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EDITION



Macroeconomics

Policy and Practice

SECOND EDITION



Frederic S. Mishkin

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0.3 The Economic Problem That Every Society Must Solve	Practice	Quiz Me	0 of 1 MP
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Homework: Assignment 3

Assignment Score: 0% (0 of 6 pts)

Chapter Problem 6

0 of 6 complete

OPEC deadlocked on oil production hike

Oil prices breached the \$100-a-barrel mark Wednesday after OPEC said could not reach an agreement about raising crude production.

Source: CNN Money, June 8, 2011

Consider the market for oil when oil prices "breached the \$100-a-barrel mark".

Draw a demand curve and a supply curve consistent with this formation. Label both curves.

Draw a point at the equilibrium price and equilibrium quantity. Label it 1.

Now suppose that OPEC members agree to increase production.

Draw a curve to show the increase. Label it.

Draw a point at the new equilibrium. Label it 2.

Initially the price of a barrel of oil is greater than \$100.

When OPEC members agree to increase production, the supply of oil increases and the supply curve shifts rightward.

The equilibrium price of a barrel of oil falls and the equilibrium quantity increases.

Click to select your answer(s), then click Check Answer.

All parts showing

Done

Clear All

Check Answer

Save

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Up-to-date macro data is a great way to engage in and understand the usefulness of macro variables and their impact on the economy. Real-Time Data Analysis exercises communicate directly with the Federal Reserve Bank of St. Louis's FRED® site, so every time FRED posts new data, students see new data.

End-of-chapter exercises accompanied by the Real-Time Data Analysis icon  include Real-Time Data versions in **MyEconLab**.

Select in-text figures labeled **MyEconLab** Real-Time Data update in the electronic version of the text using FRED data.

Work: Current News

Assignment Score: 0% (0 of 4 pts)

RTDA+: The Money Supply 1 of 4 complete

Real-Time Data Analysis Exercise

Click the following link to view M1 and Components data from FRED*. Then use that data to answer the following questions. 

The following series IDs correspond to M1 and its components, which are measured weekly and seasonally adjusted.

or each series ID, enter the value for the most recent observation October 07, 2013: (Enter your responses exactly as they appear in FRED.)

Series ID	Value
M1	\$2,551.8 billion.
CURRENCY	\$1,147.5 billion.
TCD	\$1,400.8 billion.
WTCSL	\$3.6 billion.

Based on the data above, is 54.89 percent of M1.

Click to select your answer(s), then click Check Answer.

1 part remaining

Clear All | Check Answer | Save

U.S. M1 Money Supply

Billions of dollars

Dec-12 Feb-13 Apr-13 Jun-13 Aug-13 Oct-13

Monthly data Weekly data

*Real-time data provided by Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis.



Current News Exercises

Posted weekly, we find the latest microeconomic and macroeconomic news stories, post them, and write auto-graded multi-part exercises that illustrate the economic way of thinking about the news.

Homework: Current News

Assignment Score: 0% (0 of 2 pts)

*10/1/13: Government spending Ex 1 of 2 complete

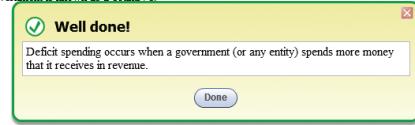
Government Furloughs Begin Due to Government Impasse

Source: Tiron, Roxana, Kathleen Hunter & Michael C. Bender. "Government Furloughs Begin Due to Government Impasse." Bloomberg.com, posted 1/2013.

Please carefully read the article, and then answer the following questions.

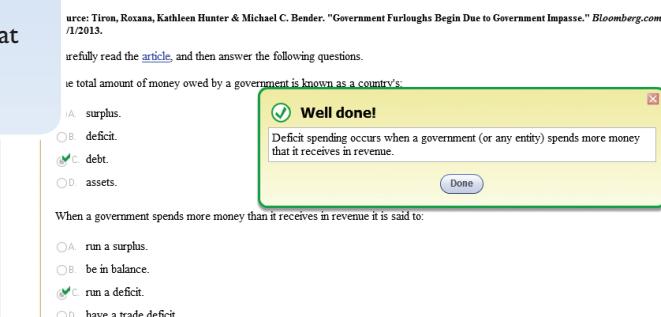
What total amount of money owed by a government is known as a country's:

A. surplus.
 B. deficit.
 C. debt.
 D. assets.


Well done!
Deficit spending occurs when a government (or any entity) spends more money than it receives in revenue.

When a government spends more money than it receives in revenue it is said to:

A. run a surplus.
 B. be in balance.
 C. run a deficit.
 D. have a trade deficit.



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INSTRUCTIONS EXPERIMENT RESULTS

Market for Cranberries Round 1 of 4

KEY:  Free Market

Click Play to start this round.

WTP: \$12.00 You are a Buyer

Your Bid: \$

CURRENT BIDS AND ASKS

Your Bid: \$11.50 Highest Bid: \$11.50 Lowest Ask: \$11.50

TOTAL RESULTS

Round	Role	WTP	Cost	Bid	Ask	Price	Gain
1	Buyer	\$12.00	\$11.50	\$11.50	\$11.50	\$0.50	

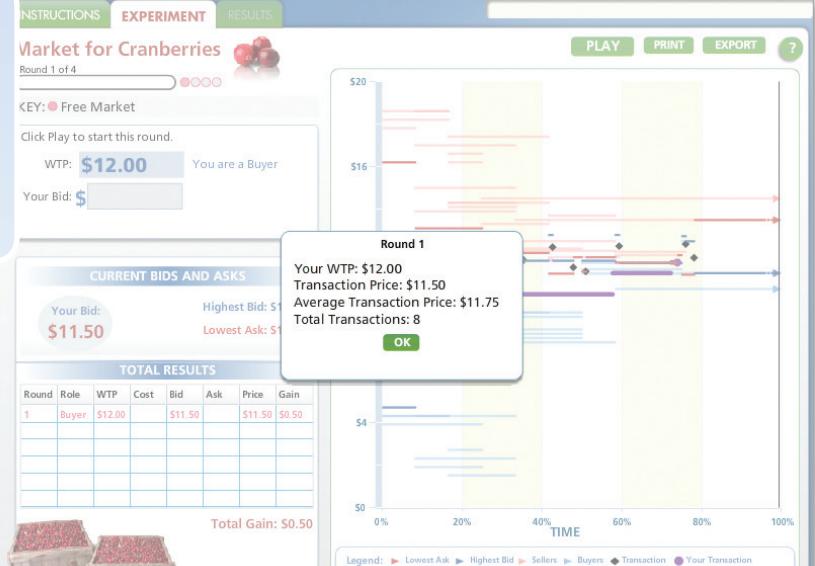
Total Gain: \$0.50

Round 1

Your WTP: \$12.00
Transaction Price: \$11.50
Average Transaction Price: \$11.75
Total Transactions: 8

OK

Legend: ▶ Lowest Ask ▶ Highest Bid ▶ Sellers ▶ Buyers ◆ Transaction ● Your Transaction



2nd Edition

Macroeconomics

Policy and Practice

Global Edition

Frederic S. Mishkin

Columbia University

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	APPLICATIONS apply the analysis in each chapter to explain important real-world situations.	POLICY AND PRACTICE cases explore specific examples of policies and how they were executed.	MACROECONOMICS IN THE NEWS boxes introduce relevant news articles and data from the daily press and explain how to read them.
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Chapter 9 The <i>IS</i> Curve	<ul style="list-style-type: none"> • The Vietnam War Buildup, 1964–1969 	<ul style="list-style-type: none"> • The Fiscal Stimulus Package of 2009 	
Chapter 10 Monetary Policy and Aggregate Demand		<ul style="list-style-type: none"> • Movements Along the <i>MP</i> Curve: The Rise in the Federal Funds Rate Target, 2004–2006 • Shifts in the <i>MP</i> Curve: Autonomous Monetary Easing at the Onset of the 2007–2009 Financial Crisis 	
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To My Mom

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FINANCIAL CRISES IN EMERGING MARKET ECONOMIES

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APPLICATION: Crisis in South Korea, 1997–1998

Financial Liberalization/Globalization Mismanagement

Perversion of the Financial Liberalization/Globalization Process: Chaebols and the South Korean Crisis

Stock Market Decline and Failure of Firms Increase Uncertainty

Aggregate Selection and Moral Hazard Problems Worsen, and Aggregate Demand Falls

Currency Crisis Ensues

Final Stage: Currency Crisis Triggers Full-Fledged Financial Crisis

Recovery Commences

APPLICATION: The Argentine Financial Crisis, 2001–2002

Severe Fiscal Imbalances

Adverse Selection and Moral Hazard Problems Worsen

Bank Panic Begins

Currency Crisis Ensues

Currency Crisis Triggers Full-Fledged Financial Crisis

Recovery Begins

When an Advanced Economy Is Like an Emerging Market Economy:

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POLICY AND PRACTICE: Preventing Emerging Market Financial Crises

Beef Up Prudential Regulation and Supervision of Banks

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Preface

There has never been a more exciting time to teach macroeconomics. The recent worldwide financial crisis cast a spotlight on macroeconomics and prompted instructors worldwide to rethink their teaching of the course. Students today enter the intermediate macroeconomics course knowing the relevance of the business cycle—it impacts what is happening in their world *right now*, in the aftermath of the most severe recession since World War II. The silver lining of these trying economic times lies in our ability to draw on this familiarity and the rich tapestry of recent economic events to enliven macroeconomic theory.

Macroeconomics: Policy and Practice, Second Edition, focuses on the policy issues currently debated by the media and the public at large. Building on my expertise in macroeconomic policy making at the Federal Reserve, I highlight the techniques used by policy makers in practice. I ground this applied approach to intermediate macroeconomics with a careful, step-by-step development of all models.



What's New in the Second Edition

In addition to the expected updating of data through 2013 whenever possible, major new material has been added in every part of the text.

Enhanced Pearson e-text with Mini-Lectures: A New Way of Learning MyEconLab

The Enhanced Pearson e-text in MyEconLab for the second edition is available online from MyEconLab textbook resources. Instructors and students can highlight the text, bookmark, search the glossary, and take notes. More importantly, the e-text provides a new way of learning that is particularly useful to today's students. Not only are students able to read the material in the textbook but, by a simple click on an icon, they are able to watch over 100 mini-lectures presented by the author—one for every analytic graph in the text. These mini-lectures build each graph step-by-step and explain the intuition necessary to fully understand the theory behind the graph. The mini-lectures are an invaluable study tool for students who typically learn better when they see and hear economic analysis rather than read it.



Real-Time Data

A high percentage of the in-text data is labeled *MyEconLab Real-Time Data*. This label indicates that students can view the latest data using the e-text to access the Federal Reserve Bank of St. Louis's FRED database. In addition, each chapter now has a whole new class of problems that make use of real-time data analysis. These problems, marked with a red sound icon, ask students to download data from the Federal Reserve Bank of St. Louis's FRED website and then use that data to answer questions about current issues in macroeconomics.

In MyEconLab, these easy-to-assign and automatically-graded Real-Time Data Analysis exercises are linked directly to the FRED site, so that every time FRED posts new data, students can see it. As a result, Real-Time Data Analysis exercises offer a no-fuss solution for instructors who want to make the most recent data a central part of their macroeconomics course. These exercises will help students understand macroeconomics better and enable them to see the real-world relevance of their study of macroeconomics.

Nonconventional Monetary Policy and the Zero Lower Bound

In recent years, monetary policy makers have entered a brave new world in which they have had to resort to nonconventional monetary policy because the policy interest rate, the federal funds rate in the United States, has hit a floor of zero, the so-called “zero lower bound.” The policy rate cannot be driven lower than this bound, making conventional monetary policy infeasible. Nonconventional monetary policy at the zero lower bound, such as quantitative easing, is very controversial and stimulates a lot of interest among students. The second edition contains extensive discussion of this topic, with the following new material:

- A new Application, “Quantitative Easing and the Money Supply, 2007–2013” (Chapter 5)
- A new section on monetary policy at the zero lower bound, which uses the dynamic aggregate demand and aggregate supply model to explain how the zero lower bound affects the conduct of monetary policy (Chapter 13)
- A new Policy and Practice case, “Abenomics and the Shift in Japanese Monetary Policy in 2013” (Chapter 13)
- A new Policy and Practice case, “Nonconventional Monetary Policy and Quantitative Easing During the Global Financial Crisis” (Chapter 15)
- A new section on fiscal multipliers at the zero lower bound that explains why fiscal multipliers are likely to be larger at the zero lower bound (Chapter 16)
- A new section on nominal GDP targeting (Chapter 21)

New Material on Business Cycle Analysis

This edition has substantial new material on business cycle analysis, to make it easier for students to understand the dynamic aggregate demand and aggregate supply model. This new material includes:

- A new section on the alternative view of the business cycle, which distinguishes the long-run trend from deviations in this trend and introduces the concept of the output gap (Chapter 8)
- New material that integrates the concept of financial frictions into the dynamic aggregate demand and aggregate supply model at the outset, by naming financial frictions as an additional factor that shifts the *IS* curve (Chapter 10) and the *AD* curve (Chapter 12)
- A new section that clarifies the difference between movements along the *MP* curve and shifts in the *MP* curve, with two new Policy and Practice cases to illustrate the difference: “Movement Along the *MP* Curve: The Rise in the Federal Funds Rate Target, 2004–2006” and “Shifts in the *MP* Curve:

Autonomous Monetary Easing at the Onset of the 2007–2009 Financial Crisis” (Chapter 10)

- A new box, “What Does Autonomous Mean?” (Chapter 12)
- A new box, “The Relationship of the Phillips Curve and the Short-Run Aggregate Supply Curve” (Chapter 11)
- A new box, “The Difference Between the Taylor Rule and the Taylor Principle” (Chapter 13)

The Euro Crisis

The Euro crisis has been a continuing drama since 2010, and so this edition includes the following new material.

- A new section on sovereign debt crises that explains the dynamics of these crises (Chapter 16)
- A new Policy and Practice case, “The European Sovereign Debt Crisis” (Chapter 16)
- A new Policy and Practice case, “The Debate Over Fiscal Austerity in Europe” (Chapter 16)
- A new Policy and Practice case, “Will the Euro Survive?” (Chapter 17)

Economic Growth

To better motivate the discussion of the Solow model, Chapter 6 now begins with an introductory section that examines economic growth around the world. Also, Chapter 6 has been reorganized so that growth accounting is discussed at the end of the chapter, in order to better motivate Chapter 7 on the drivers of economic growth. New figures have been added to Chapter 6 to show how output per worker changes over time when there is a change in the saving rate, population growth, or technology.

Links Between the Microeconomic Foundations of Macroeconomics and the Dynamic Aggregate Demand/Aggregate Supply Model

To illustrate the links between the microeconomic material in Part 7 of the text and the dynamic aggregate demand/aggregate supply model, I have added the following new material:

- A new Application, “Consumer Confidence and the Business Cycle” (Chapter 18)
- A new Application, “Stock Market Crashes and Recessions” (Chapter 19)
- A new section on the role of the natural rate of unemployment in the AD/AS model (Chapter 20)



Hallmarks

The five distinguishing characteristics of *Macroeconomics: Policy and Practice*, Second Edition, are: (1) its emphasis on policy and practice, (2) its dynamic approach to macroeconomics, (3) its focus on the interaction between finance and macroeconomics, (4) its focus on economic growth, and (5) its international perspective.

Policy And Practice

This book emphasizes policy and practice in macroeconomics by providing theoretical frameworks that are geared to discussing the most exciting, current, major policy debates in the macroeconomics field. The best way to teach macroeconomics is by continually exposing the student to cases and applications so that he or she *really* understands the underlying theory.

Over 30 in-chapter Applications show students how to apply economic theory to real-world examples. These Applications include discussions of the Great Inflation from 1965 to 1982, the 2007–2009 financial crisis, the impact of oil prices on real wages and the stock market, why income inequality has been growing over time, and why some countries are rich and others are poor. In addition, over 30 Policy and Practice cases explore specific examples of actual policies and how they were executed. These cases include such topics as how the Federal Reserve uses the Taylor rule, the use of nonconventional monetary policy during the 2007–2009 financial crisis, the political business cycle and Richard Nixon, the question of whether the Euro will survive, and China’s one-child policy. These Applications and Policy and Practice cases provide critically important perspectives on current events, domestic and global issues, and historical episodes.

A Dynamic Approach To Macroeconomics

Analyzing today’s hot-button policy issues requires approaching macroeconomic theory using the models that researchers and policy makers employ. The central modeling element in *Macroeconomics: Policy and Practice*, Second Edition, is a powerful, dynamic aggregate demand and supply (*AD/AS*) model that highlights the interaction of inflation and economic activity. In this model, inflation (as opposed to the price level) is plotted on the vertical axis.

Given the vital importance of this model, I build it step-by-step across Chapters 9–13:

- Chapter 9 develops the first building block of the aggregate demand and supply model, the *IS* curve.
- Chapter 10 describes how monetary policy makers set real interest rates with the *monetary policy (MP) curve*, which describes the relationship between inflation and real interest rates. The chapter then uses the *MP* curve and the *IS* curve to derive the aggregate demand curve.
- Chapter 11 uses the Phillips curve to derive the aggregate supply curve.
- Chapter 12 assembles the building blocks from preceding chapters to develop the aggregate demand and supply model, and then puts this model to immediate use with Applications that analyze business cycle fluctuations in the United States and abroad.
- Chapter 13 shifts perspective by showing how the aggregate demand and supply model can help us understand the issues policy makers confront when they attempt to stabilize inflation and output fluctuations.

The aggregate demand and supply model, with inflation on the vertical axis, therefore serves as the sole engine for the analysis of short-run fluctuations. Students benefit from this exclusive focus and the careful development of a single model: Reliance on the dynamic *AD/AS* model continually reinforces their understanding of the model and provides a unified framework for all analysis.

WHY THE DYNAMIC AD/AS FRAMEWORK? The dynamic *AD/AS* model includes many of the essential elements of the *ISLM* model. It develops the *IS* curve (Chapter 9) and illustrates the determination of interest rates in the money market through the interaction of money demand and supply (Chapter 10). However, the dynamic *AD/AS* model has several very important advantages over *ISLM* and traditional aggregate demand/aggregate supply frameworks:

- The dynamic *AD/AS* framework focuses on the interaction between *inflation* and output, which is exactly what the media and policy makers focus on. In contrast, traditional aggregate demand/aggregate supply analysis focuses on the interaction between the *price level* and output.
- The dynamic *AD/AS* framework characterizes monetary policy easing or tightening as a change in the *interest rate*, which is exactly the way central banks conduct monetary policy. In contrast, the *ISLM* and traditional aggregate demand/aggregate supply model frameworks characterize monetary policy as a change in the *money supply*. No central bank in the world today conducts monetary policy in this way.
- The dynamic *AD/AS* framework is consistent with modern macroeconomic analysis as it is treated in the academic literature.
- The dynamic *AD/AS* framework allows for a simple analysis of current monetary policy issues, such as nonconventional monetary policy and the zero-lower-bound problem. In addition, it allows for a modern treatment of such topical policy issues as the recent shift in monetary policy in Japan, referred to as Abenomics, and why fiscal multipliers have become larger in recent years.
- Finally, although the *AD/AS* framework is a change from the way macroeconomics has been taught in the past, it actually makes it easier for students to learn because they have to master only one model rather than three, as was the case with more traditional approaches that include separate developments of the *ISLM* model, traditional aggregate demand/aggregate supply, and the Phillips curve.

The Interaction of Finance and Macroeconomics

The financial crisis that hit the world economy from 2007 to 2009 made abundantly clear the interaction between finance and macroeconomics. Two full chapters on finance and macroeconomics provide a coherent approach to key topics such as financial system dynamics and asymmetric information, and demonstrate their relevance in macroeconomic analysis. Chapter 14, “The Financial System and Economic Growth,” shows how a well-functioning financial system promotes economic growth. This chapter develops the tools that are then used in Chapter 15, “Financial Crises and the Economy,” to examine how disruptions to the financial system affect aggregate demand and the economy, with a particular emphasis on the root causes of, effects of, and policy responses to the financial crisis of 2007–2009. An additional Web chapter, “Financial Crises in Emerging Market Economies,” expands the analysis of economic fluctuations to economies that have recently opened up their markets to the outside world.

Focus On Economic Growth

The explosion of research on economic growth in recent years is an exciting development in the macroeconomics field, with direct relevance to the question of why some countries suffer slow economic growth and remain poor, while others enjoy rapid economic growth and prosper. I discuss the Solow model in detail in Chapter 6, and present endogenous growth theory and the importance of institutions to economic growth in Chapter 7. As mentioned previously, Chapter 14 includes additional material on economic growth.

An International Perspective

Topical coverage and applications integrate an international dimension throughout *Macroeconomics: Policy and Practice*, Second Edition. For example, Chapter 4's analysis of the interaction of saving and investment discusses open and closed economies together, rather than in separate chapters. International trade and the impact of net exports on aggregate demand are discussed immediately as part of the AD/AS model in Part 4, as opposed to in a separate chapter, and the textbook applies the aggregate demand and supply model to analyze the impact of the 2007–2009 financial crisis in the United Kingdom, Ireland, and China. The Web chapter on emerging market economies provides further international perspective.



A Flexible Structure

Macroeconomics: Policy and Practice, Second Edition, offers a highly flexible structure with many different paths that instructors can take to tailor the book to their course needs. Most instructors will begin by assigning Chapters 1–4. For a long-run emphasis, instructors can then assign Chapters 5–7. Instructors wishing to cover the short run first can instead proceed directly to Part 4.

The core chapters that most instructors will teach in their courses, Chapters 1–13, make up the first four parts of the book. Instructors can assign subsequent chapters as they choose or skip them entirely, allowing them to focus on the particular areas of macroeconomics that match their course goals. Suggested outlines for semester-long courses with varying emphases follow. (Quarter-long courses would typically use three or four fewer of the optional chapters.)

- *Course Starting with Long-Run Analysis:* Chapters 1–13, and up to six of the remaining eleven chapters.
- *Course Starting with Micro Foundations and Long-Run Analysis:* Chapters 1–3, 18–20, 4–13, and up to three of the remaining eight chapters.
- *Course Starting with Short-Run Analysis:* Chapters 1–5, 8–13, 6–7, and up to six of the remaining eleven chapters.
- *Course Starting with Micro Foundations and Short-Run Analysis:* Chapters 1–3, 18–20, 4–5, 8–13, 6–7, and up to three of the remaining eight chapters.
- *Course Focusing on the Micro Foundations of Modern Business Cycle Analysis:* Chapters 1–3, 18–20, 4–5, 8–13, 21–22, and up to two of the remaining ten chapters.
- *Course with International Focus:* Chapters 1–13, 17, Web chapter on emerging market economies, and up to four of the remaining nine chapters.
- *Course with Finance Focus:* Chapters 1–15, and up to four of the remaining seven chapters.

Interest-Generating Features

Motivating the study of macroeconomics means bringing it to life through a wide variety of pedagogical features.

Previews at the beginning of each chapter tell students where the chapter is heading, why specific topics are important, and how they relate to other topics in the book.

Applications apply the analysis in each chapter to explain important real-world situations.

Policy and Practice cases explore specific examples of actual policies and how they were executed.

Macroeconomics in the News boxes introduce students to relevant news articles and data that are reported daily in the press, and explain how to read them.

Boxes highlight interesting material, including historical episodes and recent events.

Summary tables are useful study aids that recap key points.

Key statements are important points set in boldface italic type so that the student can easily find them for later reference.

Graphs with detailed captions demonstrate the interrelationship of the variables and are central to the illustrations of policy analysis. Innovative color-blended arrows guide students' analysis of the meanings of shifting curves.

Mini-Lectures, presented by the author for all of the analytic graphs in the text, are accessible through the e-text, which is available online from MyEconLab textbook resources. The mini-lectures provide a step-by-step discussion of the analysis.

A **Summary** at the end of each chapter lists the main points covered.

Key terms, which are important words or phrases, are boldfaced when they are defined for the first time and listed by page number at the end of each chapter.

End-of-chapter Review Questions, Problems, and Real-Time Data Analysis Problems guide students' mastery of the material, with a particular emphasis on real-world applications.

Supplemental Resources Simplify Teaching and Learning

A variety of comprehensive supplemental resources for professors and students accompany this book.

MyEconLab is the premier online assessment and tutorial system, pairing rich online content with innovative learning tools. The MyEconLab course for *Macroeconomics: Policy and Practice*, Second Edition, includes all the review questions and problems from the textbook. As a special feature, all Policy and Practice cases and Applications are also offered in MyEconLab, along with three to four assessment questions to test students' understanding of the key concepts. Look for these exercises within each chapter in a separate section called "Applications."

STUDENTS AND MYECONLAB The MyEconLab online homework and tutorial system puts students in control of their own learning through a suite of study and practice tools correlated with the online, interactive version of the textbook and other media tools. Within MyEconLab's structured environment, students practice what they learn, test their understanding, and then pursue a study plan that MyEconLab generates for them based on their performance on practice tests.

INSTRUCTORS AND MYECONLAB MyEconLab provides flexible tools that allow instructors to easily and effectively customize online course materials to suit their needs. Instructors can create and assign tests, quizzes, or homework assignments. MyEconLab saves time by automatically grading questions and tracking results in an online grade book. After registering for MyEconLab, instructors also have access to downloadable supplements.

ADDITIONAL MYECONLAB FEATURES

- **Weekly News Updates.** Each week, a relevant and current article from a newspaper or journal is posted, along with discussion questions.

For more information and to register, please visit www.myeconlab.com.

ADDITIONAL INSTRUCTOR RESOURCES The Instructor's Manual, an online supplement prepared by Martin Pereyra of the University of Missouri and the author, offers chapter overviews, outlines and objectives, and answers to the end-of-chapter questions and problems including solutions to the Data Analysis problems by Aaron Jackson of Bentley University. Additionally, the Instructor's Manual includes resources for each chapter that tie into the Applications and Policy and Practice features of the chapter, including discussion questions that professors can use in class with students, references to interesting outside materials such as newspaper and journal articles and macroeconomic data, and references to websites containing related real-world examples. The Instructor's Manual is available at www.pearsonglobaleditions.com/mishkin in Microsoft Word and PDF formats.

The PowerPoint Presentations, prepared by Jim Lee of Texas A&M University–Corpus Christi, provide all figures and tables from the text, as well as brief lecture notes that follow the structure and sequence of the text. They include coverage of the main topics of the chapter, organized by A-head, the key terms and equations from the chapter, and the Applications and Policy and Practice features in the chapter.

Animated PowerPoint Presentations, created by the author, are also available at www.pearsonglobaleditions.com/mishkin. These PowerPoint slides provide the analytical figures and are completely manipulable by the user. Instructors can custom design their PowerPoint lectures with step-by-step animations of all key text figures.

The Test Item File, originally prepared by Paul Kubik of DePaul University, Victor Valcarcel of Texas Tech University, and Brian Trinque of the University of Texas–Austin, and updated for the second edition by Brian Trinque, provides 75 multiple-choice questions and 10 short-answer questions for each chapter. The questions provide a mix of numerical, graphical, and conceptual approaches for all chapter topics. In addition, the questions are MyEconLab-compatible and follow the Association to Advance Collegiate Schools of Business (AACSB) tagging procedures. The Test Item File is available at www.pearsonglobaleditions.com/mishkin electronically in Microsoft Word format and as computerized TestGen-format files that can be used with TestGen test-generating software. This test-generating program permits instructors to edit, add, or delete questions from the test bank; analyze test results; and organize a database of tests and student results, allowing for flexibility and ease of use.

ADDITIONAL STUDENT RESOURCES The Companion Website, located at www.pearsonglobaleditions.com/mishkin, features Web appendices on a wide variety of topics, as well as a Web chapter, "Financial Crises in Emerging Market Economies."



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Finally, I want to thank my extended family, who enable me to be so productive because they give me so much joy: my wife, Sally; my two children, Matthew and Laura; Matthew's wife Kim; my goddaughters, Alba, Glenda, and Norma; their husbands, Isaac, Andy, and Sergio; and their six children, Robbie, Sophie, Adrian, Sam, Sarah, and Olivia.

I dedicate this book to my mother, who was still sharp as a tack and a lot of fun when she passed away in 2012 at age ninety-one.

Frederic S. Mishkin

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Professor Mishkin's research focuses on monetary policy and its impact on financial markets and the aggregate economy. He is the author of more than twenty books, including *The Economics of Money, Banking, and Financial Markets*, Tenth Edition (Pearson, 2013); *Financial Markets and Institutions*, Eighth Edition (Pearson, 2015); *Monetary Policy Strategy* (MIT Press, 2007); *The Next Great Globalization: How Disadvantaged Nations Can Harness Their Financial Systems to Get Rich* (Princeton University Press, 2006); *Inflation Targeting: Lessons from the International Experience* (Princeton University Press, 1999); *Money, Interest Rates, and Inflation* (Edward Elgar, 1993); and *A Rational Expectations Approach to Macroeconomics: Testing Policy Ineffectiveness and Efficient Markets Models* (University of Chicago Press, 1983). In addition, he has published more than 200 articles in such journals as *American Economic Review*, *Journal of Political Economy*, *Econometrica*, *Quarterly Journal of Economics*, *Journal of Finance*, *Journal of Money, Credit and Banking*, and *Journal of Monetary Economics*.

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Part

1

Introduction

Chapter 1

The Policy and Practice of Macroeconomics

Chapter 2

Measuring Macroeconomic Data

Part **1** Introduction

We begin with an introduction to the study of macroeconomics. Chapter 1 describes the questions that macroeconomists seek to answer and the data they seek to explain, raising key policy questions that will be the focus of the remaining chapters of this book: How can poor countries get rich? Is saving too low? Do government budget deficits matter? How costly is it to reduce inflation? How can we make financial crises less likely? How active should stabilization policy be? Should macroeconomic policy follow rules? Are global trade imbalances a danger? Chapter 2 examines how economists define and measure the most important macroeconomic data.

In keeping with our focus on key policy issues and the techniques policymakers use in practice, we will analyze the following specific examples in Policy and Practice cases:

- “Can GDP Buy Happiness?”
- “Policy and Overstatements of the Cost of Living”

1

The Policy and Practice of Macroeconomics

Preview

What are your career plans after graduation? Many factors beyond your grades and choice of a major affect the ultimate path you take. When you graduate from college, will jobs be plentiful or will a high unemployment rate (as occurred in the aftermath of the 2007–2009 recession) make it a challenge to find work? Will overall prices be rising rapidly, so you will need more money to pay for your expenses next year? Will the value of the U.S. dollar decline so that it will be more expensive to travel abroad? Should you worry about the current high government budget deficits? Jumping ahead, will the economy grow rapidly over the next thirty years, so your children will be better off than you? We will address the economics underlying the answers to these questions throughout this book.

In this chapter, we set the stage for your exploration of the policy and practice of macroeconomics. We start the chapter by examining what macroeconomists do and what data they seek to explain. We then preview the policy issues that we explore throughout this book.



The Practice of Macroeconomics

In formal terms, **macroeconomics** is the study of economic activity and prices in the overall economy of a nation or a region. Macroeconomic research draws heavily on **microeconomics**, which looks at the behavior of individual firms, households, or markets.¹

The Process: Developing Macroeconomic Models

Macroeconomists try to explain how the overall economy works by using an **economic theory**, a logical framework to explain a particular economic phenomenon. Economic theory involves developing an **economic model**, a simplified representation of the

¹We will explore the microeconomic foundations of macroeconomics in Chapters 18 to 20 of this book.



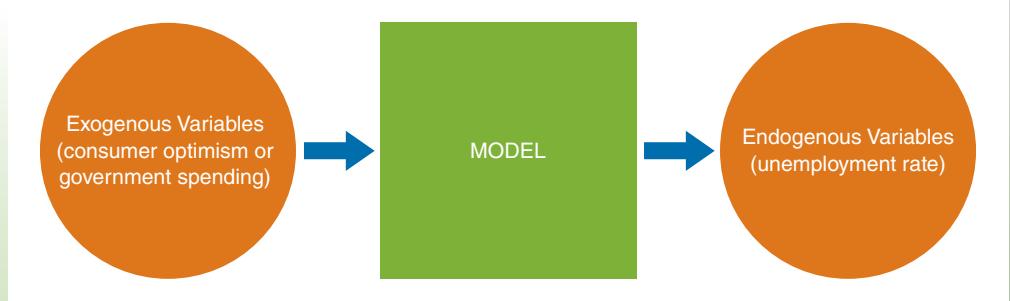
economic phenomenon that takes a mathematical or graphical form. The development of an economic theory or model typically involves five steps:

1. Identify an interesting economic question. For example, a macroeconomist might want to understand why the unemployment rate rises or falls over time, or why workers' wages in real terms (in terms of the goods and services they can actually buy) rise more rapidly during certain periods, but not others.
2. Specify the variables to be explained by the model, as well as the variables that explain them. A variable that a macroeconomist wants to explain is referred to as an **endogenous variable**, because it is explained *inside* the model he or she is building (and thus has the *endo* prefix). She would then identify a set of factors, called **exogenous variables**, that are used to explain the endogenous variable, but are taken as given and thus are viewed as determined *outside* the model. (This is why they have the *exo* prefix.)
For example, in explaining the endogenous variable (the unemployment rate), the macroeconomist might specify consumer optimism or government spending as exogenous variables that are taken as given. Or if he or she were interested in explaining real wage growth, the endogenous variable, the macroeconomist might choose the rate of technological progress or the power of unions as the exogenous variables. The schematic diagram in Figure 1.1 illustrates the relationship between endogenous and exogenous variables in an economic model.
3. Posit a set of equations or graphical analysis to connect movements in the exogenous variables to the endogenous variables. For example, we might create a formula showing how, all else being equal, a 10% increase in government spending would change the unemployment rate. This formula is our model.
4. Compare the conclusions of the model with what actually happens. For example, if the model is designed to explain the unemployment rate, we

FIGURE 1.1

Variables in Macroeconomic Models

The model is a set of equations or a graphical analysis that explains movements in the endogenous variables—variables that are explained by the model—as a result of changes in the exogenous variables—given factors not determined by the model.



would compare the model's predictions to actual unemployment data in prior years. If the conclusions do not match this historical data, return to step 2 and change the model.

5. If the data are well explained, use the model to make further predictions, say on where the unemployment rate will head a year from now, and suggest policies to lower it.

The iterative process of comparing a model to actual data, making improvements along the way, raises new economic questions and advances knowledge in macroeconomics. We will look at the interaction of data and macroeconomic models as we proceed through this book, highlighting how the field of macroeconomics has evolved over time. We will also see how well macroeconomic models explain the data by looking at numerous applications featuring the U.S. and world economies throughout every chapter.

The Purpose: Interpreting Macroeconomic Data

Macroeconomists, and in turn macroeconomic models, focus in particular on three economic data series: *real GDP*, the *unemployment rate*, and the *inflation rate*. We look at each in turn.

REAL GDP. Real Gross Domestic Product (GDP) measures the output of actual goods and services produced in an economy over a fixed period, usually a year. As we will see in Chapter 2, real GDP also equals the total amount of real income of every person and firm in the economy.

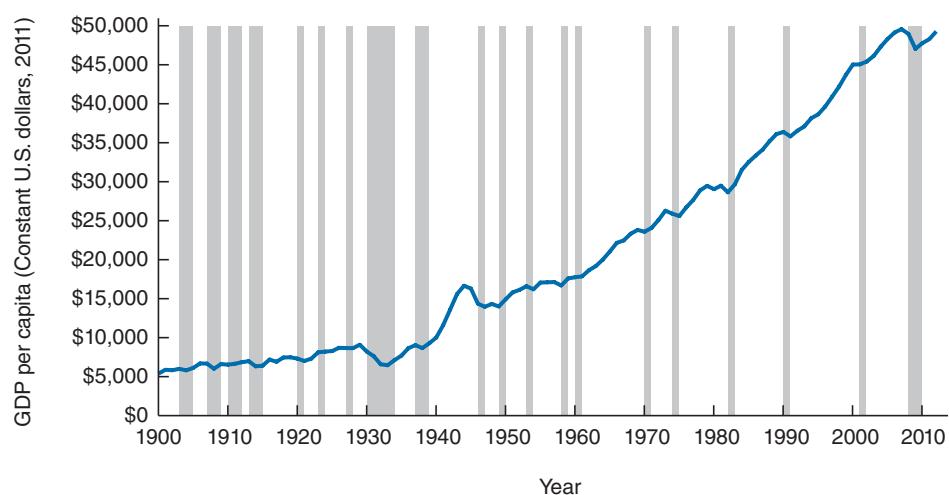
Figure 1.2 shows real GDP per person in the U.S. economy from 1900–2013 and has two important attributes. (To account for changes in the purchasing power of a dollar, we treat all goods and services as if they were sold at prices from the year 2011.) First,

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FIGURE 1.2

U.S. Real GDP Per Capita, 1900–2013

Due to business cycle fluctuations, real GDP per person has grown substantially but not smoothly, over time. We represent recessions with the shaded areas. Depressions are severe declines in real GDP, the most notable being the Great Depression (1929–1933).



Sources: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>; and for data before 1960, Maddison, Angus. *Historical statistics*. <http://www.ggdc.net/maddison/>

notice in Figure 1.2 that real GDP per person has grown substantially over time. In 1900, the average U.S. person earned nearly \$5,000. Today, this number has risen by more than a factor of nine, to nearly \$50,000. U.S. citizens today have far more income than their great grandparents did, and have been getting richer and richer over time. What explains this rise in income? Economic growth, the subject of Chapters 6, 7, and 14 of this book, is one of the most important topics in macroeconomics.

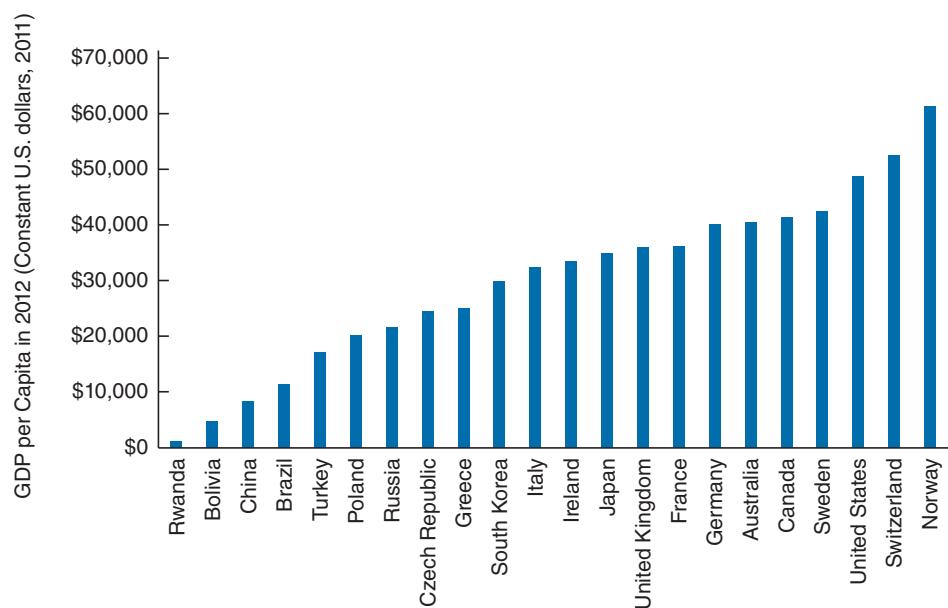
Second, notice in Figure 1.2 that real GDP grows unevenly over time and fluctuates around a trend. Fluctuations in real GDP are called a **business cycle**, which represents recurrent up and down movements in economic activity that differ in how regular they are. When economic activity declines and real GDP per person falls, there is a **recession**. In Figure 1.2, recession periods are marked by the shaded areas—and are frequent phenomena. When the decline in real GDP is severe, a recession is classified as a **depression**. The most notable of these is the Great Depression that lasted from 1929 until 1933. What causes recessions and particularly depressions is another of the most-studied questions in macroeconomics. We study short-run fluctuations in economic activity in Chapters 8–13.

So far we have only looked at real GDP per person in the United States. Figure 1.3 compares real GDP per person in a number of countries. As you can see, there are huge differences from country to country. Rwanda has a real GDP per person of just over \$600, which is less than one-eightieth of U.S. real GDP. Macroeconomists study factors that affect real GDP over time. South Korea, for example, in 1960 had a real GDP per person of \$1,500 that was actually lower than that of Bolivia. Today, Bolivia remains poor, while South Korea has moved into the rich countries' club, with its ranking of per person real GDP in the top quarter of all nations. South Korea turned around its prospects through very high economic growth rates. We focus on why some countries are so rich and others so poor, and how countries can improve their prospects, in Chapters 6, 7, and 14.

FIGURE 1.3

Cross-Country Comparison of Real GDP per Capita in 2012

Real GDP per person varies widely across countries. Rwanda has a real GDP per person of just over \$600, which is less than one-eighthieth of U.S. real GDP, which is nearly \$50,000.



UNEMPLOYMENT RATE. The **unemployment rate** measures the percentage of workers looking for work, but who do not have jobs, at a particular point in time. When unemployment is high, households suffer a loss of income and may even find themselves unable to meet basic needs for food and shelter.

Figure 1.4 shows the U.S. unemployment rate from 1929–2013. Notice that the unemployment rate always remains well above zero, indicating that even during good times, there is always some unemployment. In addition, in Figure 1.4 the unemployment rate fluctuates substantially and rises sharply in the shaded areas denoting recessions. In 1933, during the Great Depression, the unemployment rate climbed to 25%. The most recent recession from 2007–2009, which has been dubbed the “Great Recession,” although not nearly as severe as the Great Depression, still resulted in the largest rise in unemployment in the post–World War II period, with the unemployment rate rising by six percentage points, peaking at over 10%. What happens in labor markets to drive up unemployment during contractions in economic activity? We will seek answers to this question in Chapters 9–12 and 20.

Figure 1.5 compares the average unemployment rates over the past decade for different countries. Greece’s over 12% unemployment rate is more than four times that of Switzerland, indicating the wide variation across countries. We will study the characteristics of labor markets that lead to high average unemployment rates in some countries but not others in Chapter 20.

INFLATION. **Inflation** or the **inflation rate** tells us how rapidly the overall level of prices is rising. Notice in Figure 1.6 that up until World War II, the inflation rate was on average about zero, and was often negative, a situation referred to as **deflation**. In the late 1960s, inflation rose and remained quite high for an extended period of time through the early 1980s, a period economists often refer to as the Great Inflation. We will address the causes of inflation and its historical peaks in Chapters 9–13.

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FIGURE 1.4

U.S. Unemployment Rate, 1929–2013

The unemployment rate always remains well above zero, has substantial fluctuations, and rises sharply during recessions, denoted by the shaded areas.

Sources: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>; and data prior to 1948, National Bureau of Economic Research. *Macro history database, income and employment*. www.nber.org/databases/macrohistory/contents/chapter08.html

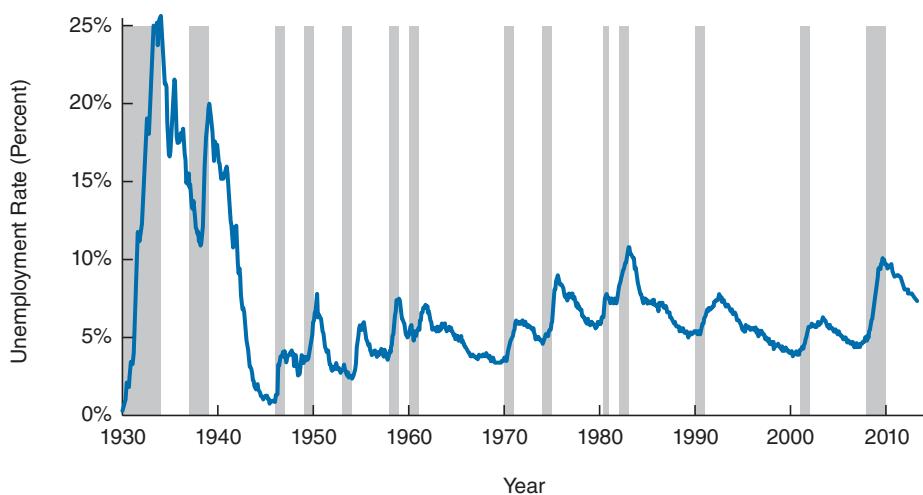
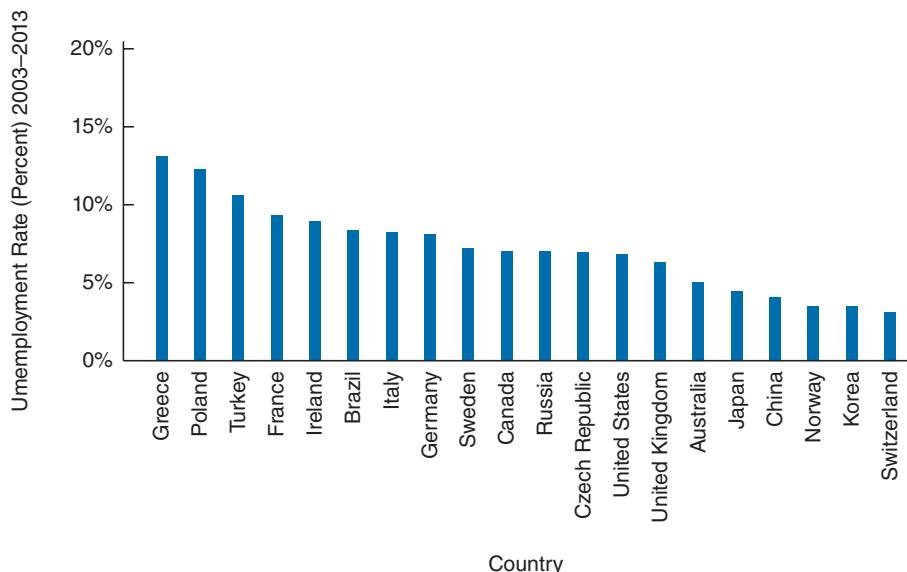


FIGURE 1.5

Cross-Country Comparison of Average Unemployment Rates, 2003–2013

The average unemployment rates over the past decade for a number of countries show much variation. For example, Greece's over 12% unemployment rate is four times higher than Switzerland's 3.1% unemployment rate.

Source: International Monetary Fund. <http://www.imf.org/external/data.htm>

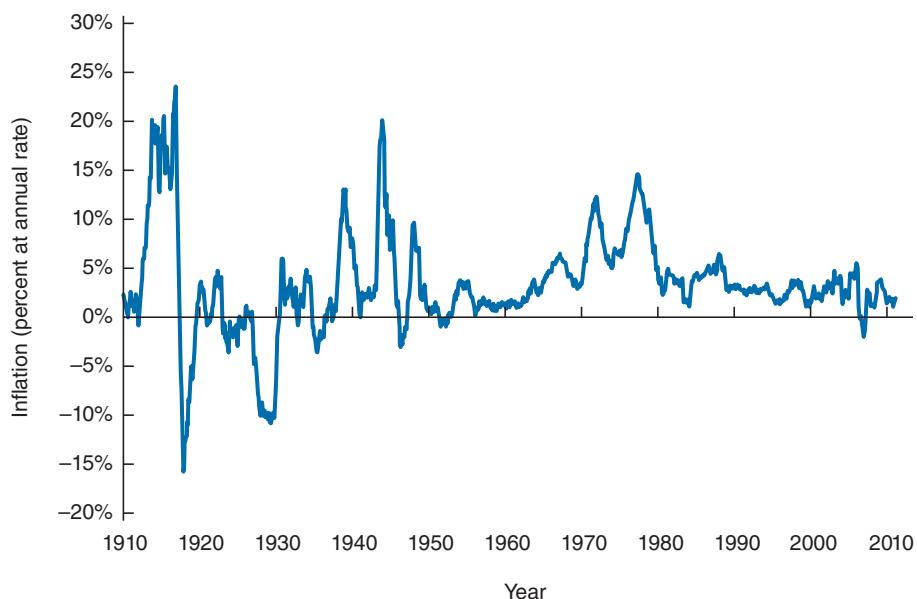


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FIGURE 1.6

U.S. Inflation Rate, 1910–2013

Up until World War II, the average inflation rate was near zero. In the late 1960s, inflation rose and remained quite high for an extended period of time through the early 1980s, the period of the Great Inflation.

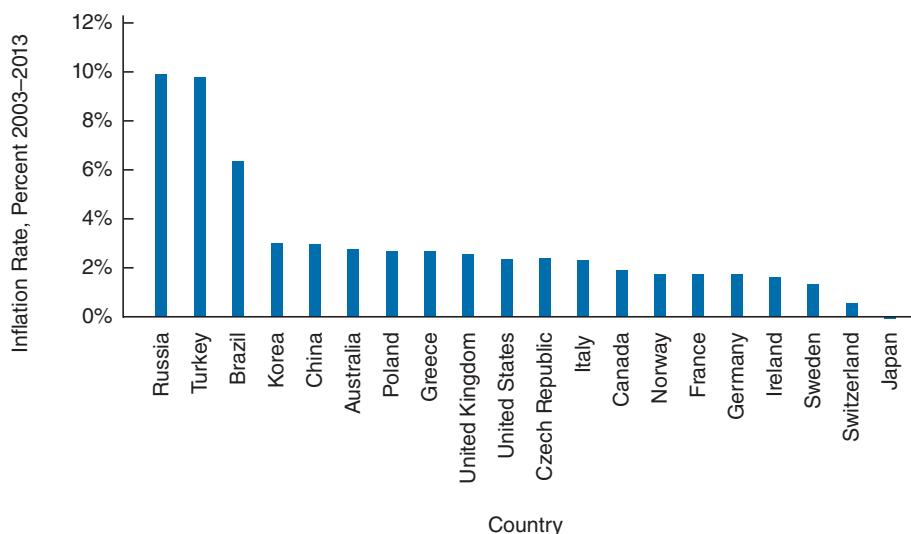


Source: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>

FIGURE 1.7**Cross-Country Comparison of Average Inflation Rates, 2003–2013**

Countries' average inflation rates over the past decade have differed, with most countries having inflation rates averaging less than 5% at an annual rate, but some, such as Turkey and Russia, with inflation rates well above that.

Source: International Monetary Fund. <http://www.imf.org/external/data.htm>



A changing price level complicates decision making for consumers, businesses, and government, and this uncertainty can hamper economic growth. Consider a shop owner who finds that he or she can raise prices and make more profit. The owner might conclude that demand for his or her goods is rising and invest in expanding the store. If the overall price level is rising and demand for his or her goods hasn't changed, the decision to expand the shop could backfire.

Figure 1.7 shows that the average inflation rates over the past decade for a number of countries have differed substantially. What makes some countries more prone to inflation than others? Some countries have experienced super high inflation rates, which we refer to as **hyperinflation**. Zimbabwe (not shown in the figure) is the most recent extreme example, with its inflation rate soaring to over two million percent at an annual rate. Why do some countries experience hyperinflation? We will pursue these questions in Chapters 5 and 16.



Macroeconomic Policy

The careful work necessary to develop economic models and analyze key data is not simply an academic exercise: the underlying goal is to determine what policies can produce better macroeconomic outcomes. We will look at numerous specific examples of how macroeconomic policy is practiced in the Policy and Practice cases that appear throughout the text. We now set the stage by previewing several policy issues that are of particular concern to macroeconomists.

How Can Poor Countries Get Rich?

It's a simple insight that high economic growth enables poor countries to become rich. Nonetheless, designing policies to achieve economic growth is one of the greatest

challenges facing macroeconomists. If it were easy to raise growth rates in poor countries, policymakers could eliminate much of world poverty. Doing so might even help create a more stable world in which the threat of terrorism would diminish.

Numerous questions are central to growth-stimulating policies. What institutions in a country foster economic growth? Will policies to encourage the development of a more efficient financial system significantly raise economic growth rates? What role does education play in economic growth? How important are policies to encourage research and development in fostering economic growth? While there are not always clear-cut answers to these questions, we will see in Chapters 6, 7, and 14 that macroeconomics has a lot to say about policies aimed at achieving high economic growth.

Is Saving Too Low?

As Figure 1.8 shows, the percentage of income saved by U.S. citizens—known as the U.S. personal saving rate—fell sharply between 1975 and 2007, but rose during the financial crisis and 2007–2009 recession. Most countries have appreciably higher saving rates than the United States, with some countries like China having very high rates, above 50%. Figure 1.9 compares average national saving rates (which includes government saving) over the last decade for a number of countries.

We will see in Chapters 4, 6, and 16 that higher saving rates translate into higher investment, which boosts economic growth and the long-run level of real GDP. When households have very low saving, they lack a cushion to cope with severe economic downturns. During the most recent recession, many U.S. households had so little savings that they found themselves unable to pay their bills and were forced to declare bankruptcy.

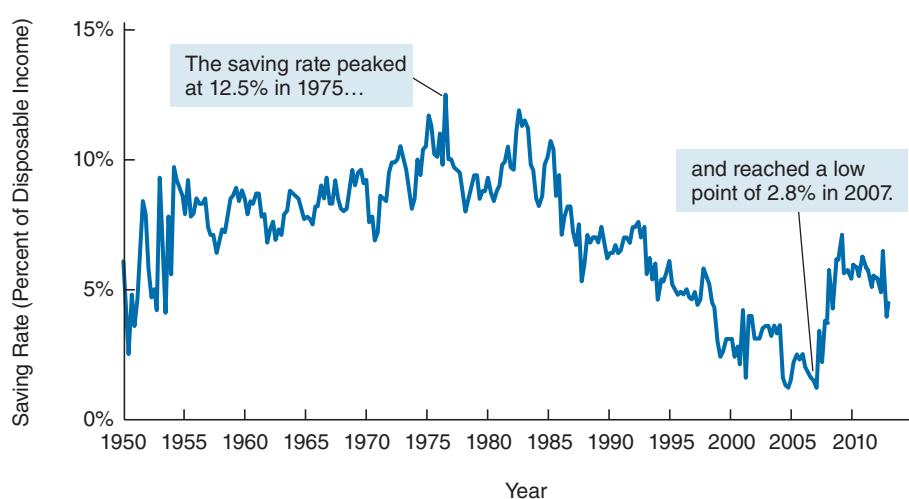
We will see in Chapters 4 and 18 that households will save more if the amount they earn on their savings is high. Tax policy is one way to increase the returns to saving. For

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FIGURE 1.8

U.S. Personal Saving Rate, 1960–2013

The U.S. saving rate fell sharply between 1975 and 2007, but rose during the financial crisis and 2007–2009 recession



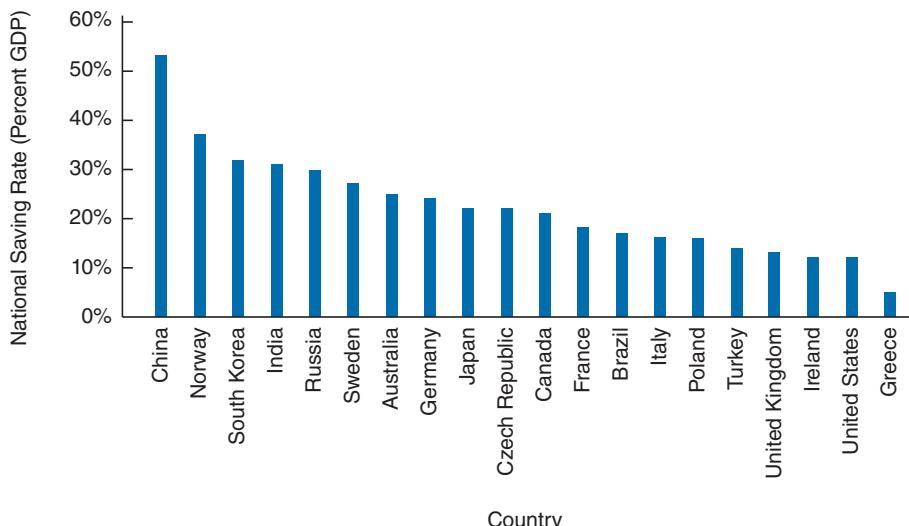
Source: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>

FIGURE 1.9

Average Saving Rate for a Number of Countries

Most countries have appreciably higher saving rates than the United States, with rates in some countries, like China, exceeding 50%.

Source: National Saving Rate, % of GDP, 2011. World Bank, World development indicators, <http://data.worldbank.org/indicator/>



example, governments can lower income taxes for households that put money into saving vehicles such as 401(k)s. Alternatively, governments can make consumption more costly through national sales taxes, or give tax breaks to businesses that contribute to employee pensions.

Do Government Budget Deficits Matter?

Government budget deficits, an excess of government spending relative to revenue, widened to over 10% of GDP after the 2007–2009 recession, their highest levels since World War II, as shown in Figure 1.10. The sea of red ink since has caused many commentators to worry about the future of America and propose drastic actions. Will budget deficits lead the government to go broke? Will they burden future generations with higher taxes to repay debt issued to fund these deficits? Will the government print money to finance its profligate spending and cause runaway inflation?

To cut the deficit, some propose tightening **fiscal policy** (policymakers' decisions to raise taxes, cut government spending, or both). Others say the budget deficit doesn't pose a danger and warn that tighter fiscal policy can do more harm than good. Are drastic actions required to get deficits under control? Massive recent U.S. government budget deficits—matched in many other countries throughout the world—have raised the stakes on the debate about government budget deficits. We will address the issue in Chapter 16.

How Costly Is It to Reduce Inflation?

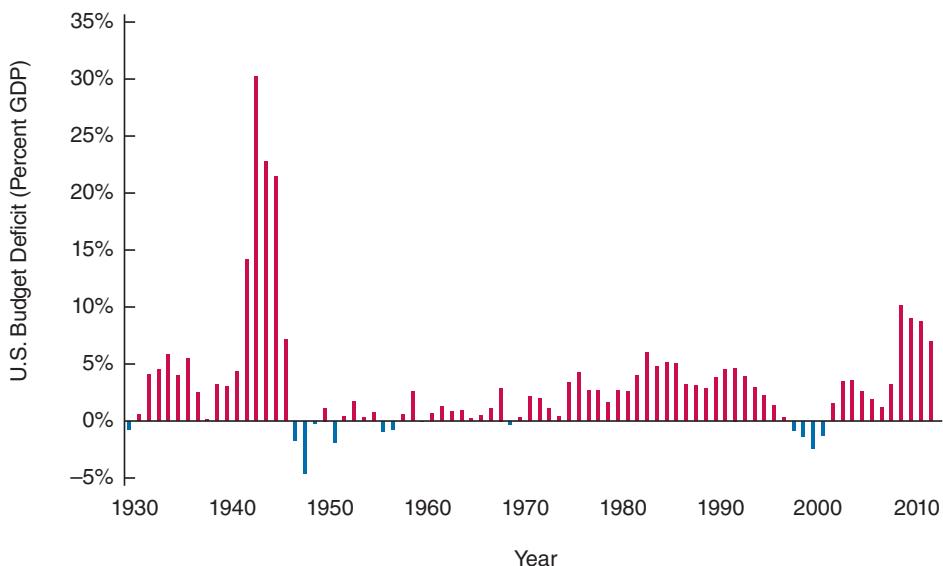
By the end of the 1970s, the inflation rate in the United States and many other countries exceeded 10%, a period often referred to as the Great Inflation. Some macroeconomists proposed policies to fight the inflation; many others argued that these steps would be too painful, reducing output and triggering high unemployment rates. During the

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FIGURE 1.10**U.S. Government Budget Deficits, 1930–2013**

After a brief period in the 1990s when the government budget was in surplus, government budget deficits started to widen. These deficits become massive—over 10% of GDP—in the wake of the severe 2007–2009 recession.

Source: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>



Great Recession of 2007–2009, the inflation rate fell to zero. But many were concerned that the price level could soar when the economy started to recover.

The job of keeping inflation in check is core to the mission of U.S. Federal Reserve and other **central banks**, the government agencies that oversee banking systems. Central banks also conduct **monetary policy**, the management of the amount of money in the economy and interest rates. Given the challenges of fighting inflation, central bankers spend a great deal of time investigating monetary policy frameworks to control the price level. We will examine the issue of how costly it is to keep inflation low and how to conduct monetary policy to contain inflation in Chapters 13 and 22 of this book.

How Can We Make Financial Crises Less Likely?

Starting in 2007, the United States and many other countries throughout the world experienced a major **financial crisis**, a large-scale disruption in financial markets characterized by sharp declines in the prices of **assets** (property that includes bonds, stocks, art, land, etc.) and business failures. Financial crises are always accompanied by sharp economic downturns, as we saw in the Great Recession of 2007–2009. We discuss the roots of financial crises and actions to make them less likely in Chapter 15.

How Active Should Stabilization Policy Be?

An important goal for macroeconomic policy is to minimize business cycle fluctuations and stabilize economic activity, commonly referred to as **stabilization policy**. One group of economists, known as *activists*, advocates the use of policies to eliminate excessive unemployment whenever it develops. In contrast, another group of economists, known as *nonactivists*, argues that the economy has a self-correcting mechanism that

will quickly restore an economy in recession to a healthy condition. Activist policies, nonactivists say, could kick in at the wrong time, producing undesirable fluctuations in economic activity and inflation. For their part, activists think that doing nothing will leave too many people out of work for too long.

When recessions occur, as happened in 2007–2009, the debate between activists and nonactivists becomes very heated. We examine this issue in detail in Chapters 13, 21, and 22.

Should Macroeconomic Policy Follow Rules?

Another dimension of the debate on stabilization policy is whether policymakers should conduct policy in a *discretionary manner*—that is, react as they see fit as the situation evolves—or with *rules*—a binding plan that specifies in advance how policy will respond to data on variables such as inflation and unemployment. As we will analyze in Chapter 21 on the role of expectations in macroeconomic policy, discretionary policy can lead to a set of short-run policies that produce bad long-run outcomes, such as high inflation. Rule-determined policy can avoid these bad outcomes by making sure that policy accounts for appropriate long-run considerations, making good long-run outcomes more likely. However, rules can put policymakers in a straightjacket, and changes in the structure of the economy may make a rule obsolete. Are rules made to be broken?

The long-standing debate over rules versus discretion in macroeconomics is an important focus of Chapters 21 and 22 of this book.

Are Global Trade Imbalances a Danger?

In the 2000s, the U.S. economy was running large trade deficits in which it was purchasing far more goods and services from abroad than foreigners were buying from it. Massive amounts of capital flowed into the United States to fund U.S. spending, especially from China, which was running large trade surpluses. These global trade imbalances left the United States increasingly indebted to foreigners and provided the capital inflows that helped fuel a boom in housing purchases. The subsequent bust in the housing market after 2006 was a key factor in the Great Recession of 2007–2009.

We will explore what causes global trade imbalances in Chapters 4 and 16, and see what government policies can be used to reduce them. We will also see, in Chapter 15, why these imbalances can be dangerous and can help fuel financial crises like the one in the 2007–2009 period.



How We Will Study Macroeconomics

I hope that the policy questions in this chapter have piqued your interest and have convinced you that studying macroeconomics will be a worthwhile enterprise.

Emphasis on Policy and Practice

This textbook will introduce you to the policy and practice of macroeconomics by developing several macroeconomic models to help you understand how the aggregate economy works. Because theory without practice is inherently sterile, this book will

emphasize the policy and practice of macroeconomics, both by using the models developed here in a large number of applications, which are separately broken out in the text, and with the Policy and Practice cases mentioned earlier. This exposure to real-world examples will help you appreciate that economics is far more than abstract theories: it is a powerful way of thinking that can help you understand the world—and your own economic options—better.

Concluding Remarks

I have been a practicing macroeconomist for over thirty years now. I fell in love with macroeconomics as an undergraduate in a similar course to the one you are taking here (taught by the famous Robert Solow, mentioned prominently in this book). I have had the privilege of applying my knowledge to policy and practice as a Federal Reserve official in exciting periods: from 1994 to 1997, when I was an executive vice president and director of research at the Federal Reserve Bank of New York, and from 2006 to 2008, when I was a governor of the Federal Reserve System. I hope that your progress through the chapters in this book will help you understand what is happening in the overall economic environment, and perhaps foster the enthusiasm for this subject that I have had for most of my life.

SUMMARY

1. The practice of macroeconomics involves examining macroeconomic data and then developing an economic theory or model to explain it. The key economic data series that macroeconomists try to explain are real GDP, the unemployment rate, and inflation.
 2. Several policy issues that receive the most attention from macroeconomists are as follows: Is saving too low? How can we help poor countries to get rich? Do government budget deficits matter? How costly is it to reduce inflation?
 3. This textbook will introduce you to the policy and practice of macroeconomics by developing several macroeconomic models and applying them to real-world examples and data.
- How can we prevent financial crises? How active should stabilization policy be? Should macroeconomic policy follow rules? What can be done about global trade imbalances? We will address all of these policy issues in the coming chapters.

KEY TERMS

assets, p. 56	exogenous variables, p. 48	microeconomics, p. 47
business cycles, p. 50	financial crisis, p. 56	monetary policy, p. 56
central banks, p. 57	fiscal policy, p. 55	Real Gross Domestic Product (GDP), p. 49
deflation, p. 51	government budget deficits, p. 55	recession, p. 50
depression, p. 50	hyperinflation, p. 53	stabilization policy, p. 56
economic model, p. 47	inflation, p. 51	unemployment rate, p. 51
economic theory, p. 47	inflation rate, p. 51	
endogenous variables, p. 48	macroeconomics, p. 47	

REVIEW QUESTIONS

All Questions are available in [MyEconLab](#) for practice or instructor assignment.

Preview

1. What macroeconomic conditions, issues, and events can shape your future?

The Practice of Macroeconomics

2. What is the distinction between endogenous variables and exogenous variables in economic models?
3. What is the main test that an economic model should pass?
4. What three macroeconomic data series are of particular interest to macroeconomists? Why?
5. What is the business cycle? Which part of the business cycle is of particular concern to macroeconomists? Why?
6. What happens to the overall level of prices during periods of inflation and deflation?

Macroeconomic Policy

7. What is a nation's savings rate? Why are the Chinese and the US savings rates so different from one another (Figure 1.9)?
8. What is a government budget deficit? Why are macroeconomists concerned with budget deficits?
9. Explain the difference between fiscal policy and monetary policy. Which of the two is in the hands of the European Central Bank?
10. What is stabilization policy? What two important debates occur among macroeconomists regarding its use, and who are the parties to these debates?
11. What are global trade imbalances and why do economists focus on them?

PROBLEMS

All Problems are available in MyEconLab for practice or instructor assignment.

The Practice of Macroeconomics

1. Sciences other than economics also use models to explain the behavior of endogenous variables based on assumptions about the environment and changes in exogenous variables. Suppose you have to design a model that links childhood obesity and diabetes.
 - a) Which one would be the exogenous variable? Which one would be the endogenous variable?
 - b) Can you think of other exogenous variables?
2. Suppose your model predicts that overweight children have an 80% higher risk of suffering from diabetes in their adult life. If data show that overweight children do not suffer from diabetes as predicted by your model (i.e., data show a lower than 80% probability), what would your next step be?
3. The following table shows Spain's (annualized) quarterly real GDP growth rates for the 2007–2012 period. (Roman numbers refer to quarters.)

Variable	2007	2007	2007	2007	2008	2008
	I	II	III	IV	I	II
Real GDP	7.6	7.3	6.5	6.4	5.6	4.6

Macroeconomic Policy

5. During the 1970s, most Latin American countries ran huge budget deficits. As their governments resorted to printing money (increasing the money supply) to pay for these deficits, very high inflation rates resulted. As a con-

Variable	2008	2008	2009	2009	2009	2009
	III	IV	I	II	III	IV
Real GDP	3.1	0.5	-0.1	-4.1	-4.5	-3.3

Variable	2010	2010	2010	2010	2011	2011
	I	II	III	IV	I	II
Real GDP	-1.5	-0.2	0.0	0.4	0.5	0.5

Variable	2011	2011	2012	2012	2012	2012
	III	IV	I	II	III	IV
Real GDP	0.6	0.0	-0.7	-1.4	-1.6	-1.9

a) Plot real GDP growth rate in a graph. Can you identify a trend in the data?

b) Based on the data shown, can you identify the beginning (i.e., the year and the quarter) of the current recession?

4. The Spanish unemployment rate was less than 10% before the 2007 crisis. At the end of 2012 it moved to about 25%. Comment on the economic and social consequences of such a dramatic change.

sequence, real GDP declined or remained constant during the 1980s. Comment on the relationship between budget deficits, inflation, and real GDP growth.

6. Assume that a civil war erupts in a given country, creating chaos and destroying most of the economy's infrastructure (e.g., roads, businesses, and telecommunications).
 - a) What would be the effect on economic growth?
 - b) How do you think a civil war affects incentives to invest in that country?
 7. The recent financial crisis led to expansionary fiscal policy responses both in the United States of America and in Europe to counteract the adverse effects on the economy. Increased budget deficits in Europe resulted in high public debts (and the so-called sovereign debt crisis). What can governments do to lower their deficits and debts? What measures have already been taken?
 8. The United States has been experiencing very low or even negative savings rates during the recent past. If this situation persists, what does it mean for future generations?
 9. According to a note in the House of Commons, United Kingdom, in June 2011, since September 2007 the Government was dealing both with specific banks in crisis and with the broader problems of the monetary
- and banking system. Does this statement about the economic activities of the British government reveal an activist or a non-activist policy behavior?
10. A financial crisis hit the British economy at the end of 2007. In the aftermath of the crisis, the Bank of England provided liquidity to the UK economy and pursued a loose monetary policy in order to favor recovery. Do these policy measures affect future inflation, and individuals' expectations about it?
 11. Consider the difficult task of raising children. One of the most widely recognized challenges of this task is to properly balance rules and ad-hoc decisions. Constantly breaking rules might send the wrong message to a kid, while strictly enforcing rules every time might result in excessive punishments. The debate about the conduct of macroeconomic policy is not significantly different from this example.
 - a) Comment on the American Recovery and Reinvestment Act of 2009. Can this Act be characterized as discretionary policy?
 - b) Is it possible for this set of policies to affect the incentives of financial intermediaries or other major economic agents?

DATA ANALYSIS PROBLEMS

The Problems update with real-time data in **MyEconLab** and are available for practice or instructor assignment.

-  1. For each of the following pairs of variables, pull the data from the St. Louis Federal Reserve FRED database and create a scatter-plot graph of the two variables using Excel. For each pair, name the exogenous variable relative to the endogenous variable, and indicate whether the variables are unrelated.
 - a) Personal Income (PINCOME) and Personal Consumption Expenditures (PCEC), quarterly data since 1980 Q1.
 - b) Total Nonfarm Payrolls (PAYEMS) and M1 money supply (M1SL), monthly data since January 2000.
 - c) Personal Saving Rate (PSAVERT) and the 10-year US Treasury Rate (GS10), monthly data since January 1980.
-  2. Go to the St. Louis Federal Reserve FRED database, and calculate the GDP growth rate and inflation rate. For GDP, use (GDPC1).

For the inflation rate, use the personal consumption expenditure price index (PCECTPI). For each series, change the units to *Percent Change from Year Ago* and download using data since 2000 Q1. Note that quarters in which the US was officially in a recession are 2001 Q2 to 2001 Q4, and 2008 Q1 to 2009 Q2.

- a) Which period had the highest inflation rate? The lowest inflation rate? When, if at all, did deflation occur?
- b) Which period had the highest growth rate of GDP? The lowest growth rate of GDP?
- c) What relationship, if any, is there among GDP growth, the inflation rate, and recessions?
-  3. Go to the St. Louis Federal Reserve FRED database, and pull data on annual

unemployment rates for the following countries, starting in 2000: United States (USAURNAA), Canada (CANURNA), United Kingdom (GBRURNAA), Japan (JPNURNAA), and Germany (DEUURNAA). Graph the data for all five countries on one graph by using the *Add Data Series* function, and download the data into an Excel table. Note that the United States experienced a recession in 2001 and in 2008–2009.

- a) Which country experienced the highest unemployment rate, and when? Which country experienced the lowest unemployment rate, and when?
- b) Calculate the average unemployment rates for the U.S. during years of recession and when not in recession. How do they compare? Is this what you would expect?
- c) Look at the graph of unemployment rates. Which countries seem to show similar trends? Which seem to behave differently than the rest?

-  4. Go to the St. Louis Federal Reserve FRED database, and pull data on a common measure of standard of living, real GDP per capita, in 2011 U.S. dollars. Choose the following countries: United States (USARGDPC), Japan (JPNRGDPC), United

Kingdom (GBRRGDPC), and South Korea (KORRGDPC). Download the data since 1990 into an Excel spreadsheet. For your last country, choose China. For China, real GDP per capita will have to be constructed by using nominal GDP per capita and a measure of prices. To do this, download nominal GDP per capita for China (PCAGDPCNA646NWDB) and a measure of the price level in China (CHNCPIALAINMEI). Once the Chinese data are downloaded onto a spreadsheet, create a column for real GDP per capita, which will be nominal GDP per capita divided by the price level; then multiply by 100. Place all of the data for the five countries in a single spreadsheet, and then create one graph showing all five series, from 1990 until the present day.

- a) Which country among these five currently has the highest standard of living? Which has the lowest?
- b) How has South Korea's standard of living changed in comparison to that of Japan and the United Kingdom over this time period?
- c) How has China's standard of living changed in comparison with the standard of living in the other countries since 1990?

2

Measuring Macroeconomic Data

Preview

It is easy to take macroeconomic data for granted, especially when print and electronic media bombard us with economic facts and figures. When the most recent recession started in 2007, the latest releases of economic statistics quickly indicated that the economy was weakening. In contrast, when the Great Depression of the 1930s began, economists did not have immediate access to data indicating the severity of the situation. Economists recognized that better data were needed, to both inform the public and guide policymakers. Economists like Simon Kuznets, with his colleagues at the U.S. Department of Commerce, developed the National Income and Product Accounts in the 1930s. What became known as *national income accounting* may not sound very exciting—after all, who ever thinks that accounting is exciting—but it has been called one of the great inventions of the twentieth century.¹ In 1971, Simon Kuznets was awarded a Nobel Prize for his role in inventing national income accounting.

In this chapter, we examine how economists define and measure the most important data in macroeconomics, areas of study critical to your gaining a full understanding of macroeconomics. In this chapter, we will examine the following questions: How do we measure economic activity, and specifically *gross domestic product*, a broad measure of economic activity? What are the key components of gross domestic product? How do we measure inflation, and does it tell us how rapidly the cost of living is rising? What is unemployment and how do we measure it? What are interest rates, and which measures of interest rates are the most important in macroeconomics?



Measuring Economic Activity: National Income Accounting

Gross domestic product (GDP), the total value of goods and services produced in an economy, is the broadest measure of economic activity. We add up the value of all the goods and services produced in one year—say, from cell phones, automobiles, textbooks, DVDs, computers, haircuts, and rock concerts—to determine GDP. The U.S. Bureau of

¹See Paul Samuelson and William Nordhaus, "GDP: One of the Great Inventions of the Twentieth Century," *Survey of Current Business* (January 2000): 6–9.



Economic Analysis (part of the U.S. Commerce Department) calculates GDP on a quarterly basis with data provided by other government agencies such as the Census Bureau and the Bureau of Labor Statistics. U.S. GDP is currently around \$15 trillion, that is, nearly \$50,000 per person.

There are several alternate definitions and approaches for measuring GDP. Our initial definition of GDP is given in terms of goods and services produced. We will also define GDP in terms of expenditure and income: GDP is the total income of everyone in the economy, and it is also the total amount of expenditure for goods and services in the economy. These various GDP definitions are equivalent because the total income in an economy must equal the total amount of expenditure, which equals total production. This reasoning makes intuitive sense because there is a buyer and a seller for every good or service produced in the economy. When you pay \$15 for a haircut at your local barbershop, your \$15 expenditure is \$15 of income for the barber, who has produced the \$15 haircut.

National income accounting, an accounting system to measure economic activity and its components, shows the relationship among the expenditure, income, and production methods of measuring GDP. We express national income accounting in the **fundamental identity of national income accounting**:

$$\text{Total Production} = \text{Total Expenditure} = \text{Total Income} \quad (1)$$

Equation 1 says that any of the three approaches—production, expenditure, or income—should give the same answer when computing GDP. Let's calculate GDP with each of these approaches to refine our definitions of GDP.



Measuring GDP: The Production Approach

In the **production approach**, we define GDP as the current *market value* of all *final goods and services newly produced* in the economy during a *fixed period* of time. Each of these italicized phrases indicates key principles that we will examine in detail.

Market Value

An economy produces countless goods and services. This fact raises the age-old question, "How do we compare apples with oranges?" If the economy produces one billion apples and two billion oranges, would it be just as successful if it instead produced two billion apples and one billion oranges? If the economic value of apples and oranges is the same, the answer is yes: the total number and value of apples and oranges produced is the same amount, three billion. Because prices of various goods and services are rarely identical, we use national income accounting, which bases the economic value of a good or service on its market value, that is, the price it sells for. To calculate the value of output in the economy, you weigh each good and service by its current market price and add the results. In the case of apples and oranges, GDP would be as follows:

$$\begin{aligned} \text{GDP} &= (\text{price of apples} \times \text{quantity of apples}) \\ &\quad + (\text{price of oranges} \times \text{quantity of oranges}) \end{aligned}$$

If apples and oranges each sold for \$1, then total output for apples and oranges would indeed be the same in both cases, \$3 billion ($2 \text{ billion} \times \$1 + 1 \text{ billion} \times \$1 = \$3 \text{ billion}$)

$1 \text{ billion} \times \$1 + 2 \text{ billion} \times \1). But if apples sold for 50 cents and oranges for \$2, then the total output of apples and oranges would differ in the two cases. In the first case, total output would be \$3 billion ($2 \text{ billion} \times \$0.50 + 1 \text{ billion} \times \2), while in the second, it would be \$4.5 billion ($1 \text{ billion} \times \$0.50 + 2 \text{ billion} \times \2).

NONMARKET GOODS AND SERVICES. Unfortunately, for the ease of computing accurate measures of GDP with national income accounting, not all goods and services produced in the economy are sold in markets that provide a market price. Some of these nonmarket goods and services are left out of measures of GDP by necessity. Many household services that are produced within a family or by friends—cleaning, cooking, child care—would be included if it were easier to measure them.

UNDERGROUND ECONOMY. Goods and services produced in the *underground economy* are also not counted in GDP. In the **underground economy**, goods and services produced are hidden from the government, either because they are illegal (drugs or prostitution) or because the person producing the goods and services is avoiding paying taxes on the income he or she receives (the carpenter who is paid in cash and does not declare it on his or her tax return). In some countries, the underground economy (also sometimes referred to as the “black market economy”) is very large, and as a percentage of the total economy it differs substantially among countries. Italy, an example among rich countries, is notorious for tax avoidance, so its GDP is likely to be understated relative to other countries because of the large size of its underground economy.

IMPUTED VALUES FOR NONMARKET GOODS AND SERVICES. Many other nonmarket goods and services lacking a market price are counted in GDP by determining an **imputed value**, an estimate of what the price of the good or service would be if it were traded in a market. For example, an important component of GDP is housing services. When you rent your college apartment, there is a market price that you pay and so it is easy to include it in GDP. But what if, instead, you owned the apartment? A homeowner is getting housing services, just as a renter is. To impute the value of these services, the Department of Commerce, which computes GDP, assumes that in effect the homeowner is paying rent to him- or herself. A homeowner’s imputed value is the rental price of comparable housing in the market.

The existence of nonmarket goods and services suggests that GDP is an imperfect measure of output produced in the economy. An especially large component of GDP that is not traded in the market is goods and services provided by the government, such as national defense, police protection, firefighting, and education. The standard practice is to value these services at the cost of providing them. The imputed value of a police officer giving out traffic tickets, for example, is the wages he or she is paid when doing traffic duty.

Final Goods and Services

Production of goods and services typically occurs in stages. We classify goods and services into two types: **intermediate goods and services** are used up entirely in the stages of production, whereas **final goods and services** are the end goods in the production process.

To illustrate, suppose that Intel produces \$400 of microprocessors to go into the Mac that Apple sells for \$1,500, and it costs \$50 to ship the Mac to the computer store where you buy it. The \$400 of microprocessors is an intermediate good, the \$50 of shipping is an intermediate service, and the \$1,500 Mac is a final good. Would it make sense to include all these goods and services in GDP? No. We include only the \$1,500 Mac, the final good, in GDP. Otherwise, there would be double counting because the costs of the intermediate goods and services used in producing the Mac are already included in the price for the final good. That is, GDP should include only the market value of final goods and services.

VALUE-ADDED TECHNIQUE AND GDP. One important technique for calculating the value of all final goods and services produced in the economy is with **value added**, the value of a firm's output minus the cost of the intermediate goods and services purchased by the firm. By adding up the value added for each firm, we get the final value of the goods and services produced. In our Mac example, the value added for the producer of microprocessors is \$400, while the value added for the shipping firm is \$50 (assuming that it did not use any intermediate goods). The value added for Apple is the final price of the Mac minus the cost of the intermediate inputs: \$1,500 minus the \$400 cost of the microprocessors and the \$50 cost of shipping, that is, \$1,050. The sum of the value-added items for each of these firms—\$1,050 plus \$400 plus \$50—is \$1,500, the same value as the final good, the Mac. Now imagine adding up all the value added in the economy to determine the total value of final goods and services in the economy. This approach is likely to include all final goods and services in the economy, but appropriately excludes intermediate goods and services.

CAPITAL GOODS AND GDP. There are some subtleties as to when to classify goods as intermediate versus final goods. Suppose a robot is manufactured to install windshields in new automobiles. Is it an intermediate good or a final good? Although the robot is used to help produce new cars, it is not used up in producing the car and will keep on installing windshields for many years. The robot is a **capital good**, a good that is produced in the current period to be used in the production of other goods and that is not used up in the stages of production. We classify new capital goods as final goods and thus include them in GDP because they are not included in spending on other final goods and yet their production is certainly part of economic activity.

INVENTORY INVESTMENT AND GDP. **Inventories**—firms' holdings of raw materials, unfinished goods, and unsold finished goods—are another type of good that is not used up in the current period. The change in inventories over a given period of time, say a year, is referred to as **inventory investment**. We include inventory investment in GDP for the same reason that we include capital goods: an increase in the level of inventories means that there has been an increase in economic activity. For example, suppose that at the beginning of the year, Apple has \$1 billion of microprocessors and \$1 billion of finished Mac computers on hand, for a total of \$2 billion of inventories. At the end of the year, it has \$1.5 billion of microprocessors and \$1.5 billion of finished Macs in stock. Its level of inventories has increased from \$2 billion to \$3 billion, an increase of \$1 billion. This \$1 billion increase in inventories is the inventory investment for that year, and we add it into GDP.

Newly Produced Goods and Services

GDP should include only goods and services that are newly produced in the current period; it excludes those that were produced in previous periods. If you buy a three-year-old car from a used car lot, there is no increase in production of automobiles: the cost of the used car is *not included* in GDP. The car was already counted in GDP when its original owner purchased it new. However, the value of the services provided by the car dealership that sold you the used car is included in GDP.

Fixed Period of Time

We calculate GDP over a fixed period of time, such as a quarter or a year. For example, GDP for the year 2014 tells us the value of final goods and services produced over the course of 2014. GDP is a **flow**, an amount *per* a given unit of time, in contrast to a **stock**, a quantity *at* a given point in time. (Note that the *stock* concept is not to be confused with the term *common stock*, such as a share of IBM.) The concept of stocks versus flows is vitally important in economics and is discussed in the box, “Stocks Versus Flows.”

Although we see from the discussion in this section that the technical difficulties in measuring GDP are serious, there is an even deeper question of whether GDP provides an appropriate measure of how well an economy is doing, as the following Policy and Practice case indicates.

Policy and Practice

Can GDP Buy Happiness?

You won’t find Bhutan anywhere near the top of the list of wealthiest nations. But in 1972, the king of Bhutan said his tiny South Asian nation would rank much higher if its wealth were measured not by gross domestic product but by “gross national happiness,” incorporating factors such as spirituality and culture. At the time, his idea sounded ludicrous to most economists. But over the years, many governments began to acknowledge that GDP is an inadequate—albeit highly useful—measure of well-being.

Starting in 1990, the United Nations began to rank countries on a so-called “human development index”: a combination of life expectancy, education, literacy, educational participation, and GDP. By this measure, in 2012 the United States ranked third behind Norway and Australia, countries whose GDP per person is well below that of the United States. (Bhutan ranked 140.) In 2008, a French economic commission led by Nobel Prize winner Joseph Stiglitz called for significant modifications to GDP and the development of a new generation of national statistics to measure factors such as political freedom, physical safety, and work-life balance. The proposal was taken up by the Organization for Economic Cooperation and Development, a body of the world’s richest countries. In spite of these efforts, per-capita GDP remains the most broadly accepted measurement of national well-being.

Stocks Versus Flows

Throughout this book, we will discuss many macroeconomic variables, some of which are stocks and the others flows. Understanding the difference between them is critical to avoiding confusion when we study macroeconomics.

To see the difference between a stock and a flow, consider the classic example of a bathtub, shown in Figure 2.1. Stocks and flows are clearly related: a stock is often an accumulation of flows over time. If the faucet has been running for a half hour with a *flow* of one gallon per minute and the tub was initially empty, then the *stock* of water in the tub will be thirty gallons, that is, thirty minutes times the flow of one gallon per minute. The most important flow variable we have discussed in this chapter is GDP, which always has to be thought of as an amount produced *per year* or *per quarter*. Examples of stocks and flows that are related include the following: inventory investment, a flow, which accumulates into the stock of inventories;

saving, a flow, which accumulates into a person's wealth; and fixed investment, a flow, which accumulates into the economy's capital stock.

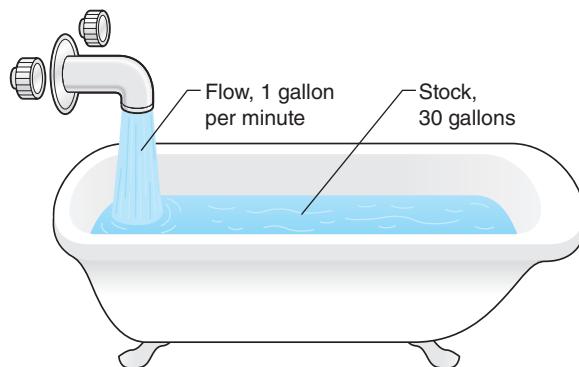


FIGURE 2.1

Stocks Versus Flows

The water coming out of the faucet is a *flow* (one gallon per minute), while the amount of water in the tub is a *stock* (thirty gallons).

Measuring GDP: The Expenditure Approach

We now turn to our second technique for computing GDP: with the **expenditure approach**, GDP is the total spending on currently produced final goods and services in the economy. The expenditure approach allows us to get information on the different components of spending that add up to GDP. The national income accounts divide spending into four basic categories: *consumption expenditure*, *investment*, *government purchases (spending)*, and *net exports*, each of which we will discuss in turn. The national income accounts add up these four categories of spending to determine GDP in the **national income identity**,

$$Y = C + I + G + NX \quad (2)$$

where

Y = GDP = total production (output)

C = consumption expenditure

I = investment

G = government purchases of goods and services

NX = net exports = exports – imports

TABLE 2.1 GDP AND ITS COMPONENTS, 2012

	Billions of Dollars	Percent of GDP
Personal consumption expenditure (<i>C</i>)	11,286	68.7
Consumer durables	1,231	7.5
Nondurable goods	2,595	15.8
Services	7,459	45.4
Investment (<i>I</i>)	2,500	15.2
Fixed investment	2,018	12.3
Inventory investment	13	0.14
Residential investment	469	2.9
Government purchases (<i>G</i>)	3,151	19.2
Federal	1,275	7.8
State and local	1,875	11.4
Net exports (<i>NX</i>)	–516	–3.1
Exports	2,214	13.5
Minus imports	2,730	16.6
Total = GDP (<i>Y</i>)	16,420	100.0

Source: Bureau of Economic Analysis. Table 1.1.5. www.bea.gov/national/nipaweb>SelectTable.asp?Selected=Y

Note: Numbers may not add up to the totals due to rounding.

Equation 2 is one of the most fundamental equations in macroeconomics, and we will make use of it many times throughout this book. Table 2.1 provides 2012 data from the U.S. economy on these four components and some subcomponents.

Consumption Expenditure

Consumption expenditure (also referred to as **personal consumption expenditure** and **consumption**) is the total spending for currently produced consumer goods and services. Consumption expenditure is by far the largest component of GDP and was 68.7% of GDP in 2012 (see Table 2.1). We can break it down into three basic categories:

1. *Consumer durables* are goods purchased by consumers that last a long time (are *durable*), such as automobiles, electronic goods, and appliances.
2. *Nondurable goods* are short-lived consumer goods such as food, housing services (but not purchases of houses, which are part of investment), gasoline, and clothing.
3. *Services* are purchased by consumers; examples include haircuts, education, medical care, air travel, and financial services.

Investment

Investment is spending on currently produced capital goods that are used to produce goods and services over an extended period of time. Investment was 15.2% of GDP in 2012. We can break it down into three basic categories:

1. *Fixed investment*, also referred to as *business fixed investment*, is spending by businesses on equipment (machines, computers, furniture, and trucks) and structures (factories, stores, and warehouses).
2. *Inventory investment* is the change in inventories held by firms. If inventories are increasing, inventory investment is positive, but if they are decreasing, inventory investment is negative.
3. *Residential investment* is household purchases of *new* houses and apartments. (We do not include purchases of existing housing in GDP because it was produced in earlier periods.) Houses and apartments are capital goods for households because they produce a service (a roof over our heads) over an extended period of time. Indeed, for most of us, housing is the most important purchase we ever make in our lives.

Government Purchases

Government purchases is spending by the government—whether federal, state, or local—on currently produced goods and services. Government purchases were 19.2% of GDP in 2012. Although most of the media attention focuses on federal spending, as you can see from Table 2.1, more spending is done by state and local governments than by the federal government.

GOVERNMENT CONSUMPTION VERSUS GOVERNMENT INVESTMENT. Government purchases that appear in GDP include purchases of goods (highways, military equipment, and computers) and services (rangers for national parks, police protection, health care, and education). We refer to government purchases for short-lived goods and services like health care and police protection as **government consumption**, whereas spending for capital goods like buildings and computers represents **government investment**.

TRANSFERS AND GDP. Government payments for Social Security, Medicare, and unemployment insurance benefits are **transfers** from one segment of society—healthy, working people—to another segment—the elderly, sick, and jobless. Because they are

Meaning of the Word *Investment*

Economists use the word *investment* somewhat differently than other people do. When noneconomists say that they are making an investment, they are normally referring to the purchase of common stocks or bonds, purchases that do not

necessarily involve newly produced goods and services. But when economists speak of investment spending, they are referring to the purchase of physical assets such as *new* machines or new houses—purchases that add to GDP.

not payments in exchange for currently produced goods and services, they are not included in government purchases, G , or GDP. Interest payments on government debt are also not made in exchange for goods and services, so we exclude them from government purchases, G , and GDP.

Net Exports

Net exports are exports minus imports: that is, the value of currently produced goods and services exported, or sold to other countries, minus the value of goods and services imported, or purchased from abroad. It is easy to see why exports should be included in GDP. But why must we subtract imports out to get a correct measure of GDP? The answer is that spending on imports is included in consumption expenditure, investment, and government purchases, but imports are not produced in the United States.²

Net exports have been quite negative in recent years, -3.1% of GDP in 2012, because U.S. citizens buy more foreign goods and services than foreigners buy U.S. goods and services. For example, exports at 13.5% of GDP in 2012 were substantially less than imports at 16.6% of GDP. We also refer to net exports as the **trade balance**; the negative trade balance in 2012 is often discussed in the media by saying that the United States has been running a large trade deficit.

Changes in the Spending Components of GDP over Time

Figure 2.2 shows how the different expenditure components as a percentage of GDP have changed over the last sixty-three years. Four interesting facts are apparent from looking at Figure 2.2.

1. Consumption expenditure grew steadily as a share of GDP from 1970 to 2013, rising from 63% of GDP to close to 70%. Why the consumption expenditure share showed this positive trend is one of the questions that macroeconomics seeks to explain, which we will turn to in Chapter 18.
2. Investment is much more volatile than other components of GDP. We will explain why this occurs in Chapter 19 on investment. Because of its high volatility, even though the average size of investment relative to GDP is only a third that of consumption expenditure, investment plays a very large role in explaining fluctuations in economic activity.

²Another way to see why imports have to be subtracted from exports, giving net exports as a component of GDP, is to recognize that domestic output equals consumption, investment, and government purchases on domestically produced goods, marked with a subscript d , plus foreign spending on domestically produced goods, that is, exports, EX :

$$Y = C_d + I_d + G_d + EX$$

Total consumption expenditure, investment, and government purchases have an additional component of foreign produced goods, i.e., imports, denoted by an im subscript, so adding in these terms and then subtracting them again means that we can rewrite GDP as follows:

$$Y = (C_d + C_{im}) + (I_d + I_{im}) + (G_d + G_{im}) + EX - (C_{im} + I_{im} + G_{im})$$

Then, since we can write total consumption expenditure, investment, and government purchases as $C = (C_d + C_{im})$, $I = (I_d + I_{im})$, and $G = (G_d + G_{im})$, while total imports is $IM = (C_{im} + I_{im} + G_{im})$, we can use substitution to write

$$Y = C + I + G + EX - IM$$

which, since net exports equals exports minus imports (i.e., $NX = EX - IM$), we can rewrite as

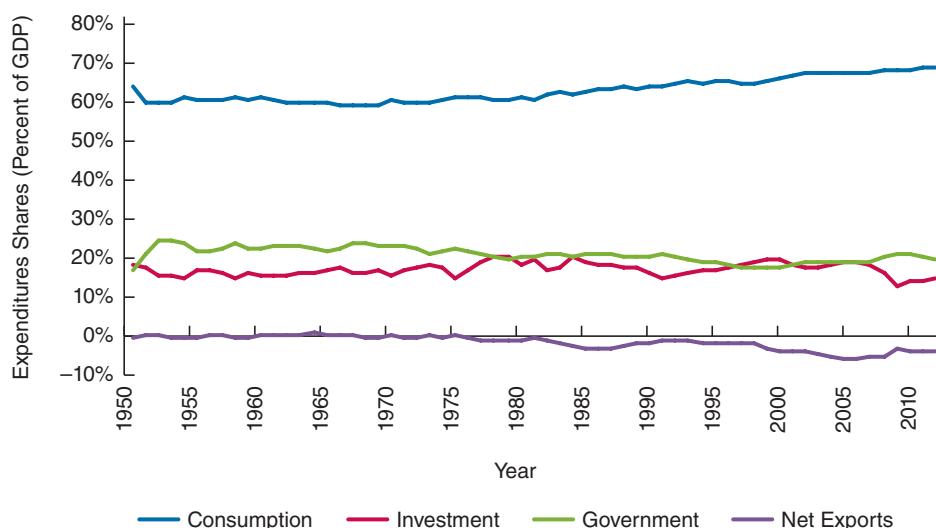
$$Y = C + I + G + NX$$

MyEconLab Real-time data

FIGURE 2.2

Expenditure Components of U.S. GDP, 1950–2013

Over the past sixty-three years, U.S. consumption expenditure rose steadily as a share of GDP, and investment was much more volatile than other components of GDP. Government purchases remained quite stable over the past sixty-three years at around 20% of GDP, while net exports were near zero or negative, with the trade deficit worsening over time.



Source: Federal Reserve Bank of St. Louis, FRED Database. <http://research.stlouisfed.org/fred2/>

3. Despite claims that the government has expanded in size, government purchases have actually remained quite stable at around 20% of GDP over the past sixty-year period. Transfer payments, which are not included in government purchases, have grown relative to government purchases, giving the impression that the government has expanded in size.
4. In most years, net exports have been negative and the United States has been running a trade deficit. Just a few years ago, the trade deficit climbed to over 5% of GDP.

Different countries have different sizes of expenditure components relative to GDP, as the box entitled “An International Comparison of Expenditure Components” suggests.



Measuring GDP: The Income Approach

The third way of measuring GDP, the **income approach**, involves adding up all the incomes received by households and firms in the economy, including profits and tax revenue to the government.

Categories of Income

Table 2.2 (on page 74) shows the major categories of U.S. income in 2012. We will discuss each major category in turn.

1. *Compensation of employees* includes both the wages and salaries of employees (excluding the self-employed) and employee benefits, which include

payments for health insurance and retirement benefits. As Table 2.2 indicates, employee compensation is the largest category of income, 53.2% of GDP in 2012. Although wages and salaries have been declining relative to GDP, total compensation relative to GDP has stayed nearly constant over time because the declining share of wages and salaries has been offset by increasing employee benefits.

2. *Other income* includes income of the self-employed, income that individuals receive from renting their properties (which includes royalty income on books and music), and the net interest earned by individuals from businesses and foreign sources (interest income minus the interest that they pay).

An International Comparison of Expenditure Components

Other countries have very different shares of consumption, investment, government purchases, and net exports relative to GDP, as Figure 2.3 indicates. The United States differs from other countries in the figure by having the highest share of

GDP going to consumption, a low share of GDP going to investment, and a negative share going to net exports. China stands out by having the lowest share of consumption and the highest share of investment.

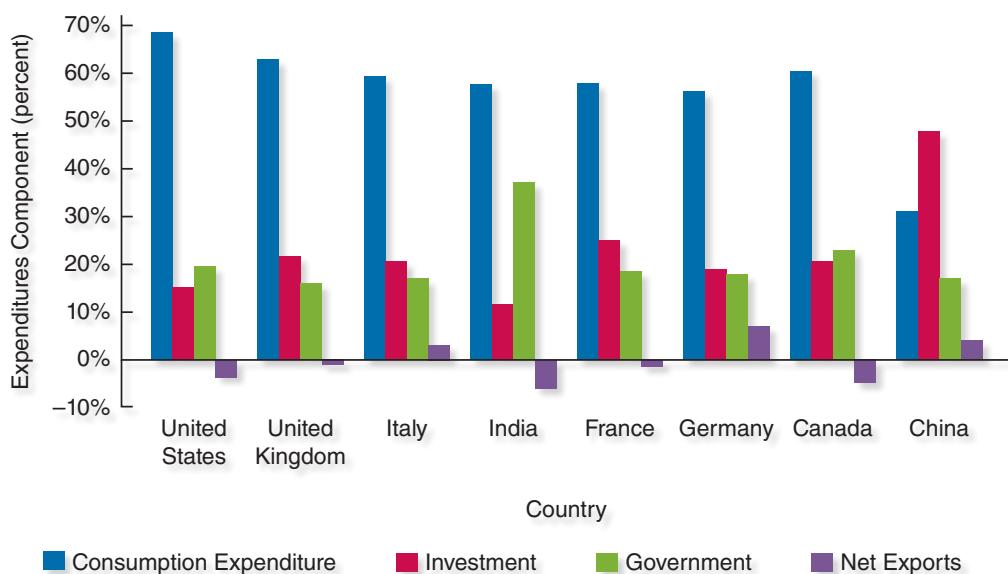


FIGURE 2.3

Shares of Expenditure Components for Different Countries

The United States differs from other countries by having the highest share of GDP going to consumption, a low share of GDP going to investment, and a negative share going to net exports. China has the lowest share of consumption and the highest share of investment.

Source: OECD and for China estimates from *National Bureau of Statistics*. The data are for the year 2010.

TABLE 2.2 INCOME APPROACH TO GDP, 2012

	Billions of Dollars	Percent of GDP
Compensation of employees	8,787	53.2
Other income	3,370	20.4
Corporate profits	2,047	12.4
Total = National income	14,204	86.0
Depreciation	2,575	15.6
Total = Gross national product (GNP)	16,779	101.6
Net factor income	−257.0	−1.6
Total = Gross domestic product (GDP)	16,420	100.0

Source: Bureau of Economic Analysis. Tables 1.12 and 1.7.5. [www.bea.gov/national/nipaweb/
SelectTable.asp?Selected=Y](http://www.bea.gov/national/nipaweb>SelectTable.asp?Selected=Y)

Note: Numbers do not add up to the totals because the statistical discrepancy is ignored.

In addition, the other income category includes indirect business taxes like the sales tax because these taxes need to be added to net income of business to yield their total income. Other income was 20.4% of GDP in 2012.

3. *Corporate profits* is made up of the profits of corporations. It was 12.4% of GDP in 2012.
4. *Depreciation* is the loss of value of capital from wear and tear or because capital has been scrapped because it is obsolete. To obtain the net income of businesses, depreciation was subtracted out, so in order to compute gross income, we have to add it back into GDP. If we do not add depreciation back into GDP, then we call the measure **net domestic product**. Depreciation was 15.6% of GDP in 2012.
5. *Net factor income* equals wages, profits, and rent (called *factor income*) paid to U.S. residents by foreigners minus factor income paid by U.S. residents to foreigners. When U.S. residents get more factor payments from abroad than they pay out, their overall income goes up. Net factor income is typically very small. In 2012, it was a negative number, −1.6% of GDP, indicating that U.S. residents received less income from foreigners than they paid out to foreigners, and so made a negative contribution to GDP.

Income Measures

By adding up the various items in Table 2.2, we get several measures of income reported in the national income accounts. We add up the first three items to obtain **national income**. We then add depreciation to obtain **gross national product (GNP)**, which measures the total income earned by U.S. residents.³ However, some of this income is

³We have ignored *statistical discrepancy*, which is the difference between the production-based measure of GDP and the income-based measure of GDP, because the statistical discrepancy item is usually small. In 2012, the statistical discrepancy was \$101.7 billion, 0.6% of GDP.

not produced domestically, but rather is earned from wages, rents, and profits from production abroad. To get a domestically produced measure of gross product, gross *domestic* product (GDP), we have to add net factor income, which is negative, to gross *national* product (GNP), as Table 2.2 indicates. In 2012, U.S. GDP was \$16.4 trillion.

Private disposable income, the amount of income the private sector has available to spend, is another important income measure that is a key determinant of the level of private sector spending. **Private disposable income** equals the income received by the private sector, plus payments made to the private sector by the government, minus taxes paid to the government. More precisely,

$$\begin{aligned} \text{Private Disposable Income} = & \text{GDP} & (3) \\ & + \text{net factor income} \\ & + \text{transfer payments received from the government} \\ & + \text{interest payments on government debt} \\ & - \text{taxes} \end{aligned}$$

The government also has disposable income available to spend, **net government income**, which equals the following:

$$\begin{aligned} \text{Net Government Income} = & \text{taxes} & (4) \\ & - \text{transfers} \\ & - \text{interest payments on government debt} \end{aligned}$$

Adding Equations 3 and 4 together, we see that private disposable income plus net government income equals GDP plus net factor payments from foreigners, which is gross national product, GNP.



Real Versus Nominal GDP

Now that we have established how macroeconomists determine GDP, let's examine how to use this data for analysis. Refining the GDP data involves separating changes in economic activity from changes in prices.

Nominal Variables

So far, all of the income, expenditure, and production variables we have been discussing are measured at current market (*nominal*) prices and are referred to as **nominal variables**. Market prices allow us to sum up different goods and services to get a measure of GDP, which more accurately should be called **nominal GDP**. However, nominal variables, such as nominal GDP, have one huge disadvantage: they don't tell us what is happening to economic activity over time if prices are changing. If, for example, all prices of goods and services in the economy doubled, then nominal GDP would as well, but the actual quantity of goods produced, and hence economic activity, would be unchanged. When you see an increase in nominal GDP, it could be rising because the quantities of goods and services are rising, or alternatively because the prices of goods and services are rising, or both.

Real Variables

A measure of an economic variable in terms of quantities of actual goods and services is called a **real variable**. The measure of GDP that tells us how economic activity is changing over time is *real GDP*. Real GDP is the value of goods and services produced using constant prices rather than current prices, as is the case for nominal GDP. In other words, real GDP is the GDP measure that is adjusted for changes in the average level of prices in the economy, referred to as the **price level**. Real GDP tells us the total amount of output (actual goods and services) produced in an economy. We can write the relationship between real GDP and nominal GDP as follows:

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Level}} \quad (5)$$

or

$$\text{Nominal GDP} = \text{Price Level} \times \text{Real GDP} \quad (6)$$

To calculate real GDP for the year 2014, let's return to the example of an economy that produces only apples and oranges. We can calculate GDP with all prices set at the values they had in a given year, called a *base year*, say, the year 2005:

$$\begin{aligned} \text{Real GDP in 2014} &= (\text{price of apples in 2005} \times \text{quantity of apples in 2014}) \\ &\quad + (\text{price of oranges in 2005} \times \text{quantity of oranges in 2014}) \end{aligned}$$

If apples sold for 50 cents and oranges for \$2 in 2005, with 1 billion of each produced in 2014, the calculation of real GDP would be as follows:

$$\text{Real GDP in 2014} = (\$0.50 \times 1 \text{ billion}) + (\$2 \times 1 \text{ billion}) = \$2.5 \text{ billion}$$

If the quantity of apples produced rose to 2 billion and the number of oranges produced rose to 1.5 billion, then real GDP for 2015 would be as follows:

$$\begin{aligned} \text{Real GDP in 2015} &= (\text{price of apples in 2005} \times \text{quantity of apples in 2015}) \\ &\quad + (\text{price of oranges in 2005} \times \text{quantity of oranges in 2015}) \\ &= (\$0.50 \times 2 \text{ billion}) + (\$2 \times 1.5 \text{ billion}) = \$4.0 \text{ billion} \end{aligned}$$

Because we kept prices in these calculations at their base-year values, we see that changes in real GDP can occur only if quantities of goods and services produced change. This relationship is exactly what we would want if a measure of GDP is to be an accurate measure of economic activity: changes in *real GDP* provide information on whether economic well-being is improving, while *nominal GDP* frequently does not. Economists quote real GDP in terms of base-year prices. For example, we would say that real GDP in 2015 is \$4 billion in 2005 dollars.

If you just looked at the raw data on GDP, you might conclude that every winter the economy goes into recession, when in reality output tends to fall in cold and snowy months. To get a clearer assessment, economic statistics are **seasonally adjusted**, which means economists adjust the data to subtract out the usual seasonal fluctuations using advanced statistical techniques.