (and more accurate) to base macroeconomic theories on the behavior of the individuals who make up the macroeconomy.
7. To stimulate expansion, the government could spend *more* or *lower* tax rates. Here, higher taxes reduce consumer spending, while the government itself spends less. Thus, total spending drops. In times of slow economic growth, most people would expect the government to adopt an "expansionary fiscal policy" of cutting taxes and raising spending instead of this contractionary policy. In fact, the Federal Reserve conducted a relating expansionary monetary policy at the same time. The expansionary monetary policy helped to offset the effects of the contractionary fiscal policy.

8. Wars result in high levels of government spending, which helps to increase total spending in the economy.
9. Wrong. Incomes have actually risen faster than prices, so that the purchasing power of the average citizen has increased. Prices may now be higher in dollar amounts, but compared to people's earnings, some goods may in fact be cheaper than they were in the 1940s.
10. At the time Keynes wrote, the economy was in the middle of a recession or a depression. GDP was falling sharply and unemployment was close to 25%.

The two leading presidential candidates proposed many ideas to deal with the slowing economy. Both candidates proposed some kind of expansionary fiscal policy stimuli for the economy. Expansionary fiscal policy includes increases in government spending and /or decreases in taxes. Here is a list of a few of the proposals from the two candidates:

John McCain: cut corporate tax rate from 35% to 25%, to be funded by cuts in "pork-barrel" spending; tax credits for research and development; repeal the Alternative Minimum Tax (AMT); renew the Bush tax cuts (\$100 billion / year); tax credits for health care insurance; reduce wasteful government spending (\$18 billion / year); reduce congressional earmarks (\$60 billion / year); eliminate tax loopholes (\$45 billion / year); increase defense spending.

Barack Obama: tax credits, including eliminating taxes for 10 million lower-income Americans and 7 million senior citizens, expanding child tax credits and earned income tax credits for lower income workers, eliminate capital gains taxes for small businesses; \$150 billion to develop clean energy technology; increase the minimum wage; provide national health insurance.

11. (a) Money market
 (b) Goods-and-services market
 (c) Goods-and-services market
 (d) Labor market
 (e) Money market
 (f) Labor market
12. The classical belief is that markets are resilient and that wages and prices are flexible. Thus the decline in the demand for auto workers should result in lower wages. This will cause some workers to cease looking for work and will serve as an incentive for firms to increase the number of workers demanded. What would otherwise be a surplus (unemployment) in the labor market results in the market clearing, or no additional unemployment. Keynes argued that wages may not adjust right away. Thus the decline in the demand for labor is not met by a commensurate drop in the wage rate. This means that there will be many more auto workers actively seeking employment but much fewer being hired in the market, so unemployment will increase.
13. Prior to the Great Depression, economists applied microeconomic, or classical, models to economy-wide problems. Classical models could not explain the Great Depression. According to classical models, the economy is self-correcting and unemployment should not persist. During the Great Depression, very high levels of unemployment persisted for about 10 years. Because classical models could not explain the Great Depression, the approach to macroeconomics had to be rethought.

CHAPTER 6

1. Using the expenditure approach: $C+I+G+(X-M) = 5,000 + 1,000 + 1,000 + (500-700) - 6,800$.
- Using the income approach:
 $\text{Compensation of employees} + \text{Profit} + \text{depreciation} =$

$$5,300 + 900 + 600 = 6,800$$

Recall that depreciation has to be added in because it is taken out in the calculation of profit and we want to get back to “gross domestic product.”

2. Every payment made by a buyer becomes revenue for the seller, which is paid to someone or held by the seller as profit. Thus, the dollar value of the purchases of new goods and services in a year must be equal to the dollar value of the income generated in that year.
 3. Nominal GNP rises when real output rises and when prices rise. Between 1973 and 1975 the data shows that prices rose a lot. Thus, GNP rose faster than real GNP. Real GNP is simply GNP adjusted for inflation. Conditions in 1974 and 1975 were quite bad. The data shows substantial inflation and declining real GNP. The economy was in recession and there was substantial inflation at the same time, a combination of circumstances called “stagflation.”
 4. With fixed-weight indexes, the percentage change in the index from year to year depends on the weights chosen and thus on the base year.

Goods whose output decreases (or increases slowly) because of slowly- or backward-shifting supply curves will have their relative prices increase. If we use the old prices as weights, we will tend to underestimate the importance of this decrease. Likewise, if we use the new prices as weights, we overstate the importance of the production decline.

Fixed-weight price indexes that use old quantities as weights are generally taken as overestimates of the increase in the price level, because these indexes ignore consumers' opportunities to find substitutes for goods whose relative prices rise. Those that use current-year quantities as weights are taken to underestimate changes in the price level because they implicitly assume that the substitutes people chose for the goods whose relative prices rose are considered just as good as the "real thing."

The use of fixed-weight indexes poses special problems when used to make measurements over long periods of time because the use of, for example, 1950 weights for the 1995 economy is not desirable.

The BEA's new approach does two things: First, it takes the (geometric) average of fixed-weight indexes to deal with the overestimation and underestimation issues. Second, it "updates" the base years for the fixed-weight indexes every time it makes a new calculation to ensure that the weights remain appropriate. That is, the indexes whose average it takes are those whose base years are the previous year and the current year.

5. Double counting occurs when intermediate goods are counted directly in calculating GDP. This means these intermediate goods will be counted more than once because they are also counted as part of the value of the final product. Total sales includes sales of intermediate goods that firms sell to each other. GDP includes only the sales of final goods and services.

6. Growth in real GDP:
$$[(16,084 - 15,392) / 15,392] \times 100 = 4.5\%$$

Per capita GDP for 2015:
$$15,392 / 321.4 = 47,890$$

Per capital GDP for 2016:
$$16,084 / 323.8 = 49,673$$

Growth in real per capita GDP:
$$[(49,673 - 47,890) / 47,890] \times 100 = 3.7\%$$

7. This is a current events question; answers will vary.

8. Consumption as measured by retail sales is just part of GDP. Using the expenditure approach, real GDP is made up of consumption plus investment plus net exports plus government purchases. If the sum of I , G , and $(X - M)$ grows more rapidly than C , real GDP will rise more rapidly than retail sales.

9. (a) not counted—financial transaction (b) counted—investment spending
(c) not counted—financial transaction (d) not counted—financial transfer
(e) counted—consumption spending

Gross Private Domestic Investment: Fixed Investment – Residential, quarterly
Measured in billions of chained (2000) dollars up through 2008 and in billions of chained (2005)
dollars from 2009-2012.

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Q1 | 459.0 | 484.1 | 540.5 | 578.3 | 606.1 | 506.3 | 383.0 | 367.9 | 330.7 | 322.2 | 352.1 |
| Q2 | 469.5 | 496.3 | 561.7 | 596.4 | 587.5 | 490.7 | 369.6 | 344.4 | 350.1 | 325.5 | 359.3 |
| Q3 | 471.8 | 521.8 | 567.5 | 606.4 | 555.0 | 463.3 | 353.7 | 359.6 | 323.3 | 326.6 | 386.2 |
| Q4 | 479.3 | 535.2 | 570.9 | 607.2 | 529.4 | 430.9 | 332.2 | 364.0 | 326.0 | 336.0 | 397.8 |

- 14.** A recession is a period during which aggregate output declines. An expansion is a period when output and employment grow.

Answers on the state of the economy will depend on what happens in the economy.

By conventional standards, a recession occurs when aggregate output declines for two consecutive quarters, and when the recession ends (an economic trough), the economy then enters an expansion. These are not the same criteria used by the NBER, so reading the newspaper or watching cable news may not be an accurate way of determining if the economy had entered an expansion.

15. Since the home was built in 1934, its value will not be included in 2013 GDP. Since the sale was made in 2013, any real estate commission that Jeannine earned will be included in 2013 GDP, as will any fees collected by eBay on the sale of the house. The fact that the buyer is in Denmark is irrelevant since the sale was made in the United States.

- 16.** The value added of Larson is $(\$10 \times 2,000) - \$4,000 = \$16,000$.

The value added of the restaurant is $(\$45 \times 2,000) - (\$10 \times 2,000) = \$70,000$.

- 17.** Answers will vary based on the chosen items.

18. (a) Nominal GDP = $(100 \times \$1.25) + (30 \times \$95.00) + (150 \times \$3.25) + (420 \times \$0.50) + (60 \times \$4.50) + (100 \times \$15.00) = \$125 + \$2,850 + \$487.50 + \$210 + \$270 + \$1,500 = \$5,442.50$.

(b) Real GDP for 2009 = $(90 \times \$0.90) + (20 \times \$85.00) + (175 \times \$3.50) \times (450 \times \$0.60) + (40 \times \$3.50) + (70 \times \$10) = \$3,503.50$.

Real GDP for 2010 = $(100 \times \$0.90) + (25 \times \$85.00) + (150 \times \$3.50) \times (400 \times \$0.60) + (50 \times \$3.50) + (80 \times \$10) = \$3,955.00$.

Real GDP for 2011 = $(100 \times \$0.90) + (30 \times \$85.00) + (150 \times \$3.50) \times (420 \times \$0.60) + (60 \times \$3.50) + (100 \times \$10) = \$4,627.00$.

The growth rate of real GDP during 2010 = $[(\$3,955.00 - \$3,503.50) / \$3,503.50] \times 100 = 12.89\%$.

The growth rate of real GDP during 2011 = $[(\$4,627.00 - \$3,955.00) / \$3,955.00] \times 100 = 16.99\%$.

(c) Real GDP for 2009 = $(90 \times \$1.00) + (20 \times \$90.00) + (175 \times \$3.50) \times (450 \times \$0.50) + (40 \times \$4.00) + (70 \times \$12.50) = \$3,762.50$.

Real GDP for 2010 = $(100 \times \$1.00) + (25 \times \$90.00) + (150 \times \$3.50) \times (400 \times \$0.50) + (50 \times \$4.00) + (80 \times \$12.50) = \$4,275.00$.

Real GDP for 2011 = $(100 \times \$1.00) + (30 \times \$90.00) + (150 \times \$3.50) \times (420 \times \$0.50) + (60 \times \$4.00) + (100 \times \$12.50) = \$5,025.00$.

The growth rate of real GDP during 2010 = $[(\$4,275.00 - \$3,762.50) / \$3,762.50] \times 100 = 13.62\%$.

The growth rate of real GDP during 2011 = $[(\$5,025.00 - \$4,275.00) / \$4,275.00] \times 100 = 17.54\%$.

- 19.** The GDP deflator is calculated as (nominal GDP / real GDP) x 100.

The percentage change is calculated as $[(\text{value in the second period} - \text{value in the first period}) / \text{value in the first period}] \times 100$.

| Quarter | Nominal GDP | Real GDP | GDP Deflator | Percent Increase in Price Level |
|---------|-------------|----------|--------------|---------------------------------|
| 2011q1 | 14,867.8 | 13,227.9 | 112.40 | --- |
| 2011q2 | 15,012.8 | 13,271.8 | 113.12 | 0.64% |
| 2011q3 | 15,176.1 | 13,331.6 | 113.84 | 0.64% |
| 2011q4 | 15,294.3 | 13,422.4 | 113.95 | 0.10% |
| 2012q1 | 15,478.3 | 13,506.4 | 114.60 | 0.57% |
| 2012q2 | 15,585.6 | 13,548.5 | 115.04 | 0.38% |
| 2012q3 | 15,811.0 | 13,652.5 | 115.81 | 0.67% |
| 2012q4 | 15,864.1 | 13,665.4 | 116.09 | 0.24% |

- 20.** The statement is correct. Real GDP measures the actual physical quantity of goods and services produced in an economy. It is possible for prices to increase on a large number of goods and services (or even all goods and services) in the economy and also experience a decline in the physical quantity of those goods and services produced.

CHAPTER 7

- 1.** The conventional definition of a recession is two consecutive quarters of declining aggregate output. It is possible for the unemployment rate to remain relatively low even when the economy is entering

into a recession. If the recession is mild, the unemployment rate may not rise to high levels. If the recession is severe or prolonged, the unemployment rate will likely rise due to an increase in the cyclical rate of unemployment.

2. This is structural unemployment, which can sometimes exist for long periods, especially when workers must learn new skills to find jobs. The social costs of this unemployment might be greater than the costs of retraining these workers, providing some justification for government assistance. In the present economy, rapid technological advancement can be the cause of some firms exiting a market due to inefficiency or lack of demand for their products. This would result in structural unemployment.
3. Answers will vary depending on the state(s) in which students live.
4.
 - a. The labor force participation rate will likely increase.
 - b. The labor force participation rate will likely decrease.
 - c. The labor force participation rate will likely decrease.
 - d. The labor force participation rate will likely decrease.
 - e. The labor force participation rate will likely increase.
5. Yes, inflation would still be a problem. There are other costs of inflation besides the redistribution of income that occurs when incomes are not indexed. One example is the waste of time and resources spent coping with inflation. See the section on “Administrative Costs and Inefficiencies” under the heading “Costs of Inflation.”

6.

| | 1/80 - | 7/81 - | 7/90 - | 3/01 - | 12/07 - |
|---|--------|--------|--------|----------|----------|
| Recession | 7/80 | 11/82 | 3/91 | 11/01 | 6/09 |
| Starting unemployment rate (%) | 6.3 | 7.2 | 5.5 | 4.3 | 5.0 |
| Ending unemployment rate (%) | 7.8 | 10.8 | 6.8 | 5.5 | 9.5 |
| Time until decrease (mo.) | 1 | 2 | 1 | Not yet* | Not yet* |
| Time until return to pre-recession level (mo.) | 81 | 20 | 66 | Not yet* | Not yet* |

* as of April 2013

7. Answers will vary depending on the state(s) in which the students live. For the nation as a whole, the overall labor force participation rate is approximately 75% for men and 60% for women.
8. The CPI is intended to measure the cost of living—the price of a typical market basket. This is the figure that tells us how well off in real terms a given wage or pension makes someone. It is used by the government in setting social security payments, by unions in bargaining over wages, by workers in evaluating their incomes, by economists in studying the standard of living, and as the basis of wage and pension indexation. PPIs measure the prices of the bundles of goods that firms buy, i.e., the prices of intermediate goods and raw materials. Since these items are not directly consumed, PPIs are not a good measure of the cost of living, but they can be used to predict the increase in the prices of consumer goods.

9.

| | 2011 | 2012 | 2013 |
|--------------|-------|----------|-------|
| Bundle price | \$400 | \$531.25 | \$550 |
| Index | 1.00 | 1.328 | 1.375 |
| % change | 32.8 | 3.54 | |

Yes. There was a modest increase in the price level between 2012 and 2013.

10. (a-b) Yes, both statements can be true. The labor force of Tappania may have grown faster than the number of employed, which can lead to an increase in both the number of people who are looking for work but are currently not working, and an increase in the number of people who are employed.
11. The capacity of the economy refers to the amount of goods and services the economy is capable of producing, or the potential level of productivity of the economy. Clearly, in the long run, output can only grow if the quantity of inputs grows or the productivity of those inputs increases. The capacity at any point in time is given by the available capital stock (plant and equipment) and the available labor force. Ultimately, the labor force is limited by the working age population. Since there are always firms going out of business and new firms being born, there are always people looking for work that further limits the number of workers that can actually be working at any given moment of time. Economists often look at the unemployment rate and the “capacity utilization rate” as indicators of how close we are to capacity. When demand exceeds the capacity constraints in an economy, the result is usually an increase in the price level or inflation.
12. Tying the minimum wage to the CPI will continuously raise the minimum wage, which could increase unemployment in the short term. In the longer term, as firms adjust their costs to the increases in minimum wage, prices would most likely increase, creating inflation and further raising the minimum wage. Since fixed-weight price indexes like the CPI tend to overestimate inflation, tying the minimum wage to a chain-linked CPI as opposed to a fixed-weight CPI would most likely result in slower minimum-wage growth and therefore less inflation growth in the longer term.
13. This is a current events question, so answers will vary.
14. In the short run, this can easily happen if more of the labor force becomes employed . . . the unemployment rate falls . . . or more of the existing capital stock is used . . . capacity utilization rises. In the long run, it can happen if technological advance increases factor productivity . . . each unit of labor and capital produces more output over time.
15. (a) Since the unemployment rate is 10.4 percent or .104, the employment rate has to be 89.6 percent or .896. The size of the labor force is calculated as the number of employed divided by the employment rate. The labor force = $(121,166,640 / .896) = 135,230,625$.
 Another way to come up with the answer is to understand that the unemployment rate and the employment rate must equal 1. $U+E = LF$, thus $U/LF + E/LF = 1$. Since you are given $U/LF = 10.4$ and E is $121,166,640$, you simply solve for LF .
 Substituting: $.104 + 121,166,640/LF = 1$. Multiplying both sides by LF you get $.104*LF + 121,166,640 = LF$, or $121,166,640 = (LF - .104*LF)$, or $121,166,640/.896 = LF = 135,230,625$.
- (b) The number of people unemployed is calculated as the labor force minus the number of employed. The number of people unemployed = $135,230,625 - 121,166,640 = 14,063,985$.
- (c) The working age population is calculated as the labor force divided by the labor force participation rate. The working-age population = $(135,230,625 / .725) = 186,525,000$.
16. In general, the higher the unemployment benefits and the longer the duration of these benefits, the higher the unemployment rate. The type of unemployment affected most by the amount and duration of unemployment benefits is frictional unemployment. Frictional unemployment is short-term unemployment that arises from matching workers with jobs. The longer the duration of unemployment benefits and the higher the amount of these benefits, the less incentive workers have to find a job that matches their skills. This would tend to result in a higher rate of frictional unemployment in an economy.

- 17.** The borrower would be best off with the lower real interest rate, and the lender would be best off with the highest real interest rate.

In situation A, the real interest rate is $17\% - 14\% = 3\%$.

In situation B, the real interest rate is $7\% - 3\% = 4\%$.

In situation C, the real interest rate is $4\% - (-2\%) = 6\%$.

In situation D, the real interest rate is 6% .

The borrower is best off with situation A, and the lender is equally well off with situations C and D.

- 18.** (a) Maya is frictionally unemployed. Job openings exist and she is deciding on which position to take.

(b) Hector is cyclically unemployed since his unemployment is the result of a recession.

(c) Alejandro is frictionally unemployed. Job openings exist for him, but he has not found a job.

(d) Yvonne is not in the labor force since she has not looked for a job in the past 4 weeks.

(e) Taylor is structurally unemployed since his unemployment is due to a technological change.

(f) Ruby is not in the labor force since she is no longer employed and is not actively looking for a job.

- 19.** The real interest rate is 7 percent. The inflation rate in year 2 is $[(160 - 125) / 125] \times 100 = 28$ percent. The real interest rate is the nominal interest rate minus the inflation rate, or $35\% - 28\% = 7\%$ percent.

CHAPTER 8

- 1.** *MPC*: Marginal propensity to consume; the fraction of additional income that is spent on consumption. Multiplier: the concept that a sustained increase in one component of aggregate expenditure (like I) could lead to an increase in the equilibrium level of income that is a multiple of the initial increase in expenditure. In a simple economy, the multiplier is equal to $1/MPS$ or $1/(1 - MPC)$.

Actual investment: The actual amount of investment that takes place; it includes items such as unplanned changes in inventories. Planned investment: Those additions to the capital stock and inventory that are planned by firms. Actual investment and planned investment are equal only in equilibrium; at levels of output below equilibrium actual investment will be less than planned investment, and at levels of output above equilibrium, actual investment will be greater than planned investment.

Aggregate expenditure: The total amount the economy spends in a given period. Real GDP: The value of gross domestic product corrected for the effect of higher prices. At equilibrium, planned aggregate expenditure is equal to the level of real GDP.

Aggregate output: The total quantity of goods and services produced (or supplied) in an economy in a given period. Aggregate income: The total income received by all factors of production in a given period. Aggregate output and aggregate income are the same (just seen from two different points of view).

- 2.** We know that $C = .75Y = 150$ billion. $C + I = 150 + 75 = 225$ billion. Thus, $C + I > Y$. Aggregate spending is greater than aggregate output. Inventories will fall (which firms will take as a signal to increase production) and in the coming months Y (real GDP) will rise. GDP will stop rising when $C + I = Y$. That is when $.75Y + 75 = Y$ or $75 = .25Y$ or $Y = 300$ billion Yuck dollars.
- 3.** Answers will depend on future events.

4. (a)

| | Aggregate Output/Income | Consumption | Planned Investment | Saving | Unplanned Inventory |
|--|--------------------------------|--------------------|---------------------------|---------------|----------------------------|
| | 2,000 | 2,100 | 300 | -100 | -400 |
| | 2,500 | 2,500 | 300 | 0 | -300 |
| | 3,000 | 2,900 | 300 | +100 | -200 |
| | 3,500 | 3,300 | 300 | +200 | -100 |
| | 4,000 | 3,700 | 300 | +300 | 0 |
| | 4,500 | 4,100 | 300 | +400 | +100 |
| | 5,000 | 4,500 | 300 | +500 | +200 |
| | 5,500 | 4,900 | 300 | +600 | +300 |

Equilibrium Output $Y^* = 4,000$. When $Y < 4,000$, inventories are lower than desired (unplanned investment is negative). Firms will increase production to increase their inventories, causing aggregate output/income to rise. When $Y > 4,000$, the opposite will happen, causing output/income to fall.

- (b) Over all ranges $MPC = 400 / 500 = .80$ and $MPS = 100 / 500 = .20$. The multiplier is $1/MPS = 1/.20 = 5$.

(c)

| | Aggregate Output/Income | Consumption | Planned Investment | Saving | Unplanned Inventory |
|--|--------------------------------|--------------------|---------------------------|---------------|----------------------------|
| | 2,000 | 2,100 | 500 | -100 | -600 |
| | 2,500 | 2,500 | 500 | 0 | -500 |
| | 3,000 | 2,900 | 500 | +100 | -400 |
| | 3,500 | 3,300 | 500 | +200 | -300 |
| | 4,000 | 3,700 | 500 | +300 | -200 |
| | 4,500 | 4,100 | 500 | +400 | -100 |
| | 5,000 | 4,500 | 500 | +500 | 0 |
| | 5,500 | 4,900 | 500 | +600 | +100 |

If I increases by 200 to 500, Y^* goes up by $5 \times 200 = 1,000$. Thus, the new equilibrium level of output (income) is 5,000. Yes, the two are consistent.

5. Think of the adjustment that occurs when, with the economy at the equilibrium level of output, an increase in planned investment occurs. Inventories are drawn down, and output increases. If firms increase output by the amount of the increase in planned investment, equilibrium will not be reestablished. The increased output (income) will also increase consumption. Thus, there will have been an increase in Y of ΔI , but an increase in aggregate expenditure of more than ΔI . Y must increase further to establish equilibrium. The multiplier is finite because a fraction of income is saved. Thus, as Y grows, S grows; so we will eventually reach a level of Y at which the new planned investment just offsets the leakage into savings. This will be a new equilibrium. At this point, $\Delta S = \Delta I$. Because $\Delta S = MPS \times \Delta Y$, we can solve for ΔY :

$$\Delta Y = \frac{1}{MPS} \times \Delta I.$$

6. (a) $MPC = .8; MPS = .2.$

(b) $Y^* = AE = C + I =$

$$[(200 + 0.8Y) + 100] = 300 + 0.8Y.$$

$$0.2Y = 300.$$

(c) $Y^* = 1,500.$

$$\Delta Y = (1/MPS) I$$

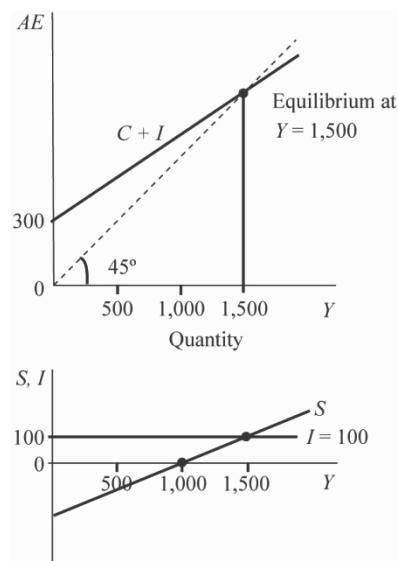
Multiplier = $1/MPS = 1/(.2) = 5$. In this case, with the multiplier equal to 5 and an increase in investment of 10, $\Delta Y = (5)(10) = 50$. Equilibrium Y increases from 1,500 to 1,550.

$$S = Y - C = Y - (200 + .8Y) \\ = -200 + .2Y$$

The equilibrium must be the same in both

- (d) graphs because $Y = C + I$ and $S = I$ are the same condition. To see this, remember that $Y = C + S$ always. Substitute $C + S$ for Y in the equilibrium condition $Y = C + I$ to obtain $C + S = C + I$, which simplifies to $S = I$.

(b)



7. $Y = 110 + .75Y + .04(1000) = 150 + .75Y.$

$$.25Y = 150.$$

$$Y = 600$$

$$C = Y - I = 600 - 100 = 500$$

$$S = Y - C = 600 - 500 = 100 \text{ (which is equal to } I\text{)}$$

When wealth increases by 50 percent to 1,500:

$$Y = 110 + .75Y + .04(1500) = 170 + .75Y$$

$$.25Y = 170$$

$$Y = 680$$

$$C = Y - I = 680 - 100 = 580$$

$$S = Y - C = 680 - 580 = 100 \text{ (which is equal to } I\text{)}$$

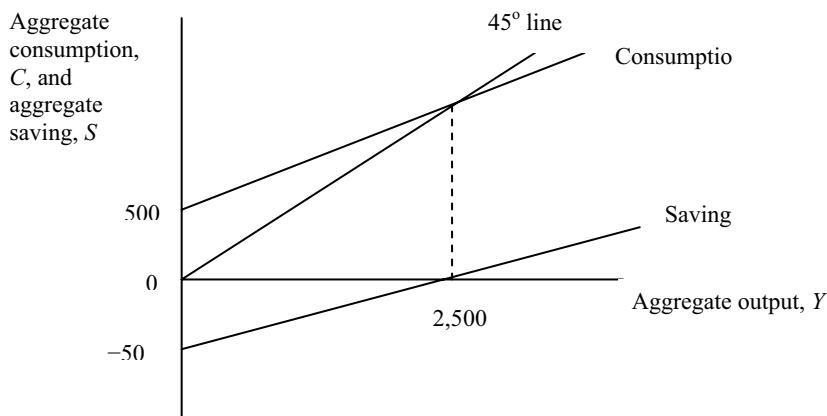
Wealth accumulation increases Y . If the stock market gets overvalued, it inflates GDP on the way up and could deflate it on the way down adding to cyclical.

8. No. AE is *planned* aggregate expenditure. If you add unplanned changes in inventory to AE , the sum equals aggregate output (income).
9. Of course answers will differ. Household saving involves the trade-off between present and future consumption. When I save I am trading present for future consumption. The future is uncertain, and people tend to mis-estimate the future. Most people have no idea how much they will need when they retire. In global climate change, the costs may be huge, but we don't fully understand what will happen. People are faced with the "drop-in-the-bucket problem" in both cases. To stop global warming will take a Herculean effort. My little contribution will mean nothing. As the box shows, people make inconsistent choices in saving. In our behavior toward the environment we may make

different choices in our private lives that we make as voters. The trade-offs and choices we face reflect the opportunity costs involved with these two issues.

- 10.** It is really simple. If households all of a sudden start saving more they will spend less. Aggregate expenditure will fall, causing inventories to rise, and output /income (Y) will fall. The decline in income will drive down consumption and saving until a new equilibrium is reached at a lower level of aggregate saving.
- 11.**
- (a) Celestial's total investment consisted of:
- | | |
|---|--------------|
| A new plant at | \$5,000,000 |
| Equipment at | \$2,500,000 |
| Increased inventories (50,000 units at \$100) | \$5,000,000 |
| For a total of | \$12,500,000 |
- (b) Planned investment consisted of \$7.5 million worth of plant, equipment and a planned increase of 25,000 units or \$2.5 million for a total of \$10,000,000.
 - (c) It actually had unplanned investment of \$2,500,000. To cut inventory back Celestial would reduce output next year. Because it needs to cut the cost of maintaining inventories especially with falling sales.
- 12.**
- (a) The MPC is calculated as the change in planned aggregate expenditure divided by the change in aggregate output. You can calculate the MPC two different ways from the graph: $(1,200 - 900) / (1,300 - 900) = 0.75$; or $(900 - 450) / (900 - 300) = 0.75$. Either way, you get an answer of 0.75.
 - (b) The MPS is calculated as $1 - MPC$. $1 - 0.75 = 0.25$.
 - (c) The multiplier is calculated as either $1/MPS$ or $1 / (1 - MPC)$. $1/0.25 = 4$, and $1 / (1 - 0.75) = 4$. Either way, you get an answer of 4.
 - (d) Unplanned investment is the difference between planned aggregate expenditure and actual aggregate output. It is represented by the vertical distance between the 45° line and the AE line at each output level. When aggregate output is 300, planned aggregate expenditure is 450, leaving an unplanned investment of -150. When aggregate output is 900, planned aggregate expenditure is 900, leaving an unplanned investment of 0. When aggregate output is 1,300, planned aggregate expenditure is 1,200, leaving an unplanned investment of 100.
- 13.** A higher saving rate would decrease MPC , increase MPS , and decrease the multiplier. With a smaller multiplier, changes in planned investment will have a smaller impact on equilibrium output.
- 14.** The saving function is $S = -500 + 0.2Y$. Since $Y = C + S$, then $C = Y - (-500 + 0.2Y)$. Therefore, the consumption function is $C = 500 + 0.8Y$.

The consumption curve crosses the 45° line at an aggregate output of 2,500. This is the point where all income is used for consumption, so saving is equal to zero. In the saving function, if $S = 0$, then $Y = 2,500$. In the consumption function, if $Y = 2,500$, then C also = 2,500.



CHAPTER 9

1. The debt starts at 1 million lavs at the end of year one and grows to 10 million lavs at the end of year ten. In year ten the interest on the debt will be 5% of the 10 million lavs: 500,000 lavs. Thus, government spending will be 10,500,000 lavs and taxes will be 9,000,000 lavs.

[The key to the problem is that taxes are raised to cover the interest payments each year. Thus, the annual deficit remains at 1,000,000. If the interest was added to the expenditure side but taxes were not raised each year, the total debt would grow from 1 million to over 12.5 million and the interest payment would be 629,000 in year 10.]

2.
$$Y = C + I + G = .75Y + 100 + 150; .25Y = 250; Y = 1,000$$

$$C = Y - I - G = 1,000 - 100 - 150 = 750$$

$$S = Y - C - T = 1,000 - 750 - 200 = 50$$

$$\text{Tax multiplier} = -[\text{MPC} / (1 / \text{MPC})] = -[.75 / (1 - .75)] = -.75 / .25 = -3$$

$$\text{Increase in } Y = (\text{decrease in } T \times \text{tax multiplier}) = -20 \times -3 = +60$$

$$Y = 1,000 + 60 = 1,060$$

$$C = Y - I - G = 1,060 - 100 - 150 = 810$$

$$S = Y - C - T = 1,060 - 810 - 180 = 70$$

Pro: Higher GDP, higher employment, and saving.

Con: If the economy is running at or near full employment, it could overheat and cause inflation as you will see later.

3. (a) Disagree. During periods of budget surplus, government debt shrinks. The debt grows only if expenditures exceed taxes.
 (b) Disagree. A tax cut will increase the equilibrium level of GDP whether the budget is in surplus or deficit. The only exception might be if the economy was at full employment.
 (c) Disagree. The expenditure multiplier is always greater than the tax multiplier if $MPC < 1$. If $MPC < MPS$, the tax multiplier is < 1 . If $MPS = .90$, the expenditure multiplier is 1.11 and the tax multiplier, MPC/MPS is 0.11.

- 4.** *Saving* is that part of annual disposable income not spent: $S = (Y - T) - C$. *Investment* is the value of planned purchases of plant, equipment and inventory by business firms. Equilibrium occurs when $C + I + G \equiv AE = Y$. This can only occur if leakages from the circular flow, S and T , are exactly matched by injections of demand, I and G . In other words, at equilibrium, $S + T = I + G$. If $S > I$ and $G = T$, it follows that $S + T > I + G$.

If leakages exceed injections, aggregate spending must be lower than aggregate output. Inventories will rise and Y will fall. In other words when $C + S + T \equiv Y > C + I + G$, inventories rise and Y falls: Newt will experience a recession. If, however, $G > T$ and $S = I$, $S + T < I + G$. Injections exceed leakages and therefore aggregate expenditure exceeds aggregate output, so inventories will fall and Y will rise.

- 5.** (a) $Y = 1,000$; $Y_d = 1,000 - 200 = 800$; $C = .75 \times 800 = 600$; $S = .25 \times 800 = 200$; $I = 100$; $G = 200$. Because total spending $= C + I + G = 600 + 100 + 200 = 900$ is less than total output of 1,000, one would predict that inventories will pile up, and firms will decide to reduce output.
- (b) Since $S + T = I + G$ at equilibrium, then $S + 200 = 100 + 200$, so $S = 100$ at equilibrium.
 $S = 25\%$ of Y_d , so $Y_d = 100 / .25 = 400$
 $C = Y_d - S = 400 - 100 = 300$
 $Y = C + I + G = 300 + 100 + 200 = 600$
 Y would settle at 600. At this level of output, we would have $C = 300$, $I = 100$, and $G = 200$ so that $Y = C + I + G = 600$.
- (c) Cutting government purchases would make the fall in output worse! In particular, a cut of 25 would cause equilibrium Y to decline by $25(1/MPS) = (25)(4) = 100$. This would mean Y would decline to 500.
- 6.** Dollar for dollar, an increase in G has a bigger effect on output than a decrease in T . However, there are also political controversies about the efficiency and appropriate size of the government sector that would lead some to favor the tax cut even though it raises the deficit by more. In addition, taxes may create economic inefficiencies, so lower taxes may reduce these inefficiencies.
- 7.** (a) Equilibrium with government requires that output = spending, or that $Y = C + I + G$. Since we know that $Y = C + S + T$ by definition, then equilibrium also requires that $I + G = S + T$. To see if $Y = 200$ is an equilibrium, add $C + I + G$ to obtain $160 + 30 + 0 = 190$. This is not an equilibrium because spending (190) is less than output (200). Alternatively, saving + taxes = $40 + 0 = 40$, while investment + government spending = $30 + 0 = 30$. Thus, $S + T$ is not equal to $I + G$. (Notice that there is no autonomous consumption.) In the coming months, we can expect output (Y) to decline and workers to be laid off. Equilibrium $Y = 150$. At $Y = 150$, $C + I + G = 0.8(150) + 30 + 0 = 150$.
- (b) If \$200 is the full-employment level of Y , the government would most likely follow an expansionary fiscal policy, cutting taxes and/or raising spending. In this case, an increase in spending would occur since taxes are currently zero.
- (c) If \$250 is the full-employment level of Y , the government would most likely follow an expansionary fiscal policy, cutting taxes and/or raising spending. In this case, an increase in spending would occur since taxes are currently zero.
- (d) Equilibrium requires that $Y = C + I + G = C + S + T$. In this case, $C + I + G = 160 + 40 + 0 = 200$, and $C + S + T = 160 + 40 + 0 = 200$, so the economy is in equilibrium.
- (e) Equilibrium requires that $Y = C + I + G = C + S + T$. In this case, $C + I + G = 160 + 40 + 30 = 230$, and $C + S + T = 160 + 40 + 0 = 200$. Spending exceeds output (Y), so in coming months we can expect output (Y) to increase. In equilibrium, $I + G = S + T$, or $40 + 30 = S + 0$, so the new level of $S = 70$. Since $S = .2Y$, $Y = 350$. $C = .8Y$, so C will equal 280.

(f) Equilibrium requires that $Y = C + I + G = C + S + T$. In this case, $C + I + G = 160 + 40 + 0 = 200$, and $C + S + T = 160 + 40 + 30 = 230$. Spending is less than output (Y), so in coming months we can expect output (Y) to decrease. In equilibrium, $I + G = S + T$, or $40 + 0 = S + 30$, so the new level of $S = 10$. Since $S = .2Y$, $Y = 50$. $C = .8Y$, so C will equal 40.

In part (e), the government is stimulating the economy by increasing spending. In part (f), the government is slowing the economy by increasing taxes.

8. If G goes up and T does not, the equilibrium level of Y rises. $C + I + G > Y$, inventories fall, and Y increases! In 1946 gross federal debt was 127.5% of GDP. Recent data (2010) put the figure at approximately 94%.
9. There would be no automatic stabilizers. (At least none that have been presented in the text thus far. In future chapters, we will see that interest rate changes and price level changes also act as automatic stabilizers.)

There would be no distinction between the actual and full-employment deficit because changes in income would have no impact on the budget deficit.

10. (a) Govt. spending multiplier = $1/.4 = 2.5$. (b) Govt. spending multiplier = $1/(1 - .9) = 10$.
 (c) Govt. spending multiplier = $1/(.5) = 2$. (d) Tax multiplier = $-[.75/(1 - .75)] = -3$.
 (e) Tax multiplier = $-[.9/(1 - .9)] = -9$.
 (f) MPC must be .833. Tax multiplier = $-[.833/(1 - .833)] = -5.0$.
 (g) MPC must be .666. Government spending multiplier = $1/(1 - .666) = 3.0$.
 (h) Output will increase by \$100 billion (use the balanced-budget multiplier, which has a value of 1).

11.

| Output | Net Taxes | Disposable Income | Consumption Spending | Saving | Planned Investment Spending | Government Purchases | Planned Aggregate Expenditures | Unplanned Inventory Change |
|--------|-----------|-------------------|----------------------|--------|-----------------------------|----------------------|--------------------------------|----------------------------|
| 1,050 | 50 | 1,000 | 1,000 | 0 | 150 | 200 | 1,350 | -300 |
| 1,550 | 50 | 1,500 | 1,400 | 100 | 150 | 200 | 1,750 | -200 |
| 2,050 | 50 | 2,000 | 1,800 | 200 | 150 | 200 | 2,150 | -100 |
| 2,550 | 50 | 2,500 | 2,200 | 300 | 150 | 200 | 2,550 | 0 |
| 3,050 | 50 | 3,000 | 2,600 | 400 | 150 | 200 | 2,950 | 100 |
| 3,550 | 50 | 3,500 | 3,000 | 500 | 150 | 200 | 3,350 | 200 |
| 4,050 | 50 | 4,000 | 3,400 | 600 | 150 | 200 | 3,750 | 300 |

Equilibrium output is 2,550.

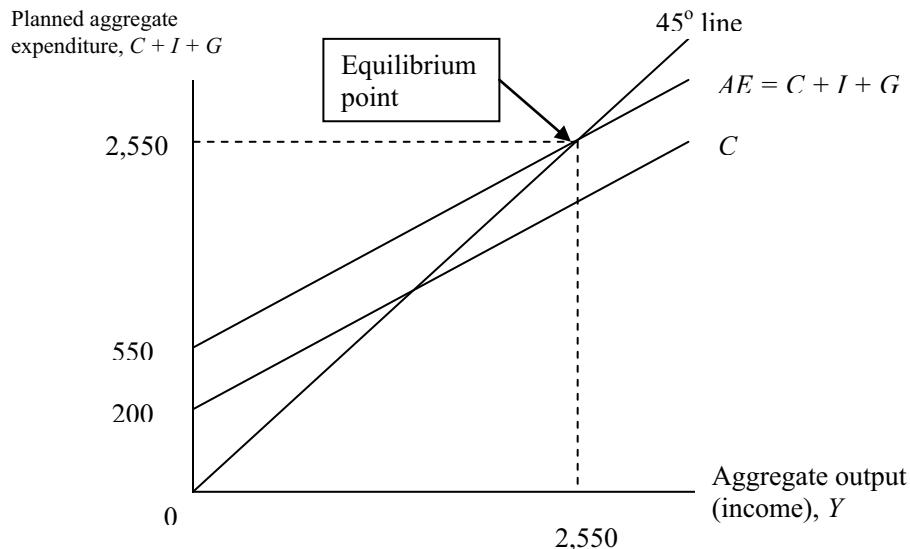
12.

$$MPC = 0.8$$

$$MPS = 0.2$$

$$\text{Government spending multiplier} = 1 / 0.2 = 5$$

$$\text{Tax multiplier} = -0.8 / 0.2 = -4$$



13. The balanced-budget multiplier is the ratio of the change in the equilibrium level of output to a change in government spending, where the change in government spending is offset by a change in taxes so as not to create any deficit. The balanced-budget multiplier is equal to 1 because the change in government spending is impacted by the government spending multiplier and the change in taxes is impacted by the tax multiplier. The government spending multiplier is calculated as $1/MPS$, and the tax multiplier is calculated as $-(MPC/MPS)$. Since $MPC + MPS = 1$, the government spending multiplier plus the tax multiplier will equal 1. So, an increase in government spending and an equal increase in taxes will increase output by the exact amount of the additional government spending, thus having a multiplier effect of 1.
14. The statement is correct. For an economy in equilibrium, planned aggregate expenditure equals aggregate output ($AE = Y$). Aggregate expenditure equals consumption spending plus planned investment spending plus government purchases ($AE = C + I + G$). Aggregate output equals consumption spending plus saving plus net taxes ($Y = C + S + T$). In equilibrium, $C + I + G = C + S + T$, so $I + G = S + T$. For an economy in equilibrium, the saving plus net taxes which are being withdrawn from the circular flow are offset by the planned investment spending and government purchases being added to the circular flow.
15. The national debt is the total amount owed by the federal government. If the federal budget deficit is increasing, the national debt is increasing. The federal budget deficit is the difference between what it spends and what it collects in taxes in a given period. If federal spending is increasing and/or if federal tax revenues are decreasing, the federal budget deficit is increasing. Remaining answers will vary based on date, but as of April 2013, the national debt was increasing, the federal budget deficit was decreasing, federal spending was increasing, and federal tax revenues were increasing. To reduce the national debt, federal spending should be decreased and/or federal tax revenues should be increased.

CHAPTER 9 APPENDIX B

1.
$$\begin{aligned} Y &= C + I + G = 85 + .5(Y - T) + 85 + 60 = 85 + .5(Y - [-40 + .25Y]) + 85 + 60 \\ &= 85 + .5Y + .5(40) - .5(.25Y) + 85 + 60 = 85 + .5Y + 20 - .125Y + 85 + 60 \\ .625Y &= 250 \\ Y &= 250/.625 = 400 \end{aligned}$$

Taxes = $-40 + .25(400) = 60$. The budget deficit is $G - T = 60 - 60 = 0$.

CHAPTER 10

1. (a) The debt increases by 5 million rags in total; the privately held debt increases by only 4.5 million rags because the Central Bank bought 500,000 rags worth.
(b) The treasury sale has no effect on the money supply; the Treasury goes to the public to borrow money that it immediately spends.
(c) When the Central Bank buys in the open market it pays with new high-powered money that becomes a part of the banking system's reserves; it pays essentially with newly printed money. The money multiplier is $1/RR$ or $1/0.2$ or 5. Thus the money supply expands by $5 \times 500,000$ or 2.5 million rags.
2. Paying down the debt by buying bonds with tax receipts has no impact on the supply of money. Money that comes to the Treasury in tax payments is immediately returned to the economy as the bonds are paid for by the Treasury. The result is that there is no change in reserves. When the Fed buys bonds in open market operations, it uses what is essentially printed money. The whole point is to expand reserves and, thus, the money supply.
3. *Cash*: Asset—Bank has it on hand.
Demand Deposits: Liability—Claims by depositors can be withdrawn at any time.
Savings deposits: Liability—same logic.
Reserves: Assets—They are in the vault as cash or on deposit with the Fed.
Loans: Assets—They represent claims of the bank on borrowers.
Deposits at the Fed: Assets—They can be withdrawn at any time; they are owned by the bank.

4. At first, prisoners bartered with each other. As time passed, the “market” inside the P.O.W. camp became more complex and was comprised of many middlemen. As the market became more complex, a unit of account was needed to facilitate transactions by providing a consistent way of quoting prices. Cigarettes became this unit of account because prisoners of war were given a certain ration of cigarettes each week by the detaining forces and by the Red Cross, they could be given value, they were standardized, and they moved easily through the market. Using cigarettes as currency, P.O.W. camp markets developed into an economic system where people could buy and sell goods at set prices. Instead of having an established price of a specific number of dollars for an item such as a ration of chocolate, prices were quoted in terms of the number of cigarettes required to obtain a product.

An interesting first-hand account of this process is an essay entitled “The Economic Organization of a POW Camp” by R.A. Radford, who was a prisoner of war during World War II. This essay can be found on several websites by performing a search for the essay title or the author.

5. Decrease the reserve ratio. This would immediately free up reserves (create excess reserves) system-wide. Banks could lend more, expanding the money supply.

Decrease the discount rate. This would encourage banks to borrow reserves and lend more money, expanding the money supply.

Buy government bonds. The Bank of Japan pays with cash or by increasing deposits in banks' accounts. This increases reserves in the system and expands the money supply.

6. Reducing the reserve requirement means that reserves of 6.24 million hurls can support 62.4 million in total deposits. The money supply could increase by as much as 10.4 million hurls. The Central Bank could counter with open market sales of bonds, withdrawing reserves from the economy.
7. If banks are loaned up and the money supply is \$1,148 billion, the 10% reserve requirement would imply \$114.8 billion in reserves. If the reserve requirement was raised to 11%, \$114.8 billion is 11% of \$1,044 billion. Raising the reserve requirement to 11% would reduce the money supply by \$104 billion.
8. If the army is unaware of the king's scheme, the plan will work temporarily, but it will also lead to an increase in the money supply, with all of the macroeconomic effects that will be studied in the next few chapters. (It will be shown that this plan will cause inflation.) If the army is aware of the king's scheme, there will be immediate inflation. The army would demand that the king pay them ten percent more coins for their wages.
9. M_2 includes everything in M_1 , plus savings accounts, money market accounts, and some other categories. A shift of funds between, for example, savings accounts and checking accounts, will affect M_1 but not M_2 , because both savings accounts and checking accounts are part of M_2 .
10. (a) Agree. The two sentences are correct. When the Fed sells bonds, the proceeds do not go back into circulation. Rather, the proceeds are withdrawn from the economy, reducing the quantity of reserves in the system and reducing the supply of money. Fed open market operations change the money supply.
(b) Disagree. The money multiplier is equal to $1/RR$. The expenditure (fiscal) multiplier is equal to $1/MPS$. The expenditure multiplier and the money multiplier are very different. The expenditure multiplier gives the change in equilibrium output (income) that would result from a sustained change in some component of aggregate expenditure.
11. Money injected through open market operations results in a multiple expansion of the money supply only if it leads to loans, and loans can be made only if the new money ends up in banks as reserves. If the Fed buys a bond from James Q. Public, who immediately deposits the proceeds into a dollar-denominated Swiss bank account, the U.S. money supply won't expand at all. If the money ends up in his pockets or in his mattress, the expansion of the money supply will stop right there. If he had deposited the proceeds in a U.S. bank, excess reserves would have been created, stimulating lending and further money creation.
12. (a) The bank is required to hold $.1(\$3,500) = \350 in reserves.
(b) Excess reserves = $\$500 - \$350 = \$150$.
(c) Assuming that money lent out by the bank gets deposited in this same bank, the bank can lend out an additional $\$150(1/1) = \$1,500$.
(d) New T-account:

| Assets | | Liabilities | |
|---------------|---------|--------------------|---------|
| Reserves | \$300 | Deposits | \$3,300 |
| Loans | \$3,000 | | |

Required reserves are now \$330. The bank has deficit reserves of \$30. The bank will need to reduce its loans and increase its reserves by at least \$30. This would result in reserves of \$330, loans of \$2,970, and deposits of \$3,300.
13. People in Zimbabwe will accept U.S. dollars so long as they believe that others in the country will also accept U.S. dollars. The currency does not have to be issued by the ruling government to act as a medium of exchange in that country. Zimbabwean dollars had become virtually worthless, and U.S. dollars were a good store of value, so people had faith in the value of the U.S. dollar.

- 14.** Money serves as a medium of exchange, a store of value, and a unit of account. If these currencies are widely accepted as payment for goods and services in their respective communities, they would serve as a medium of exchange. As long as businesses continue to accept the currencies, they would also serve as a store of value, since they could be used to transport purchasing power from one time period to another. The currencies will serve as a unit of account as long as businesses continue to issue the currencies at the same exchange rate to the dollar, as this will provide a consistent way of quoting prices.
- 15.** When the currency was in the safe, it was counted as a part of both M1 and M2. Checking account deposits are included in both M1 and M2, so the \$2,500 deposit to your checking account will have no impact on either M1 or M2. Savings accounts are included in M2, but not in M1, so the \$2,500 deposit to your savings account will not impact M2, but it will reduce M1 by \$2,500. This is new “high powered money. Over time it will find its way into bank reserves. As the new money becomes deposited in the system, m1 and m2 may grow. If the reserve requirement for checking account deposits was 10% and for savings accounts was 8% then the money multiplier was somewhere between 12.5 and 10 resulting in a M1/M2 increase between \$50,000 and \$62,500 depending on the mix between savings accounts and checking accounts.

16. (a)

| Bank of Bonzo | |
|----------------|----------------|
| Assets | Liabilities |
| Reserves 8,000 | 8,000 Deposits |

(b)

| Bank of Bonzo | |
|----------------|-----------------|
| Assets | Liabilities |
| Reserves 8,000 | 15,600 Deposits |
| Loans 7,600 | |

(c)

| Bank of Bonzo | |
|---------------|----------------|
| Assets | Liabilities |
| Reserves 400 | 8,000 Deposits |
| Loans 7,600 | |

| Iceberg Bank | |
|----------------|----------------|
| Assets | Liabilities |
| Reserves 7,600 | 7,600 Deposits |

(d) Maximum deposits = (Initial deposit) x (Money multiplier).

$$\text{Maximum deposits} = \$8,000 \times (1 / 0.5) = \$160,000.$$

(e) Maximum loans = (Initial loan) x (Money multiplier)

$$\text{Maximum loans} = \$7,600 \times (1 / .05) = \$152,000.$$

- 17.** The three tools the Fed can use to change the money supply are changing the required reserve ratio, changing the discount rate, and engaging in open market operations.

If the Fed increases the required reserve ratio, banks would be legally required to hold more of all deposits as required reserves. The more banks have to legally keep as reserves, the less they have to loan to customers. As banks loan less, the money supply decreases. If the Fed lowers the required reserve ratio, banks would have more money to loan. The more banks loan, the larger the money supply grows.

If the Fed increases the discount rate, it charges banks more to borrow from the Fed. If the discount rate increases, banks will tend to borrow less, and this leaves banks less to loan, therefore decreasing the money supply. If the Fed decreases the discount rate, banks will pay less to borrow from the Fed. This will make it more attractive for banks to borrow, and the more they borrow, the more they can loan, which will increase the money supply.

If the Fed makes an open market purchase of government securities, it pays for the security by writing a check that, when it clears, expands the quantity of reserves in the system which increases the money supply. If the Fed makes an open market sale of government securities, it receives a check which, when cleared, reduces the quantity of reserves in the system which decreases the money supply.

CHAPTER 11

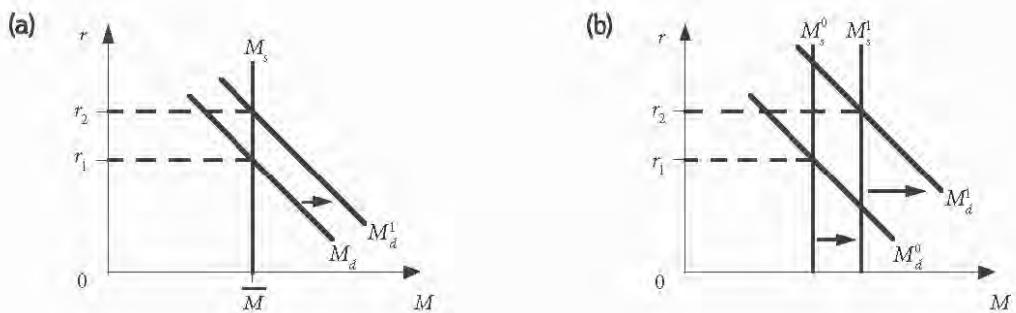
1. (a) Disagree. A rise in Y increases the demand for money as more transactions take place, but the supply of money is unaffected.
 (b) Disagree. *Ceteris paribus*, a rise in P means that each transaction is more expensive and households and firms need to hold more money, not less.
 (c) Disagree. When the Fed buys bonds, it expands the money supply. The supply curve shifts to the right. When we experience a recession (Y falls) the demand for money falls, shifting the demand curve to the left. Both tend to push interest rates lower.
2. A decline in P would shift the money demand curve to the left since transactions would require less money. If the Fed held the money stock constant, interest rates would fall.
3. Answers will vary regarding the number of times per week an ATM is used and how many times a day cash is used.

If ATMs were not available, most people would tend to carry more cash since going to the bank to get cash is usually more inconvenient than going to an ATM. With the growing popularity of debit cards, access to cash is not as necessary as it once was, so although more cash would probably be carried if ATMs were not available, less cash would probably be carried in this age of the debit card than would be without the debit card.

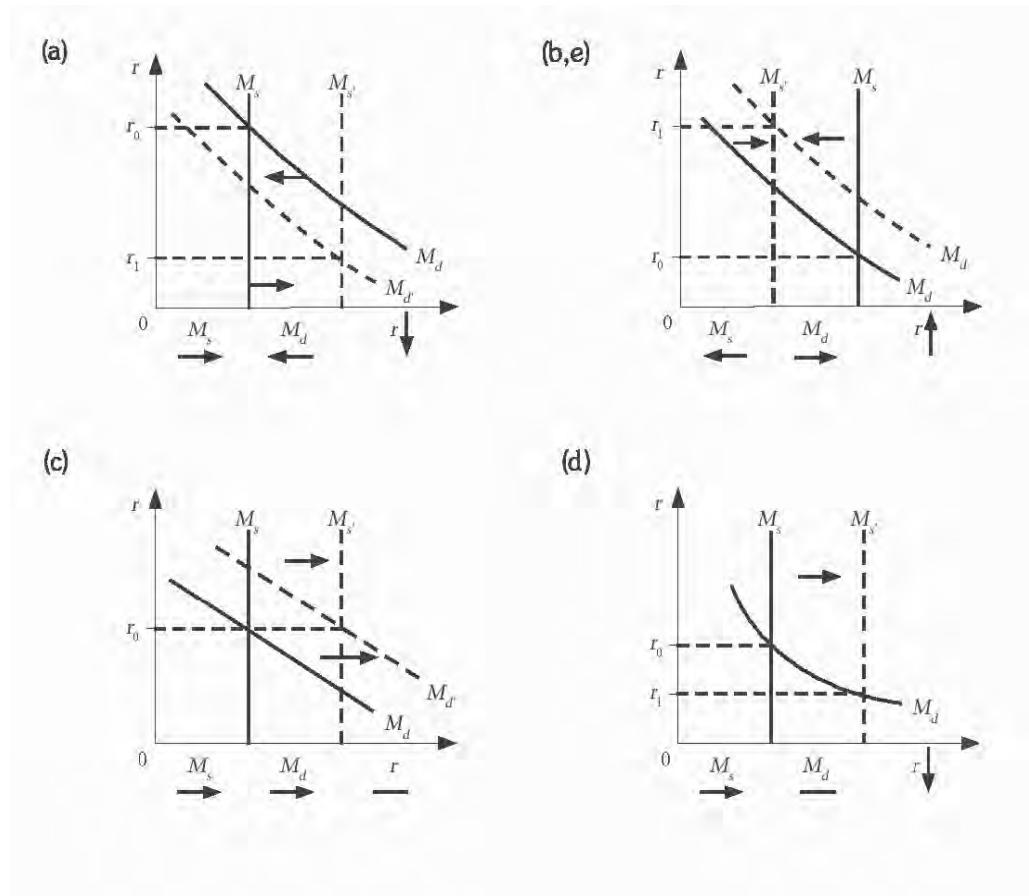
The more cash people tend to carry, the less cash they have to keep in their checking accounts.

4. This is what Keynes called a “liquidity trap.” Expanding the money supply would not push interest rates lower. The public would essentially hold as much money as we inject into the system. Since, as you will see, monetary policy works through lowering or raising interest rates, it will not work to stimulate the economy if the money demand curve is flat.
5. a. The value of the estate would decrease.
 b. The value of the estate would increase.
 c. The yield on the securities would increase.

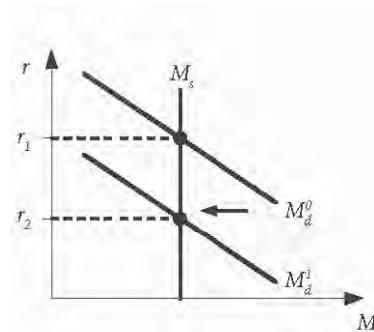
6.



7.



8. A recession is a decline in real GDP. When output falls, there is less economic activity and fewer transactions. Fewer transactions means that (*ceteris paribus*) money demand will fall. This will cause a leftward shift in the M_d curve, which results in a lower equilibrium interest rate (assuming that the money supply remains fixed).



9. *Ceteris paribus*, an expansionary fiscal policy at a time when the Fed wants to hold the rate of growth of the money supply steady, will drive up interest rates. First, the added expenditure will push up the growth of real GDP. The increased spending and GDP would increase the demand for money, M_d . If the Fed holds the line, $M_d > M_s$ and rates will rise. At the same time these policies hit taxpayers, the Asia crisis of 1998 hit the U.S. economy and slowed down the growth of real GDP as exports to Asia fell. By early 1998, the Fed was even thinking of expanding M_s to push r down to restore GDP growth.

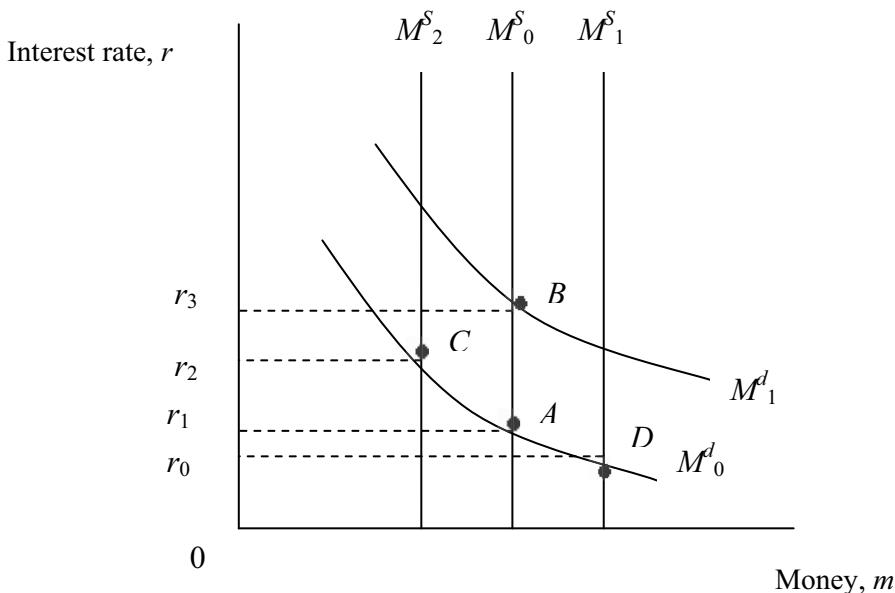
Md_0 : Original money demand.

Ms_0 : Original money supply.

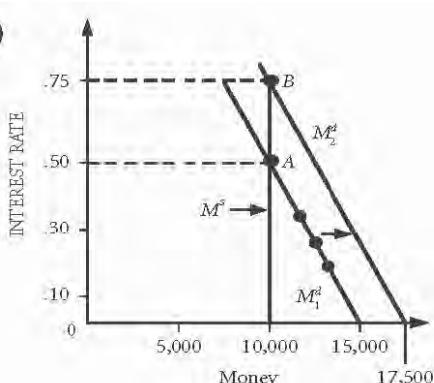
The expansionary policy shifts money demand from Md_0 to Md_1 , and the Fed holds the money supply constant at Ms_0 , so the economy moves from point A to point B, and the interest rate rises from r_1 to r_3 .

If the Fed wants to raise the interest rate, it would decrease the money supply from Ms_0 to Ms_2 . The economy moves from point A to point C, and the interest rate rises from r_1 to r_2 .

If the Fed wants to lower the interest rate, it would increase the money supply from Ms_0 to Ms_1 . The economy moves from point A to point D, and the interest rate falls from r_1 to r_0 .



10. (a,b)



The equilibrium is at $r = .5$ or 50%, which is found as the intersection of the money demand and money supply curves. Alternatively, we can solve for r algebraically by setting $M^d = M^s$: $10,000 - 10,000r + 5,000 = 10,000$
 $\rightarrow r = 5,000/10,000 = .5$.

(c) With $P \cdot Y = 7,500$, the intersection occurs at $r = .75$

Algebraically, $10,000 - 10,000r + 7,500 = 10,000$
 $\rightarrow r = 7,500/10,000 = .75$ or 75%.

- (d) We need the money supply equal to what money demand would be when $r = .5$. Money Demand = $10,000 - 10,000(.5) + 7,500 = 12,500$. Increase the money supply by \$2,500, to \$12,500.
(e) One possibility is that the price level has fallen, shifting the money demand curve back to its original position.

11. Answer will vary.

12. (a) Your 10 year fixed-rate bond at 5% would pay you \$500 a year in interest every year until July of 2017. That means as of July 2010, it is effectively a seven year bond.

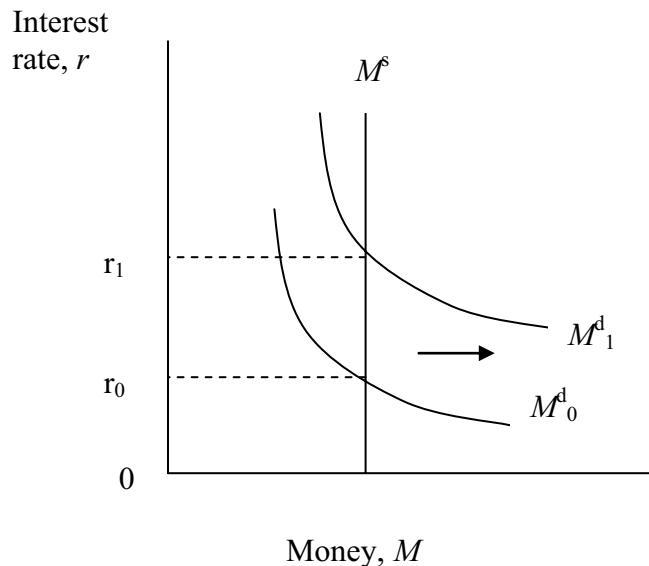
But the market data shows me that lots of people are buying up seven year bonds that pay 2.43%. A bond paying 2.43% only pays interest of \$243 each year. That means I can easily find a buyer willing to buy my bond since I can offer him a better deal. It is not quite as good as it might seem though. When my bond matures I get back only \$10,000. If I bought a new bond today I would get back what I paid for it. It is the flow of interest that has changed making the bond worth more if I sell it today.

- (b) If a recession was coming, you would expect the Fed to react by lowering rates to stimulate more aggregate demand in the goods market. If you thought interest rates were going down, it is a good time to lock in a high rate. In addition if rates are going down, the bonds you hold will go up in value and you will earn capital gains.
(c) The opposite is true if you expect inflation. With inflation coming you would expect to see rates driven up by the Fed to reduce aggregate demand in the goods market. Those coming higher rates would reduce the value of bonds paying low rates.
(d) Answers will vary.

13. If there is an excess supply of money in the economy, people will want to increase their holding of bonds and decrease their holding of money. This will drive down interest rates to restore equilibrium. If there is excess demand for money in the economy, people will want to decrease their holding of bonds and increase their holding of money. This will push up interest rates to restore equilibrium. You can tell a “bank story” as well. If there is excess supply of money, banks have excess reserves. In general if banks have excess reserve, they will cut lending rates to attract borrowers. Similarly if there is excess demand for money, say from an expansion with a need for more money in cash drawers or in people’s pockets with business doing better, you would expect to see banks with a shortage of reserves and willing to lend only at higher rates.

14. The increase in income will increase the demand for money, causing excess money demand. The excess demand for money will cause individuals to reduce their bond holdings, which will result in an increase in the interest rate. To prevent any change in the interest rate, the Macadamia Central Bank would have to offset any increase in money demand with an equal increase in money supply.

- 15.** An expansionary fiscal policy will increase the demand for money, which will increase the interest rate. An increase in the interest rate will tend to reduce consumption and investment expenditures, weakening the effectiveness of the expansionary fiscal policy.



- 16.** The transaction motive for holding money refers to people holding money for the primary purpose of using the money to make purchases. The speculation motive for holding money is based on interest rates. When interest rates are high, the opportunity cost of holding money is high, so individuals will reduce their money holdings in favor of holding bonds, and hope to sell the bonds when interest rates are lower and the value of the bonds increase.

CHAPTER 11 APPENDIX A

- Rates in 1980 were much higher due to higher inflation and higher expected inflation. The higher interest rates in 1980 were due to a higher “inflation premium” based on this expected inflation.

In 1980, most debt holders believed that the inflation rate would decrease in the future. Long-term debt thus had a lower inflation premium than short-term debt. In 1993, the situation was reversed: inflation was unusually low, but many debt holders were wary of higher inflation rates in the future. Thus, it was long-term debt in this case that carried the higher inflation premium.

CHAPTER 11 APPENDIX B

- (a) Peabody should hold the amount of money that maximizes the “net profit” from holding money, balancing the convenience of money against the opportunity cost of foregone interest.

(b) At $r = 10\%$ per month:

| Number of Switches | Average Holding | Average Bond | Interest Earned | Cost of Switch | Net Profit |
|--------------------|-----------------|--------------|-----------------|----------------|------------|
| 0 | \$750 | 0 | 0 | 0 | 0 |
| 1 | 375 | 375 | 37.5 | 4 | 33.5 |
| 2 | 250 | 500 | 50 | 8 | 42 |
| 3 | 187.5 | 562.5 | 56.25 | 12 | 44.25 |
| 4 | 150 | 600 | 60 | 16 | 44 |

The optimal number of switches is 3, with average money holdings of \$187.50.

(c) At $r = 15\%$ per month:

| Number of Switches | Average Holding | Average Bond | Interest Earned | Cost of Switch | Net Profit |
|--------------------|-----------------|--------------|-----------------|----------------|------------|
| 0 | \$750 | 0 | 0 | 0 | 0 |
| 1 | 375 | 375 | 56.25 | 4 | 52.25 |
| 2 | 250 | 500 | 75 | 8 | 67 |
| 3 | 187.5 | 562.5 | 84.38 | 12 | 72.38 |
| 4 | 150 | 600 | 90 | 16 | 74 |
| 5 | 125 | 625 | 93.75 | 20 | 73.75 |

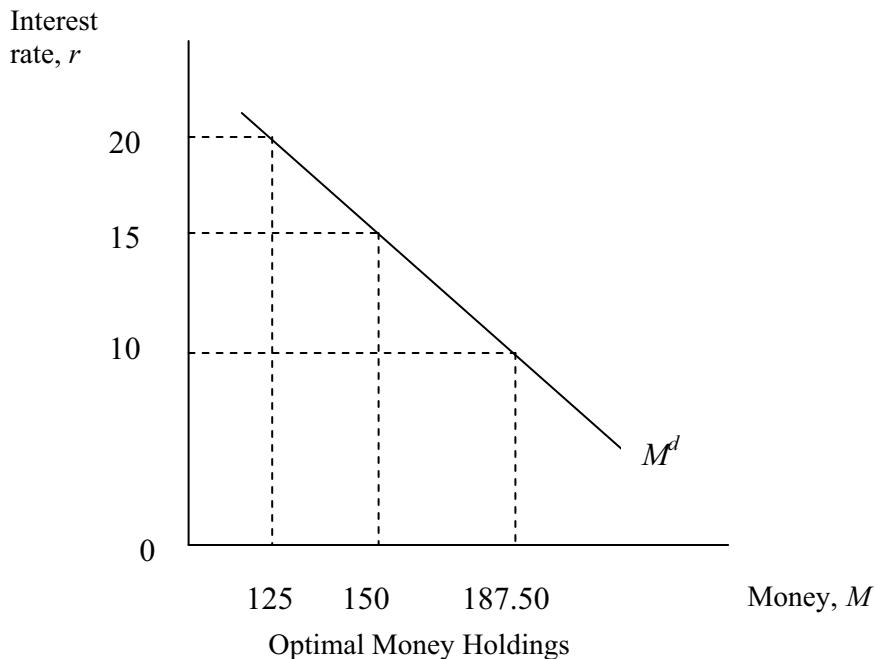
The optimal number of switches is 4, with average money holdings of \$150.

At $r = 20\%$ per month:

| Number of Switches | Average Holding | Average Bond | Interest Earned | Cost of Switch | Profit Net |
|--------------------|-----------------|--------------|-----------------|----------------|------------|
| 0 | \$750 | 0 | 0 | 0 | 0 |
| 1 | 375 | 375 | 75 | 4 | 73 |
| 2 | 250 | 500 | 100 | 8 | 92 |
| 3 | 187.5 | 562.5 | 112.50 | 12 | 100.50 |
| 4 | 150 | 600 | 120 | 16 | 104 |
| 5 | 125 | 625 | 125 | 20 | 105 |
| 6 | 107.14 | 642.86 | 128.57 | 24 | 104.57 |

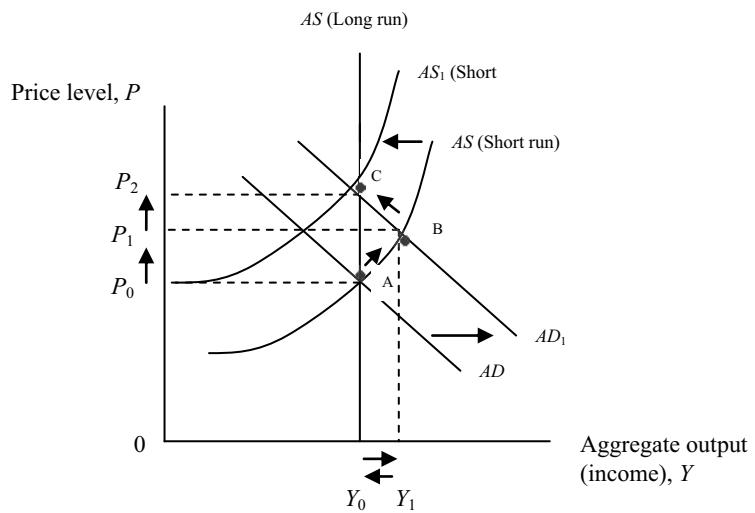
The optimal number of switches is 5, with average money holdings of \$125.

(d) The money demand curve slopes downward because an increase in the interest rate increases the opportunity cost of holding money, so less money will be held.

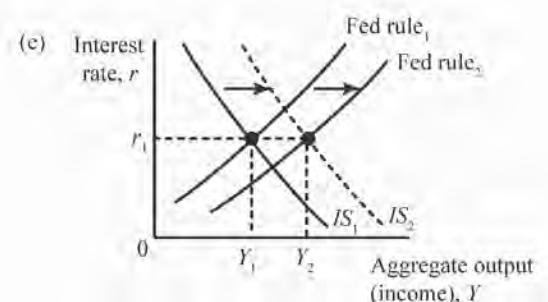
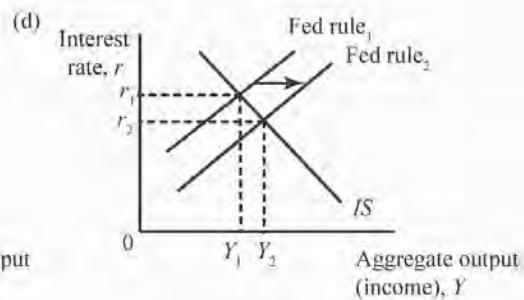
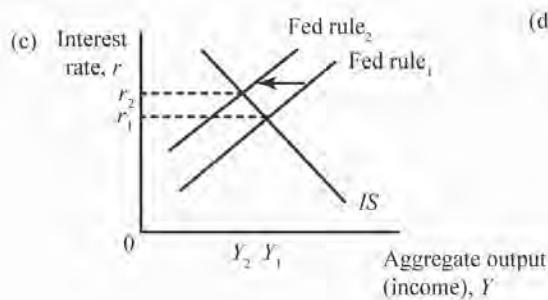
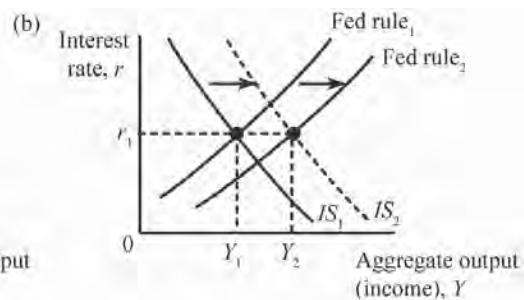
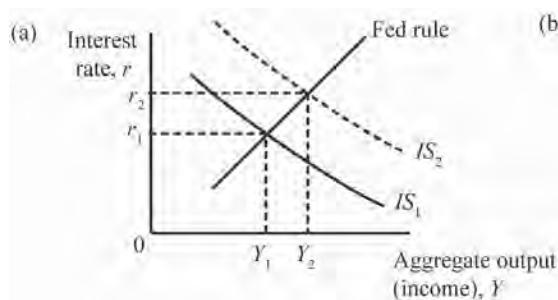


CHAPTER 12

1. The bank hoped that the rate cut, brought about by an increase in the money supply, would increase investment spending (I). This would cause $C + I + G > Y$, inventories would fall and GDP (Y) would rise. Y increasing would set off a multiplier effect with C rising.
2. (a) If investment depended in no way on interest rates, planned investment in Figure 12.4 would be represented as a vertical line.
 (b) A change in interest rates would cause no change in planned aggregate expenditure because planned investment would not change. (One could argue that consumption spending might change, but we have not yet discussed the impact of interest rates on consumption spending.)
3. The Fed “leans against the wind” when it increases the money supply to lower interest rates to counteract contraction of the economy, and decreases the money supply to raise interest rates to counteract rapid expansion. These policies are designed to stabilize the economy.
4. In the short run, the increase in the money supply will create an increase in aggregate demand, shifting aggregate demand to the right from AD to AD_1 . This will move the economy to point B, increasing the price level from P_0 to P_1 and increasing aggregate output from Y_0 to Y_1 . In the longer run, wages will respond to the higher price level, shifting the short-run aggregate supply to the left from AS to AS_1 . This will move the economy to point C, further increasing the price level from P_1 to P_2 , but returning aggregate output back to Y_0 . Therefore, the long-run impact of Prince Barney’s actions will only cause the price level to increase, but will not generate economic growth.



5.



For part (a), both equilibrium output and the equilibrium interest rate will increase.

For part (b), equilibrium output increases and the equilibrium interest rate remains constant.

For part (c), equilibrium output decreases and the equilibrium interest rate increases.

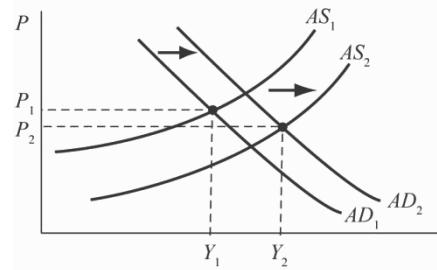
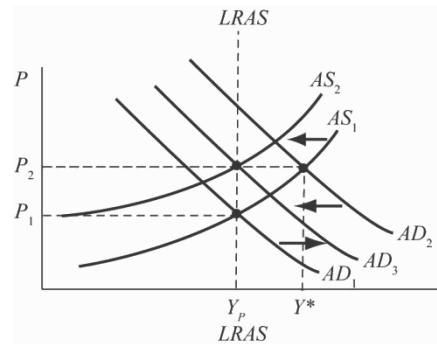
For part (d), equilibrium output increases and the equilibrium interest rate decreases.

For part (e), equilibrium output definitely increases and the equilibrium interest rate may increase, decrease, or remain constant (as is shown in the graph), depending on the magnitude of the curve shifts.

- 6.** The actual physical capacity of existing plants represents the maximum output level the economy could produce in the short run. It is where the short-run AS curve becomes vertical. Potential GDP is the maximum output the economy could maintain in the long run without exacerbating inflation. It is less than full-capacity output because the bottlenecks and labor shortages that would exist at full-capacity output would cause wages and input prices to rise, leading to worsening inflation.

- 7. (a)** AD shifts to the right pushing equilibrium beyond Y_p (potential GDP). The price level rises. Costs rise causing the AS curve to shift upwards. The Fed belatedly contracts driving r up shifting the AD curve back down, down, pushing Y^* back to Y_p at a higher level of P_2 .

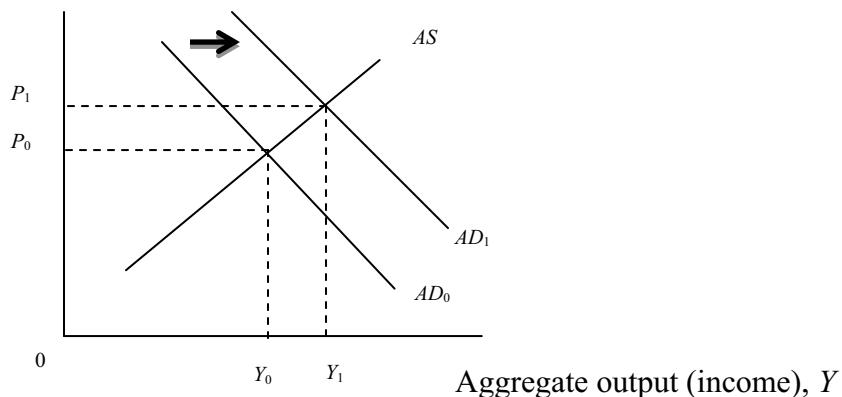
- (b)** Aggregate supply shifts right. Aggregate demand also shifts to the right, but not as far, so the price level falls from P_1 to P_2 , and output rises from Y_1 to Y_2 .



8.

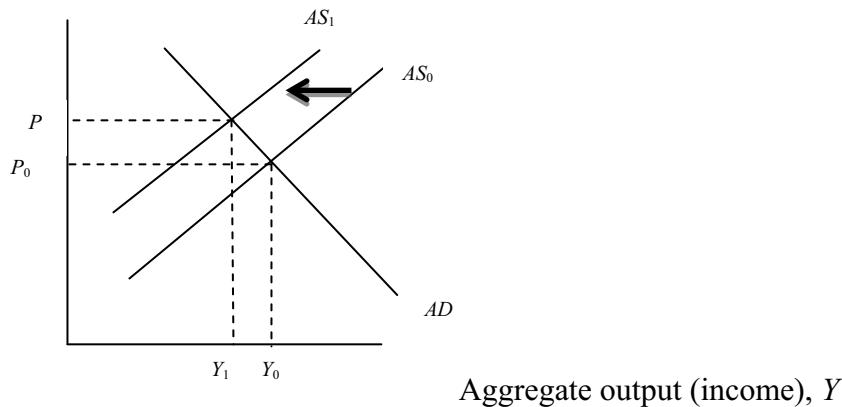
(a)

Price level, P



(b)

Price level, P



For part (a), equilibrium price level and equilibrium aggregate output both increase.

For part (b), equilibrium price level increases and equilibrium aggregate output decreases.

For part (c), equilibrium price level and equilibrium aggregate output both increase.

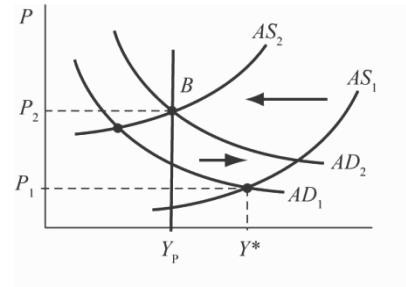
For part (d), equilibrium price level may increase, decrease, or remain constant (in the graph it is shown as increasing) and equilibrium aggregate output increases.

9. This is not a good explanation for the downward slope of the AD curve. The curve actually slopes down because an increase in the price level causes the demand for money to rise, driving up the interest rate and discouraging investment, which causes aggregate income to fall. The higher interest rate may also discourage consumption and the higher price level may lower the value of some types of wealth. The AD curve is not like a market demand curve.
10. The slope of a simple demand curve depends on the price of a single product relative to other product prices. The substitution effect and the income effect explain the downward slope. When a price falls, the opportunity cost of buying that product relative to other products falls. That means you tend to substitute this good for others that you might consider. The income effect works in the same way. If the price of a product falls, you are better off and can buy more for the same gross income. For

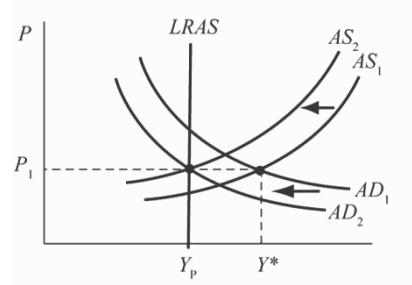
normal goods, that works in the same direction as the substitution effect...higher P means a lower quantity demanded.

The AD curve is completely different. On the X-axis is equilibrium aggregate expenditure, and on the Y axis is the overall price level. The logic goes like this: If we are at equilibrium and in both the goods market and the money markets and the price level price level increased, ceteris paribus, that would raise the demand for money. The higher money demand would push up the interest rate if the Fed did not respond (and we assume that it does not), then investment would fall, inventories would rise, and aggregate output would fall as well. The result is that when P rises AE falls.

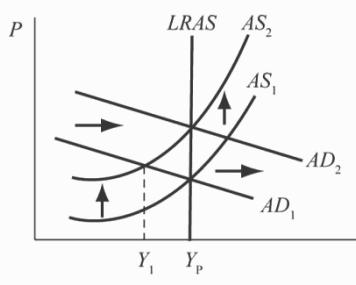
11. (a) If the short-run aggregate supply and aggregate demand curves intersect to the right of Y_p , wages and other input prices will rise, causing aggregate supply to shift left. If at the same time there is an increase in the money supply, aggregate demand will shift right. The expansionary monetary policy increases the rise in the price level that will occur in the long run as the economy adjusts back to full employment at Point B.



- (b) If the short-run aggregate supply and aggregate demand curves intersect to the right of Y_p , wages and other input prices will rise, causing aggregate supply to shift left. If at the same time a decrease in government spending and in the money supply occurs, aggregate demand will shift left. If the shift in aggregate demand is great enough, the price level will not have to rise during the adjustment process.



- (c) The increase in oil prices pushes the aggregate supply curve up. Without Fed accommodation, the higher price level would raise interest rates and GDP would drop below Y_p – a recession. But the Fed accommodates the rise in price level, shifting the AD curve to the right and holding GDP at Y_p . In the long run, if oil prices return to their original level, and the Fed returns to its original policy, AD and AS will shift back to their original positions.



12. Not all firms in all industries hit full capacity at the same time. Some firms are operating near full capacity while others are not. Thus, as output rises following a shift of the AD curve, prices and output both rise. Some firms are eager to get back to business and have plenty of customers. At the same time, other firms are at full capacity. For them, the shift of demand requires an increase in price since supply is at capacity. Thus, as demand shifts, it generates increases in employment and

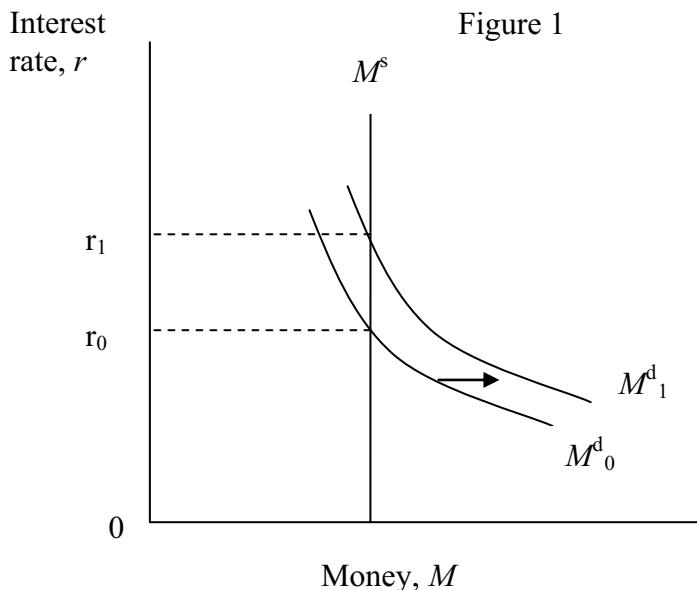
capacity utilization. To be on the flat portion implies that output is very low relative to capacity. It might be a period of stagnation or a deep recession with high unemployment. To be on the steep portion implies that output is very high relative to capacity. It is probably a period of low unemployment and economic expansion.

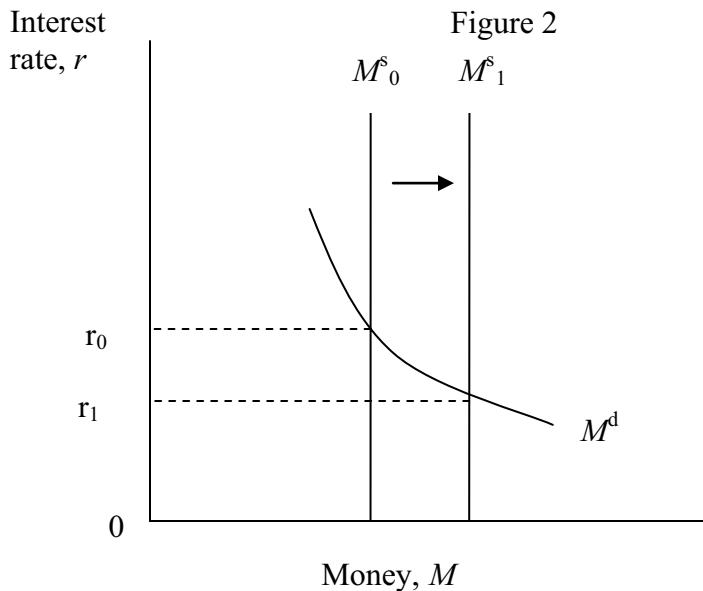
CHAPTER 13

1. Taxes (T) rise, causing disposable income (Y_d) to fall. When Y_d falls, C falls, causing $AE < Y$. When $AE < Y$, inventories rise and firms cut back on output/income: Y falls and unemployment rises. If I was the central bank and I wanted to counteract these effects, I might lower interest rates to try to stimulate investment with expansionary money policy.
2. (a) Because these two policies have opposite effects on aggregate spending, the result is ambiguous. The tax cut raises Y_d and thus C . $C + I + G > Y$. Inventories fall and Y rises. At the same time, if M_s is cut by the Fed, r rises. Higher r leads planned investment (I) to fall. Lower I implies $C + I + G < Y$ inventories rise and Y falls. The only thing certain is that r will rise because the tax cut leads to an increase in M_d .
 - (b) In 2003, the tax cuts caused disposable income to rise. When Y_d rises, C increases and $C + I + G > Y$. Inventories contract, causing Y to rise. Higher Y causes money demand M_d to rise. If M^s is fixed, that will cause r to rise. This will cause I to fall, partially offsetting some of the rise in aggregate expenditure and Y .
 - (c) The tax increase reduces disposable income and thus consumption. $C + I + G < Y$, so inventories build and output falls. A lower Y means lower money demand. At the same time, since the Fed is increasing the money supply, interest rates will fall, causing I to rise, perhaps offsetting the effects of the initial tax increase on Y . (Final result: ambiguous Y , lower r .)
 - (d) The drop in consumption cuts aggregate expenditure: $C + I + G < Y$, so inventories rise and Y falls. As Y falls, money demand drops. If the Fed holds M^s constant, r will fall. Here again, the lower r may stimulate I , causing I to rise, partially offsetting the initial decline in Y . (Final result: lower Y , lower r .)
 - (e) The Fed expands the money supply. $M^s > M_d$, so r falls. Normally, the lower r might be expected to cause I to rise, but gloomy expectations and no need for new plants and equipment keep I low. Thus the link to the goods market is broken, and the monetary policy doesn't have much impact. (Final result: lower r , little or no change in Y .)
3. (a) The decline in investment would be a reduction in aggregate expenditure, causing equilibrium output (income) to decrease in the goods market. In the money market, the drop in income would decrease the demand for money (shift the M^d curve to the left), causing the interest rate to fall and investment spending to rise back up somewhat. However, the net effect would be a decline in output (income) and the interest rate.
 - (b) Option 3 is the most expansionary, because the increase in the money supply works to offset the crowding-out effect. Option 2 would come next, but would involve some crowding out. Option 1 would be at least expansionary, because the tax increase would decrease consumption spending. (Option 1 relies on the balanced-budget multiplier, which has a value of 1. Option 2 relies on the government spending multiplier, which is larger than 1.)

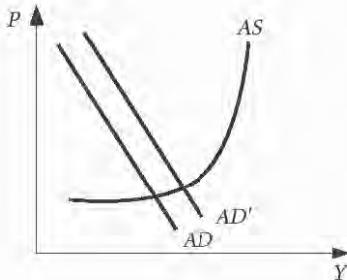
4. Disagree if anything the exact opposite is true. The mechanism for monetary policy transmission is that expanded money supply drives down interest rates, the lower interest rates cause investment spending to rise. Investment demand is part of total expenditure. Higher investment leads to a contraction of inventories and real output/income (Y) rises. Two very important conditions can block the effectiveness of monetary policy: 1. expanding the money supply does not bring down interest rates, or 2. lower interest rates do not cause investment spending to rise since. It is hard to push interest rates down if they were effectively 0% already which was the case in August 2010. All of this was exactly what was on the minds of members of Congress as they debated the importance of repealing the Bush tax cuts during the 2010 elections.
5. (a) A policy mix of contractionary fiscal policy and expansionary monetary policy would result in the interest rate and investment to increase, and would have an indeterminate effect on aggregate output.
 (b) A policy mix of expansionary fiscal policy and expansionary monetary policy would cause aggregate output to increase with an indeterminate effect on the interest rate.
 (c) A policy mix of expansionary fiscal policy and contractionary monetary policy would result in an increase in the interest rate, a decrease in investment, and have an indeterminate effect on aggregate output.
 (d) A policy mix of contractionary fiscal policy and contractionary monetary policy would cause aggregate output to decrease with an indeterminate effect on the interest rate.
6. Expansionary fiscal policy is an increase in government spending or a reduction in net taxes. The increase in government spending and the increase in consumption spending which will result from the decrease in net taxes will create an increase in the demand for money. This will cause the money demand curve to shift to the right, increasing the interest rate (Figure 1).

Expansionary monetary policy is an increase in the money supply. The money supply curve will shift to the right, decreasing the interest rate (Figure 2).

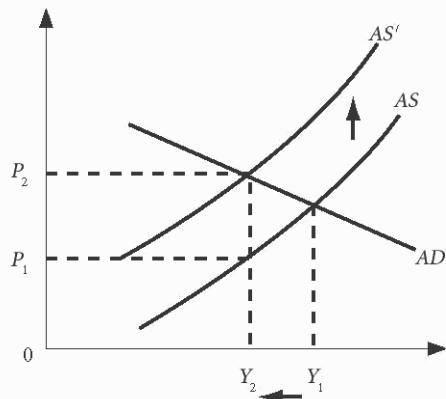




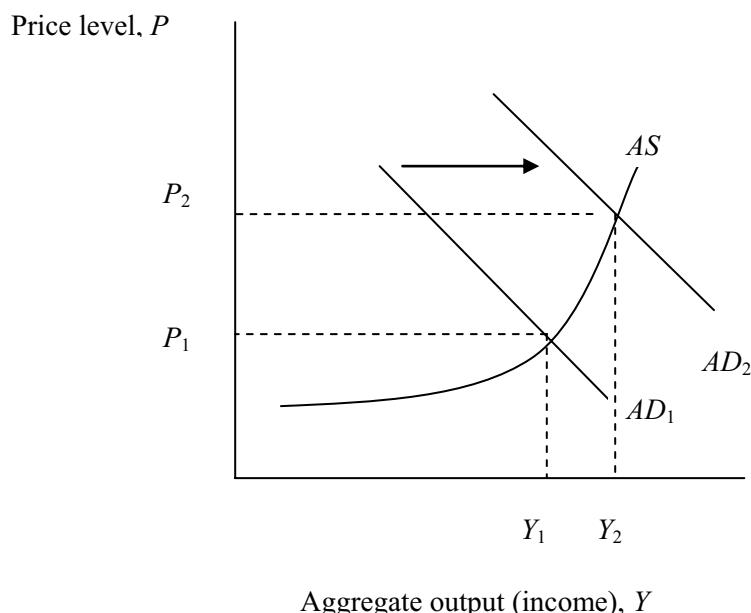
7. (a) A lower discount rate will increase bank borrowing and lending. The increased lending will increase investment spending, which will shift the aggregate demand curve to the right.
 (b) A decrease in the price level will cause a movement down and to the right along the aggregate demand curve.
 (c) Higher federal income taxes will reduce disposable income. This will decrease consumption spending, shifting aggregate demand to the left.
 (d) If firms decrease investment spending, the aggregate demand curve will shift to the left.
 (e) If the inflation rate falls, the price level decreases. This will cause a movement down and to the right along the aggregate demand curve.
 (f) If the federal government increases purchases, the aggregate demand curve shifts to the right.
8. Both monetary expansion to push (and hold) down interest rates and expansionary fiscal policy (G up and T down) shift AD to the right. Because the price level did not rise but Y did, Japan was on the flat part of the short-run AS curve in 2000.



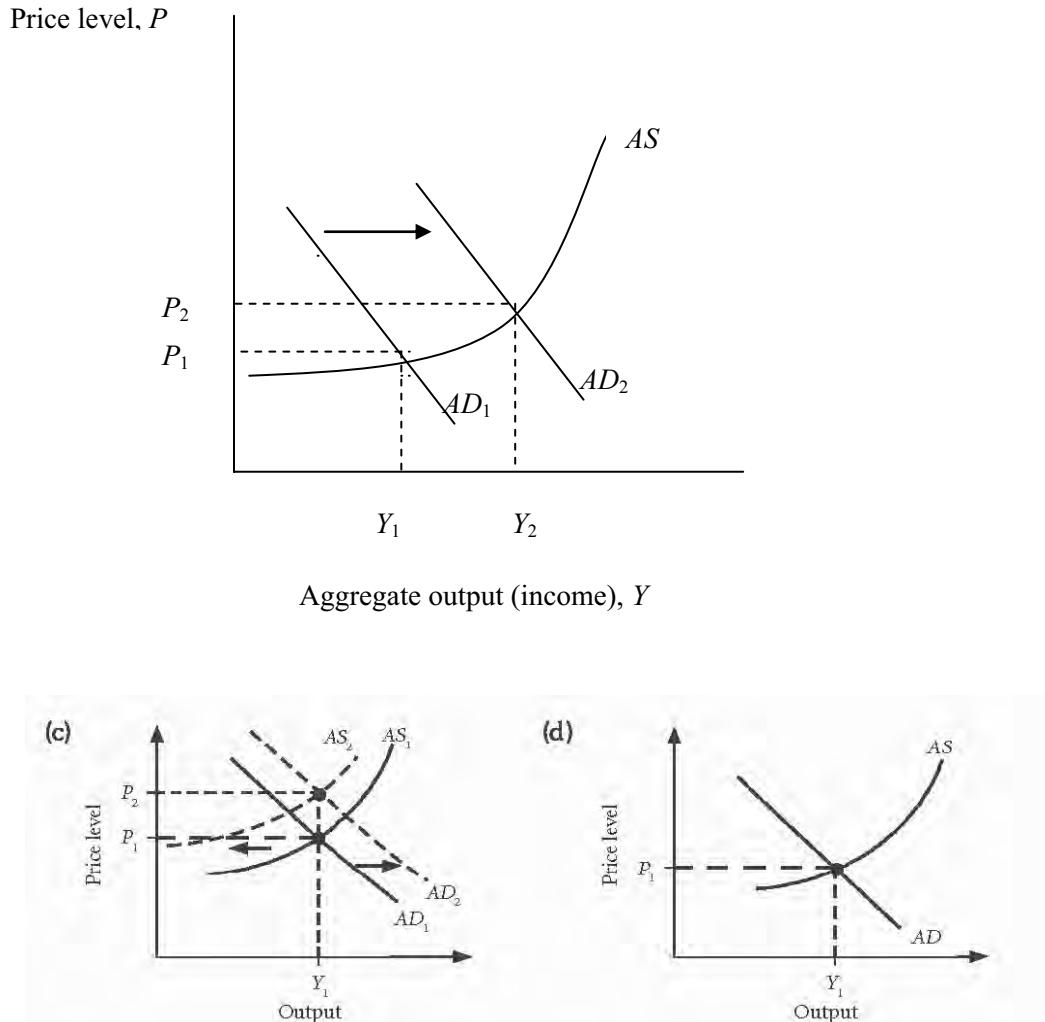
- 9.** An increase in the price of oil increases the cost of production in many manufacturing and service industries. Higher costs will mean that these industries slow down. A cost increase pushes up the aggregate supply curve (the same as a shift to the left). This has the effect of pushing up the price level and reducing the level of aggregate output in the short run. Assuming the Fed does nothing to the money supply, interest rates could rise or fall. The increase in the price level will cause money demand to shift to the right while falling real output will cause it to shift to the left.



- 10. (a)** The price level will rise considerably. Equilibrium GDP will rise only a little.



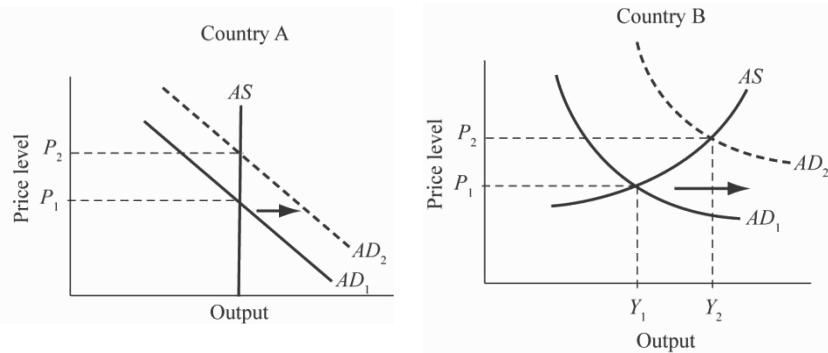
- (b) GDP will rise considerably; prices will rise only a little.



The price level will rise considerably. Equilibrium GDP may fall, but by less than it would if the Fed did not accommodate.

Neither the price level nor output would change. The fiscal and monetary policies have opposing effects on the AD curve. If they are of equal strength, there will be no shift in the curves.

11. Expansionary monetary policy is likely to have a greater effect in country B. Because production costs adjust automatically to price increases in country A, the AS curve will be vertical. A rightward shift in the AD curve would cause an increase in prices without increasing output because costs increase at the same time as prices. In country B, input prices lag behind output prices, so the short-run AS curve is not vertical. In the short run, a rightward shift in the AD curve will cause an increase in output.



12. The Fed began cutting interest rates in June of 2000 when the Fed Funds Rate was 6.5%. Rates were cut steadily through mid-2003 when The Fed Funds Rate hit 1%. The Fed Funds rate then steadily increased to 5.25% in August, 2007. From August 2007 to April 2008, the Fed Funds rate steadily dropped again, from 5.25% to 2.00%. The federal budget was in surplus in 2001 as a whole when the surplus was \$40 billion according to the Bureau of Economic Analysis. In 2002 the deficit was \$354 billion. The deficit rose to a high of \$413 billion in 2004, then fell to \$319 billion in 2005, \$248 billion in 2006, and \$163 billion in 2007. The projected budget deficit for 2008, as reported by the Bush administration, is \$410 billion, considerably higher than the previous three years. The increase in the budget deficit and the decrease in the Fed Funds rate since the middle of 2007 indicate a slowdown in the economy and fiscal and monetary policy attempts to stimulate the economy, similar to the reaction in 2001-2003.

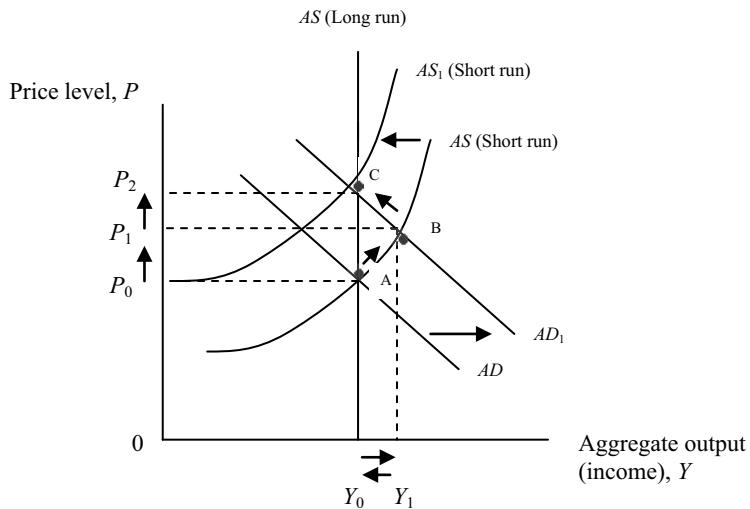
There seems to be a bigger response lag for fiscal policy.

13. Scenario 1. The economy is initially at equilibrium point A. The cost shock causes aggregate supply to shift to the left (AS to $AS1$), increasing the price level from P_0 to P_1 and decreasing aggregate output from Y_1 to Y_0 , moving the economy to short-run equilibrium at point D. The expansionary fiscal policy increases aggregate demand, shifting the aggregate demand curve to the right (AD to $AD1$), increasing the price level from P_1 to P_2 and increasing aggregate output from Y_0 back to Y_1 , where the economy reaches a new, long-run equilibrium at point C.

Scenario 2. The economy is initially at equilibrium point A. The increase in government purchases causes aggregate demand to shift to the right (AD to $AD1$), increasing the price level from P_0 to P_1 and increasing aggregate output from Y_1 to Y_2 , moving the economy to short-run equilibrium at point B. The response of higher wages to the inflation causes a decrease in aggregate supply, shifting the aggregate supply curve to the left (AS to $AS1$), increasing the price level from P_1 to P_2 and decreasing aggregate output from Y_2 back to Y_1 , where the economy reaches a new, long-run equilibrium at point C.

Scenario 3. The economy is initially at equilibrium point C. The increase in taxes causes aggregate demand to shift to the left ($AD1$ to AD), decreasing the price level from P_2 to P_1 and decreasing aggregate output from Y_1 to Y_0 , moving the economy to short-run equilibrium at point D. The lower price level and subsequent cost adjustment increases aggregate supply, shifting the aggregate supply curve to the right ($AS1$ to AS), decreasing the price level from P_1 to P_0 and increasing aggregate output from Y_0 back to Y_1 , where the economy reaches a new, long-run equilibrium at point A.

Scenario 4. The economy is initially at equilibrium point C. The decrease in energy prices causes aggregate supply to shift to the right (AS_1 to AS), decreasing the price level from P_2 to P_1 and increasing aggregate output from Y_1 to Y_2 , moving the economy to short-run equilibrium at point B. The contractionary fiscal policy decreases aggregate demand, shifting the aggregate demand curve to the left (AD_1 to AD), decreasing the price level from P_1 to P_0 and decreasing aggregate output from Y_2 back to Y_1 , where the economy reaches a new, long-run equilibrium at point A.



- 14.** The statement is not correct. The cause of the inflation also affects aggregate output in the short run. If the inflation is primarily the result of an increase in aggregate demand (demand-pull inflation), aggregate output will increase beyond potential GDP. If the inflation is primarily the result of a decrease in aggregate supply (cost-push inflation), aggregate output will fall below potential GDP. If the government chooses to use policy to attempt to return aggregate output back to potential, the policy chosen to reduce aggregate output back to potential would be a contractionary policy, and the policy chosen to increase aggregate output would be an expansionary policy.

CHAPTER 14

1. An improved trade-off between inflation and unemployment could be the result of a leftward shift in the Phillips Curve. This could be the result of increased productivity, a more efficient labor market, falling world prices, or other supply-side factors. The tradeoff would be worsened by decreases in productivity and increases in resource prices (like the increased price of oil at the end of 2000 and beginning of 2001).
2. Answers will vary based on student opinion and on the current unemployment data.
3. Answers will vary depending on what occurs.
4. Answers will vary depending on date.
5. (a) If the minimum wage is 9 slugs per hour, then:

$$Q_D = 100 - 5(9) = 55 \text{ million workers}; Q_S = 10(9) - 20 = 70 \text{ million workers}.$$

The excess supply of labor (number of unemployed) would be $70 - 55 = 15$ million workers. The unemployment rate would be $15/70 = .214$ or 21.4%.

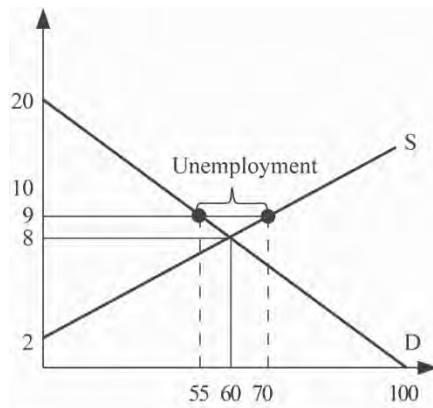
- (b) With no minimum wage, the equilibrium wage is found by setting labor demand equal to labor supply:

$$100 - 5W = 10W - 20 \rightarrow 120 = 15W \rightarrow W = 8 \text{ slugs per hour.}$$

Equilibrium employment is found by substituting $W = 8$ into either the labor-demand or labor-supply equation:

$$Q_D = 100 - 5(8) = 60 \text{ million workers}; Q_S = 10(8) - 20 = 60 \text{ million workers}.$$

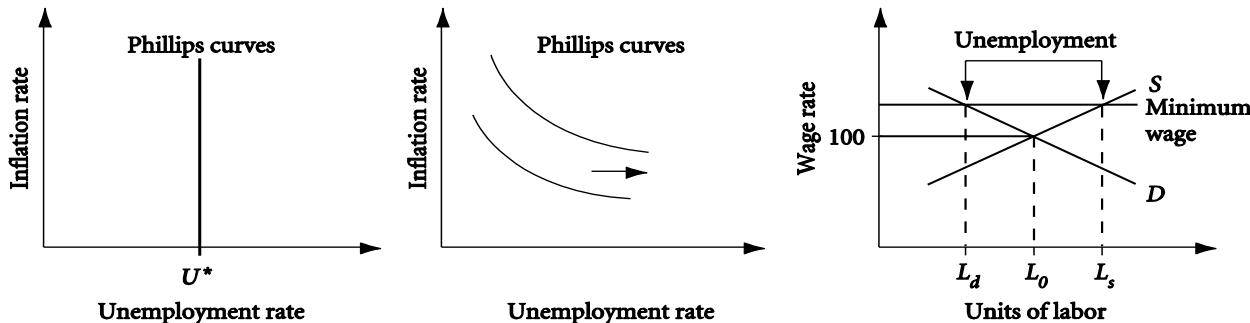
The labor force shrinks from 70 million to 60 million workers. Total employment rises from 55 million to 60 million workers. The unemployment rate shrinks from 21.4% to zero. (The model assumes no frictional unemployment.)



- (c) The labor market might not adjust so quickly due to wage rigidity, which has a number of possible causes, including implicit and explicit contracts, workers' concerns over their relative wages, and firms' concerns over the decline in productivity that might follow a wage cut.
- 6. (a) This policy would decrease frictional unemployment by helping employers and workers find each other. The time spent in job hunting would be reduced.
 (b) This policy would decrease structural unemployment by making it profitable to hire workers who would otherwise not be productive enough to employ. (To some extent, however, teenage workers might be substituted for existing workers, thus lessening the impact on unemployment.)
 (c) This policy would reduce structural unemployment by providing workers with skills needed in new or expanding industries.
 (d) Typically this policy is a means to cope with cyclical unemployment, although it could also address structural unemployment (at a cost) if the government was willing to maintain the policy.
 (e) This policy is similar to the policy in (a).
 (f) This is an attempt to reduce cyclical unemployment by encouraging workers to accept relatively small wage increases, which means relatively more of them will be hired.
- 7. The wage increase may be inefficient to compensate for rising prices. If a wage increase is less than the rate of inflation, real wages fall.
- 8. (a) The effect of a higher wage tax on household labor force behavior is ambiguous. Workers may respond to the decrease in after-tax wages by consuming more leisure, which now has a lower opportunity cost, so that labor supply will fall. However, workers are worse off. Since leisure is a normal good, consumption of it might fall and thus labor supply might rise. At the same time, lower Social Security benefits might force the elderly back into the workforce. With higher benefits, some elderly may stay out of the workforce or be able to continue their retirement.
 (b) Improved child care reduces the opportunity cost of working. It is likely to attract more parents to the work force, increasing the labor force and labor supply. It would also reduce the demand for labor by increasing the full costs of hiring a worker. Over the short run, during which some wage rigidity is likely, the effect of an increase in labor supply and a decrease in labor demand would be an increase in the unemployment rate.

- (c) Increased immigration will increase the labor force and labor supply at a given wage rate without a corresponding increase in jobs. With short-run wage rigidity, unemployment will rise.
- (d) Labor supply (and the labor force) should increase as more workers begin to seek even low-paid work to support themselves. With short-run wage rigidity, unemployment will rise.
- (e) Increased investment might increase or decrease labor demand, depending on whether the new capital is more complementary to or substitutable for labor. There would be no immediate impact on labor supply. The effect on employment and unemployment would be ambiguous.

9.

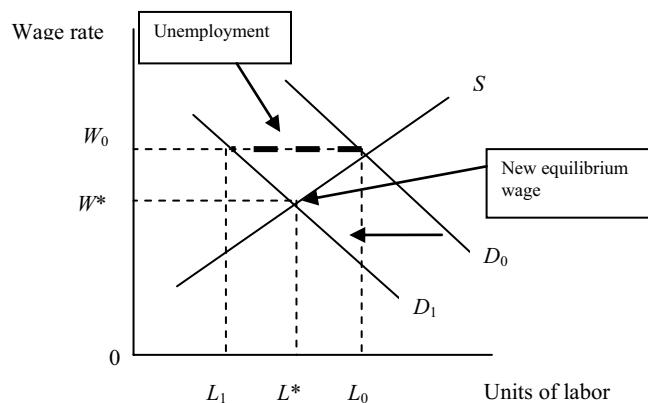


10. Answers will vary.

11. The trade-offs would likely not be identical largely because of differences in institutions in the two countries. For example, Japan had a tradition of “lifetime” employment for male workers in the country’s largest industries. As a result, there are fewer layoffs in Japan, and it probably has a lower natural rate of unemployment than does the United States.

12. Answers will vary.

13. Social, or implicit, contracts are unspoken agreements between workers and firms that firms will not cut wages. If the economy goes into recession and the demand for labor decreases, these contracts would maintain wages at their pre-recession level, but would result in additional unemployment. With the social contract, the wage would be sticky and remain at W_0 , instead of falling to the new equilibrium wage of W_1 . At the new equilibrium wage, labor would fall from L_0 to L^* , but because of the social contract, labor actually falls from L_0 to L_1 , resulting in additional unemployment.



CHAPTER 15

1. (a) Standard and Poor's 500 (S&P 500) is an index based on the stock prices of 500 of the largest firms by market value.
- (b, c, d) Answers will vary.
2. Certainly such big drops have large effects on the wealth of households in these countries. Consumers in these countries are, therefore, likely to spend less, dropping C and eventually Y . Recessions are likely to result. There are several possible problems for the United States. First, Americans are invested in foreign stock markets so there is a modest wealth effect in the United States. Second, recessions in foreign countries mean that their consumers buy less from the United States and export demand drops. Finally, prices of imports from these countries could fall, competing with U.S. firms.
3. When the economy contracts, both taxable income and corporate profits fall, causing a decrease in tax revenues. In addition, some government expenditure categories, such as unemployment insurance benefits, tend to rise. With decreased tax revenues and increased government expenditures, the government deficit typically rises when the economy contracts.
4. (a)
$$\begin{aligned} Y &= C + I + G = 100 + .8Y_d + 60 + 80 = 100 + .8[Y - (-150 + .25Y)] + 60 + 80 \\ &= 100 + .8Y + 120 - .2Y + 60 + 80 = 360 + .6Y \\ Y &= 360/.4 = 900 \\ D &= G - T = 80 - [-150 + .25(900)] = 5 \end{aligned}$$

(b) With $G = 75$

$$\begin{aligned} Y &= C + I + G = 100 + .8Y_d + 60 + 75 = 100 + .8[Y - (-150 + .25Y)] + 60 + 75 \\ &= 100 + .8Y + 120 - .2Y + 60 + 75 = 355 + .6Y \\ Y &= 355/.4 = 887.5 \\ D &= G - T = 75 - [-150 + .25(887.5)] = 3.125 \end{aligned}$$

The deficit is not zero because the cut in government spending shifts the AD curve to the left, decreasing aggregate output and causing a drop in the net tax revenue. Although the original cut in government spending would seem to eliminate the deficit, the resulting drop in GDP tends to raise the deficit, so the net effect is a deficit that is smaller, but not zero.

(c) With $I = 55$

$$\begin{aligned} Y &= C + I + G = 100 + .8Y_d + 55 + 80 = 100 + .8[Y - (-150 + .25Y)] + 55 + 80 \\ &= 100 + .8Y + 120 - .2Y + 55 + 80 = 355 + .6Y \\ Y &= 355/.4 = 887.5 \\ D &= G - T = 80 - [-150 + .25(887.5)] = 8.125 \end{aligned}$$

Following the methodology of part (c), we need Δ deficit to equal -8.125 so $-8.125 = .375(\Delta G)$ or $\Delta G = (-8.125/.375) = -21.67$.

5. States that must have balanced budgets are unable to use spending and taxing to offset local economic shocks. Moreover, an adverse shock that sends the state budget into deficit requires the state to raise taxes or cut spending, which will cut local spending and exacerbate the impact of the shock. The effect is therefore destabilizing.

If all states followed this philosophy, the effect would be destabilizing on a national basis. Adverse shocks would send the economy into recession, causing the federal deficit to swell. If states cannot pursue expansionary policies to help a nation out of the recession, then they must rely more heavily on the federal government to do so. Thus, a larger increase in the federal deficit will be necessary to stimulate the economy than would otherwise be the case.

6. Stabilization policy may be difficult to carry out because there are time lags in the economy's response to such policies. Stabilization policies can thus be destabilizing because they may affect the economy much later, when the adjustments are no longer desirable.
7. Answers will vary based on countries chosen.
8. The reduction in government spending and the increase in taxes will reduce aggregate demand and aggregate output. To offset these reductions, the Fed can implement an easy money policy and increase the money supply. The increase in the money supply will increase aggregate demand by lowering interest rates.
9. It is still possible for the budget deficit to change if there is a change in GDP. If the economy expands and GDP increases, there will be an automatic reduction in the deficit due to increased tax collections and reduced government transfers. If the economy slows down, reducing GDP, the deficit will tend to grow because of a reduction in tax collections and an increase in government transfers.
10. For changes in fiscal policy to be implemented, Congress must authorize changes in government spending or changes in taxes. Once tax laws and spending programs embodied in the annual federal budget are in place, they are hard to change, so implementing any changes takes time. Monetary policy is less subject to the kinds of restrictions that slow down changes in fiscal policy. The Fed's main tool for controlling the supply of money and interest rates is open market operations – buying and selling government securities. If the Fed chooses, it can buy or sell a large volume of securities in a very short period of time.

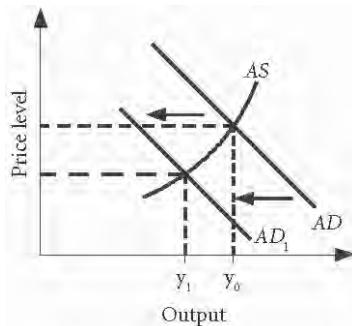
The response lag is generally shorter for fiscal policy than it is for monetary policy because fiscal policy directly impacts aggregate demand by changing the amount of government spending or the amount of after-tax income available to consumers. Monetary policy works more indirectly since it usually takes consumers and firms longer to react to changes in interest rates.

11. Answers will depend on actual future deficit-to-GDP ratios, CBO estimates, and policy changes.

CHAPTER 16

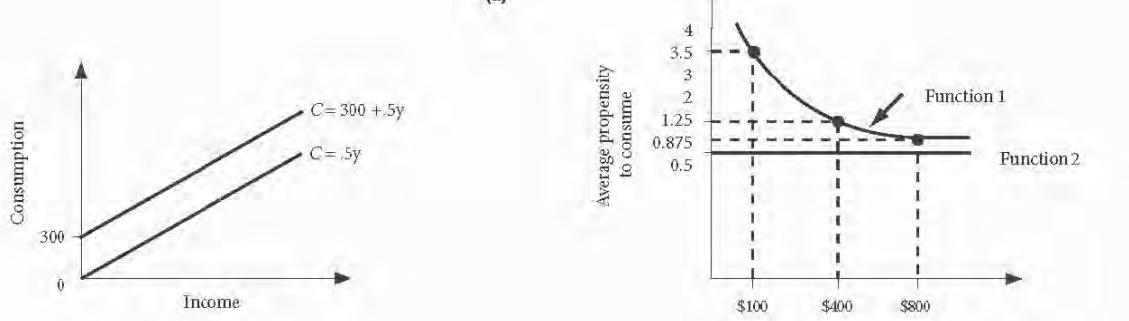
1. Productivity must have increased. It must be the case that the United States was producing more output with fewer workers. This could be, in part, the result of firms holding onto excess labor after the peak of the cycle. Holding excess labor and capital may be efficient if a downturn is seen to be short-lived. The 2001 recession led to slow growth particularly in terms of profits. Firms may just have been slow to cut their workforces.
2. (a) When the cost of borrowing is higher, households are less likely to buy items for which they must borrow money such as consumer durables (automobiles and houses). Firms face a higher cost of capital when r rises, thus the rate of investment spending is likely to fall.
(b) A fixed rate bond paying 7% for the next 10 years is simply worth less to its holder if potential buyers can now get 8% by buying a new bond.

- (c) When wealth falls, consumers are less well off. Their net worth is lower and they are inclined to spend less. Thus, higher interest rates have a secondary effect on consumer spending by reducing wealth, which leads to lower consumption spending. The AD curve shifts further to the left than the direct effect on investment would suggest.



3. When taxes are cut, after-tax wages rise. People keep a larger portion of their wages. The substitution effect refers to the fact that the opportunity cost of leisure is higher after the after-tax wage increase. That would imply that people would work more in response to the Bush tax cuts. On the other hand, when tax rates are cut, people have higher incomes after tax. To the extent that leisure is a normal good—higher income leads to more consumption of normal goods—people would consume more leisure and work fewer hours. The ultimate effect will depend on how strong the two effects are. In reality, some people will work more and others less. Since the two act to offset each other, the aggregate effect is likely to be small.

4.



(Note: APC is the average propensity to consumer: $APC = C/Y$)

For the first consumption function:

$$\text{If } Y = \$100, C = 300 + .5 \times 100 = 350, APC = 350/100 = 3.5$$

$$\text{If } Y = \$400, C = 300 + .5 \times 400 = 500, APC = 500/400 = 1.25$$

$$\text{If } Y = \$800, C = 300 + .5 \times 800 = 700, APC = 700/800 = .875$$

For the second consumption function:

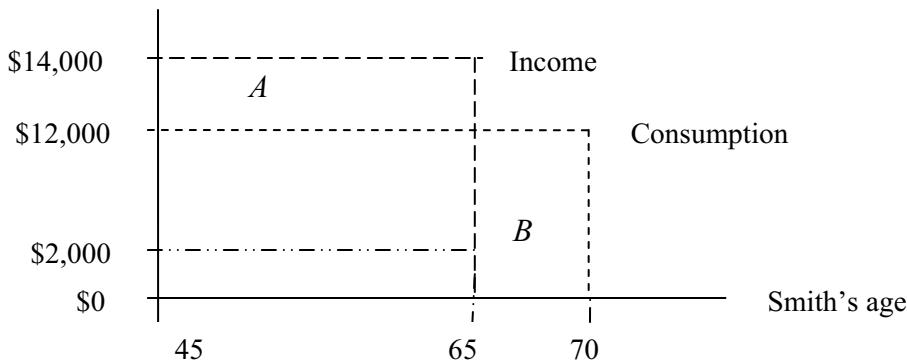
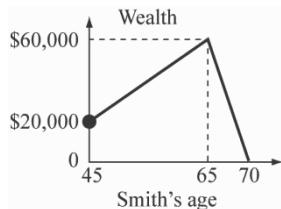
$$\text{If } Y = \$100, C = .5 \times 100 = 50, APC = 50/100 = .50$$

$$\text{If } Y = \$400, C = .5 \times 400 = 200, APC = 200/400 = .50$$

$$\text{If } Y = \$800, C = .5 \times 800 = 400, APC = 400/800 = .50$$

- (b) For the first consumption function (with the constant term 300), as income increases, APC decreases. For the second consumption function (with no constant term), the APC remains constant as income increases.
- (c) For the first consumption function, the APC is always larger than the MPC . For the second consumption function, the APC is equal to the MPC .
- (d) When income changes, it is the MPC (not the APC) that determines how consumption spending changes. Even though the $APCs$ for the two families differ, the $MPCs$ are the same. Thus, the decrease in consumption in one family is the same as the increase in consumption in the other.

5. (a) The value of homes is an important component of household wealth. When home prices rise, household wealth rises and consumption tends to increase. When home prices fall, household wealth falls and consumption decreases.
- (b) Because changes in consumption are changes in aggregate expenditure, they lead to changes in output and employment in the same direction.
6. (a) Over his life, Smith will have a total of $\$20,000 + 20 \times \$14,000 = \$300,000$ available for spending. He has 25 years to consume, so each year his consumption will equal $\$300,000/25 = \$12,000$.
- (b) Smith's annual saving is equal to the annual increase in his wealth. When Smith is 65, his wealth starts to decline because his consumption continues to be \$12,000 while his income goes to zero. When he dies, Smith has zero wealth.



Net worth at 65 equals the area *A* + \$20,000

Net worth at 65 equals area *A*, which is $\$40,000 + \$20,000 = \$60,000$

Area *B* equals consumption after retirement = \$60,000

{Notes: Income goes to zero at age 65. Saving goes to -\$12,000 at age 65}

- (c) The permanent tax rebate will give additional lifetime income of $\$100 \times 20 = \$2,000$. This must be spread out over 25 years, so consumption each year will be $\$2,000/25 = \80 higher than before.
- (d) The temporary tax rebate increases lifetime income by only \$100. Each year, consumption will be $\$100/25 = \4 higher than it was before.
7. A given consumption path requires a given amount of lifetime income to pay for it. But, given initial wealth, lifetime income is determined by working hours. This implies that income is not really an "independent" variable in the consumption function. Rather, the desire to consume and the desire to enjoy leisure together will determine how much income one will earn.
8. Investments are the creation of new capital. Expectations of future sales determine how much capital a firm will want to have in place in the future. To have this capital when it is needed, investment

spending must take place in earlier periods. Because expectations of future sales are affected by government policy announcements, release of economic data, and “animal spirits”—all of which can change rapidly—the resulting investment spending is quite volatile.

9. Maintaining inventory stocks helps a firm maintain a smooth production level. When sales unexpectedly increase, goods can be sold out of inventory. When sales unexpectedly decrease, goods can be added to inventories. By smoothing production, a firm can save on the adjustment costs associated with frequent changes in capital stock and employment levels. The cost of this policy is the forgone interest from investing funds in inventory stocks instead of lending out the money in financial markets.

10. (a) As firms draw down inventories in response to the recovery, output does not respond as quickly to demand changes. This will lower the value of the multiplier.
 (b) The increase in prices that result from expansionary policy will lower the value of the multiplier since a set level of income will no longer buy as many goods and services.
 (c) If people expect policy changes, like a tax rebate, to be temporary rather than permanent, the multiplier effects will be smaller.
 (d) If the government decreases spending and the Fed does not change the size of the money supply, the interest rate will decrease. The decrease in the interest rate will increase planned investment, consumption, and aggregate output, reducing the effect of the spending decrease. This will decrease the size of the multiplier.
 (e) When the economy expands and income increases, the amount of taxes collected also increases. The rise in taxes offsets some of the expansion, so the value of the multiplier is smaller.
 (f) An increase in transfer payments like unemployment benefits lessens the effect of economic contractions, thereby decreasing the size of the multiplier.

11. (a) According to Okun’s Law, the unemployment rate decreases about 1 percent for every 3 percent increase in GDP. For the unemployment rate to decrease from 9.5 percent to 4.7 percent (a 4.8 percent decrease), GDP would have to increase by $(3 \times 4.8) = 14.4$ percent.
 (b) If GDP grows at an annual rate of 2.4 percent, the length of time for the economy to grow by 14.4 percent would be $(14.4 / 2.4) = 6$ years.

12. The first slippage is between the change in output and the change in the number of jobs in the economy. When output increases by 1%, the number of jobs tends to increase by less than 1%. This happens for two reasons. First, a firm is likely to meet some of the increase in output by increasing the number of hours worked per job. Second, if a firm is holding excess labor at the time of the output increase, at least part of the increase in output can come from putting the excess labor back to work. The second slippage is between the change in the number of jobs and the change in the number of people employed. If a person has two jobs, that person is counted only once in the persons-employed data. If some new jobs are filled by people who already have jobs, there will be no change in the unemployment rate. The third slippage concerns the response of the labor force to an increase in output. As output increases, the size of the labor force increases. Discouraged workers reenter the labor force as the economy expands, and this means that the measured unemployment rate does not fall as much as it would have if the discouraged workers had not reentered the labor force.

13. The optimal level of inventory is the level at which the extra cost (in lost sales) from lowering inventories by a small amount is just equal to the extra gain (in increased revenue and decreased storage costs). An increase in the interest rate would reduce the optimal level of inventory because it would increase the cost of holding inventory. A decrease in the interest rate would increase the optimal level of inventory because the cost of holding inventory would fall. The cost of holding inventory is the cost of storage and the interest revenue that is lost on the income tied up in inventory. The benefit of holding inventory is the ability to meet an unforeseen increase in demand.

- 14.** Adjustment costs are the costs that a firm incurs when it changes its production level. An increase or a decrease in production levels for Futurama Medical would tend to incur more significant adjustment costs than would changes in production levels at Gonzo Garments. Increasing or decreasing the amount of capital stock and finding and training new employees would be much more difficult and costly for Futurama Medical. Because finding and training new employees would tend to be much more costly for Futurama Medical, this firm would be more likely to hold excess labor, and because selling used machines which are so specialized may prove very costly, Futurama Medical would also be more likely to hold excess capital.

CHAPTER 17

1. The new technology clearly enhances productivity. There are countless examples. Just imagine writing a paper or doing research without a search engine. Law clerks can do in ten minutes what would have taken a hundred hours to do reading printed documents and looking through newspapers. There are also the effects of email and online banking, and the list goes on. Any time you get over-expansion in a sector, inventory builds and output falls. We upgraded and changed most of the systems in the country for the Y2K bug. Everyone and every business put up a website during that period. The economy ‘overbuilt’ the new technology and a downturn was inevitable.

2.

| Table 1 | | Table 2 | | Table 3 | |
|------------|-------------|------------|-------------|------------|-------------|
| <i>Y/L</i> | Growth Rate | <i>Y/L</i> | Growth Rate | <i>Y/L</i> | Growth Rate |
| 4.28 | — | 4.28 | — | 4.28 | — |
| 4.23 | 3.7 | 4.41 | 3.9 | 4.45 | 5.0 |
| 4.17 | 3.6 | 4.53 | 3.9 | 4.63 | 5.0 |
| 4.12 | 3.7 | 4.66 | 3.9 | 4.81 | 5.0 |

In Table 1, *L* is growing rapidly while *K* is growing slowly. It is likely that much of the growth in *Y* is due to growth in *L*. Because of diminishing returns to *L*, it is not surprising that *Y/L* is declining. In

Table 2, *L* is growing slowly while *K* is growing rapidly. In this case, it seems that the growth in *Y* is caused mainly by growth in *K*. The ratio *Y/L* is increasing because each worker has more capital with which to work.

Finally, in Table 3, both *L* and *K* are growing slowly relative to *Y*. Technology must be the cause of most of the growth in *Y* in this case. This technological improvement also has the effect of increasing the amount of output per worker (*Y/L*).

3. This is a current events question. Answers will vary.
4. The key focus of the tax law proposals is on capital. When the capital stock grows, output is likely to grow and labor productivity is likely to increase. This can be accomplished by increasing investment directly or by influencing saving. A number of provisions are designed to encourage saving. Lower taxes on capital gains, dividends, and interest income are designed to increase the after-tax returns that people can earn on their saving. That increases the opportunity cost of present consumption. Higher savings increases the pool of available resources to firms and brings down the cost of capital. The investment tax credit is a direct reduction in the cost of capital ... a 10% ITC reduced taxes by 10% of the amount of investment. This is a direct stimulus to investment.
5. Increasing research and innovation and raising the academic credentials of researchers can and often does increase the quality of the labor supply (human capital), increase the quality of capital, (embodied technical change), and increase disembodied technical change (improving the production process). All of these increases increase labor productivity, which will assist in increasing long-run economic growth.

6. Answer will vary.
7. High budget deficits are financed with private saving. That saving otherwise would have found its way through financial markets into private capital production. If the deficit is used to finance current expenditures such as paying judges and congresspeople, it is not contributing to an expansion of output in the long run. The same is true of a tax cut, which is used to increase current consumption expenditures. But if the government used the money to build capital, such as roads and bridges, or to increase human capital through better education and job training, it would at least offset part of the reduction in private investment spending. Whether the net result for output growth is positive or negative depends on whether private capital or public capital has a higher rate of return. This is a subject of much debate and would depend on the specific capital expenditures undertaken by the government.
8. One principal stimulus to growth is capital accumulation. Capital investment requires saving and saving comes mostly from the rich rather than the poor. Also, growth requires high incentives for those who work and invest in the “right” way (the way that matches consumer desires most closely), and this means that the rewards for work and investment will be unequally distributed. It is possible for the poor to benefit from economic growth because capital accumulation ultimately raises wages. Also higher average incomes can mean more tax revenues, which can be used to finance government programs aimed at helping the poor.
9. Productivity refers to the amount of product produced by each unit of labor or capital. If productivity is increasing, this means that workers are producing more output per hour and/or capital is generating more output per hour. If real GDP is decreasing while productivity is increasing, then more output is being produced per hour, but fewer hours are being worked, resulting in lower total output.
10. (a) The growth rate in real GDP from 2009 to 2010 is calculated as: $[(\text{real GDP}_{2010} - \text{real GDP}_{2009}) / \text{real GDP}_{2009}] \times 100$.
- U.S. = 2.39%
El Salvador = 0.98%
Republic of South Africa = 2.84%
Cambodia = 6.61%
Russia = 4.03%
- Cambodia experienced the highest rate of economic growth.
- (b) The growth rate in real GDP from 2010 to 2011 is calculated as: $[(\text{real GDP}_{2011} - \text{real GDP}_{2010}) / \text{real GDP}_{2010}] \times 100$.
- U.S. = 1.81%
El Salvador = 1.45%
Republic of South Africa = 3.12%
Cambodia = 6.32%
Russia = 4.34%
- Cambodia experienced the highest rate of economic growth.
- (c) The growth rate in real GDP from 2011 to 2012 is calculated as: $[(\text{real GDP}_{2012} - \text{real GDP}_{2011}) / \text{real GDP}_{2011}] \times 100$.
- U.S. = 2.14%
El Salvador = 1.91%
Republic of South Africa = 2.63%
Cambodia = 6.82%
Russia = 3.77%
- Cambodia experienced the highest rate of economic growth.

- (d) The average annual growth rate in real GDP from 2009 to 2012 is calculated as the sum of the growth rates from 2009 to 2010, 2010 to 2011, and 2011 to 2012, divided by 3.

U.S. = 2.11%

El Salvador = 1.45%

Republic of South Africa = 2.86%

Cambodia = 6.58%

Russia = 4.21%

Cambodia experienced the highest average annual rate of economic growth.

11. The average annual growth rate in real GDP per capita for the 40 year period from 1972 to 2012 is calculated as: $[(\text{per capita real GDP}_{2012} - \text{per capita real GDP}_{1972}) / \text{per capita real GDP}_{1972}] \times (100 / 40)$.

| Country | Real GDP per capita in 1972 | Real GDP per capita in 2012 | Annual growth in real GDP per capita 1972-2012 |
|--------------------------|-----------------------------|-----------------------------|--|
| United States | 22,189 | 43,219 | 2.37 % |
| El Salvador | 2,352 | 3,152 | 0.85 % |
| Republic of South Africa | 4,677 | 6,254 | 0.84 % |
| Cambodia | 113 | 649 | 11.86 % |
| Russia | 4,084 | 6,877 | 1.71 % |

Convergence theory, also known as catch-up, states that the growth rates of less developed countries will exceed the growth rates of developed countries, allowing the less developed countries to catch up. In the table, Cambodia's GDP per capita in 1972 was the lowest at \$113 and its growth between 1972 and 2012 was the highest at an average annual rate of 11.86%, which is consistent with convergence theory as its growth rate significantly exceeded the growth rate in the United States. But, El Salvador and the Republic of South Africa, countries with relatively low GDP per capita in 1972, also experienced relatively low growth rates, which is not consistent with convergence theory, so overall, the data in the table is not consistent with convergence theory

12. (a) Spending on research and development tends to increase productivity and economic growth.
 (b) Increased government regulation may increase productivity and economic growth through improved efficiency, and it may decrease productivity and economic growth if the costs of the regulation exceed the benefits.
 (c) Human capital refers to the quality of the labor supply. An increase in human capital tends to increase productivity and growth.
 (d) If output per worker hour increases, productivity increases. Economic growth may increase or decrease, depending on the actual level of output produced.
 (e) Embodied technical change increases the quality of capital, increasing productivity and economic growth.
 (f) Disembodied technical change refers to technical change that is not imbedded in either labor or capital, but rather works to get more out of both. Disembodied technical changes are mostly positive, increasing productivity and growth, but can also be negative in cases of regulations which slow production and reduce efficiency.

13. Economic growth is measured as the change in real GDP from one year to the next. Standard of living can be measured as the percent change in real GDP per capita. Real GDP per capita is calculated as real GDP for a particular year divided by the population for that year. Change in real GDP per capita is calculated as $[(\text{real GDP per capita}_{2012} - \text{real GDP per capita}_{2011}) / \text{real GDP per capita}_{2011}] \times 100$.

For Astoria, real GDP per capita in 2012 is $(10,600 / 1,500) = 7.07$

Real GDP per capita in 2011 is $(9,750 / 1,325) = 7.36$

The percent change in real GDP per capita is $[(7.07 - 7.36) / 7.36] \times 100 = -3.94\%$

Real GDP increased from 2011 to 2012, so the country experienced economic growth, but since the percent change in real GDP per capita is negative, the standard of living declined in Astoria.

For Tiberius, real GDP per capita in 2012 is $(3,500 / 650) = 5.38$

Real GDP per capita in 2011 is $(3,150 / 585) = 5.38$

The percent change in real GDP per capita is $[(5.38 - 5.38) / 5.38] \times 100 = 0.0\%$

Real GDP increased from 2011 to 2012, so the country experienced economic growth, but since the percent change in real GDP per capita is zero, the standard of living did not change in Tiberius.

For Zorba, real GDP per capita in 2012 is $(47,750 / 12,500) = 3.82$

Real GDP per capita in 2011 is $(49,100 / 13,440) = 3.65$

The percent change in real GDP per capita is $[(3.82 - 3.65) / 3.65] \times 100 = 4.66\%$

Real GDP decreased from 2011 to 2012, so the country experienced economic decline, but since the percent change in real GDP per capita is positive, the standard of living improved in Zorba.

- 14.** Answers will vary based on current data. In March 2013, the overall seasonally-adjusted unemployment rate was 7.6 percent. The unemployment rate for those without a high school diploma was 11.1 percent. The unemployment rate for those with only a high school diploma was 7.6 percent. The unemployment rate for those with a bachelor's degree or higher was 3.8 percent. This data suggests that higher education levels are desirable for jobs in the United States. The census.gov data for 2012 shows that 87.6 percent of the total population 25 years or older had completed 4 years of high school (which means 12.4 percent were without a high school diploma), yet only 30.9 percent had completed 4 years of college or more. The data indicates that higher education levels are desirable for jobs, but less than one-third of the population 25 years and older have 4 years of college or more, suggesting a possible slowdown in productivity and growth in the United States.

CHAPTER 18

1. (a) It's hard to make predictions based on two numbers, but if you took them as signs of a trend you would worry any time the money supply ($M1$) was growing more rapidly than the rate of real growth (rate of growth of real GDP). Thus Canada and Japan seem to have the biggest problem, followed by Australia and Britain. Money supply growth in the United States is much less than its rate of growth of real GDP.
 (b) If you were a Keynesian, and assuming an activist central bank, you might interpret high rates of money growth as indicators of expansionary policies (for example in Japan).
2. (a) Graph I: Supply-side economics: It focuses on the supply-side effects of a tax cut and tends to ignore the demand-side impacts. Tax cuts should increase the incentive to work, save, and invest. If work effort, saving, and investment all increase, the AS curve will shift to the right, increasing output and reducing the price level. The extent to which the supply curve is likely to shift depends on the responsiveness of behavior to the tax cuts. This is the subject of much controversy.

Graph II: Monetarism/New classical economics. Both schools believe that fiscal policy cannot have an impact on the level of real output. Monetarism believes that nominal GDP cannot change as long as the money supply and the velocity of money remain constant. Thus, real GDP will not respond to a tax cut. New classical theories predict that "anticipated" fiscal policies will have no effect on real GDP, which remains at the potential output level determined in the long run in markets such as the labor market.

Graph III: Keynesian economics. As long as the economy is not operating at capacity, and as long as the Fed accommodates somewhat by increasing the money supply, a permanent tax cut

can increase the level of real GDP and is likely to be inflationary. The impact on the price level is determined by how close to capacity the economy is operating.

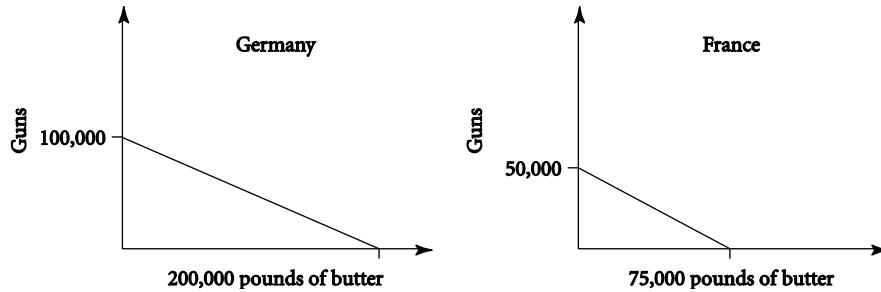
- (b) Individual response.
3. Several considerations should be taken into account, including the stability of your job, the possibility of having to relocate for your job, current and expected future interest rates, expectations of future inflation, and the current state of the housing market. Buying may be your best option if you believe you are not in danger of losing your job or having to relocate, if you believe the housing market is currently weak but will get stronger, if current interest rates are relatively low or if you believe rates will be increasing in the near future, or if you believe inflation will be increasing. Otherwise, you may find renting is your best option. Your past experiences and perceptions of the past regarding the economy can definitely play a role in your decision. Expectations can change the state of the housing market in several ways, including expectations of recession (housing market could slow down) or economic growth (housing market could expand), expectations of inflation (housing market could expand if people want to purchase before price levels increase), and expectations that the current inventory of new or existing homes for sale will remain fairly stable or will be changing significantly, either up or down.
 4. The supply-side logic is that cutting taxes increases the incentive to work, save, and invest. Expanding the workforce and the capital stock clearly can have an expansionary effect allowing the economy to grow more rapidly. But a lower T means that disposable income, Y_d , rises. Higher disposable income increases C and, thus, aggregate expenditure. If $AE > Y$, inventories contract and Y rises. Thus, the AD curve shifts; there is an expansionary demand-side effect.
 5. Answers will vary based on where students reside.
 6. Nominal income = $M \times V = (\$1,000)(5) = \$5,000$. If we select the current year as our base year, real income is also \$5,000. If you are a strict monetarist you believe V is constant. Therefore, a doubling of the money supply to \$2,000 will cause a doubling of nominal GDP to $(\$2,000)(5) = \$10,000$. If, however, velocity is a function of the interest rate as well as institutional factors, then it cannot be assumed a constant. In this case, an increase in the money supply (which reduces interest rates) would lower velocity, so $M \times V$ would not increase by as great a percentage as M itself increased, and nominal GDP would rise by a smaller percentage than the money supply increased. If the money supply doubles (rises by 100%), nominal GDP will rise by less than 100%. (We cannot know how the rise in nominal GDP is apportioned between a rise in P and a rise in real GDP without knowing more about the current state of the economy).
 7. (a) Clinton's tax increases and spending cuts would be a fiscal contraction. With no change in Fed policy, output would decrease and unemployment would increase. The Fed's policy to match the fiscal contraction with a monetary expansion, lowering interest rates to stimulate investment, was an attempt to avoid the decline in output.
 (b) Monetarists would worry about imperfect policy timing. Fed stimulation might take effect at the wrong time (e.g., after the economy has recovered from the impact of the fiscal contraction). Supply-siders would worry that higher tax rates would decrease the incentive to work and invest.
 (c) To evaluate the supply-side argument, you would need to see what happened to tax revenues and labor supply after the tax rate increases. An increase in tax revenues, *ceteris paribus*, would contradict the view of extreme supply-siders. If labor supply did not decrease much, general supply-side arguments would be weakened. To evaluate the monetarist argument, you would need to see if investment spending increased as consumption spending declined (proper policy timing), or only after consumption began to recover (poor timing).
 8. Quite simply, it is because the labor market clears if wages are fully flexible. If there is unemployment, wages will fall, the quantity of labor demanded will rise, and the quantity of labor supplied will fall until there is no more excess supply.

- 9.** A policy of cutting taxes and increasing expenditures on national defense should be inconsistent with balancing the budget. However, supply-side economists believe that cutting tax rates can actually result in greater tax revenues, and so it would be possible to have all three. The question really turns on how tax revenues respond to reductions in tax rates. Reagan believed that lower taxes would cause a substantial increase in work effort and investment. He was clearly wrong about this.
- 10.** A tax cut from .25 to .20 is a 20% reduction, and if labor supply did not change, tax revenues would fall 20%. Tax revenue = tWL . In order for tax revenues not to change, we need to have $.25WL_{OLD} = .2WL_{NEW}$. This implies $L_{NEW} = .25WL_{OLD}/.2W = 1.25 L_{OLD}$. Thus, the new supply of labor must be 25% higher than the old supply of labor. What does this tax cut mean to net wages? It means that net wages rise from $.75W$ to $.80W$, an increase of $.05/.75 = .0667$ or 6.67%. Thus, in order to keep revenues constant, a 6.67% increase in net wages would have to generate a 25% increase in labor supply, implying an elasticity of $25/6.67$ or 3.75. This is much larger than any empirical estimates of the actual elasticity of labor supply.
- 11.** (a) $M \times V = P \times Y$, so $(600 \text{ million} \times 4) = (2.5 \times Y)$. $Y = (2,400 \text{ million} / 2.5)$. $Y = 960 \text{ million}$.
 (b) Nominal GDP = $P \times Y$, so nominal GDP = $2.5 \times 960 \text{ million} = 2,400 \text{ million}$.
 (c) If Y doubled, it would have a value of $(960 \text{ million} \times 2) = 1,920 \text{ million}$. $M \times V = P \times Y$, so $(M \times 4) = (2.5 \times 1,920 \text{ million})$. $M = (4,800 \text{ million} / 4)$. $M = 1,200 \text{ million}$. The money supply would need to increase from 600 million to 1,200 million, so if real output doubled, the money supply would also need to double.
 (d) An easy money policy would increase the money supply, and if the economy is in a recession, nominal GDP will increase by the same percentage as the increase in the money supply.
 (e) We know from part b that nominal GDP = 2,400 million. If GDP grows by 8 percent, the GDP for 2013 = $(2,400 \text{ million} \times 1.08) = 2,592 \text{ million}$. $M \times V = P \times Y$, so $(M \times 4) = 2,592 \text{ million}$. $M = (2,592 \text{ million} / 4)$. $M = 648$. Since the original money supply = 600 million, the money supply would need to increase by $(648 \text{ million} - 600 \text{ million}) = 48 \text{ million}$.
- 12.** The key assumption of the quantity theory of money is that the velocity of money is constant over time, so it would best explain changes in the rate of inflation in the nation of Lower Vicuna. The equation for the quantity theory of money is $(M \times V = P \times Y)$, where velocity (V) is constant. When velocity is constant, changes in the money supply (M) cause equal percentage changes in nominal GDP ($GDP = P \times Y$). If the velocity of money fluctuates greatly, a change in the supply of money may not result in a change in nominal GDP, and no change in the money supply may still result in a change in nominal GDP.
- 13.** (a) If inflation expectations are correct, $Y = 600 + 40(1.95 - 1.95) = 600$.
 (b) If the actual price level rises to 2.0, $Y = 600 + 40(2.0 - 1.95) = 602$.
 (c) If the actual price level does not change, $Y = 600 + 40(1.8 - 1.95) = 594$.
 (d) The “price surprise” = $(P - P^e)$. In part a, the price surprise = $(1.95 - 1.95) = 0$. In part b, the price surprise = $(2.0 - 1.95) = 0.05$. In part c, the price surprise = $(1.8 - 1.95) = -0.15$.
- 14.** It is possible for the unemployment rate to exceed the natural rate of unemployment, but this should be a short-term situation. If an unpredictable shock affects the economy, unemployment may rise above the natural rate, but with rational expectations, firms set wages and prices at their market-clearing values, so unemployment above the natural rate should not persist for a long period of time.
- 15.** (a) If the Fed decreases the required reserve ratio, the money supply will increase. Since the change was unexpected, people and firms will not be expecting the price level to increase, so there will be a positive price surprise. There will be a positive price surprise and firms will incorrectly believe that the price of their output has risen relative to other prices and will therefore increase production. Workers will incorrectly believe that their real wage rates have risen and will increase

- their supply of labor, which also leads to an increase in output. Eventually, workers and firms will realize that they were wrong and that all prices have risen, and output will fall to its original level.
- Since the tax reduction bill will not go into effect for one year, people will expect the price level to increase. There will be no price surprise and no change in the level of output.
 - If the decrease in the money supply is expected, people will expect the price level to decrease. Therefore, there will be no price surprise and no change in the level of output.
 - An unexpected shock like a sudden cut in oil production will raise prices unexpectedly. There will be a positive price surprise and firms will incorrectly believe that the price of their output has risen relative to other prices and will therefore increase production. Workers will incorrectly believe that their real wage rates have risen and will increase their supply of labor, which also leads to an increase in output. Eventually, workers and firms will realize that they were wrong and that all prices have risen, and output will fall to its original level.
 - If the government unexpectedly increases government spending, there will be a positive price surprise and firms will incorrectly believe that the price of their output has risen relative to other prices and will therefore increase production. Workers will incorrectly believe that their real wage rates have risen and will increase their supply of labor, which also leads to an increase in output. Eventually, workers and firms will realize that they were wrong and that all prices have risen, and output will fall to its original level.

CHAPTER 19

1. (a)



- (b) Yes. The opportunity cost of a gun in Germany is 2 pounds of butter. The opportunity cost of a gun in France is only 1.5 pounds of butter. France has a comparative advantage in guns. Similarly, the opportunity cost of a pound of butter in Germany is 1/2 of a gun, whereas the opportunity cost of a pound of butter in France is 2/3 of a gun. Germany has a comparative advantage in the production of butter.
- (c) As long as the agreement specifies between 1.5 pounds of butter and 2 pounds of butter per gun, specialization and trade will benefit both countries. For example, an agreement to exchange 1.75 pounds of butter per gun would benefit both countries.
2. (a) You cannot tell from the information given which country has an absolute advantage because you are not given any information that would indicate the actual quantities of inputs used in production in either country.
- (b) If resources are fully mobile between sectors, the opportunity cost of a cap is 2/3 of a bushel of wheat in Russia; the opportunity cost of a cap is 7/10 of a bushel of wheat in the United States. Russia has a comparative advantage in cap production. The opportunity cost of a bushel of wheat in Russia is 1.5 caps. The opportunity cost of a bushel of wheat in the United States is 10/7, or 1.43, caps. The United States has a comparative advantage in wheat.
- (c) At \$1 = 1 Ru, both goods in the United States are cheaper to everyone. That means that there was a big demand for dollars and no supply on foreign exchange markets. The price of the dollar would rise. When a dollar was valued at between 1.43 Ru (calculated as 10 Ru/\$7) and 1.50 Ru (calculated as 15 Ru/\$10), caps would be cheaper in Russia and wheat would be cheaper in the

United States. If the price of a dollar rises to more than 1.50 Ru, everyone would buy both goods in Russia.

3. Clearly, apparel is produced with cheap labor, and we buy most of our apparel from abroad because of the relatively high cost of labor in the United States. On the other hand, aircraft are produced with highly skilled workers, and the United States does enjoy a comparative advantage there. The United States does not have as large an endowment of oil reserves as the rest of the world, yet we are a big consumer. Both vehicles and food products are very heterogeneous. Vehicles lend themselves to “acquired comparative advantage.” While the United States has a lot of very fertile land for crop production, many things that we consume are not suited for production: coffee, tea, dates, tropical fruits (like bananas), and so forth. The table demonstrates the enormous complexity of the pattern of international trade.
4. (a) Illinois would have an absolute advantage in both wheat and soybeans.
(b) In Illinois, taking 1 acre out of wheat and moving it into soybeans sacrifices 48 bushels of wheat for 39 bushes of soybeans. This is $48/39 = 1.23$ bushels of wheat for each bushel of soybeans. In Kansas, the sacrifice is $40/23 = 1.67$ bushels of wheat for each bushel of soybeans.
(c) Based on the calculations in (b), Kansas has a comparative advantage in wheat and Illinois has a comparative advantage in soybeans.
(d) Yes, the data are consistent with the conclusions in (c). Kansas has more acreage devoted to wheat than to soybeans, whereas Illinois devotes more acreage to soybeans than to wheat. Although neither state completely “specializes,” each state seems to be devoting more of its resources to producing the good in which it has a comparative advantage.
5. Answers will vary depending on the state in which the student resides.
6. (a) The opportunity cost of a bottle of red wine is 1.5 bottles of white in the United States and 2 bottles of white in Australia. The United States, therefore, has a comparative advantage in red wine. The opportunity cost of a bottle of white wine is .66 bottles of red in the United States and .5 bottle of red in Australia. Australia, therefore, has a comparative advantage in white wine.
(b) No, at the current exchange rate, both white and red wine are cheaper in Australia. U.S. citizens will want to import both types of wine from Australia, but Australians will not want to import U.S. wine.
(c) In this situation, we would expect the price of the dollar to decrease until U.S. red wine became attractive to Australians whereas Australian white wine remained attractive to Americans. [An exchange rate between 1.5 (calculated as 15 US\$/10 AU\$) and 2 (calculated as 10 US\$/5 AU\$) U.S. dollars to 1 Australian dollar would accomplish this.]
(d) In the long run, we would expect exchange rates to adjust until Americans were exporting red wine to Australia and Australians were exporting white wine to the United States.
7. Often times, countries differentiate their products to please a wide variety of tastes that exist worldwide. Just as some Americans may have a preference for foreign-made shirts, some foreigners may have a preference for shirts produced in America. The United States, which may not have a natural comparative advantage in producing shirts, could have an acquired comparative advantage in the production of specific kinds or styles of shirts. These differing global tastes would explain why a country may import and export the same type of product.
8. According to the document:
Economic growth has increased in all three countries: 30% in Mexico, 30.9% in Canada, and 38% in the United States.
U.S. exports to Canada grew from \$87.8 billion to \$145.3 billion, and U.S. exports to Mexico grew from \$46.5 billion to \$105.4 billion. Mexican exports to the United States grew to more than

\$138 billion, and Mexican exports to Canada grew from US\$2.7 billion to US \$8.7 billion. Canadian exports to the United States and Mexico grew by 104% in value.

Total trade volume among the three countries grew from \$289.3 billion in 1993 to \$623.1 billion in 2003.

From 1993-2003, productivity increased 28% in the United States, 55% in Mexico, and 23% in Canada.

Answers will vary for the remaining parts of the problem.

9. Some of the political arguments against CAFTA-DR include:

- It is an outsourcing agreement that will lower living standards in all affected countries.
- CAFTA gives special protection to foreign investors operating in the United States that are not available to U.S. citizens and businesses.
- CAFTA forbids anti-offshoring policies that require government contract work be done by U.S. workers.
- Many Central American organizations, political parties, churches, and residents have come out against CAFTA.
- CAFTA will have negative environmental and labor effects, threatening the sovereignty of states and countries to set their own labor and environmental standards.

Industries in the United States opposed to CAFTA-DR include the sugar, textile, and agriculture industries. In addition to these industries, organized labor, workers' rights organizations and environmentalists have also expressed opposition to the trade agreement.

Answers comparing the arguments of these industries to those of the candle makers will vary, but the arguments of both groups revolve around protection from more efficient, lower-priced rivals.

10. (a) Without trade, the equilibrium price is \$1.75 per pound and the equilibrium quantity is 125 million pounds.

- (b) If the market is opened to trade and Columbia enters the market, pricing coffee at \$1 per pound, the domestic price of coffee will drop to \$1 per pound. At \$1 per pound, the domestic quantity demanded increases to 200 million pounds, and the domestic quantity supplied falls to 50 million pounds. The difference between the domestic quantity supplied and the domestic quantity demanded, 150 million pounds, will be imported from Columbia.

- (c) If the government imposes a \$0.50 per pound tariff on imported coffee, the domestic price of coffee will increase by \$.50 per pound to \$1.50 per pound. At \$1.50 per pound, the domestic quantity demanded falls to 150 million pounds, and the domestic quantity supplied increases to 100 million pounds. The difference between the domestic quantity supplied and the domestic quantity demanded, 50 million pounds, will be imported from Columbia.

- (d) The government will receive \$0.50 per pound in tariff revenue for every pound of coffee imported. With the tariff, 50 million pounds of coffee will be imported, so the government will receive $(50 \text{ million} \times \$0.50) = \$25 \text{ million}$ in tariff revenue.

- (e) Since the \$0.50 per pound tariff raised the price of coffee from \$1 per pound to \$1.50 per pound, the consumer ultimately pays the price of the tariff by paying the higher price for coffee.

11. If a quota is set at 50 million pounds of Columbian coffee, the price will still rise to \$1.50 per pound, because at \$1.50 per pound, exactly 50 million pounds of coffee will be imported from Columbia. Since the price will still rise to \$1.50 per pound, the domestic quantity demanded will still be 150 million pounds and the domestic quantity supplied will still be 100 million pounds. The main difference in results will be that with the tariff, the government received \$25 million in tariff revenue, but with the quota, that \$25 million will go to the Columbian producers since they would keep the entire \$1.50 per pound.

12. These nations can still benefit by trading with each other. Even with an absolute advantage in everything it produces, Pixley can not have a comparative advantage in everything, and the basis of trade is made on comparative advantage. Pixley will benefit if it chooses to only produce those goods which can be produced at a lower cost relative to other goods. The same is true for Hooterville. Even though Hooterville has an absolute disadvantage in everything it produces, it will have a comparative advantage in at least one good.
13. While lower exchange rates do make a nation's exports more attractive, they also make a nation's imports more expensive. Consumers will end up paying a higher price for all imports, reducing their buying power. With higher prices on imports, consumers will purchase fewer, even when there is a comparative advantage in production. Also, the exchange rate could drop so low that the currency becomes virtually worthless. If this happened, other countries would be very hesitant to accept this nation's currency for payment of any goods or services.
14. Both the United States and Cuba would see benefits from this action. Consumers in Cuba will benefit from the availability of more goods and services as well as lower relative prices on those U.S. imports in which the producer has a comparative advantage. Producers of exports in the United States would benefit from the increase in exports of their products.

CHAPTER 20

1. Answer will vary
2. (a) Answers can include, an increase in British interest rates, a decrease in U.S. interest rates, a decrease in the British price level, and an increase in the U.S. price level.
(b) All of the above would also cause the supply curve to shift left.
(c) The two changes in interest rates listed in (a) above (which would raise the value of the pound without any other simultaneous change in import or export demand) would make British goods relatively more expensive and decrease Britain's trade balances (shrink the surplus or increase the deficit).
3. Answers will vary. The trade balance is simply made up of exports and imports of goods and services. A country with a trade deficit is one that imports more than exports. The current account balance takes into account investment income paid to foreigners as well as foreign investment income paid to a country's citizens. Investment income earned abroad is added to exports, and investment income paid to foreigners is added to imports.
4. (a) The consumption function does not change so instead of spending their money on Japanese goods, U.S. citizens will spend it on domestic goods. All else equal, this will stimulate U.S. output and decrease U.S. unemployment, and decrease output and employment in Japan.
(b) If income rises, consumers are likely to buy more imports as well as more domestic goods. Imports from Japan will increase somewhat after the initial decrease.
(c) If imports decrease, then the demand for yen will also decrease because importers will not need as many yen to purchase Japanese goods.
(d) The yen will depreciate and the dollar will appreciate. This gives U.S. consumers more buying power in the market for foreign goods. Consumers will buy more imports, causing a decrease in aggregate expenditure on domestic output. Output and employment in the United States will fall. The current account deficit will rise, but the total balance of payments will still sum to zero.
(e) The quota would have to increase U.S. output and employment, at least in the short run. The increase in the U.S. trade balance increases U.S. output and employment. This causes the dollar to appreciate, which works to decrease output.
5. (a) Under fixed rates, higher U.S. income would increase the demand for imports. The U.S. current account balance would decrease (i.e., the trade surplus would decrease or the trade deficit would increase). Under floating rates, there would be two forces acting on the exchange rate. Higher

U.S. income would increase the demand for imports, increasing the supply of dollars on foreign exchange markets and causing the dollar to depreciate. However, with higher income, assuming the Fed is not fully accommodating, the interest rate in the United States would rise due to the higher demand for money. This increase in the interest rate would increase the demand for (and decrease the supply of) dollars on foreign exchange markets, causing an appreciation of the dollar. The net effect on the value of the dollar is ambiguous. However, because of the increase in U.S. income, the demand for imports would increase and the current account balance would decrease, although this change in the current account balance may be partially offset if the dollar depreciated.

- (b) Under fixed rates, higher U.S. prices would make U.S. goods less attractive. U.S. imports would increase, and exports would decrease, causing a decrease in the current account balance. Under floating rates, the dollar would depreciate, with no effect on the current account balance.
 - (c) Because U.S. interest rates fall, foreigners will take their money out of U.S. financial markets and the demand for dollars will decrease. U.S. citizens will find foreign financial markets more attractive, so the supply of dollars will increase. At the same time, U.S. income increases so the demand for foreign goods also increases, further increasing the supply of dollars. Under fixed rates, all this would decrease the current account balance. Under floating rates, the dollar would depreciate, causing a decrease in imports and increase in exports. As imports would increase due to the higher U.S. income, the net effect on the current account balance is ambiguous.
 - (d) Imports will decrease and consumers will buy more domestic goods, so the demand for foreign currency decreases. Under fixed rates, this would increase the current account balance. Under floating rates, this would cause the dollar to appreciate, and the impact on the current account balance would be ambiguous.
6. (a)
$$\begin{aligned} Y &= C + I + G + (EX - IM) = 100 + .8(Y - 40) + 38 + 75 + 25 - .05(Y - 40) \\ &= 238 + .8Y - .8(40) - .05Y + .05(40) = 208 + .75Y = 832 \end{aligned}$$
- Government deficit = $G - T = 75 - 40 = 35$.
- Current account balance = $EX - IM = 25 - .05(832 - 40) = -14.6$
- (b) The multiplier = $1/[1 - (MPC - MPM)] = 1/[1 - (.8 - .05)] = 4$
When G increases from 75 to 80, Y will increase by $5(4) = 20$. Imports will rise by $.05(20) = 1$.
 - (c) With the quota, the MPM is zero so the multiplier = $1/(1 - .8) = 5$. Y will rise by $5(5) = 25$. (This assumes that IM is greater than or equal to 40 without the quota, before the increase in G . Actually, it is 39.6, but assuming $MPM = 0$ is a very close approximation.) Imports that rise with income act as a leakage and reduce the size of the multiplier.
 - (d) With $EX = 25$, we need $IM = .05(Y - 40) = 25$. This implies $Y = 540$. Income is currently 832 so it must be decreased by $832 - 540 = 292$. With a multiplier of 4, this will require a decrease in government spending of $292/4 = 73$.
7. The following are the exchange rates from January 2, 2008:
- \$1 U.S. = 0.6848 euro
 - \$1 U.S. = 0.9922 Canadian dollar
 - \$1 U.S. = 109.70 yen
 - \$1 U.S. = 7.2946 yuan

The following are the exchange rates from December 31, 2008:

- \$1 U.S. = 0.7184 euro
- \$1 U.S. = 1.2240 Canadian dollar
- \$1 U.S. = 90.79 yen
- \$1 U.S. = 6.8225 yuan

The U.S. dollar appreciated against the euro and the Canadian dollar during 2008.

The U.S. dollar depreciated against the yen and the yuan during 2008.

The following are values at the beginning of 2008:

$$\text{U.S. exports} = \$1,648,665 \text{ million}$$

$$\text{U.S. imports} = \$2,350,763 \text{ million}$$

$$\text{U.S. trade balance} = -\$702,099$$

The following are values at the end of 2008:

$$\text{U.S. exports} = \$1,839,012 \text{ million}$$

$$\text{U.S. imports} = \$2,537,814 \text{ million}$$

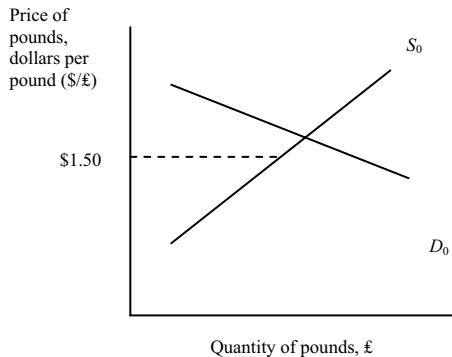
$$\text{U.S. trade balance} = -\$698,802$$

The values of U.S. exports and imports both increased during 2008, and the trade balance declined slightly (0.47 percent).

Canada and China are, respectively, the largest and second largest trading partners of the United States. The U.S. dollar appreciated against the Canadian dollar, which means that Canadian imports are more affordable for U.S. consumers, and U.S. exports are more expensive for Canadian consumers. The U.S. dollar depreciated against the Chinese yuan, which means that Chinese exports are more expensive for U.S. consumers, and U.S. exports are more affordable for Chinese consumers. Since there was only a very slight change in the U.S. trade balance in 2008, the increase in total exports (possibly from the dollar depreciating against some countries), was approximately equally offset by the increase in total imports (possibly from the dollar appreciating against some currencies).

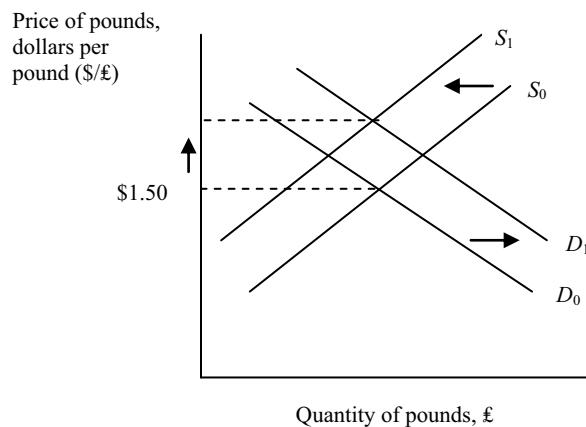
8. (a) If $12 \text{ MXN} = \$1$, then $1 \text{ MXN} = (1 / 12) = \0.0833 .
If $215 \text{ HUF} = \$1$, then $1 \text{ HUF} = (1 / 215) = \0.0047 .
- (b) Is $12 \text{ MXN} = \$1$ and if $215 \text{ HUF} = \$1$, then 12 MXN should equal 215 HUF , so $1 \text{ MXN} = (215 / 12) = 17.9167 \text{ HUF}$, and $1 \text{ HUF} = (12 / 215) = 0.0558 \text{ MXN}$.
- (c) If the exchange rate between the peso and the dollar changes to $9 \text{ MXN} = \$1$, it takes fewer pesos to purchase \$1, so the peso has appreciated against the dollar and the dollar has depreciated against the peso. If the exchange rate between the forint and the dollar changes to $240 \text{ HUF} = \$1$, it takes more forint to purchase \$1, so the forint has depreciated against the dollar and the dollar has appreciated against the peso. The new exchange rate between the peso and the forint should be $9 \text{ MXN} = 240 \text{ HUF}$, so $1 \text{ MXN} = (240 / 9) = 26.6667 \text{ HUF}$. It takes more forint to purchase 1 peso, so the forint has depreciated against the peso and the peso has appreciated against the forint.

9. (a)

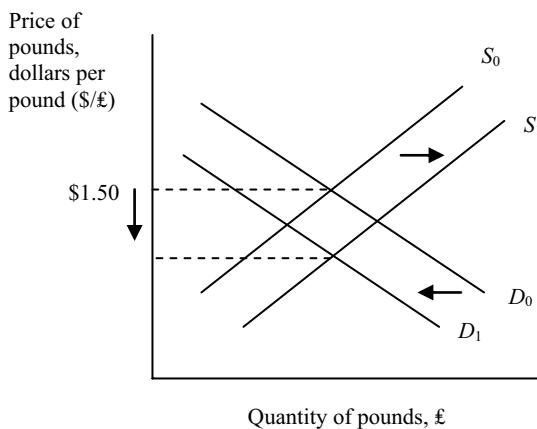


- (b) If the Bank of England implements a contractionary monetary policy, interest rates in Great Britain will increase. Then increase in interest rates will increase the desire to invest in financial assets in Great Britain relative to the United States. The demand for pounds will increase, shifting the demand curve to the right. The British also shift out of dollar assets, choosing to invest at home to get the higher rate of interest, which causes the supply of pounds to decrease, shifting the

supply curve to the left. These changes will cause the exchange rate for the dollar to fall. One dollar now buys fewer pounds (and one pound now buys more dollars), so the dollar has depreciated relative to the pound and the pound has appreciated relative to the dollar.



- (c) If the U.S. government implements an expansionary fiscal policy, interest rates in the United States will increase. Then increase in interest rates will increase the desire to invest in financial assets in the United States relative to Great Britain. The demand for pounds will decrease, shifting the demand curve to the left, and the supply of pounds will increase as the British invest more in the United States, shifting the supply curve to the right. This will cause the exchange rate for the dollar to rise. One dollar now buys more pounds (and one pound now buys fewer dollars), so the dollar has appreciated relative to the pound and the pound has depreciated relative to the dollar.



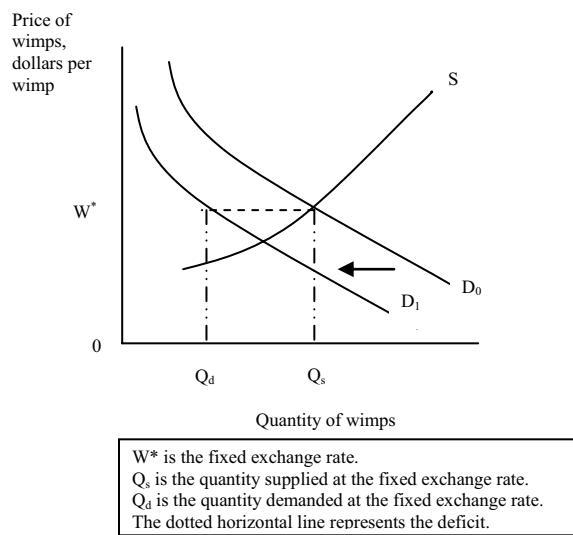
10. From January 1, 2009 to January 1, 2010, the U.S. dollar depreciated in value relative to the Canadian dollar. (The depreciation was more than 16 percent.) This would have a negative effect on U.S. consumers because imports from Canada would cost more. The depreciation of the dollar would also have a negative effect on U.S. firms that import parts for its products from Canada. U.S. firms that export to Canada would benefit from the dollar's depreciation because the products they export will cost less for Canadian customers.
11. There does not appear to be a consistent relationship between the two. The trade deficit increased annually in the years 2002-2006, and decreased in 2007-2009, rose again in 2010-2011, and fell in

2012. Oil prices increased annually in the years 2003-2008, 2010-2011, and 2013, and they decreased in 2002, 2009, and 2012. Many other factors can influence the trade balance, including exchange rates, productivity, economic growth, and foreign national income. The United States is the largest oil importer in the world, and since 2002, oil imports have grown from approximately one-fourth to one-half of the U.S. trade deficit, so although no consistent relationship seems apparent for the past 10 years, that could change if oil imports continue to grow as a percentage of the trade deficit.

12. Answers will vary based on current data.
13. When the 17 EU countries adopted the euro as their currency, they gave up being able to implement their own independent monetary policy. If a country's central bank lowers the interest rate, the country's currency would depreciate relative to the currencies of countries where interest rates did not change. Since the 17 EU nations using the euro share a common currency, they must also "share" a common interest rate, which is the benchmark rate set by the ECB. (It would be impossible for euros being used in Greece to depreciate in value compared to euros being used in Germany.)

CHAPTER 20 APPENDIX A

1. (a) The graph below shows the market for Wimps: When exports suddenly drop the demand for Wimps shifts to the left, U.S. citizens are buying less from Atlantis. At the pegged exchange rate, Atlantis is in balance of payments deficit ...they are buying more from the United States than the United States is buying from them.



- (b) To maintain the peg Atlantis must buy Wimps . . . supply dollars at the old exchange rate. In the longer run, it is obligated to do what it can to correct the deficit . . . for example, contractionary monetary policy would slow inflation and raise interest rates both of which will attract demand for the Wimp (export demand and demand for securities) back to Atlantis (shift the demand for wimps to the right and the supply to the left).
- (c) If originally Atlantis was operating at full employment, unemployment would rise: Exports (X) is part of AE! $C + I + G + (X - M) < Y$ inventories rise and Y falls causing unemployment to rise.
- (d) Expansionary monetary policy would imply lower interest rates in Atlantis. That would reduce the demand for wimps and increase the supply of wimps as citizens of both countries would buy bonds in the U.S. to get higher interest rates. But that would make the balance of payments deficit worse. Atlantis would have to dig deeper into its basket of reserve assets to maintain the peg.

With fiscal policy, rates might even rise if the Fed is not fully accommodative. The tax cut would raise incomes which would increase imports and also make the current account deficit worse.

- (e) If the Wimp was floating, the exchange rate (price of wimps) would fall immediately. As it fell, the quantity of exports rise in Atlantis, and the quantity of imports would fall, restoring balance. Atlantis would not have to sell reserve assets (dollars) to maintain the peg, nor would it have to use contractionary monetary policy although it might want to. The GDP decline would be offset by the increase in X due to the exchange rate adjustment.

CHAPTER 21

1. Answers will vary but should include the direct costs of health care, the loss of workforce, declining productivity, shortage of saving and capital investment, uncertainty, etc.
2. Answers will vary. There is no “right answer” to this problem, only trade-offs. Capital accumulation requires saving (reduced consumption); and when most citizens are earning subsistence wages, reducing consumption is not an option for many.
3. (a) Capital increases the productivity of labor. As labor becomes more productive, a given-sized labor force can produce more output, and output per capita rises.
 (b) In a market economy, individual household saving decisions determine the pool of aggregate saving. Aggregate saving, in turn, is the amount made available for firms to purchase capital. Saving is matched to investment projects in financial markets, where the interest rate adjusts to equate total desired investment with total desired saving.
 (c) In developing countries, a greater fraction of output is needed just to ensure the current population’s survival. An increase in investment—which requires a decrease in current consumption—cuts dangerously close to this survival level of consumption, and at a minimum causes more discomfort than it would in developed countries.
 (d) Answers will vary. Market-oriented economists would stress increased incentives for private investment (political stability, lower government budget deficit, and perhaps loans from abroad). Planning-oriented economists might stress government-directed projects, taxes on luxury goods, and capital controls designed to prevent capital flight to developed countries.
4. The World Bank’s Multilateral Debt Relief Initiative (MDRI) called for 100 percent cancellation of International Development Association (IDA), African Development Fund (AfDF)*, and International Monetary Fund (IMF) debt for countries that reach the HPIC (heavily indebted poor country) completion point. The debt cancellation, scheduled for July 1, 2006, was to take place at the start of the 2007 fiscal year. The debt relief listed in the table is for the 18 initial countries that have met the HPIC completion point as established by the MDRI. As other poor countries achieve this status, they will become eligible for debt cancellation. The debt relief listed in the table is for fiscal year 2007–2008. The entire debt relief initiative runs through 2044.

| Country | Debt Relief (SDR, millions) | Debt Relief (US\$, millions) |
|--------------|--------------------------------|---------------------------------|
| Benin | 18 | 26.59 |
| Bolivia | 30 | 44.32 |
| Burkina Faso | 16 | 23.64 |
| Ethiopia | 18 | 26.59 |
| Ghana | 67 | 98.98 |
| Guyana | 4 | 5.91 |
| Honduras | 20 | 29.55 |
| Madagascar | 42 | 62.05 |
| Mali | 30 | 44.32 |

| Country | Debt Relief (SDR, millions) | Debt Relief (US\$, millions) |
|----------------|--|---|
| Mauritania | 11 | 16.25 |
| Mozambique | 22 | 32.50 |
| Nicaragua | 8 | 11.82 |
| Niger | 11 | 16.25 |
| Rwanda | 4 | 5.91 |
| Senegal | 41 | 60.57 |
| Tanzania | 60 | 88.64 |
| Uganda | 62 | 91.60 |
| Zambia | 25 | 36.93 |

Information in table is from www.worldbank.org. Debt relief is listed in SDR, Special Drawing Rights, (Millions). The World Bank conversion rate used in this table is 1 SDR = 1.47738 US\$. The data reflect projected debt relief for fiscal year 2007–2008.

*The African Development Bank (AfDB) carries out the AfDF's operations.

The expected benefits are numerous, some of which are detailed in the following statement by World Bank President Paul Wolfowitz:

“Additional debt relief will help these countries channel resources into programs that directly help the people who need it most—the poor who need and deserve a better education, better health services, greater access to clean water, and greater opportunities to escape poverty.”

5. It is true that poor countries must accumulate capital in order to grow, but many poor countries do indeed have little or no extra output available for saving. One problem is that the available saving goes abroad (capital flight). Increased political stability and a more stable investment climate can help stimulate investment in the domestic economy. In addition, poor countries can get loans and other assistance from developed countries to help them accumulate capital.
6. Many recent famines have resulted from government policies. In some cases, keeping farm prices artificially low has led to a decrease in production. In other cases, a failure to invest in a distributional infrastructure has led to famine in outlying rural areas.
7. When property is collectively owned by the village, the farmers who manage the land have less incentive to operate efficiently since profits are distributed to the public. With private ownership, the owners reap all the rewards of their successes or suffer the consequences of their failures. Private ownership, therefore, provides a strong incentive for efficient operation, innovation, and hard work. Private ownership would tend to generate more optimal land management, use, and allocation than would collective, public ownership.
8. With peer lending, the borrowers and lenders know a lot about each other's character. As is described in the text example of Muhammad Yunus and Bangladesh, community pressure to repay loans becomes a substitute for collateral, and villagers have an incentive to only join forces with other reliable borrowers. Knowing the reliability of borrowers and lenders helps to reduce or even eliminate the problem of adverse selection.
9. Answers will vary. A key is that cell phones connect people to the web and an enormous amount of data and knowledge. They don't require massive investment. Just think of all that you do with your phone...and all the things that businesses can do at a very low cost.
10. One of the attractions of a well-functioning market economy is that the most efficient firms survive. Typically, over time the rigors of the marketplace weed out those firms with high costs and/or low

quality. Bribes and/or the use of influence rearranges that allocation. The consequence is a deadweight loss associated with the fact that firms with higher costs will at times be involved in transactions. The fact that corruption often leads to the “wrong” firms surviving is one of its extra economic costs. In the Fisman study, the fall in stock price associated with Suharto’s illness provides us with a measure of just how much profitable business those “wrong” firms were getting as a result of corruption.

11. There are arguments on both sides. Firms that acquire market power tend to overprice and underproduce relative to the efficient price and output levels. Market power, it is argued, stifles both price and quality competition. Microsoft was charged with anticompetitive behavior by packaging its web browser with its dominant operating system, Windows. After knocking out the competition, they can raise prices without competitive pressure. But what about foreign competition? Isn’t it a bigger, tougher game when the competition is a foreign firm receiving government support? The real problem is that the government is likely to be lousy at picking winners. What makes us think that the government can pick winners better than the market can? Even recent Japanese attempts to subsidize a winner (fifth-generation computers) have failed.
 12. Children in developing countries may be viewed as an investment good. Children are needed to help contribute to the current economic well-being of the family by providing labor services. Parents also rely on children to help support them when they can no longer support themselves.
 13. The increase in wealth should help increase saving, which would help in raising the level of investment, allowing for the capital stock to grow. Increases in health should also occur, as should improvements in education. These should all be beneficial for economic development and growth in these rural areas.
 14. (a) If there is insufficient capital formation, then capital stock does not grow and output in the future will be reduced. A lack of capital also reduces the productivity of labor.
 (b) A shortage of human resources may be a barrier to growth because this reduces productivity. Also, foreign companies will not invest in countries that do not have a trained labor force.
 (c) A lack of social overhead capital makes countries less able to attract private investment. A lack of social overhead capital also increases the difficulty of transporting food throughout the country, which worsens the food shortage.
 15. Rapid population growth stretches a nation's resources to their limits. As a result, when a nation's population is growing too quickly, its ability to save and invest is greatly hindered. It is through savings and investment (including human capital investment) that a nation improves the ability of labor to be productive. In order for labor to be productive, there needs to be a certain level of capital investment to aid and ensure productivity. Thus, when savings and investment are reduced due to rapid population growth, the ability of labor to improve productivity is also reduced.
- One way that population growth can be beneficial is that it can help to finance national pension programs, which often are derived by taxing current workers to provide benefits for the retired. Another benefit is that it can allow companies to market their products to a larger market and permit economies of scale in the production and distribution of goods which wouldn’t be possible with a smaller population. Both of these benefits, though, are more likely to occur in developed nations than in developing nations.
16. Answers on recommendations will vary. The primary policy recommendation for Ishtar should be to ensure political stability. Without government and political stability, Ishtar will find it extremely difficult to attract investment because of the risks associated with an unstable government.